

July 27, 2000

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SUBJECT: RDTME KTI INTERMEDIATE MILESTONE NO.20-01402.671.040: THERMAL-
MECHANICAL EFFECTS ON LONG-TERM HYDROLOGICAL PROPERTIES

Dear Dr. Chowdhury,

I have reviewed the Center report entitled: "Thermal-Mechanical Effects on Long-Term Hydrological Properties at the Proposed Yucca Mountain Nuclear Waste Repository." I concur with the change of title, which better reflects the contents of the report. The subject report documents the progress made to date in the review of the Department of Energy's (DOE's) work in this area. In addition, conclusions from the Center's own selective independent analyses are also presented. The conclusions of the subject report differ from the DOE findings that the thermal loading will produce negligible changes in rock hydrologic properties of the rock surrounding the emplacement drifts.

One of the comments I have on the contents of the subject report has to do with Figure 2-2, which postulates a relationship between the reduction of cohesion with time to represent the effects of geochemical alteration of fracture-wall rock. The admittedly "arbitrary" relationship postulated in the report does not explain the basis for the assumption that there would be such a drastic reduction in cohesion between 50 to 100 years of thermal interactions. It is not clear how this assumption impacts the results presented.

Finally, it is necessary to discuss the issue of permeability change and its impacts on the ability of the repository to meet the post closure performance objectives. If the changes are deemed to be substantial contributors to waste package performance, we would consider a technical exchange with the DOE to resolve the discrepancies between the Center's and the DOE's findings. I suggest that a conference call be held among all interested teams before a technical exchange is proposed.

I look forward to further discussions on this study with the interested teams. If there are any additional comments on the subject report from other KTI teams, they will be communicated to you through informal discussions or e-mails. If you have any questions on the contents of this

letter, please contact me at (301) 415-6695 or via e-mail (msn1@nrc.gov). No written response to this letter is required, and the progress report is considered to fulfill the Center's contractual obligations for this Intermediate Milestone.

Sincerely.

/ra/

Mysore Nataraja
Program Element Manager
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Effect KTI
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cc: J. Linehan, PMDA
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