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		Design Agent			
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		QA			
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K.S. McDaniel 2/4/99 Signature of EDT Originator / Date	K.S. McDaniel 2/4/99 Authorized Representative for Receiving Organization / Date	S.J. Giamberardini 2/4/99 Design Authority/ Cognizant Manager / Date	[ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments

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Software Configuration Management Plan for the B Plant Canyon Ventilation Control System

K. S. McDaniel
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Abstract: Project W-059 installed a new B Plant Canyon Ventilation System. Monitoring and control of the system is implemented by the Canyon Ventilation Control System (CVCS). This Software Configuration Management Plan provides instructions for change control of the CVCS.

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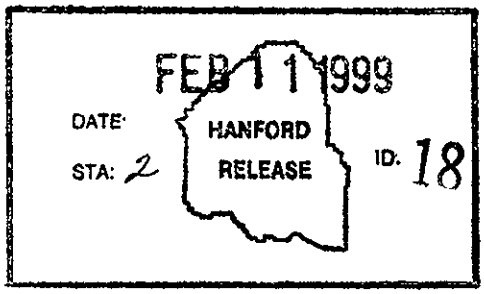

Release Stamp

Approved For Public Release

SOFTWARE CONFIGURATION MANAGEMENT PLAN FOR THE B PLANT CANYON VENTILATION CONTROL SYSTEM

PROJECT W-059

Prepared for

B&W HANFORD COMPANY

January 1999

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Software Configuration Management Plan for the B Plant Canyon Ventilation Control System

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Software Configuration Management Plan for the B Plant Canyon Ventilation Control System

1.0 INTRODUCTION

1.1 Purpose

This Software Configuration Management Plan (SCMP) provides the instructions for change control of the B Plant Canyon Ventilation Control System (CVCS) designed and constructed by Project W-059, B Plant Canyon Ventilation Upgrade. Refer to HNF-3330 for the System Description.

1.2 Scope

This plan applies to the Operator Interface Unit software and the Programmable Logic Controller (PLC) ladder logic software operating on the control system located in Building 221BK. The computers and PLC are located in control panel 221BK-CP-1.

Accompanying this system is a Gateway Solo 2300 laptop computer. The laptop does not directly control the system, but is used for software development and administration. The laptop is portable and maintained by the owner/operator of the system.

1.3 Definitions

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

Software Change Request and Problem Report (SCR/PR): A document which identifies a proposed change to or suspected problem with the software. An SCR/PR may identify a new function, modify an existing function or report suspected problems of the software.

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. It identifies and documents the functional and physical characteristics of a product, controls changes to those characteristics, and it records and reports the change processing and implementation.

2.0 MANAGEMENT

2.1 Organization

CVCS Design Authority --shall be designated as system owner, operator and maintenance authority.

CVSC Design Agent--shall be designated developer, maintainer and custodian until acceptance and process testing of the system has been completed. Once this occurs, the system will be completed and the software transferred to the system owner.

2.2 Responsibilities

Individuals assigned the following roles will be designated by the owner/operator of the system. Current designations will be listed in the change status log maintained by the software custodian.

Design Authority - Review and Approval of all software changes. Authorizes start of implementation. Ensure configuration is compliant with safety basis.

Design Authority Manager - Approval of all software changes prior to installation.

Design Agent - Software Engineer - Implements, installs, and tests software changes.

Design Agent - Software Custodian - Maintains media and change status.

2.3 Interface Control

The Ventilation Control System (VCS) does not interface to any other system.

2.4 Implementation

This SCMP becomes effective whenever a problem is identified or change request is issued. Overall responsibility for the SCM activity rests with the Design Authority described in Section 2.2. Version change control of source code and executables becomes effective when released for testing for major revisions, and released for production on minor revisions.

3.0 SOFTWARE CONFIGURATION MANAGEMENT ACTIVITIES

Configuration Management will be applied to the CVCS as described in this section.

3.1 Configuration Identification

3.1.1 Application Software

Design basis documentation which sets the foundation for the configuration of the CVCS is found in the system description, HNF-3330.

The Operator Interface Unit (OIU) software is Citect that runs on a Pentium class personal computer with Windows NT as the operating system. The software used to configure the PLC also runs on a personal computer and is Siemens TISOFT™.

The OIU software creates a number of different file types specific to an application, which are used to create an operator interface environment. The file types used by the OIU software are described in the Citect Users Guide (Vendor Information). The PLC code created by TISOFT™ is in the form of ladder logic and related configuration database files.

