WHITING LETTER



AUG 09 1989

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Mr. Allen Whiting, Director
Systems Engineering and Integration
Center for Nuclear Waste Regulatory Analysis
P. O. Box 28510
6220 Culebra Road
San Antonio, Texas 78228-0510

Dear Mr. Whiting:

SUBJECT: DRAFT PLAN FOR CONVERSION, TRANSFER, AND CONFIGURATION MANAGEMENT OF TECHNICAL COMPUTER CODES

NRC staff has reviewed CNWRA's informal draft plan for transfer and maintenance of computer codes, and has the following comments:

1) The passage of time has made Phase I of CNWRA's draft plan moot. (Phase I deals with maintenance of codes during conversion of INEL's computer facilities from CYBER to CRAY hardware.) We recommend deletion of the items in Phase I.

2) Item 1 of Phase II (compilation of a "complete listing" of codes and databases at INEL, SNL, and other computer facilities) is overly broad, and would identify numerous codes and databases of little or no value to the NRC staff. I recommend that item 1 be reworded to read:

> Compile a listing of codes and databases developed by Sandia National Laboratories and other NRC contractors for the NRC HLW program, and of other codes and databases as specifically requested by the NRC or as presently determined by CNWRA to be important to the HLW program.

3) Item 3 of Phase II (evaluation of codes and comparison with user needs) would be a major undertaking if carried out in any detail. Instead of trying to perform such evaluations as part of this code maintenance project, it seems more reasonable to view the evaluation as the user's responsibility, and to require documentation of the evaluation as part of the statement of user need. It is recommended that item 2 (conduct user need survey) be reworded accordingly, and that the first two sentences of item 3 be deleted. CNWRA should, as a user, remain cognizant of codes in use by DOE, the State of Nevada, and others if significant, for example other countries, and should recommend to NRC computer codes deemed important for acquisition.

4) Deletion of item 5 of Phase II is recommended, which refers to identification of ongoing or new programs that will fulfill user needs that are not currently being met. As with 3), above, it seems that this identification can be done better by the users than by a code maintenance project.



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5) Two new items should be added to Phase II: a) Identification of codes and data bases expected to be used or generated in the NRC's "MOU" preliminary performance assessment exercise, and b) Identification of codes and data bases expected to be developed by the Center for the NRC. Phase III should include a plan for implementing configuration management for these codes and data bases at the direction of the NRC program element manager.

6) Item 1 of Phase III refers to "validation, verification, and configuration management" of codes. We recommend deletion of the terms "validation" and "verification," since these activities are well outside the scope of a maintenance and configuration management project.

7) CNWRA's draft plan should be expanded to include maintenance and configuration management of HLW program codes and databases developed for personal computers.

8) CNWRA's draft plan should contain a provision for an NRC/CNWRA approval of "user needs" for codes or databases to be maintained. Without some control, the number of codes and databases being maintained could become excessive.

9) CNWRA's draft plan should be more specific regarding the proposed project. For example, no criteria are presented for identification of codes or databases to be maintained. If a "user need" identified a code to be used only for scoping studies, but not in support of rulemaking or licensing activities, that code should probably not receive formal maintenance and configuration management. As another example, no mention is made of the conversion effort often required when acquiring codes developed for different hardware. While the title of the draft plan seems to indicated that conversion is included, no specific plans are included for accomplishing this effort.

In summary, the final plan should be based on acquisition only of codes identified by NRC and CNWRA users; thereby limiting the expenditure of resources on unnecessary codes. The initial phase should proceed with the acquisition of codes which CNWRA has already been requested to acquire. After completion of that phase of the project, a joint NRC/CNWRA "lessons learned" session would be held before proceeding with acquisition of additional codes from other sources.

Sincerely,

/S/

Philip Altomare, Project Element Manager
Engineering Branch
Division of High-Level Waste Management

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# DRAFT PLAN FOR CONVERSION, TRANSFER, AND CONFIGURATION MANAGEMENT OF TECHNICAL COMPUTER CODES
February 28, 1989

## I. BACKGROUND

In its "Modeling Strategy Document for HLW Performance Assessment" (July 1984), the NRC described its plans and options concerning development and use of computer codes and associated databases to evaluate compliance of the DOE with the relevant portions of 10 CFR 60 and 40 CFR 191. The strategy being pursued by the NRC requires that a complete range of codes (models) and databases be available to its direct and contractor staffs. Four specific "levels" of modeling were identified in the Strategy document:

1. "Critically evaluate and comment in detail on DOE work."
2. "Use simple, conservative (bounding) models with conservative data."
3. "Review and qualify DOE (or third party) models and codes to the extent practicable. Use DOE (or third party) models and codes to verify some or all of DOE's analyses."
4. "Independently develop models and codes for use in independently verifying some or all of DOE's analyses."

Figure 1, displays the NRC's view (as of 1984) concerning the levels of modeling appropriate to the various aspects of the licensing methodology.

