ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 643121

Proj. ECN NA

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	C. A. Rieck, Project W-211, S2-48, 372-2913	[] Yes [X] No	9/25/98
	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
	Project W-211	Tank Farms	Q
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
	HNF-SD-WM-CSCM-036, Rev 0	N/A	N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

The initial release of this document described the software configuration management plan for the 102-SY retrieval control system. This Revision 1 modifies the software configuration management plan to provide comprehensive coverage of all retrieval control systems to be developed for Project W-211.

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

Revising the 102-SY software configuration management plan to provide comprehensive coverage for all W-211 retrieval control systems eliminates unnecessary redundance of developing individual plans for each project-provided control system.

15. Distribution (include name, MSIN, and no. of copies)

GA Block	S2-47	1
SR Briggs	S2-48	1
LR Hall	S2-47	1
EM Koellermeier	S2-47	1
CA Rieck	S2-48	1

DOE/RL Reading Room H-2-53

RELEASE STAMP

DATE: OCT 08 1998 HANFORD RELEASE ID: 2 STA: 1

A-7900-013-2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 643121

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $0	Additional	[] $0	Improvement	[] 0
[X] No	Savings	[] $0	Savings	[] $0	Delay	[] 0

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

Signature		Date	Signature		Date
Design Authority N/A		NA	Design Agent G. A. Block	G A Block	9/23/98
Cog. Eng. C. A. Rieck	C A Rieck	9/25/98	PE N/A		NA
Cog. Mgr. J. E. Van Beek	J E Van Beek	9/30/98	QA N/A		
QA L. R. Hall	Larry R. Hall	9/29/98	Safety N/A		
Safety N/A		NA	Design N/A		
Environ. N/A			Environ. N/A		
Other N/A			Other N/A		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

Project W-211, Initial Tank Retrieval Systems, Retrieval Control System Software Configuration Management Plan

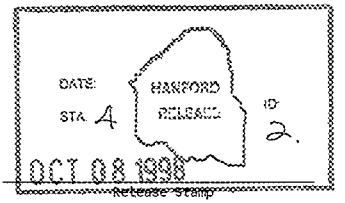
C. A. Rieck
Numatec Hanford Corporation, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 643121 UC: 2030
Org Code: 8C620 Charge Code: D3220
B&R Code: 39EW31301 Total Pages: 18

Key Words: Project W-211, Initial Tank Retrieval Systems, Configuration Management, Retrieval Control System, Software Configuration Management Plan

Abstract: This Software Configuration Management Plan describes the configuration management processes for development of the Project W-211 Retrieval Control Systems.

10/8/98
Release Approval Date



Approved for Public Release

RECORD OF REVISION	(1) Document Number HNF-SD-WM-CSCM-036	Page 1

(2) Title

Project W-211, Initial Tank Retrieval Systems, Retrieval Control System Software Configuration Management Plan

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initial release.		
1 RS	Direct revision to convert tank-specific software configuration management plan to a comprehensive plan that will apply to all retrieval control systems developed by Project W-211. ECN-643121		10/8/98

PROJECT W-211
INITIAL TANK RETRIEVAL SYSTEMS

RETRIEVAL CONTROL SYSTEM
SOFTWARE CONFIGURATION MANAGEMENT PLAN

Prepared by

W211 Control Systems Engineering
Fluor Daniel Northwest

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE

This Software Configuration Management Plan (SCMP) provides the instructions for change control of the W-211 Project, Retrieval Control System (RCS) software after initial approval/release but prior to the transfer of custody to the waste tank operations contractor.

1.2 SCOPE

This plan applies to the W-211 system software developed by the project, consisting of the computer human-machine interface (HMI) and programmable logic controller (PLC) software source and executable code, for production use by the waste tank operations contractor.

The plan encompasses that portion of the W-211 RCS software represented on project-specific AUTOCAD® drawings that are released as part of the C1 definitive design package (these drawings are identified on the drawing list associated with each C-1 package), and the associated software code. Implementation of the plan is required for formal acceptance testing and production release.

The software configuration management plan does not apply to reports and data generated by the software except where specifically identified. Control of information produced by the software once it has been transferred for operation is the responsibility of the receiving organization.

1.3 OVERVIEW

The W-211 project provides for waste retrieval systems in several double-shell tanks. The W-211 software is used to perform process control, monitoring, and data acquisition during retrieval campaigns.

1.4 DEFINITIONS

Software Change Control Board (SCCB): A board, with chairperson, whose primary function is to act as a formal entity to ensure planned and controlled change occurs to a computer system (hardware and software), as appropriate. Personnel on the SCCB typically consist of a mix of selected technical personnel and system users. The SCCB evaluates formally proposed system changes (software and hardware), prioritizes these changes for implementation, and evaluates/approves all completed work.

