

NRC FORM 699
(9-2003)

U.S. NUCLEAR REGULATORY COMMISSION

DATE

08/15/2011

CONVERSATION RECORD

TIME

2:30 PM

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Michael Richardson, Tammy Morin

TELEPHONE NO.

888-324-9687

TYPE OF CONVERSATION

☐ VISIT☒ CONFERENCE☐ TELEPHONE☐ INCOMING☒ OUTGOING

ORGANIZATION

Pacific Gas & Electric (PG&E), Holtec

SUBJECT

Diablo Canyon ISFSI amendment request no. 2, Draft Request for Information (RAI) no. 1

SUMMARY (Continue on Page 2)

Call participants.

NRC- John Goshen, Jorge Solis, David Tarantino

PG&E - Michael Richardson, Rich Hagler, Kath Kunz, Larry Pulley, Sean Flickinger

Holtec - Tammy Morin, Kelly Kozink, Abrar Mohammed

The purpose of the call was to review the final draft RAIs. No technical issues were discussed and no regulatory decisions were made.

The RAIs are listed below:

6.1 Explain the reasons why the design ambient temperatures may be exceeded without exceeding the fuel temperature limits.

A note in Table 1.2 of Holtec Report HI-2104625 states that the design ambient temperatures may be minimally exceeded without exceeding the fuel temperature limits. Provide site information to justify the design ambient temperatures. This information should include maximum average values and length. If the duration at ambient temperatures higher than design limits is long enough to achieve thermal equilibrium, then the higher temperature should be considered the design ambient temperatures.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

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ACTION REQUIRED

1. PG&E to withdraw Exemption request. (Michael Richardson)
2. RAI 6-16 to be deleted.
3. PG&E to coordinate a conference call with the NRC on RAI responses. (Michael Richardson)

NAME OF PERSON DOCUMENTING CONVERSATION

John Goshen

SIGNATURE



DATE

08/16/2011

ACTION TAKEN

TITLE OF PERSON TAKING ACTION

SIGNATURE OF PERSON TAKING ACTION

DATE

CONVERSATION RECORD (Continued)

SUMMARY (Continue on Page 3)

6.2 Clarify the maximum heat load and operating pressure being requested in this license amendment. Holtec Report HI-2104625 includes two different scenarios with thermal evaluations performed based on these two scenarios. The thermal calculations performed for two different scenarios are confusing and the staff can't make a safety determination based on these calculations. The thermal evaluation should be modified to include only the thermal calculations for what is being requested in this amendment.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-3 Clarify if the multi-purpose canister (MPC) gas and fuel effective thermal conductivity included the effect of gas dilution during the 100% rod rupture accident. Holtec Report HI-2104625 states that the 100% rod rupture accident is evaluated with due credit for increased heat dissipation under increased molecular weight of the cavity gases. However, it is not clear how the gas dilution affects the heat dissipation.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-4 Clarify if the temperatures with fuel spacers reported in Table B.5.10 of Holtec Report HI-2104625 were obtained based on the finest mesh. Note 18 on this table states that all temperatures tabulated herein include the temperature adder reported in Table B.5.2 for all the components. The calculation should be performed at the design basis heat load and operating pressure for the finest mesh and the resulting temperature should be reported in the thermal evaluation.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-5 Explain the reasons why for the same storage system Table B.5.13 of report HI-2104625 includes different temperature limits for the two scenarios described in this report. Specifically for the MPC shell, lid bottom plate, and lid top plate, the temperature limits are different. The amendment should only include results from the thermal evaluation of what is being requested. See also RAI 6-2.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-6 Demonstrate that multiplying the thermal conductivity of air by 1.4 is equivalent to using equation C.2.1 of report HI-2104625 to calculate the effective radial thermal conductivity of air based on this equation without modifying the air conductivity and considering the material expansion (and therefore gap reduction.)

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-7 Clarify why a helium absolute pressure of 7 atm. is conservative for MPC internal convection heat transfer during on-site transfer of the MPC in the HI-TRAC. Clarify what is the absolute operating pressure of the MPC. It appears from the amendment request that the design operating pressure is 5 atm absolute. Assuming a higher operating pressure is non-conservative because it overstates internal convection heat transfer.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-8 Perform the on-site transfer thermal evaluation for the thermal-hydraulic conditions being requested in this amendment application. The staff can't make a safety determination if adequate supporting analyses are not provided. Most of the thermal analyses provided in the amendment request correspond to conditions which are not being requested. See also RAI 6-2.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-9 Provide a definition for "operable" for LCO 3.1.4. As part of surveillance requirement SR 3.1.4.1 provide monitored parameters for the system user to conclude (or not) that the supplemental cooling system is operable.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

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CONVERSATION RECORD (Continued)

SUMMARY (Continue on Page 4)

6-10 Clarify if the cask transfer facility (CTF) thermal analysis includes the effect of wedge assemblies in the convective heat transfer. Page 4.4-14 of the Final Safety Analysis Report (FSAR) states that with the CTF wedge assemblies in place between the loaded overpack and the CTF walls, there is still some convective heat transfer through the overpack, albeit not at a rate commensurate with the conditions on the ISFSI pad. Since this hardware affects the convective air flow, its effect should be included in the calculation of peak cladding temperature for the CTF configuration.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

Change to 6-11

6-12 Explain the reasons why during the 100 percent vent blockage the peak cladding temperature is the same for either the thermo-siphon enabled or thermo-siphon suppressed solutions.

