

MAR 06 1993

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MEMORANDUM FOR: Joseph Holonich, Project Director
Repository Licensing & Quality Assurance
Project Directorate
Division of High-Level Waste Management, NMSS

Ronald Ballard, Branch Chief
Geology and Engineering Branch
Division of High-Level Waste Management, NMSS

Mel Silberberg, Branch Chief
Waste Management Branch
Division of Regulatory Applications, RES

FROM: Margaret Federline, Branch Chief
Hydrology and Systems Performance Branch
Division of High-Level Waste Management, NMSS

SUBJECT: DEVELOPMENT OF PERFORMANCE ASSESSMENT STRATEGIC PLAN

The Performance Assessment Section of HLHP, in cooperation with the CNWRA, is developing a Performance Assessment Strategic Plan. This document will provide a strategic plan for the conduct of performance assessment and performance assessment-related activities for the high-level waste management program at the NRC for the duration of the HLW program. The plan will consist of the identification of: (1) top-level goals for performance assessment activities, (2) technical issues of importance in predicting postclosure performance, (3) strategies to address resolution of these issues, and (4) task descriptions and schedules for the implementation of these strategies. A final version of the plan is scheduled to be completed by the end of June 1993. This effort will support the Overall Review Strategy.

Because performance assessment is inherently interdisciplinary and because we have been successful in a cooperative, collegial approach to performance assessment, I am requesting your assistance and that of your respective staffs to aid in the development of this plan. The Performance Assessment Section of HLHP has the primary responsibility for the development of the strategic plan. However, we would like to obtain the assistance in this endeavor of the Section Leaders within each branch and a selected staff member within each section, who would help in identifying and prioritizing the relevant technical issues and the strategies for their resolution. In addition, there will be several opportunities for review and comment on drafts of the document at various stages in its development. Ultimately, we will seek your concurrence for this plan.

We are working by E-mail to find a suitable time this week for a kick-off meeting to apprise you of the current status of the plan's development. We intend to discuss an annotated outline of the document and a list of technical issues which have already been tentatively identified (both of which are

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attached detailed schedule through which we hope to meet our June deadline will be discussed. We would appreciate any feedback you may have on the schedule at that time. I request that the Section Leaders and the designated Section staff contacts attend this meeting.

Jim Park of my staff is the project manager for this task. If you have any questions about this task, please contact him. He can be reached at 504-2592.

15/

Margaret V. Federline, Branch Chief
Hydrology and Systems Performance Branch
Division of High-Level Waste Management, NMSS

Attachments:
As stated

cc: BJYoungblood
JJLinehan
Section Leaders

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*SEE PREVIOUS CONCURRENCE :

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| OFC | HLHP * | HLHP * | HLHP | | | |
| NAME | JPark/cj | NAEisenberg | MVFederline | | | |
| DATE | 03/ /93 | 03/ /93 | 03/ /93 | | | |

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PROPOSED SCHEDULE FOR COMPLETION OF PA STRATEGY
(MM 062-510-010)

March

Week 1 (3/1 - 3/6)

- o NRC PA Section staff (Eisenberg, Codell, Fehringer, Neel, Park) review and comment on 2/26/93 working draft of PA Strategy Plan
- o CNWRA continues preparation of Chapter 3 (PA Issues and Strategies)

Week 2 (3/7 - 3/13)

- o NRC PA Section comments on 2/26/93 working draft transmitted to CNWRA (Baca) on 3/8
- o CNWRA completes working draft of Chapter 3
- o Kick-off meeting scheduled with NRC/DHLWM and RES Section Leaders to request assistance/participation in development of Strategic Plan (Teleconference call with CNWRA (Baca and staff))

Week 3 (3/14 - 3/20)

- o CNWRA (Baca) transmits working draft of Chapter 3 to NRC (Park) on 3/15; Chapter 3 distributed to DHLWM and RES Section reviewers for information and informal review and comment. NRC PA Section formal review and comment on Chapter 3
- o CNWRA (Baca) completes working draft of Chapter 2 (Strategic PA Goals) and transmits to NRC (Park) for NRC PA Section comment. CNWRA (Baca) revises other chapters to incorporate NRC PA Section comments