The Center was recently advised that the computer center at Idaho National Engineering Laboratory (INEL) will phase out its Cyber computer on or about March 1, 1989. This event gave impetus to advising the NRC of an approach that could be taken to meet the short-term goal of maintaining staff access to the (primarily performance assessment) codes and databases that are resident on the affected computers in a manner that is consistent with fulfilling the long-term goals of (a) staff access to these and other codes and databases and (b) implementation of a configuration management program to ensure the integrity of codes and databases that are intended to be used in the high-level nuclear waste regulatory process.

This document outlines the principles, approach and schedule, and anticipated results of implementing the suggested approach.

## II. PRINCIPLES

The fundamental principles that will be employed by the Center in accomplishing the conversion, transfer, and configuration management (CTCM) for codes and databases are outlined below.

1. Prevent loss of codes and databases. With the imminent change of computer systems at INEL, this principle is of most immediate concern. Those codes and databases that must be immediately and continuously available to the NRC and Center staffs will be placed in a "safe" and accessible mode as soon as possible.



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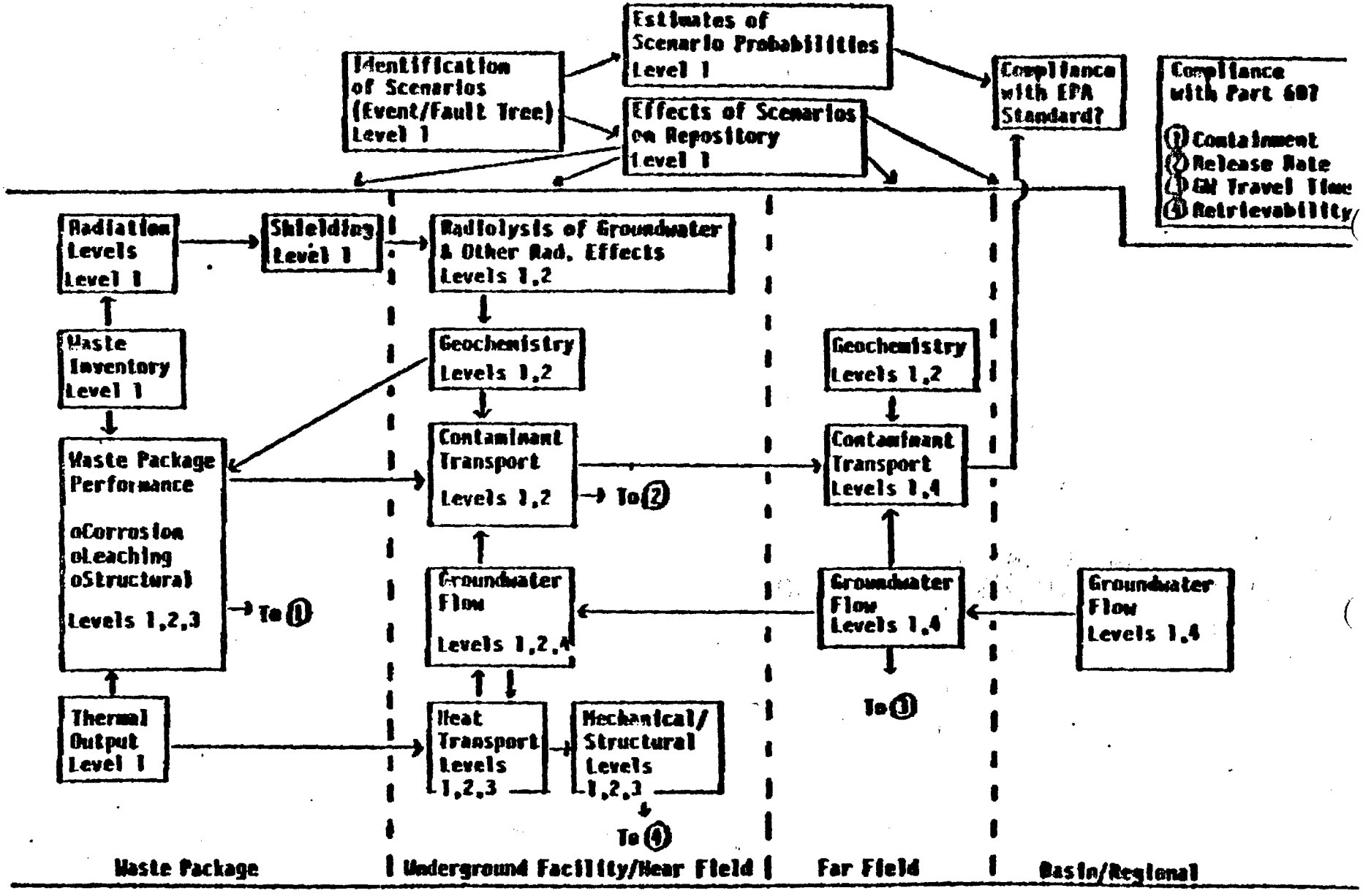


Figure 1. Illustrative Licensing Assessment Methodology

2. Minimize unnecessary expenditure of effort in code and database transfers. To prevent unnecessary commitment of resources, it will be necessary to identify those codes and databases which are needed to accomplish the regulatory mission of the NRC and its contractors under the NWPAA of 1987. Those codes and databases that are no longer needed or that are judged to be incapable of meeting programmatic needs (currently or with appropriate modifications) will be archived without any effort being expended to convert and/or transfer them.

