March 25, 2002

Mr. Lawrence F. Womack
Vice President, Nuclear Services
Diablo Canyon Power Plant
P.O. Box 56
Avila Beach, CA 93424

SUBJECT: ACCEPTANCE REVIEW FOR THE DIABLO CANYON INDEPENDENT SPENT FUEL STORAGE INSTALLATION APPLICATION

Dear Mr. Womack:

This responds to Pacific Gas and Electric's (PGE) December 21, 2001, application for a 10 CFR Part 72 license to build and operate an independent spent fuel storage installation (ISFSI) at the Diablo Canyon Power Plant. The purpose of this letter is to inform you that the U.S. Nuclear Regulatory Commission (NRC) has completed its initial acceptance review of the application. The staff found that the application contains sufficient information for the staff to initiate its technical review. Please note that this acceptance review only determined that the information was submitted in accordance with the guidelines established in NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities." The acceptance review was not intended to determine the technical adequacy of the application.

In the course of the acceptance review, the staff identified several technical areas for which they will require clarification (see Enclosure). The staff proposes that these areas be discussed on April 11, 2002, during a meeting in San Francisco, CA, that will be open for public observation, regarding geotechnical evaluations performed to support your license application. In addition, during the NRC site tour of Diablo Canyon on April 9, 2002, please be prepared to discuss which operations in the fuel handling building will be performed under your 10 CFR Part 50 license and which operations will be performed under a 10 CFR Part 72 license. The tour should include references to all potential accident conditions, such as accidents involving the transporter, transport station, and storage casks. These issues may later be the subject of a request for additional information by the staff.

This letter was also intended to notify you of the NRC's schedule to perform the technical review of the application. However, on March 18, 2002, your staff requested the NRC to postpone issuing the final review schedule until after the March 28, 2002, management meeting between NRC and PG&E. Therefore, the technical review schedule will not be issued until the first week in April 2002.

Please reference Docket No. 72-26 and TAC No. L23399 in future correspondence related to this licensing action. If you have any questions, please contact me at (301) 415-8584.

Sincerely,
/RA/

Steven Baggett, Senior Project Manager
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-26 (50-275, -323)
TAC No. L23399

Enclosure: Technical Areas Which
Require Clarification

cc: Mailing List

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Technical Areas Which Require Clarification

The following areas should be discussed at the April 11, 2002, meeting between the U. S. Nuclear Regulatory Commission and Pacific Gas and Electric. The meeting will be held in San Francisco, California.

Stability of Subsurface Materials or Stability of Slopes

Discuss the safety of the proposed facility considering the stability of natural and proposed cut slopes and the movement of dislodged debris and rock materials that may arise from potential seismically induced slope instability. The assessment currently provided in the safety analysis report (SAR) Section 2.6.5 does not appear to appropriately represent the strength of the clay-bed soil, nor provide technical basis for the value of rock-mass strength, nor provide adequate representation of the design-basis ground motion in slope-safety analysis. These discussions should include the following:

Undrained Shear Strength of Clay Beds.

Discuss the saturated undrained shear strength of the clay-bed soil.

The undrained shear strength of the clay beds is given in SAR Section 2.6.4.3.2, "Slopes," in terms of a cohesion *c* and friction angle Φ. These parameters model the undrained shear strength of the clay beds using a straight-line relationship with normal stress. The undrained shear strength of an unsaturated soil, however, has an upper-bound value equal to the saturated undrained shear strength, c_u (e.g., Reference 1, Figure 9.38). The undrained shear strength of an unsaturated soil may be represented using a straight-line relationship with normal stress as proposed in SAR Section 2.6.4.3.2, provided that the value of undrained shear strength obtained from the relationship is not permitted to exceed c_u. The use of a straight-line relationship without an upper limit may cause the strength of the soil to be overestimated, resulting in an incorrect assessment of the stability of subsurface materials or slope stability. The omission of the upper limit from the undrained-strength specification, therefore, has a potential effect on the assessment of the stability of subsurface materials (SAR Section 2.6.4) and slope stability (SAR Section 2.6.5) and on the staff review of the assessments to determine compliance with 10 CFR 72.122(b).

Rock-Mass Strength.

Discuss the technical basis (data and analysis) to justify the rock-mass friction angle of 50° used to characterize the rock-mass strength of dolomite (unit Tof_{b-1}) and sandstone (Tof_{b-2}).

Information provided in the SAR (e.g., Sections 2.6.4.3.1, 2.6.4.3.2, 2.6.5.1.2.3) indicates that this strength parameter was determined using the Hoek-Brown procedure (e.g., Reference 2 and Reference 3). The Hoek-Brown procedure would, however, result in values of friction angle significantly smaller than 50° for the rock-mass, considering the values of rock-mass quality index (GSI) and intact-rock parameter (m_i) given in the data reports. A rock-mass friction angle of 50° would require a GSI>80 and m_i>30 (e.g., Reference 2 and Reference 3), both of which exceed the values given for the dolomite (GSI≈56 and m_i≈15) and sandstone (GSI≈65 and m_i≈18) rock masses. The technical basis for the rock-mass friction angle should be presented since it has a potential effect on the assessment of the stability of subsurface materials (SAR Section 2.6.4) and slope stability (SAR Section 2.6.5) and on the staff review of the

assessments to determined compliance with 10 CFR 72.122(b).

Representation of Design Basis Earthquake in Slope Safety Analysis.

Discuss the evaluation of potential coupling of the effects of the three ground-motion components on slope safety. Information provided in SAR Section 2.6.5.1.3.4 suggests that the vertical component of the ground motion representing the design-basis earthquake (DBE) was not included in the analyses of slope stability.

The vertical ground-motion component would affect the slope stability indirectly through its effect on the shear resistance of the potential failure surface, and directly through its effect on the slope-parallel motion component. Therefore, excluding the vertical component from the analysis may lead to an incorrect assessment of slope stability. For this reason, the slope safety evaluation presented in the SAR, which was developed using the horizontal ground-motion components without the vertical component, should be clarified for the staff to determine compliance with 10 CFR 72.122(b).

References

1. Fredlund D.G. and H. Rahardjo. *Soil Mechanics for Unsaturated Soils*. New York, NY: John Wiley & Sons, Inc. 1993.

2. Hoek E. and E.T. Brown. Practical estimates of rock mass strength. *International Journal of Rock Mechanics and Mining Sciences and Geomechanics Abstracts*, 34(8): 1165–1186. 1997.

3. Hoek E. *Practical Rock Engineering: Chapter 11, Rock Mass Properties*. Rocscience, Inc. http://www.rocscience.com/roc/Hoek/Hoeknotes2000.htm. 2000.

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