Week 4 (3/21 - 3/27)

- o DHLWM and RES Section reviewers participate in development of Chapter 3; NRC PA Section completes review and comment on Chapters 2 and 3. NRC comments transmitted to CNWRA (Baca) by 3/24
- o CNWRA (Baca) revises working draft to incorporate NRC comments

Final 4 Days in March (3/28 - 3/31)

- * CNWRA submits final working draft on 3/31 (Administrative Item)

April

First 3 Days in April (4/1 - 4/3)

- o Final working draft submitted for NRC and CNWRA technical staff review

Week 2 (4/4 - 4/10)

- o NRC and CNWRA technical staff review continues
- o Presentation to NRC Branch Chiefs, Section Leaders, Section staff reviewers, and IPA Phase 2 team on 4/13 by Baca, Eisenberg, and others (Teleconference call with relevant CNWRA staff)

Week 3 (4/11 - 4/17)

- o NRC and CNWRA technical staff review continues

Week 4 (4/18 - 4/24)

- o Section Leader and technical staff review of working draft -- comments due on 4/21
- o NRC (Park) incorporates comments

Week 5 (4/25 - 4/30)

- o NRC (Park) incorporates comments and transmits to CNWRA (Baca) on 4/28
- * CNWRA submits Draft Performance Assessment Strategic Plan for management review on 4/30 (Administrative Item)

May

Weeks 1 and 2 (5/3 - 5/15)

- o Draft Performance Assessment Strategic Plan submitted for NRC and CNWRA management review; comments due 5/14

Weeks 3 and 4 (5/16 - 5/29)

- o Resolution of management comments and incorporation into draft PA Strategic Plan at NRC (Park). Final PA plan transmitted to CNWRA (Baca)

June

- * CNWRA submits Final Performance Assessment Strategic Plan on 6/30 (Major Milestone)

Summary of PA Issues and Key Technical Uncertainties

IPA Methodology

- o Model abstraction process (review of adequacy) - (RW)
- o CCDF construction method (RW)

Site Subsystem

- o Transient unsaturated flow (episodic recharge) - (RC)
- o Property scaling - (RB)
- o Recharge (focused vs distributed) - (RB)
- o Alternate interpretations of hydrostratigraphy - (JT)
- o Fracture vs Porous Flow - (RB)
- o Role of Faults (conduits or barriers) - (RB)
- o Volcanism-groundwater hydrology coupling (RB)
- o Applicability of Kds - (JB)
- o Radionuclide solubilities (data sufficiency) - (JB)
- o Possible role of organics - (JB)
- o Age dating techniques for use in estimating recurrence of events - (JB)
- o Validity of thermodynamic data - (JB)
- o Vapor phase flow - (JB)
- o Plume dilution - (JB)

RC

EBS

- o Modeling corrosion (understanding mechanisms and data sufficiency) - (RW)
- o Seismo-mechanical effects (AC)

PA Issues and Key Technical Uncertainties (Continued)

EBS (Continued)

- o Contribution of partially failed container and cladding - (JW)
- o Alteration rate of the waste form - (HM)
- o Formation and transport of radiocolloids - (JB)
- o

Near-Field Environment

- o Modeling pore fluid composition (distilled vs brine) - (JW)
- o Predicting hydrothermal conditions (dryout zone, dripping, flow past container)
- o

Expert Judgment

- o Selection of Experts
- o Combination of Expert Judgments
- o Combination of hard and soft data
- o

Model Validation

- o General Strategy (methods and procedures)
- o Site, EBS, Total System
- o Role of V/B testing
- o Qualification of PA codes (scientific and engineering)
- o Role of SCM and SQA

PA Issues and Key Technical Uncertainties (Continued)

Model Validation (Continued)

- o General Strategy (methods and procedures)

Annotated Outline for the NRC's Strategic Plan for PA Activities

Executive Summary < 1 to 2 >

- o Briefly explain the need for the strategic plan,
- o Provide an overview of the content of the plan,
- o Describe how the plan will be implemented, and
- o Status of progress.

