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PG&E Letter DIL-04-003

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Docket No. 72-26
Diablo Canyon Independent Spent Fuel Storage Installation
Response to NRC Request for Comments Pertaining to the Preliminary License and Safety Evaluation Report for the Diablo Canyon Independent Spent Fuel Storage Installation (TAC No. L23399)

Dear Commissioners and Staff:

By Pacific Gas and Electric Company (PG&E) Letter DIL-01-002, dated December 21, 2001, as supplemented, PG&E submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a 10 CFR 72 site-specific license to build and operate an independent spent fuel storage installation (ISFSI) at the Diablo Canyon Power Plant site. The application included a Safety Analysis Report (SAR), Environmental Report, and other required documents in accordance with 10 CFR 72.

By letter dated February 11, 2004, the NRC staff provided a preliminary License and Safety Evaluation Report (SER) to PG&E pursuant to the requirements of 10 CFR 72 and requested PG&E's review and identification of any inaccuracies and/or omissions.

This response provides the results of PG&E's review. The enclosure contains references to the preliminary License and SER, the related inaccuracy or omission, and a reference to related docketed information.

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

NLM550/

Sincerely,

Lawrence F. Womack
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gwh/4162
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**Review Comments**
**Draft License/Technical Specifications/Safety Evaluation Report**