Each production software release shall be a grouping of the code and executable software products, and any modifications to vendor software (e.g., configurations, etc.). The release is assigned a unique release number by the developer. The software release number is of the form R.r as described in HNF-PRO-464, Software Control. Please refer to the sample form in the "Release Cover Sheet and Revision Record", Appendix B. The release form shall also note operating system and development tool revision numbers in Section 7 of this same form.

3.1.2 Software Products

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

3.1.3 Computer Hardware

Computer hardware, such as installed field PLCs is controlled by normal Hanford administrative procedures (e.g., H-2 drawing system via Engineering Data Transmittals (EDT) and Engineering Change Notices (ECN)). Configuration control is required by this CVCS SCMP, only for the cases of 1) identification of the minimum equipment necessary for operation and 2) evaluation of impacts caused by field hardware changes that are part of the design basis documentation set--via an SCR/PR.

3.1.4 Documentation

SCR/PR forms shall be kept in local project files in log form by the Design Authority. When a Release of the CVCS software occurs, the Design Authority will establish either 1) a file with the information related to that release, or 2) will produce an HNF document to formally document the Release sheet and associated SCR/PRs.

3.1.5 Removable Media Labels

Removable media (floppy disks) shall be labeled consistent with the information contained in the HNF-PRO-464, Software Control.

The removable media will record the following information on the label:

- Media identifier (i.e., disc number)
- Software identification
- Software revision identification ("R.r", "R" = major and "r" = minor software changes, e.g., 1.0)
- Software or data name or description
- Responsible organization and software custodian's name
- Recording date and time.

3.1.6 Directory Nomenclature

Original or backup source and executable software placed on media containing multiple versions/revisions shall be segregated using the available directory/ subdirectory structure.

On the production systems, only the most current version will be maintained in a single project directory. For the OIU this will be the CITECT project directory identified as "W059." For the PLC, the configuration is stored in the PLC memory.

On the laptop, a separate CITECT project directory will be maintained for each major release. For minor releases, changes (edits) will be made directly to the most current major release files.

3.2 Configuration Control

SCR/PR approvals are recorded and submitted using the SCR/PR form. See Appendix A for an example of the form.

E-mail approvals for processing SCR/PRs may be substituted for handwritten approvals. When e-mail approvals are used a copy of the e-mail approval must be attached to the SCR/PR.

Telephone approvals for processing SCR/PRs may be used, but subsequently, must be documented on the SCR/PR form or with an e-mail approval.

3.2.1 Routine Change

Anyone in owner/operator organization:

- Prepare a SCR/PR to identify a problem with or request a change to the software.
- Ensure that evaluation is performed of design basis documentation changes (via an SCR/PR and attached ECN with USQ review) for potential changes to the WRSS DAS.
- Forward the SCR/PR to the Design Authority. Include recommendations on how to proceed when appropriate

Design Authority (or delegate):

- Ensure the change is compliant with the Safety Basis.
- Determine which SCR/PRs are appropriate and forward to the Software Engineer for analysis and hours estimate.
- Evaluate whether the change is an emergency or routine SCR/PR.

Software Engineer:

- If routine, assign a SCR/PR Number and enter it in the status log. See example in Appendix B.
- Analyze SCR/PR and estimate hours and impact to complete and implement.
- Determine if SCR/PR requires a major or minor revision.
- Evaluates SCR/PRs with change control board members and decides to accept, modify, reject, or defer.
- Prioritize accepted SCR/PRs. Forward to Software Developer and Maintainer\Software Engineer(s) to do work.
- Plan with Design Authority how and to what extent changes to the software will be tested and documented.
- Forward appropriate problem reports to vendor if it is a problem in vendor's product.
- Do the work identified in SCR/PR 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 Software Custodian.
- Group one or more SCR/PR's into a planned release.
- Evaluate the results of the tests with Independent Reviewers (e.g., the Design Authority, etc.) to determine if the changes (individually and as a whole) are acceptable for a test/production release.

- Schedule implementation with the Design Authority.

- Place source code and executable files for the release on floppy disks, labeled per Section 3.1.6.

Design Authority Manager:

- Approve or disapprove placing a release in the test\production environment.

Software Custodian:

- Verifies signatures on documentation.

- Verifies removable media are properly labeled.

- Stores removable media in a media storage cabinet designated by the Software Custodian.

- Place source code and executable files on the fileserver backup partition directory identified per 3.1.7. 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.

- Verify that the SCR/PR closeout is distributed to the initiator and others as appropriate.

- Maintains a configuration status log on the backup server.

3.2.2 Immediate Changes

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

Anyone in owner/operator organization:

- Submit a phone request or e-mail to the Software Engineer identifying problem.

Design Authority:

- Evaluate whether the change is an immediate or routine SCR/PR.

