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February 28, 2003

PG&E Letter DCL-03-020

U.S. Nuclear Regulatory Commission
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Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Response to NRC Request for Additional Information Regarding License Amendment Request 02-03, "Spent Fuel Cask Handling"

Dear Commissioners and Staff:

On April 15, 2002, the Pacific Gas and Electric Company (PG&E) submitted an application for amendment to Facility Operating License Nos. DPR-80 and DPR-82, pursuant to 10 CFR 50.90 (PG&E Letter DCL-02-044). The license amendment request (LAR) submitted, for Nuclear Regulatory Commission (NRC) review and approval, changes in the implementation of the Diablo Canyon Power Plant NUREG-0612 Control of Heavy Loads Program together with other analyses, design, and procedure changes required to implement a dry cask Independent Spent Fuel Storage Installation.

The NRC staff has identified additional criticality information required in order to complete their evaluation associated with LAR 02-03. PG&E's response to the request for additional information is included in the Enclosure.

This additional information does not affect the results of the no significant hazards determination previously transmitted in PG&E Letter DCL-02-044.

If you have any questions regarding this response, please contact Mr. Terence Grebel at (805) 545-4160.

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Sincerely,

Lawrence F. Womack
Vice President - Nuclear Services

gwh/4162
Enclosure
cc: Diablo Distribution
cc/enc: Edgar Bailey, DHS
James R. Hall
Ellis W. Merschoff
David L. Proulx
David A Repka
Girija S. Shukla

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of PACIFIC GAS AND ELECTRIC COMPANY	)	Docket No. 50-275 Facility Operating License No. DPR-80
Diablo Canyon Power Plant Units 1 and 2	)	Docket No. 50-323 Facility Operating License No. DPR-82

AFFIDAVIT

Lawrence F. Womack, of lawful age, first being duly sworn upon oath states that he is Vice President, Nuclear Services of Pacific Gas and Electric Company, that he is familiar with the content thereof; that he has executed this additional criticality information associated with LAR 02-03, "Spent Fuel Cask Handling" on behalf of said company with full power and authority to do so; and that the facts stated therein are true and correct to the best of his knowledge, information, and belief.

Lawrence F. Womack
Vice President, Nuclear Services

Subscribed and sworn to before me this 28th day of February 2003.

Notary Public
State of California
County of San Luis Obispo

SANDRA L RECTOR
Commission # 1339380
Notary Public - California
San Luis Obispo County
My Comm Expires Jan 12, 2006

Additional Criticality Information Pertaining to License Amendment Request 02-03

NRC Question 1

Please provide a criticality analysis of a cask drop from the worst angle over the spent fuel pool. State whether there is enough boron in the pool to maintain 5% subcriticality margin given damage to fuel in the SFP.

PG&E Response to Question 1

As discussed below, a drop of the transfer cask onto nuclear fuel as postulated in NRC Question 1 above is not possible due to the lateral support and guidance provided by the spent fuel pool (SFP) frame and transfer cask bumpers, the height of the cask at top of lift prior to engaging the auxiliary lift with respect to the pool frame and the ability of the cask to overturn out of the top of the SFP frame as it falls back within the frame into the cask recess area of the pool. Therefore, a criticality analysis of fuel in the pool, after damage from a dropped cask, is not needed because the engineering measures and equipment features have been provided to preclude the possibility of drops which could damage the fuel in the pool, consistent with the guidance of NUREG-0612. Thus the existing accident analyses remain bounding for criticality of fuel in the pool. These engineering measures and equipment features are described below.

In LAR 02-03, Section 4.2.1, PG&E is proposing to modify the fuel handling building crane to add a 128-ton rated auxiliary lift, which is a lifting beam suspended from two 100-ton screw jacks supported by a removable beam pinned to a yoke assembly pinned to the main hoist top block of the crane trolley.

The main hoist of the crane carries the load at all times and is seismically qualified for all Diablo Canyon Power Plant earthquakes at full-rated load (125 tons). The auxiliary lift is a redundant load-handling component, designed to the same codes and standards as the crane. The auxiliary lift retains and holds the load from the main hoist upon failure of the main hoist system. The transfer of the load from the main hoist to the auxiliary lift is an abnormal load handling condition and therefore does not require seismic qualification. The auxiliary lift is capable of limited vertical lifting or lowering of the retained load to place the load in a safe configuration while the main hoist is restored to service.