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 1.1.3 (page 1-3), 2nd paragraph, 2nd sentence | In addition to vacuum drying, forced helium dehydration is also an MPC cavity drying method. Suggest the sentence be revised to read: "After the loaded MPC and transfer cask are removed from the pool, the canister lid will be welded in place, and the canister will be drained, dried, filled with an inert gas, sealed, and leak tested." | ISFSI SAR 5.1.1.2 |
| SER 1.1.3 (page 1-3), 2nd paragraph, 4th sentence | The fourth sentence is not supported by our submittals and should be reworded as follows: "The transfer cask will then be placed on top of the empty overpack in the CTF using the cask transporter." | ISFSI SAR 5.1.1.3 |
| SER 2.1.1.4 (page 2-4), 1st paragraph, last sentence | The sentence states that a large portion of the DCPP site area is within the Los Padres National Forest, which is incorrect. It is suggested that the sentence be revised to indicate that a large portion of the land area east of U.S. Route 101 is contained within the Los Padres National Forest. | ISFSI SAR 2.1.4 |
| SER 2.1.6.1 (page 2-25), 2nd paragraph, 3rd sentence | The sentence should be revised as follows: "The clay beds generally are bedding-parallel, and commonly range in thickness from thin partings (less than 1/16 inch thick) to beds 2 to 4 inches thick." | ISFSI SAR 2.6.1.4.2.4 |
| SER 2.1.6.4 (page 2-35), 4th paragraph, last two sentences | PG&E agrees with the conclusion in the SER that the proposed cask-pad design is adequate considering the potential for bearing-capacity failure under static loading, although the NRC staff used an alternate analysis method to reach this conclusion. PG&E also agrees with the NRC summary conclusion that the ISFSI SAR and associated analytical calculations are also appropriate to support this conclusion. | |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 2.1.6.4 (page 2-37), last two paragraphs | PG&E agrees with the conclusion in the SER that the proposed ISFSI storage pad design is adequate considering the potential for bearing-capacity failure under dynamic loading from the design-basis earthquake, although the NRC staff used an alternate analysis method to reach this conclusion. PG&E also agrees with the NRC summary conclusion that the ISFSI SAR and associated analytical calculations are also appropriate to support this conclusion. | |
| SER 2.1.6.5 (page 2-40), 1st full paragraph, last two sentences | PG&E agrees with the conclusion in the SER that the long-term static stability of the proposed hill slope design above the pad is adequate to maintain safety, although the NRC used an alternate analysis method to reach this conclusion. PG&E also agrees with the NRC summary conclusion that the ISFSI SAR and associated analytical calculations are also appropriate to support this conclusion. | |
| SER 2.1.6.5 (page 2-44), last paragraph, last sentence | The sentence states that specific information on the drainage system was not provided in the Diablo Canyon ISFSI SAR or specifically committed to in any RAI responses; it is, however, expected that the design would include provisions to drain potential accumulation behind the slope face, which will be lined with shotcrete and wire mesh. PG&E commits to a drainage system to drain potential accumulation of water behind the slope face. | PG&E Calculation GEO.DCPP.01.23 Rev. 0 |
| SER 2.1.6.5 (Page 2-48), 4th full paragraph, 1st sentence | The SER states that the transporter loading was represented as an equivalent line load of approximately 25,538 N/m [1,750 lb/ft] applied uniformly over the transporter footprint. This statement did not reflect PG&E's response to RAI 7 in PG&E Letter DIL-03-004, wherein the NRC asked PG&E to model the transporter with mass and not line loads. PG&E prepared Revision 3 of Calculation GEO.DCPP.01.28 and submitted it to the NRC, which models the transporter with mass loads. | RAI Response 7 and Attachment 6-1 in PG&E Letter DIL-03-004 |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 3.1.1 (page 3-2), 2nd paragraph, 8th sentence | The sentence states, in part, that the transfer cask will be removed from the FHB/AB by the cask transporter. The transfer cask is moved out of the FHB/AB on the cask transport frame, then picked up by the transporter for transport to the CTF. | ISFSI SAR 5.1.1.2 |
| SER Table 4-2 (page 4-6) | The helium fill gas also facilitates canister heat rejection. It is suggested that this function be added to the table. | ISFSI SAR 4.2.3.3.3 |
| SER Table 4-3 (page 4-7) | The function of the cask mating device is incorrect. Suggest rewording the function as follows: "Used to manipulate the transfer cask bottom lid to facilitate MPC transfer operations at the CTF." | ISFSI SAR 4.2.3.2.4(3) |
| SER Table 4-4 (page 4-10) | The design life of 40 years for the HI-STORM 100 System is not contained in SAR 3.3.1.3.1. The design life is contained in SAR Table 3.4-2. | ISFSI SAR Table 3.4-2 |
| SER Table 4-5 (page 4-11) | As discussed in SAR 8.2.1.2, the ILP earthquake ground motions were only used in the analysis of transporter stability, slope stability, and ISFSI storage pad sliding to provide extra margin. It is suggested that this clarification be added to SER Table 4-5.<br><br>Also, the velocity for the 4 in. x 12 in. x 10 ft board DCPP generic tornado missile (190 ft/sec) does not match the 200 mph (293.3 ft/sec) value in SAR Table 3.2-2. Suggest the SER be changed to be consistent with the SAR. | ISFSI SAR 8.2.1.2<br><br>ISFSI SAR Table 3.2-2 |
| SER Table 4-5 (page 4-12) and SER 4.1.3.2 (pages 4-17 and 4-18), Fire and Explosion Subsections | The SER table entries and the SER text for fires and explosions are not consistent with the latest information provided to the NRC by PG&E. Although this later information supports the SER conclusion, the NRC may want to consider referring to the latest information. | PG&E Letter DIL-03-010 ISFSI SAR 2.2.2.2 and 2.2.2.3 and ISFSI SAR 8.2.5 and 8.2.6 (Amendment 2) |
