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December 20, 2001

SUBJECT: REPOSITORY DESIGN AND THERMAL-MECHANICAL EFFECTS KEY
TECHNICAL ISSUE INTERMEDIATE MILESTONE NO.20-01402.671.240:
LETTER REPORT

Dear Dr. Chowdhury,

We have reviewed the Center for Nuclear Waste Regulatory Analyses' (CNWRA's) Letter Report entitled: "Assessment of Mechanical Response of Drip Shields Under repository Environment -- Progress Report 2," dated November 29, 2001. The report focuses on the performance characteristics of a drip shield under certain assumed temperature and rockfall conditions using the finite element code ABAQUS. A number of simplifying assumptions are made with respect to the rock size, shape, fall height and the initial and boundary conditions of the drip shield configuration. The analyses conclude that the drip shield deflections resulting from relatively small rock block impact loads are sufficient to push the drip shield into the larger waste packages. The assessment of such rockfalls generating localized stresses on the waste packages and initiating corrosion and thus impacting long-term performance is yet to be made. The future plan for conducting more finite element analyses of drip shields to study the significance of such parameters as those listed under section 1.2 of the report under "Objective and Scope" needs further discussion between the U.S. Nuclear Regulatory Commission (NRC) and CNWRA staff.

As you know the NRC staff had extensive discussions with the authors on the contents of the report on December 17, 2001, and passed on several comments and suggestions for some changes and minor corrections. Among the important comments and suggestions were: (1) need for better explanation of the discrepancy between temperature dependent material properties of Titanium Grade-7 presented in tables 2-1 and 2-2; (2) reconciliation of stress-strain-modulus values shown on figures 2-4 through 2-9; (3) better scales and/or color schemes for figures 3-2 through 3-16 to facilitate comparison of severity of stress conditions; and (4) correct conversions from one unit to another (examples of errors were given during the discussions). I propose to hold a detailed discussion with Douglas Gute of your staff before we proceed with further analyses which should be focused towards relating the process-level models to abstractions for performance assessment.

Dr. A. Chowdhury

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If you have any questions regarding this letter, you may contact me at (301) 415-6695 or via e-mail (msn1@nrc.gov). No written response to this letter is required and the subject report is considered to fulfill the CNWRA's contractual obligations for this Intermediate Milestone. If there are comments from other staff reviewers on this report, or any recommendations for future work by other reviewers, I will forward them to you as and when they become available.

Sincerely,

/RA/

Mysore Nataraja, Program Element Manager
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

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Sincerely,

/RA/

Mysore Nataraja, Program Element Manager
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

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