3. Maintain or enhance ease of access. Access at one or more central locations, the role of "gateway" systems, and PC-based codes will be evaluated as options.

4. Maximize cost-effective availability of codes and databases. Options will be evaluated to determine the most effective and resource-efficient mode for making codes and databases available to the NRC and the Center. Federal versus private computer facilities will be evaluated.

5. Provide for code and database integrity. A code validation, verification, and configuration management program will be developed and implemented as an essential feature of the regulatory program.

## III. APPROACH AND SCHEDULE

The following general approach will be implemented upon approval to effectively and efficiently accomplish CTCM for codes and databases. Note that this approach is "phased" to ensure that the principles outlined in Section II are implemented in a timely and efficient manner. Nonetheless, certain components of the phases can be accomplished in parallel, provided sufficient resources are available and this task is given a sufficiently high priority. Note that the schedule indicated below has not yet been coordinated with the overall Center program and is, therefore, subject to modification.

### PHASE I -- ENSURE AVAILABILITY OF CODES AND DATABASES FOR WHICH THERE IS IMMEDIATE NEED

| Item | Schedule |
|---|---|
| 1. Contact INEL computer facility to determine actions needed to ensure continued availability of all codes and databases resident on the INEL mainframes. Note that the computer facility may provide for certain "routine" actions necessary to transfer codes and/or databases. | 3/89 |
| 2. Prepare lists of codes and databases that will be unaffected and those that will be affected by the change of systems at INEL. | 4/89 |



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| 3. | Advise NRC of affected codes and obtain their statement of need and schedule for need for the affected codes. Develop a similar assessment of need and schedule for codes and databases required directly by the Center. | 4/89 |
| 4. | Estimate effort and cost to convert and/or transfer those codes which were identified by the NRC and the Center as needing to be immediately and continuously available. | 5/89 |
| 5. | If estimated effort and cost are within scope, implement actions to convert and/or transfer the relevant codes and databases. If not, implement those actions that are possible, in accordance with established priorities, and request resources to accommodate remaining actions. | 5/89 |

PHASE II -- IDENTIFY AND FULFILL LONGER-TERM CODE AND DATABASE NEEDS

| Item | | Schedule |
|---|---|---|
| 1. | Compile complete listing of codes and databases resident on INEL, SNL, and other computer facilites. | 5/89 |
| 2. | Conduct "user need" survey of the NRC and CNWRA staff and management to determine code and database requirements and the schedule for those requirements. | 6/89 |
| 3. | Evaluate the available codes and the stated needs to determine the extent to which those needs are met with the available codes. Assess which codes and databases are being used but are inadequate to the task. Determine whether any codes are being maintained and/or developed which are no longer relevant to the high-level nuclear waste program, as modified by the NWPAA of 1987. | 8/89 |
| 4. | "Retire" or archive those NRC codes and databases resident at INEL, SNL, etc. that are no longer needed to support the HLW regulatory program, as modified by the NWPAA of 1987. | 8/89 |
| 5. | For those needs which were identified in Item 2 but are not currently being met, identify ongoing or new programs that will fulfill the need. | 10/89 |



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| 6. | For those codes and databases that were identified as needed in Item 2 and which are currently available, develop a plan for ensuring their continuing availability to the program. This plan would include a cost-benefit comparison for at least two options: maintain codes at a Federal facility or transfer and maintain them at a private facility. | 10/89 |

PHASE III -- ASSESS AND IMPLEMENT CODE AND DATABASE CONFIGURATION MANAGEMENT

| Item | | Schedule |
|---|---|---|
| 1. | Evaluate NUREG-CR3451, NUREG-0856, and other relevant documents to establish requirements for code validation, verification, and configuration management. | 6/89 |
| 2. | Assess the current status of codes and databases available to the NRC through INEL, SNL, etc. in the context of the requirements identified in Item 1, above. | 7/89 |
| 3. | Provide preliminary status assessment to NRC with recommendations for implementation of specific configuration management features on the HLW program (specifically, Center and NRC work in support of the licensing process). | 7/89 |
| 4. | Prepare an Integrated Configuration Management Plan (ICMP) which incorporates all pertinent quality- and management-control features that are appropriate to the high-level nuclear waste regulatory mission. Obtain NRC approval. | 11/89 |
| 5. | Implement the ICMP (by means of Technical Operating Procedures) on the codes and databases in accordance with established priorities. | TBD |

## IV. ANTICIPATED RESULTS

Employing the principles outlined in Section II, the Center intends to provide continued access to those codes and databases that are judged to be relevant to the high-level nuclear waste regulatory mission of the NRC.

It is important to recognize, however, that because of (a) lack of information concerning future actions at the INEL and other facilities, (b) the developing nature of the NRC performance assessment program, and (c) uncertainties in resource (people and facilities) availability, there are risks associated with this or any other approach. Therefore, the outlined approach will need to remain flexible and responsive to these changing needs and situations.



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