| SER Table 4-6 (page 4-21) | The peak cladding temperature limits for long-term (normal) are incorrect with respect to PG&E's commitment to ISG-11, Rev. 3. The technical limit is 400 °C per ISG-11, Rev.3. | Mark-up of ISFSI SAR 10.2 in PG&E Letter DIL-04-002 |
| SER Table 4-6 (page 4-22) | The maximum confinement boundary leak rate must be specified in terms of the leaking material (He). Suggest He be added after the leak rate value. | ISFSI SAR 10.2.2.5 |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 5.1.1.2 (page5-5), 2nd paragraph, 1st sentence | The SER states that the MPC confinement boundary is designed in accordance with ASME Section III, Subsection NG, Articles NG-3200 and NG-3300. This is incorrect, as the confinement boundary is designed to NB and the basket is designed per NG. Suggest these corrections to the SER be made. | HI-STORM FSAR, 2.0.1 and 2.2.4. |
| SER 5.1.1.3 (page 5-6), 2nd paragraph, 5th sentence | The SER sentence reads: "Material procurement is in accordance with ASME Boiler and Pressure Code, Section II (ASME International, 1995d,e,f) and Section III, Subsection NG, Article NG-2000 (ASME International, 1995a)." Since this paragraph is discussing the MPC, and not just the fuel basket, the reference should also include ASME Section III, Subsection NB, NB-2000. | HI-STORM FSAR, Table 2.2.15. |
| SER 5.1.3.4 (page 5-15), 1st full paragraph, 7th sentence | The anchor plate size has been increased from 7.5 x 7.5 inches to 12 x 12 inches. | RAI Response in PG&E Letter DIL-03-003<br>ISFSI SAR Figure 4.2-2 (Am 2) |
| SER 5.1.3.4 (page 5-17), 2nd paragraph | It is suggested that the first sentence of this paragraph be clarified to reflect the current design, that the pads are massive reinforced concrete structures with noncombustible approach surfaces. | RAI Response to Comment 2 in PG&E Letter DIL-03-005 |
| SER 5.1.3.4 (page 5-15), 1st two full paragraphs | Numerical conversions for values in the cask anchorage design calculation are incorrect. 235.63 kips = 1047 kN, and 62.13 kips = 276.1 kN. Suggest these be corrected. | PG&E Letter DIL-03-003 |
| SER 5.1.4.1 (page 5-17), 2nd paragraph, 3rd sentence | The sentence incorrectly states that the lower fuel spacer columns and end plate are part of the structure of the fuel basket. The lower fuel spacers are independent items inserted into the fuel storage locations. Suggest deleting or correcting this sentence. | HI-STORM FSAR, Drawing 1495 |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 5.1.4.1 (pages 5-18 and 5-19) | The description of the functions and performance of the cask mating device is incorrect. Suggest the section starting on page 5-18 be rewritten as follows: "... the cask mating device replaces use of the transfer lid on the HI-TRAC 125 transfer cask. The cask mating device bolts and shielding frame provide structural support and shielding at the interface between the top of the open overpack and the bottom of the transfer cask during MPC transfer operations at the cask transfer facility. The remainder of the cask mating device facilitates manipulation of the transfer cask bottom lid and is considered QA Category C. A drawing ..." | ISFSI SAR Table 1.1-2 and Section 4.2.3.2.4(3) |
| SER 5.1.4.1 (page 5-19), last sentence of first partial paragraph and 2nd paragraph | The SER states that a description of the functions and performance of the cask mating device is provided in the HI-STORM FSAR. The cask mating device as proposed for the Diablo Canyon ISFSI is a third generation redesign of the transfer lid and deployed by Holtec into the system under 72.48 as noted in SAR Table 1.1-2. Suggest deletion of all sentences except the last in the 2nd paragraph. The last sentence should be combined with the previous paragraph. | ISFSI SAR Table 1.1-2 and Section 4.2.3.2.4(3) |
| SER 5.1.4.1 (page 5-19), 3rd paragraph. Also on pages 5-23, 5-32, 5-34, and 15-5. | NUREG-0612 is referred to as a "requirements" document. It is suggested that "requirements" be changed to "criteria." | ISFSI SAR |
| SER 5.1.4.1 (page 5-21), last section | Helium fill gas is referred to as being associated with10 CFR 50 operation. It is also a fundamental heat rejection design feature of the 10 CFR 72 certification. | ISFSI SAR 4.2.3.3.3 |
| SER 5.1.4.2 (page 5-22), last paragraph, 1st sentence | The first sentence says that the HI-TRAC 125 transfer cask is designed as a special lifting device per ANSI N14.6 and NUREG-0612. This section should be clarified to note that ANSI N14.6 and NUREG-0612 only apply to the lifting trunnions and lifting trunnion blocks. | ISFSI SAR 4.2.3.3 |
| SER 5.1.4.2 (page 5-23), 4th paragraph | Same comment as on SER 5.1.4.1, page 5-19, regarding description of the cask mating device. | ISFSI SAR Table 1.1-2 and Section 4.2.3.2.4(3) |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 5.1.4.2 (page 5-24), 4th paragraph | The unreinforced concrete elements are not designed to ACI 349-85 as stated. ACI 349 is used for material selection and construction per Holtec FSAR Appendix 1.D. ACI 318 is used to calculate the compressive strength of the plain concrete. | Holtec 1014 CoC Rev. 0, FSAR Table 1.0.3, and Appendix 1.D as amended by LAR 1014-1, Rev. 2 including Supplements 1-4 |
| SER 5.1.4.3 (page 5-27), 2nd paragraph | The drawings referenced for the HI-TRAC 125D are incorrect. The correct drawing number is 3768. | HI-STORM FSAR 1.5 |
| SER 5.1.4.3 (page 5-28), 2nd paragraph | Same comment as on SER 5.1.4.1, page 5-19, regarding description of the cask mating device. | ISFSI SAR Table 1.1-2 and Section 4.2.3.2.4(3) |
| SER 5.1.4.3 (page 5-29), 1st paragraph | Same comment as on SER 5.1.4.2, page 5-24, regarding unreinforced concrete. | See above |
| SER 5.1.4.4 (page 5-31), HI-TRAC 2nd paragraph | First sentence refers to the HI-TRAC transfer lid. The HI-TRAC 125D does not have a transfer lid. | HI-STORM FSAR 1.2.1.2.3 |
| SER 5.1.5 (page 5-36) | NUREG-1567 is referred to as a "requirements" document. It is suggested that "requirements" be changed to "criteria." | ISFSI SAR |
| SER 5.2 (page 5-40) 3rd bullet | There is no low-level waste storage room. It is recommended that this language be replaced with "in accordance with Part 50 low-level waste procedures." | None |