Page 8.2.58 of the FSAR states that both the thermosiphon-enabled solution and the thermosiphon-suppressed solution compute approximately the same peak cladding temperature.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-12 PG&E should remove all references to vacuum drying in the FSAR, since the MPC is dried using the forced helium dehydration system only. The FSAR contains statements in several places which may imply that vacuum could also be used to dry the MPC. This creates significant confusion in the review of the amendment request.

This is requested to provide accuracy, clarity, and consistency within the FSAR.

6-13 Please refer to Holtec Report HI-2104625. It is not clear if computational fluid dynamics (CFD) best practice guidelines (BPG) were used to perform the thermal evaluation of the HI-STORM 100 in the CTF configuration for design basis heat load and ambient conditions and to obtain the discretization error. It is not clear that the thermal analysis results provided in Table B.5.9 of Holtec Report HI-2104625 include adequate margins. In order to facilitate the review, the analysis results should include an estimate of the numerical uncertainty, grid convergence, and sensitivity of the performed CFD analyses. To assist in the technical review, please provide an estimate of the numerical uncertainty and provide a response to the following questions:

- a) Has a sensitivity analysis been performed concerning turbulence modeling, boundary conditions, grid independence and grid convergence?
- b) Was grid convergence index (GCI) used to assess uncertainty of the predicted results?

Provide results such as percentage of the calculation discretization error and analysis files used to obtain the GCI. The applicant may consult the following documents for further information on CFD BPG: (1) Best Practice Guidelines for the use of CFD in Nuclear Reactor Safety Applications, NEA/CSNI/R(2007)5, (ADAMS accession number

ML071581053); and (2) Policy of Journal of Fluid Engineering of ASME about CFD analyses.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-14 Verify that for all thermal calculations an adequate operating density is provided in the analysis models. When reviewing some of the analysis files, the staff noticed that the used operating density provided as input does not seem to be adequately calculated for the air side. The air operating density for the air side provided as input in the Fluent thermal models should correspond to the operating conditions of pressure and temperature.

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

6-15 Verify that all the thermal models used in the thermal evaluation include adequate insulation values. When reviewing some of the analysis files, the staff noticed that some surfaces that are exposed to solar heating did not include a heat source, as a result of insulation.

Change to
insolation

Change to
insolation

This information is needed to determine compliance with 10 CFR 72.122 and 10 CFR 72.128.

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CONVERSATION RECORD (Continued)

SUMMARY

6-16 Provide additional information why an exemption for 10 CFR 72.236(f) is in the public interest consistent with 10 CFR 72.7, which states, "The Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest."

This information is necessary to determine compliance with 10 CFR 72.7

PG&E has determined that the exemption requested in the January 31, 2011, application was not required per the 10 CFR Part 72 site specific regulations. PG&E will withdraw the exemption request in the RAI response. This RAI will therefore be deleted.

8-1 Provide additional information regarding the type and properties for nonfuel hardware such as Neutron Source Assemblies (NSA), Instrument Tube Tie Rods (ITTR) and components of these devices such as individual rods in terms of galvanic/corrosive reactions. The staff recognizes that the ITTRs were approved for storage as non fuel hardware in the HI-STORM 100 Cask System in Amendment No. 6. However, that was for use for general certificate users. Information needs to be provided showing the applicability and acceptability for use at the DC site specific ISFSI. Additionally, the staff is concerned with compatibility between component materials and canister interior components, and needs additional information to ensure technical acceptability.

This information is needed to determine compliance with 10 CFR 72.120(d)

8-2 Provide additional design and operation details concerning the referenced "keep full system" to be used as a supplemental cooling system (SCS) for HBF during transfer to the ISFSI site.

The licensee is requesting an exemption to 10 CFR 72.236(f) similarly to that requested by Holtec for use in CoC No. 1014 for its SCS. However, since the DC ISFSI is a site specific license, 10 CFR 72.236(f) is not applicable. However, the requirements of 10 CFR 72.128(a)(5) are applicable. It is difficult from the information supplied by the licensee to determine if this system acceptably meets this requirement. The additional heat load affects the materials evaluation of the canister components.

This information is needed to determine compliance with 10 CFR 72.128(a)(4).

9.0 Confinement Evaluation

9-1 Clarify the information concerning the details of helium leak tests discussed in the DC ISFSI FSAR, Section 4.2.3.3.6, "Confinement Design."

The staff specifically requests additional information on testing of the base material, including the MPC shell, baseplate, lid, port covers, etc., performed by Holtec and PG&E to ensure confinement integrity over the life of the HI-STORM 100 MPC.

This information is needed to determine compliance with 10 CFR 72.122(h) and 10 CFR 72.126(d).

Comments to the draft RAIs are identified in red.

The NRC staff recommended that PG&E have a conference call with the NRC to discuss the RAI responses before they are issued. PG&E agreed.