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December 22, 2005  
Contract No. NRC-02-02-012  
Account No. 20.06002.01.342

U.S. Nuclear Regulatory Commission  
ATTN: Mrs. Deborah DeMarco  
Division of High-Level Waste Repository Safety  
Two White Flint North  
11545 Rockville Pike  
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Washington, DC 20555

SUBJECT: Programmatic Review of Conference Paper, Assessing Effects of Thermal Loading on  
the Stability of Emplacement Drifts  
Administrative Item 20.06002.01.342.603

Dear Mrs. DeMarco:

The enclosed paper and Form 390A are being submitted for programmatic review. The paper will be submitted for presentation at the International High-Level Radioactive Waste Management Conference, on April 30–May 19, 2006, in Las Vegas, Nevada. The title of the paper is

Assessing Effects of Thermal Loading on the Stability of Emplacement Drifts authored  
by G.I. Ofoegbu, B. Dasgupta, and K.J. Smart

The paper discusses the results of thermal-mechanical analyses performed to assess the effects of thermal loading on the stability of emplacement drifts used for nuclear waste disposal. The analyses focused on a U.S. Department of Energy design concept and the rock-mass properties for a potential Yucca Mountain repository. The design concept includes using forced ventilation to reduce the amount of waste-generated heat transmitted into the rock during the operational period. The analyses indicate thermally induced stress during the forced-ventilation period would be insufficient to cause instability of the drifts. Thermal stresses, however, would increase rapidly after forced ventilation is terminated and would cause overstress of rock near the perimeter of the drifts. Such overstress would not cause instability if the drifts are provided with effective ground support. The overstress, however, would persist for a long time and could cause progressive spalling of the drift perimeter after any installed ground support loses its effectiveness. Such spalling could lead to progressive degradation of drifts and the accumulation of rock rubble inside the drift openings.

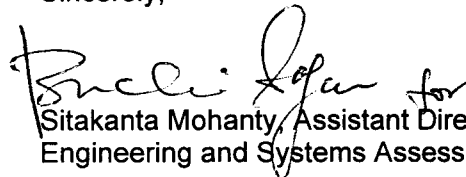


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Mrs. Deborah DeMarco  
December 22, 2005  
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If you have any questions regarding this paper, please contact me at (210) 522-5185 or Dr. Goodluck Ofoegbu at (210) 522-6641. Your cooperation in this matter is appreciated.

Sincerely,

  
Sitakanta Mohanty, Assistant Director  
Engineering and Systems Assessment

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**Assessing Effects of Thermal Loading on the Stability of Emplacement Drifts**

2. AUTHOR(S)

**G.I. Ofoegbu, B. Dasgupta, and K.J. Smart**

3. NAME OF CONFERENCE, LOCATION, AND DATE(S)

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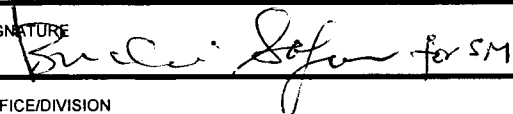
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