| SER 6.1.1 (page 6-2), 2nd full paragraph, last sentence | The SER states that the TS will impose more restrictive limits on fuel types than those for the Holtec HI-STORM system, whereas, in fact, some of the TS limits are the same. Suggest the sentence be rewritten as follows: "The proposed Diablo Canyon ISFSI Technical Specifications will impose limits, equal to, or more restrictive on fuel types than those for ..." | ISFSI TS |
| SER 6.1.5.1 (page 6-9), last paragraph, last sentence | Remove the word "diesel" from "diesel fuel fire." The evaluation performed was not limited to diesel fuel. | ISFSI SAR 8.2.5 |
| SER 6.1.5.1 (page 6-10), 2nd paragraph, item (2) | There is no mineral oil storage tank. Suggest the item be revised to read: "The Unit 2 main bank transformers, which are filled with mineral oil, are located ..." | RAI Response in PG&E Letter DIL-03-010 ISFSI SAR 8.2.5 |
| SER 6.1.5.1 (page 6-10), 2nd paragraph, item (3) and 3rd paragraph, last sentence | The hydrogen storage tanks in item (3) and in last sentence of the third paragraph should be deleted, as they are not a fire hazard. They are an explosive hazard, as described in ISFSI SAR 8.2.6. | ISFSI SAR 8.2.5 |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 6.1.5.1 (page 6-10), 5th paragraph, 3rd sentence | The fire loading has been revised downward from 2,000 gal to 50 gal and the source is the transporter fuel tank, not the fuel tanker. Suggest the sentence be revised to read: "Moreover, the consequences of this potential fire hazard are bounded by the 189-L [50 gal] transporter fuel tank fire-loading analysis. | ISFSI SAR 8.2.5.2 |
| SER 6.1.5.1 (page 6-10), last sentence, and SER 15.1.2.4 (page 15-12), 3rd paragraph, 6th sentence | The transformer vicinity clause is missing. Suggest sentence be revised to read: "Administrative procedures will also prohibit the use of onsite vehicles in the vicinity of the transformers during transport of the transfer cask, negating the potential for a vehicle accident serving as the initiating event for a transformer fire." | RAI Response in PG&E Letter DIL-03-010<br>ISFSI SAR 8.2.5.2 (Am 2) |
| SER 6.1.5.1 (page 6-11), 1st full paragraph, 2nd sentence | The elevation of the CTF opening is not the primary mitigation feature for fuel spills at the CTF. The primary mitigation is provided by removal of the transporter fuel tank. | RAI Response 15-23 in PG&E Letter DIL-02-009 |
| SER 6.1.5.1 (page 6-11), 3rd full paragraph, 1st bullet | As above, remove the word "diesel" from diesel fuel. | ISFSI SAR 8.2.5 |
| SER 6.1.5.2 (page 6-13), 1st paragraph | Should include reference to PG&E Letter DIL-03-010 (2003b), which contains the latest list of explosive hazards. | PG&E Letter DIL-03-010 |
| SER 6.1.5.2 (page 6-13), 2nd paragraph, 2nd item | Second item in list should be deleted, as transformer mineral oil detonation is not an explosive hazard. | PG&E Letter DIL-03-010 |
| SER 6.1.5.2 (page 6-14), last paragraph, 3rd sentence | Seismic restraint of the acetylene bottles and inclusion of the clause "when the transporter is in the area of the acetylene bottles," should be added. Suggest the sentence be rewritten as follows: "Moreover, administrative procedures will also require physical restraint of the acetylene bottles for seismic considerations and prohibit the use of onsite vehicles in the vicinity of the acetylene bottles during transport of the transfer cask, negating the potential for a vehicle accident being the initiating event for an acetylene bottle explosion." | PG&E Letter DIL-03-010 |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 8.1.3.1 (page 8-4), 3rd sentence | In the sentence, it is stated that the applicant (presumably Holtec) assumed in the cask system analysis that fresh fuel with a maximum possible enrichment is stored in a configuration that yields maximum reactivity and is flooded with fresh water at various densities. PG&E suggests that the sentence be revised to state, "Holtec assumed in the cask criticality analysis that fresh fuel with various enrichments is stored in a configuration that yields maximum reactivity and is flooded with fresh or borated water at various densities depending on the initial enrichment." | HI-STORM FSAR, Section 6.3.1 |
| SER 9.1.1 (page 9-3), 1st paragraph, last sentence | The closure ring weld is not qualified for accident pressure. Suggest the sentence be reworded as follows: "The MPC lid weld is designed to maintain confinement during normal and design-basis accident conditions. The closure ring weld provides a redundant welded boundary." | HI-STORM FSAR 3.4.4.3 (HI-STAR FSAR, Appendix 3.E.8.5) |
| SER 9.1.3 (page 9-5), 2nd paragraph, 2nd sentence | In addition to vacuum drying, forced helium dehydration is also an MPC cavity drying method. Suggest the sentence be revised to read: "The MPC cavity is then dried and filled with helium fill gas." | ISFSI SAR 5.1.1.2 |
| SER 9.2 (page 9-6), 1st finding, 3rd sentence and 2nd finding, 1st sentence | The MPC lid is not welded and tested in accordance with the ASME Code. It is suggested the sentence be revised to read: "Because the MPC lid is welded and tested in accordance with the ASME Code alternative methods contained in SAR Table 3.4-6 and is not expected to leak under ..." | ISFSI SAR Table 3.4-6 |
| SER 15.1.1.2 (page 15-5), 2nd sentence | The second sentence refers to the ISFSI TS permitting optional temperature monitoring in lieu of air duct inspections. The proposed Diablo Canyon ISFSI TS do not provide this option. Therefore, the phrase "or the temperature differential between the convected cooling air exiting the outlet vents and ambient air is measured every 24 hours" should be deleted. | ISFSI TS 3.1.2 and SR 3.1.2.1 |
| SER 15.1.1.3 (page 15-6), 1st and 2nd paragraphs | The discussion of onsite vehicle speeds needs to be revised to be consistent with the PRA performed to assess transportation within the owner-controlled area. In that PRA, it was assumed that vehicle speeds are below 25 mph, rather than the 15 mph included in the SER. | ISFSI SAR 8.2.5 and 8.2.6 PRA 01-01, Rev.5, attached to PG&E Letter DIL-03-010 |