The auxiliary lift receives loading from the main hoist system (hook load plus reeving) upon loss of the main hoist load path (load transfer) during specific load handling operations with the cask. In order to limit impact loading on the auxiliary lift during load transfer, the lift vertically adjusts its position to follow the vertical travel of the main hoist hook and bottom block. Vertical position of the auxiliary lift is controlled by processing of inputs from the crane main hoist drivetrain and load measurement, and auxiliary lift screw jack drivetrain and load measurement.

The rigging components between the auxiliary lift and transfer cask lifting yoke are designed to double the factor of safety normally applied to rigging for a load handling operation resulting in a ten-to-one factor of safety. This rigging is also designed to limit excessive vertical travel during load transfer to control impact loading on the lift.
In order to ensure that the transfer cask/multi-purpose canister (MPC) cannot tip over and/or impact fuel or other parts of the SFP beyond their design limits, a SFP frame has been designed to enclose the transfer cask assembly, guide it during raising and lowering, and prevent unacceptable movement (swinging or tipping). The SFP frame is designed in accordance with requirements for safety-related structures. The transfer cask is lowered until the lower guide bumper assemblies are fully engaged in the SFP frame. The auxiliary lift is detached and the cask is lowered in the SFP frame until it is resting on the bottom of the cask recess area of the SFP. The SFP frame guides the cask to the bottom of the SFP cask recess area, precluding tipping or damage to adjacent fuel storage racks.

PG&E has provided defense-in-depth through the crane enhancements in those locations where a drop could have unacceptable consequences. Specifically, the design of the auxiliary lift ensures that an uncontrolled drop onto the edge of the SFP wall, which could allow the cask to tip or tumble horizontally into the SFP or into the cask washdown area (CWA), is not credible. The only point in the load path where this could occur is near the top of the vertical lift out of the SFP frame where the bottom bumper guide assemblies emerge from the top of the frame structure, and during the horizontal traverse from above the cask recess area in the SFP to over the CWA (or vice versa). In order to preclude the possibility of this occurring, the auxiliary lift/crane enhancements as described in LAR 02-03, Section 4.2.1 will be provided which meet the guidance of NUREG-0612.

In addition, load drop analyses of the loaded transfer cask assembly (reference Holtec International Calculation HI-2002506) determined that the trajectory of the load drop of the loaded transfer cask in the SFP frame will not adversely affect fuel stored in the pool. The Holtec calculation conservatively assumes an instantaneous off-center load applied at the top of the transfer cask representing the lifting device and crane block and rigging, and no credit for guidance from the SFP frame. The calculation concluded a maximum rotation of 2.57 degrees over the 47 ft of combined air and submerged freefall into the cask recess area.

In order to assure that there is no rotation of the cask induced by rigging from the auxiliary lift, load handling procedures for use of the auxiliary lift will require simultaneous installation or removal of each sling to the auxiliary lift.

To provide additional defense-in-depth, the vertical travel of the auxiliary lift is designed to allow the bottom transfer cask bumpers shown in LAR 02-03, Figure 5 to be fully engaged (approximately 75 inches of the 234 inches overall length of the transfer cask) in the SFP frame structure (see Detail 1 of LAR 02-03, Figure 6) prior to release or installation of the auxiliary lift rigging.

NRC Question 2

Is the SFP boron concentration verified 8 hours before operations begin?

PG&E Response to Question 2

As a part of the 10 CFR 72 license application submittal for the Diablo Canyon Independent Spent Fuel Storage Installation, Technical Specification (TS) limiting condition for operation (LCO) 3.2.1 "Dissolved Boron Concentration" provides the limits and controls for the dissolved boron concentration in the water of the MPC cavity during loading and unloading operations whenever there is water and at least one fuel assembly in the MPC. This LCO requires the level of boron in the MPC cavity to meet specific values based on the type of MPC being loaded or unloaded and the initial enrichment of the fuel assemblies being loaded. This LCO requires that the level of boron in the MPC cavity water be verified by 2 independent measurements within 8 hours prior to any loading or unloading operation and re-verified every 48 hours thereafter while the MPC is in the SFP or while water is in the MPC.

Although the 10 CFR 72 TS LCO is specific to the MPC cavity and not the SFP itself, while the MPC is in the SFP it would require that the fuel pool also be maintained at the same required level as the MPC cavity. As a result, PG&E will incorporate the proper criteria into operating procedures for the dry cask storage system prior to first use of the system.