- Note: Definition of an "immediate" is up to the discretion of the Design Authority or delegate

- If immediate, then ensure all actions and documentation described for a routine change are completed as soon as possible following an immediate change to the system software.
-

3.2.3 Software Copies

Software will be controlled in four locations as follows:

- Production copy - latest release stored and operating on the production equipment.
- Working copy - latest release with changes in process stored on the laptop.
- Master copy - floppy disks for each major and minor release, labeled and stored by software custodian.
- Backup - duplicate of each master copy stored on the backup server in directories named to correspond to the floppy disk release numbers.

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 SCR/PRs and associated releases will be maintained and be available on the backup directory as a log file.

3.4 Audits and Reviews

The CVCS and associated documentation, including software change control, will be available for audit during normal working hours. The Design Authority Manager should periodically assess the project file and change control documentation to ensure compliance. Other surveillance and audits are the responsibility of other outside organizations and are outside the scope of this plan.

All changes and tests shall be reviewed (verified) by an independent technical person. For minor changes and releases, test results may be attached to the SCR/PR.

Should changes require major modifications or enhancements, the Design Authority and Design Authority Manager will determine if a formal plan will be prepared. The formal plan will identify appropriate technical, V&V and QA reviews consistent with HNF procedures and commensurate with the complexity of the change.

3.5 Access Control

Access control for operation of the CVCS software is provided by the application. It 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 Design Authority or delegate.

3.6 Backup and Recovery

Backup of the source code and executable files that constitute each product release is done by the software custodian onto the fileserver backup partition selected and documented by the Software Custodian at the time of release. The Software Custodian is responsible for verifying that the backup is in place and the appropriate files exist.

Recovery shall be accomplished by rewriting the appropriate files from the master media onto the production system. This shall be accomplished by the Software Custodian or Software Engineer as needed. Should the master media be simultaneously corrupt, recovery shall be from the backup fileserver copy.

4.0 TOOLS, TECHNIQUES, AND METHODOLOGIES

4.1 Development Tools

The working copies of CITECT and TISOFT™ software are loaded on the Gateway Solo 2300 laptop computer. Refer to vendor information on operation and use of these products.

The CITECT software permits execution of the OIU application in a simulated I/O mode. This facilitates testing and debugging. Once tested and approved for release, the OIU application can be transferred by floppy disk to the production machine. Once transferred, the application should be recompiled on the production machine before execution.

The TISOFT™ product does not have a simulation feature. However, the PLC ladder logic can be viewed, edited, and saved on the laptop and later loaded onto the PLC. The logic is loaded via a COM port and communications cable. Once connected with the PLC, TISOFT™ permits live viewing, editing, and forcing of logic states. This facilitates testing and debugging. Caution should be used when operating TISOFT™ in this mode since the PLC is in actual control of field devices.

4.2 Test Environment

All CVCS software modifications and enhancements will be completed and certified in a test environment where possible. These changes will be implemented into the production environment only after the Design Authority has reviewed and approved the test results and the Design Authority Manager has approved the implementation. Modifications and enhancements will be grouped logically into production releases.

5.0 SUPPLIER CONTROL

The Software Engineer will ensure that new releases and installation of the vendor application and software product are tested prior to its being placed in production. Changes in vendor application and/or software product will be processed as a change request or problem report with the same approval requirements as a locally generated change.

The Software Engineer will maintain a software project file or binder of all software-related project documentation, correspondence, and project produced documents. Vendor provided materials and manuals will be maintained by the Software Custodian. This software project file or binder will maintain the most current version of all documents for the life of system.

6.0 RECORDS COLLECTION AND RETENTION

The CVCS Software Engineer will process software development and maintenance records in accordance with HNF-PRO-564, Records Retention and Disposal. Any items indicating "Forward to Records Management..." will instead be sent to the Design Authority Manager. These records include, at a minimum, the SCR/PR log and SCR/PR form entries, and will be kept by the Design Authority in local project files.

7.0 REFERENCES

1. HNF Information Resource Management Procedures

HNF-PRO-433, Small Job Development,
HNF-PRO-555, System Configuration Management Plan,
HNF-PRO-464, Software Control
HNF-PRO-564, Records Retention and Disposal.