| Number | Comment/Inaccuracy | SAR/DIL Technical Reference |
|---|---|---|
| SER 15.1.2.4 (page 15-10), 1st paragraph | The list of credible fire accidents should include the "transformer mineral oil fire." | PG&E Letter DIL-03-010 |
| SER 15.1.2.4 (page 15-11), 1st full paragraph | The list of onsite stationary fuel sources is inaccurate and needs to be updated as follows:<br>Revise item (2) to read: Unit 2 main bank transformers filled with mineral oil. Delete item (3) Gas cylinders, item (4) Bulk hydrogen storage facility, item (5) Cold machine shop acetylene bottles, and item (6) Electrical transformer fire. | PG&E Letter DIL-03-010 |
| SER 15.1.2.4 (page 15-11), 2nd full paragraph | The discussion of combustible material storage should be deleted, as it is discussed more completely in the last paragraph on this page. | PG&E Letter DIL-03-010 |
| SER 15.1.2.4 (page 15-11), 3rd paragraph | Mitigation of fire at the CTF from fuel spills should state that primary mitigation is provided by removing the fuel tank from the transporter. | PG&E Letter DI-03-010 |
| SER 15.1.2.4 (page 15-14), 1st full paragraph, last sentence | Item (3), mineral oil explosion, should be deleted, as it is not an explosion hazard. | PG&E Letter DIL-03-010 |
| SER 15.1.2.4 (page 15-20) | Delete section on mineral oil as an explosive hazard. | PG&E Letter DIL-03-010 |
| SER 15.1.2.4 (page 15-22), 1st sentence | Delete item (3) explosion of mineral oil. | PG&E Letter DIL-03-010 |
| SER 15.1.2.21 (page 15-47), 1st sentence | The MPC does not fully meet the requirements of ASME Section III. Suggest the sentence be rewritten as follows: The HI-STORM 100 System MPC is a seal-welded pressure vessel, designed, fabricated, and tested in accordance with the ASME Code alternative methods contained in SAR Table 3.4-6. | |