Engineering Change Notice (ECN): The document that authorizes changes to released design media; in this instance, the AUTOCAD® logic diagrams.

Production: Pertains to the status of a given system following acceptance by the customer.

Software Configuration Management (SCM): A set of management disciplines within the context of the software engineering process that applies technical and administrative direction and surveillance. SCM identifies and documents the functional and physical characteristics of a product, controls changes to those characteristics, and records the change processing and implementation.

2.0 MANAGEMENT

2.1 ORGANIZATION

Fluor Daniel Northwest (FDNW) - FDNW is the designated W-211 software developer, maintainer, and custodian until acceptance and process testing of the system has been completed. Once this occurs, the RCS portion of the W-211 project, and software, will be transferred to the waste tank operations contractor.

Numatec Hanford Corporation (NHC) - NHC is designated as the Project Manager with overall responsibility for design and construction. NHC will establish the SCCB chair, arrange for and assign a software administrator for turnover, assign appropriate SCCB members, approve software changes, and prioritize work.

2.2 RESPONSIBILITIES

Function	Organization	Responsibilities relative to this plan.
Software Owner	NHC	o Assign Software Cognizant Engineer, who is a SCCB member o Assign the Software Administrator(s)
Software Cognizant Engineer	NHC-Assigned	o SCCB Chair o Assist in selecting representatives to SCCB o Represent Owner(s) in Approvals o Approve test results of changes before placing in operation
Software Administrator	FDNW	o Control authorized users, privilege levels, and passwords o Overall Responsibility For SCM o Assign Lead Engineer o Assign software custodian
Software Developer & Maintainer	FDNW	o Provide development and maintenance
Lead Engineer (LE)	FDNW	o Evaluate and implement changes o Evaluate requests for changes for impact on cost, schedule, & deliverables o Maintain changes request log (log is a function within the W-211 application) o Maintain a project library of all software related correspondence
Software Change Control Board	NHC-Assigned	o Accept/prioritize proposed work o Approve or disapprove completed work
Software Custodian	FDNW	o Ensure backup and recovery of application and software o Ensure proper labeling and storage of backup media o Ensure correct software is installed for test and acceptance o Ensure problem reports are distributed to users
Software Engineer(s)	FDNW	o Do the work and conduct tests o Ensure adequate tests are performed o Document test results and include with change request, or indicate supporting document number if applicable o Obtain independent review
Report problems and submit change requests	Any Involved Organization	o Identify and report problems

2.3 INTERFACES

The W-211 RCS will interface with other systems, including the Project W-314, "Tank Farm Restoration and Safe Operation," control system and the existing Tank Monitoring and Control System (TMACS). Communication with the Project W-314 control system will be via an Ethernet link between the PLCs. Communication with TMACS will be via an Ethernet connection (Hanford Local Area Network--HLAN) between the RCS PLC and the TMACS workstations.

Some reprogramming of the W-314 PLC will be required, and a communications driver for the TMACS workstation will have to be developed in order to communicate with these systems effectively. At this time, these programming efforts are outside the scope of the RCS design.

Control of interfaces described above is not required as they are intended for information exchange only.

2.4 IMPLEMENTATION

This SCMP becomes effective for each W-211 RCS after formal release of design media, and is invoked when a problem or software change request is identified. Version change control of source and executable codes becomes effective when released for testing on revisions.

2.5 POLICIES AND PROCEDURES

Applicable parts of HNF-PRO-460, HNF-PRO-464, HNF-PRO-469, HNF-PRO-556, HNF-PRO-564, and HNF-PRO-566 were used in the development of this plan. FDNW, as developer, maintainer, and custodian, will implement FDNW Practice 134.200.0960, Control of Engineering Software.

3.0 SOFTWARE CONFIGURATION MANAGEMENT ACTIVITIES

3.1 CONFIGURATION IDENTIFICATION

3.1.1 Application Software

The HMI software, CI Technologies CITECT®, runs on one or more personal computers (PCs) with Windows NT®. This software creates a number of different file types specific to an application that are used by the generic executables to create an operator interface environment. Each application version is date and time stamped to create a unique identifier assigned by the W-211 developer. The production software release consists of a grouping of the code and executable software products. Each production release is assigned a unique release number by the W-211 developer. The software release number is of the form R.r as described in paragraph 3.1.6.