INTRODUCTION (B. Sagar) - < 2 pages >

- o Outline the NWPA and CFR requirements
- o Explain the impact of the new Energy Bill
- o Discuss need for streamlining the licensing process
- o Introduce concept of Key Technical Uncertainties, SRA, CDS, LARP
- o Explain that the focus is Postclosure PA
- o Contrast NRC Strategies to DOE Strategies

STRATEGIC PA GOALS - < 8 to 10 pages >

Summary of Top-Level Goals (R. Baca)

- o Summarize the broad programmatic goals for PA activities
- o Describe types of activities performed to meet these goals

Understanding Repository Performance (R. Baca)

- o Discuss need to understand the cause-and-effect relationships
- o Discuss need to identify processes controlling uncertainty
- o Explain how DOE and PA studies will be used to develop understanding

Maintaining Independent PA Capability (R. Baca)

- o Define independent capability as analytical, codes and data
- o Explain that capability will be exercised through the IPA process
- o Describe how the IPA will contribute to staff training and guidance to DOE

Technical Integration PA Related Activities (R. Baca)

- o Discuss the need to integrate contributions of 12 research projects
- o Describe how the IPA process has (and will) identify user needs

Development of CDMs for the LARP (P. Mackin)

- o Explain relationship of CDSs, CDMs, and LARP
- o Explain how the IPA process will provide basis for CDMs

Developing Guidance on Adequacy of Site Data and Repository Design (R. Bagtzoglou/S. Hsuing)

- o Discuss how site data and repository design are reviewed
- o Describe how auxiliary analyses are conducted to assess adequacy

Review of DOE's Total System Performance Assessments (B. Ciurghian)

- o Describe the DOE's TSPA program for Yucca Mountain
- o Explain the NRC review and comment approach

PERFORMANCE ASSESSMENT ISSUES AND STRATEGIES <20 to 25 pages>

Issues Based Approach to PA Activities (R. Baca)

- o Explain how issues are used to focus PA technical assistance and research
- o Describe the hierarchy of issues (i.e., regulatory, scientific, etc.)

PA Methodology Issues

Total System PA Issues (B. Sagar)

Site Subsystem PA Issues (R. Green/R. Bagtzoglou)

Engineered Barriers PA Issues (H. Manaktala/J. Walton)

PA Research Issues (G. Wittmeyer)

- o Describe general goals of PA research and how they will meet user needs
- o Outline the issues related to conceptual models, computational methods, etc

PA Issues Related to Review of DOE's TSPA (B. Sagar)

- o Describe the DOE and NRC assessments for the total system
- o Explain benefits of TSPA review process
- o Outline current issues regarding the DOE's TSPA

PA Issues Related to Adequacy of Site Data and Repository Design (R. Green/S. Hsuing)

- o Outline issues related to assessing compliance of each subsystem

Technical and Programmatic Integration Issues (R. Baca/P. Mackin)

- o Describe the role of the SRA process and relation to PA activities
- o Describe integration issues and role of IPA

PA Issues Related to CDM Development (P. Mackin)

- o Discuss ultimate goal of preparing the LARP
- o Describe the PA aspects of CDSs and relationship to CDMs
- o Describe how IPA will be basis for CDM development

Prioritization of PA Activities (B. Sagar)

- o Discuss the problem of limited resources and need to prioritize activities
- o Describe how IPA, PA research, Technical Exchanges, ACNW recommendations will be used in setting priorities.

PA TASK DESCRIPTIONS AND SCHEDULES - < 10 to 15 >

Overview (R. Baca)

IPA for the Total System (R. Baca/B. Sagar)

PA Methodology Development

Prelicensing Reviews and Evaluations

Development of Regulatory Guidance

Subsystem Performance Assessment

Site Subsystem (R. Green)

Engineered Barrier Subsystem (H. Manaktala/S. Hsuing)

PA Research Activities (R. Baca)

REFERENCES

DEFINITIONS