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Dr. Asadul H. Chowdhury, Manager  
Mining, Geotechnical, and Facility Engineering  
Center for Nuclear Waste Regulatory Analyses  
6220 Culebra Road, Bldg. 189  
San Antonio, Texas 78238-5166

**SUBJECT: REPOSITORY DESIGN AND THERMAL MECHANICAL EFFECTS KTI  
INTERMEDIATE MILESTONE NO. 20-1402-671-940: LONG-TERM TM  
EFFECTS ON REPOSITORY DESIGN/PERFORMANCE: CONTINUUM MODEL-  
CONFERENCE PAPER**

Dear Dr. Chowdhury:

I have reviewed the Center for Nuclear Waste Regulatory Analyses (CNWRA) paper entitled "Variations of Drift Stability at the proposed Yucca Mountain Repository" submitted as an Intermediate Milestone on January 14, 1999. I have also discussed the paper with Dr. Ofoegbu, the author of the paper, to obtain some clarifications. Based on my review and discussions, the following are my comments for your consideration in finalizing the paper for presentation at the next Rock Mechanics Conference.

- (1) Please recall that I had raised some questions about the conclusions of this study during the past reviews of the CNWRA report which is the origin of this paper and, subsequently, during the review of the abstract of the current paper. Those questions are not completely addressed in the finished version of the paper. It is also not clear if the external review of the paper that was proposed by you has been completed.
- (2) The abstract of the paper states, "...potential instability is higher in the areas of higher Q and is most intense at the middle of inter-drift pillars." This statement is somewhat misleading in that the reader could interpret that failure would occur in the middle of a 23 meter thick pillar of high Q value. This is obviously not the case. There would be instability in the excavation before collapses could occur in the pillars for the configuration studied in the paper. Based on my discussion with the author, the use of the word "instability" may be the cause of the problem. What the author wants to convey is that there could be high strain concentrations in the middle of the pillar as a result of high stresses in the stiffer area of the rock. Such strain concentration could result in the rock developing cracks (without causing failure -- collapse/instability). Hopefully, the next revision of the paper can avoid the potential for misinterpretation by the readers.
- (3) Figure 3 of the paper has two components, (a) and (b), and each component has two figures. A lack of common scale between the two figures within (a) might lead to some confusion if the intent is to compare the two. (Component b has same scale for both

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