The PLC code is in the form of a text script (.prg extension), which is generated by the Control Plus® (or equivalent) development software from AutoCad® drawings created with the development software logic set. The AutoCad® drawings are logic diagrams that are released into the CAD Data Management System (CDMS). Output files of these logic drawings (.dxf extension) are converted into PLC text script code, which is then downloaded to the PLC. A Software Change Request or Problem Report form may initiate a proposed change. However, processing an ECN after initial release into the CDMS is the only mechanism for changing the logic drawings. The ECN process, therefore, provides the software configuration control of the PLC code.

3.1.2 Software Products

Each pre-purchased software product (e.g., the application software development packages, the operating system software, the network communications software, etc.) is assigned a unique product name and release version number by the appropriate vendor. The vendor-assigned identification will be used as much as practical on the software documentation.

3.1.3 Computer Hardware

Computer hardware is controlled by normal Hanford administrative procedures. No configuration control is required by the W-211 SCMP, other than identification of the minimum equipment necessary for operation. Note that the PC used to run the RCS HMI (CITECT) software requires a hardware "key" in order to run in the production mode.

3.1.4 Documentation

Each W-211 document or program version is assigned a unique name, number, and revision in accordance with the requirements of HNF-PRO-460 and company Cad file naming conventions. It is intended that each release will be written on a Compact Disk, to become a CD-ROM, specific to a release. Therefore, there will be only one version on a single disk.

3.1.5 Application Reports

Control of the application reports is the responsibility of the software user organizations and is not provided under this SCMP.

3.1.6 Directory Nomenclature

If multiple version media is used, the original or backup source and executable software shall be segregated from later releases using the available directory/subdirectory structure.

A directory shall be provided for the software product, labeled with the product mnemonic. Subdirectories shall be provided for each major revision. Each minor revision shall be contained in a separate sub-subdirectory, uniquely identified with the appropriate revision number. The Lead Engineer will designate major or minor revisions. The subdirectory name shall contain the major and minor revision number, separated by a period. For example:

E:\W211\R1\R1.0 would contain all source and executables for the initial product release.

E:\W211\R1\R1.1 would contain the source and executables for the first minor release.

E:\W211\R4\R4.3 would contain the source and executables for the third minor release of the fourth major product release.

3.2 CONFIGURATION CONTROL

3.2.1 Routine Change

Routine changes to the software will be processed as described in this section. Refer to section 3.2.2 for emergency hardware changes.

Responsible Person	Description of Action
Anyone	Identify a problem with and request a change to the software. Forward the written request to the Software Cognizant Engineer. Include recommendations on how to proceed, when appropriate.
Software Administrator	Determine which changes are appropriate and forward to the Software Developer for analysis and hours estimate.
Lead Engineer	Assign a number to the software change request and enter in the W-211 software change request log. Analyze the change request and estimate hours and impact to complete and implement. Determine if the change requires a major or minor revision. Evaluate requested change with board members and decide whether to accept, modify, reject, or defer. Prioritize accepted changes. Prepare an ECN if changes are required to released drawings. Forward to software engineers to perform the work. Plan with Software Engineer(s) how and to what extent changes to the software will be tested and documented. Forward appropriate problem reports to vendor if there is a problem in vendor's product.
Software Engineer/ Software Developer and Maintainer	Perform the work identified in the change authorization, and conduct tests. Ensure that changes that cannot be tested in a test environment are conducted in a manner that will not have adverse affect on the software production environment. Document test results and include with change request, or indicate supporting document number if applicable. Obtain independent review. Provide change documentation to Lead Engineer.
Lead Engineer	Group one or more changes into a planned release. Evaluate the test results with the Software Cognizant Engineer and/or Software Engineer to determine if the changes (individually and as a whole) are acceptable for a test/production release. Request approval of SCCB to place release into the test/production environment.
Change Control Board (Results via Chair)	Approve or disapprove placing a release in the test/production environment.

Responsible Person	Description of Action
Lead Engineer	Schedule implementation with the Software Administrator. Place source code and executable files for the release on floppy disks, labeled per 3.1.6. Alternatively, place source code and executable files on labeled project release optical of CD-ROM disks in a directory/ subdirectory identified per 3.1.6. This copy shall be treated as the master/original release copy. Place source code and executable files on the secure fileserver backup partition (<password>) in a directory/subdirectory identified per 3.1.6. This copy shall be treated as the backup release copy. The partition password shall be controlled by the Custodian and shall be disclosed only to those with a need to know. Turn over floppy or optical disks to custodian. Obtain close-out signatures. Update the Software Change Request and Problem Report information on W-211. Prepare documentation, secure approvals and place in project file.
Software Custodian	Verify signatures on documentation. Verify removable media is properly labeled. Store removable media in media storage cabinet. Verify backup exists in a properly identified subdirectory on the backup partition.

