

SEP 4 1991

TASK 5 EVALUATION

- 1 -

Dr. Budhi Sagar
Center for Nuclear Waste
Regulatory Analyses
Southwest Research Institute
6220 Culebra Road
San Antonio, Texas 78228-0510

Dear Dr. Sagar:

SUBJECT: EVALUATION OF CNWRA PERFORMANCE ASSESSMENT TASK 5 INTERMEDIATE
MILESTONE 20-3702-065-405: TECHNICAL OPERATING PROCEDURE FOR
CONFIGURATION MANAGEMENT AND CONTROL OF SCIENTIFIC AND ENGINEERING
COMPUTER CODES

Performance Assessment Task 5 Intermediate Milestone No. 20-3702-065-405,
submitted by the CNWRA on August 16, 1991, has been reviewed by appropriate
NRC staff and found acceptable.

Comments from the review are enclosed. If you have any questions regarding
the comments, please contact James Park at (301) 492-0592.

Sincerely,

Shirley L. Fortuna
CNWRA Deputy Program Manager
Program Management, Policy Development
and Analysis Staff, NMSS

Enclosure:
As stated

cc: J. Funches, NMSS/PMDA
S. Mearse, ADM/CAB

DISTRIBUTION: CNWRA-91-0123

Central Files
BJYoungblood, HLWM
SCoplan, HLHP
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MFederline, HLHP
SFortuna, PMDA

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Wm-11
NHXR
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WM-11 CF

OFC :	HLHP	HLHP	: PMDA/NMSS	: NMSS	:
NAME:	JPark/cj	SCoplan	: SFortuna	: JLFunches	:
Date:	9/14/91	9/14/91	: 9/14/91	: 9/14/91	: / / 91 : / / 91



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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A handwritten signature in cursive script that reads "Shirley L. Fortuna".

Shirley L. Fortuna
CNWRA Deputy Program Manager
Program Management, Policy Development
and Analysis Staff, NMSS

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Staff Comments

on

CNWRA Technical Operating Procedure, TOP-018, "Configuration Management and Control of Scientific and Engineering Computer Codes" (Rev. 0)

General Comments

The Technical Operating Procedure presented takes into account almost every aspect of code configuration. Additionally, the procedure reflects knowledge of industry standards in configuration management.

Specific Comments

1. Applicability of Procedure

In Section 1, Purpose and Applicability, it is stated that "[t]he Center will also use this procedure for the management of those computer codes that will be used by the DOE in developing its license application that will be provided to the NRC (and the Center) for review." The staff considers that the procedure will be applicable to the DOE codes to a limited extent, since these codes will have been developed and modified by DOE outside of the Center's procedure. Subsequent modifications to the codes by NRC or the Center will need to be documented according to the procedure.

2. Initial Code Baselines

Under the code configuration procedure, all changes to a baselined code will be documented. It is not immediately clear from the procedure how the initial baseline will be established. Although general reference is made to (1) executing test problems to ensure a code is functioning (page 8), (2) preparing a certain minimum amount of documentation (page 8), and (3) preliminary testing to determine code accuracy (page 12), explicit criteria for the establishment of initial code baselines are not apparent. In addition, the staff considers that terms such as "functioning" and "code accuracy" can take on a range of meanings. Criteria for the establishment of initial baselines need to be clarified.

The staff anticipates that the procedures for verification and validation of computer codes (to be developed in the future) will address further the establishment of code baselines.

3. User's Documentation

In Section 6.1(e), the minimum acceptable documentation for a computer code will consist of, in part, a User's Manual, which will provide "step by step instructions" on the use of the code. Additional documentation detailing the mathematical and numerical bases for the code is desirable but not mandatory. While it is recognized that the preparation of a User's Manual can be a tedious task, the staff considers that the minimum requirements for such

documentation should be made more specific. NUREG-0856 provides extensive guidance in this area.

4. Use of Software Problem/Change Report

The Software Problem/Change Report (SPCR) is used to document requests for changes to particular codes to fix problems identified by a user. The Element Manager must approve these changes before they can be implemented. The SPCR also is used to document modifications made by users to specific codes; these modifications do not require any prior approval. The use of a single form to document both approved and unapproved changes to a code may lead to some confusion among the participants implementing this procedure. The staff considers that a possible solution could be to create two separate forms, one to document changes approved to deal with identified problems with a code, and another to track normal and trial modifications made to codes by users. This would appear to improve the transparency of the procedure and its products.

5. Transferal of Code Changes Across Hardware Environments

In Section 6.3(e), Control of Software on Multiple Machines (page 14), the Code Custodian will insure that "modifications made for a code for one hardware environment are transferred to other versions appropriately." It is not clear whether this means that the changes will be transferred to the same versions of the code on other hardware environments or only to other versions of the code on the same environment. The staff considers that users should have access to all current versions of a code on each hardware environment on which the code is running.

6. Abbreviation and Definitions

- o A definition was provided for a Version Description Document. The procedure does not discuss this document, and the abbreviation is not used in the text.
- o Verification is defined as the "assurance that a model as embodied in a computer code is a correct representation of the process or system for which it is intended." This appears to be an incorrect definition. In NUREG-0856, this is the definition of validation and not of verification. Furthermore, a discussion of verification or of validation does not seem appropriate for this procedure, which deals only with the configuration control of software and documentation for computer codes.
- o Under the discussion of software media and source code header data and formats, on pages 10 and 11, the undefined term "unit" is used. The staff considers that perhaps the term "subroutine" was intended instead.

7. Typographical Errors and Unidentified References

- o On pages 7, 12, and 13, the Software Summary Form is referenced as Figure 1. This form, which can be found in Appendix A, is not labeled there as Figure 1.

- o Under Paragraph 2 of Section 6.1(b), Maintaining Active Code Directories, the last word on the first line, "separate," is apparently misspelled.
- o In Section 6.1(d) on page 8, the Software Release Notice is referenced as Figure 2. This form, which can be found in Appendix C, is not labeled there as Figure 2.
- o In Section 6.1(d) on page 8, the Software Problem/Change Report is referenced as Figure 3. This form, which can be found in Appendix B, is not labeled there as Figure 3.
- o In the first sentence of Section 6.1(e), Computer Code Documentation, "file custodian" is not capitalized.
- o In Section 6.1(e)(1), Minimum Documentation, a reference is made to Section 5.3 in order to locate further detail on the preparation of user's documentation. In the procedure, Section 5.3 provides the definition for "Component model."
- o Under Paragraph 2 of Section 6.1(f), Control of Physical Files, Section 5.1(b) is referenced. This section does not appear in the procedure.
- o In Section 6.2(c), Testing the Code, Section 5.3(e) is referenced. This section does not appear in the procedure.
- o In Section 6.2(d), Preparing a User's Manual, Section 5.3(a) is referenced. This section does not appear in the procedure.