2. HNF Engineering Program

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

3. B Plant Canyon Ventilation Control System Description, HNF-2115

APPENDIX A

SOFTWARE CHANGE REQUEST AND PROBLEM REPORT FORM

SOFTWARE CHANGE REQUEST OR PROBLEM REPORT

NOTE: Submitter Fills In Parts 1-8 (NON-GRAY)	DESIGN AUTHORITY USE ONLY
1. SCR Type: [ ] Problem [ ] Enhancement	SCR Number:
2. Submitted By:	Date:
3. Project Name:	TPCN, W/O, Task Order:
4. Software Program Name:	Current Ver/Rev:
5. Submitter's Priority [ ] (1= Critical 2= Very Important 3= Important 4= Inconvenient 5= Interesting)	6. Requested Completion Date:

7. Task/Change/Problem Title (One Sentence Description):

8. Detailed Description/Justification (Attach Additional Sheet If Necessary):

DESIGN AUTHORITY USE ONLY:	Software Change Request Or Problem Report Resolution Information
Decision By:	[ ] Accept [ ] Modify [ ] Reject [ ] Defer
Assigned To:	Target Release Date:
Solution Comments/Impact:	
Software Programs, Modules or Files Affected:	
Task Completed By:	Date:
Verified By:	Date:
Actual Release Version:	Date:
Closed By:	Date:

These instructions are for preparing the Change Request or Problem Report. If more space is needed, use blank pages and attach to the SCR/PR form. This will be the record of the change request or problem report.

Anyone may submit a Change Request or Problem Report:

1. Indicate if this is a problem report or request for enhancement.

2. Record the name of the person submitting the form and the date.

3. Enter CVCS for project.

4. Enter CVCS for software program name.

5. Record submitter's evaluated priority as shown.

6. Provide a requested completion date, or leave blank if unknown.

7. Provide a single sentence title of problem or enhancement.

8. Provide a description of the changes requested or the problems being reported. Provide justification if this is a change request. Attach additional sheets if necessary.

Design Authority:

a. On receipt, enter into the CVCS SCR/PR Log. Enter the next SCR number on the form.

b. Enter the date received.

c. Enter charge number if known, otherwise, leave blank.

d. Enter current Version/Revision of the product.

e. Review change request or problem with manager. Note that SCR/PR may require attached cost estimate and planning if extensive changes or testing are anticipated. Mark accept, modify, reject or defer as appropriate.

f. Design Authority signs "decision by" block, and assigns to Software Engineer, if accepted.

g. Assigns a Software Engineer in the Assigned To field and a Target Release Date as appropriate.

h. Software Engineer fills in solution, impacts and comments area, and identifies programs, modules and files to be affected. A list may be attached. Also documents/performs testing as identified by the Design Authority and attaches test results or additional verification documentation.

i. Software Engineer signs "Task Completed By" block and passes to independent reviewers.

j. Independent reviewer(s), at a minimum including the Design Authority, signs "Verified By" block.

k. When included in a release, place release version in "Actual Release Version" block.

l. Design Authority signs "Closed By" block when complete or rejected.

APPENDIX B

CVCS RELEASE COVER SHEET AND REVISION RECORD

RELEASE COVER SHEET & REVISION RECORD

1. Software ID (Name): Rev:
2. Release Type: [ ] Initial Release [ ] Change [ ]App Des [ ] Sfty Cls

3. Abstract

4. Software Files (or attach directory listing)

5. Software files record storage media and location

6. Documentation	Title	Number	Rev
Requirements			
Design			
Design Verif.			
Validation			
User			
Config. Cntl.			

7. Environment	Description	Rev	IL/Sfty Class
Hardware			
Oper. Software(s)			
Language(s)			
Comm. Networks			

8. Released for:

[ ] Integration [ ] Operational Test [ ] Operation

9. Approvals

Software Engineer:_____ Date:_____

Design Authority:_____ Date:_____

Software Custodian:_____ Date:_____

Instructions for the Release Cover Sheet & Revision Record

Fill out as indicated. See example as follows:

1. Provide Software Name and new revision number.

2. Check release type. Indicate Approval Designator and Safety Class (SC, SS, GS).

3. Provide an abstract describing the product being released. Indicate if only a portion of the software is being modified.

4. List all source and executable files that are being released, and where they reside. Attaching a directory listing is acceptable, if it includes the full name of the file, creation date and time (combination is version identification). Date on all files may be set to release date, time may be set to indicate the release version number (e.g. 2.07a).

5. Indicate source and executable file master type (floppy disk, optical, magnetic tape), media serial number and storage location. This media will be held by the software custodian.

6. List the documentation components for the release.

7. List the operational environment of the software.

8. Check the reason/limits for the release.

9. Provide approval signatures as required by SCMP.

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	K. S. McDaniel	Date 02/04/99
Project Title/Work Order		EDT No. 625883
Software Configuration Management Plan for the B Plant CVCS (HNF-3331)		ECN No. N/A

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
K. S. McDaniel	S6-70	x			
S. J. Giamberardini	S6-70				x
R. G. Egge	S3-21	x			
G. M. MacFarlan	S3-21	x			
R. F. Schumacher	S6-70				x
E. Gonsalves	S6-70				x
G. V. Delisle	B4-39	x			