3.2.2 Emergency Changes

Emergency changes may be initiated to correct software problems that are interfering with the software operation.

Responsible Person	Description of Action
Anyone	Submit a phone request or cc:mail to Lead Engineer, Software Engineer, or Manager identifying problem.
Lead Engineer or Software Engineer	Ensure all actions and documentation described for routine changes are completed as soon as possible following an emergency change.

3.3 CONFIGURATION STATUS ACCOUNTING

The configuration status of all controlled items is shown on the Release Cover Sheet. In addition, the status of all written software change requests and associated releases will be maintained and is available on the W-211 project directory.

3.4 AUDITS AND REVIEWS

W-211 software documentation, including software change control, will be available for audit during normal working hours. The W-211 Project Management team should periodically review the project file and change control documentation to ensure compliance. Other surveillance and audits are the responsibility of outside organizations, and are beyond the scope of this plan.

All changes and tests shall be reviewed (verified) by an independent (i.e., not involved with the actual change, may be involved with the system in general) technical person. For minor changes and releases, test results may be attached to the change request.

Should changes require major modifications or enhancements, the Lead Engineer, Software Cognizant Engineer, and Software Owner/Cognizant Management will determine if a formal project plan will be prepared. The formal plan will identify appropriate technical, verification and validation, and QA reviews commensurate with the complexity of the change.

3.5 ACCESS CONTROL

Access control for operation of the W-211 software is provided by the application, which provides for an authorized user list and associated privilege levels. Authorized users are required to provide a user name and password. Authorized users and passwords for access will be assigned and controlled by the Software Administrator.

3.6 BACKUP AND RECOVERY

At the time of release, the Software Custodian shall create a backup of the source code and executable files in a fileserver backup partition (see section 3.2.1). The Software Custodian is responsible for verifying that the backup is in place and the appropriate files exist.

Recovery is accomplished by rewriting the appropriate files from the master media onto the production fileserver or its replacement. The Software Custodian or Lead Engineer and Software Engineer, as needed, shall perform this task. Should the master media be simultaneously corrupt, recovery shall be from the backup fileserver partition.

4.0 TOOLS, TECHNIQUES AND METHODOLOGIES

Tools and instructions for software administration and usage are contained in the Programmer's Manual that will be submitted for each RCS.

4.1 TEST ENVIRONMENT

All released and controlled W-211 hardware and software modifications/enhancements will be completed and certified in a test environment where possible. Changes will be implemented only after the Software Cognizant Engineer has reviewed and approved the test results and the Software Change Control Board members have approved the implementation. Modifications and enhancements will be grouped logically into subsequent releases.

5.0 SUPPLIER CONTROL

The software developer will ensure that vendor application/software products and revisions are tested prior to being released and transferred for operations use. Changes in vendor application and/or software product will be processed as change requests with the same approval requirements as a locally generated change.

The Software Developer will maintain a software project file or binder of all software-related project documentation, correspondence, and project-produced documents until turnover to the operating contractor. Similarly, vendor provided materials and manuals will be maintained by FDNW until turnover to the operating contractor. This software project file or binder will updated as required to contain the most current version of all documents. The operating contractor may continue implementation of this plan after turnover, but project responsibility ends at turnover unless contracted separately.

6.0 RECORDS COLLECTION AND RETENTION

The W-211 Software Developer will process software development and maintenance records in accordance with FDNW Tank Waste Remediation System Project Procedures Manual, section 3.1.7, Project Filing System.

7.0 REFERENCES

1) HNF-PRO-460 Software Practices - Software Document Control
HNF-PRO-464 Software Practices - Software Control
HNF-PRO-469 Software Practices - Change Request and Problem Report
HNF-PRO-556 Software Practices - Verification and Validation Reports
HNF-PRO-564 Software Practices - Records Retention and Disposal
HNF-PRO-566 Software Practices - Introduction

2) HNF-PRO-244 Engineering Data Transmittal Requirements
HNF-PRO-440 Engineering Document Change Control Requirements

3) CVI Number TBD--User Manual for the W-211 Mixer Pump Variable Frequency Drive

4) CVI Number TBD--User Manual for the W-211 Mixer Turntable Variable Frequency Drive

5) CVI Number TBD--User Manual for the W-211 Transfer Pump Variable Frequency Drive

6) HNF-TBD -- W-211 RCS Programmer's Guide (Tank Specific)

7) CVI Number TBD--User Manual for the W-314 PLC System

8) CVI#22783--Supplement 2, Modicon Quantum Operating Manuals