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PG&E Letter HIL-21-007

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Director, Division of Fuel Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

10 CFR 72.56

Humboldt Bay Independent Spent Fuel Storage Installation
Docket No. 72-27, Materials License Number SNM-2514
License Amendment Request 21-02
Proposed Revisions to Humboldt Bay Independent Spent Fuel Storage Installation
Special Nuclear Materials License Number 2514 and Technical Specifications

Dear Commissioners and Staff:

Pursuant to 10 CFR 72.56, Pacific Gas and Electric Company (PG&E) hereby requests approval of the enclosed proposed amendment to Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI) Special Nuclear Material (SNM) License Number 2514 and associated Technical Specifications (TS). The proposed amendment incorporates the following changes:

1. Makes administrative changes to license conditions that reference Humboldt Bay Power Plant (HBPP).
2. Deletes license conditions that are complete, no longer applicable, or restate NRC regulations.
3. Revises the TS to remove HBPP systems, structures, components, and activities that are no longer applicable.
4. Adds a new administrative TS for processing administrative changes to the Humboldt Bay ISFSI Quality Assurance Program.

The Enclosure provides a detailed description and evaluation of the proposed changes. Attachments 1 and 2 of the Enclosure contain proposed markups of SNM-2514 and TS, respectively. Enclosure Attachments 3 and 4 contain the retyped clean copies of SNM-2514 and TS, respectively.

Attachment 5 of the Enclosure provides a markup of proposed changes to the TS Bases, for information only. After NRC approval, and upon the effective date of the

amended Humboldt Bay ISFSI License and TS, PG&E will update the Humboldt Bay ISFSI TS Bases in accordance with TS 5.1.1.

The changes proposed in this license amendment request (LAR) are not required to address an immediate safety concern. PG&E requests approval of this LAR no later than one year from the date of this submittal. PG&E requests the license amendments be made effective upon NRC issuance, to be implemented within 90 days from the NRC approval of the license amendment.

There are no new or revised regulatory commitments (as defined by NEI 99-04) in this submittal.

If you have any questions or require additional information, please contact Mr. James Morris at 805-305-9775.

I state under penalty of perjury that the foregoing is true and correct.

Executed on December 14, 2021 .
(date)

Sincerely,



Maureen R. Zawalick
Vice President, Generation Business and Technical Services

rntt/51104904

Enclosure

cc: HBPP Humboldt Distribution
cc/enc: William C. Allen, NRC Project Manager
Scott A. Morris, NRC Region IV Administrator
Gonzalo L. Perez, Branch Chief, California Dept. of Public Health

Evaluation of the Proposed Change

Subject: Proposed Revisions to Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI) Special Nuclear Materials (SNM) License Number 2514 and Technical Specifications (TS)

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1. SUMMARY DESCRIPTION

Pursuant to 10 CFR 72.56, PG&E requests an amendment to the Humboldt Bay ISFSI License SNM-2514. The Humboldt Bay ISFSI License contains several license conditions that reference the Humboldt Bay Power Plant (HBPP), completed activities, or activities that restate NRC regulations. In addition, the Humboldt Bay ISFSI TS include activities that are no longer applicable after all spent nuclear fuel and Greater Than Class C (GTCC) waste were loaded into the ISFSI. As a result, LAR 21-02 proposes to amend License SNM-2514 and the TS for the Humboldt Bay ISFSI as follows:

- a. Make administrative changes to license conditions that reference HBPP.
- b. Delete license conditions that are complete, no longer applicable, or restate NRC regulations.
- c. Revise the TS to remove HBPP systems, structures, components, and activities that are no longer applicable.
- d. Add a new administrative TS for processing administrative changes to the Humboldt Bay ISFSI Quality Assurance (QA) Program.

A mark-up of License SNM-2514 is included in Attachment 1. Attachment 3 provides a clean "Amendment 5" version of License SNM-2514 incorporating the proposed changes for NRC approval.

A mark-up of the Humboldt Bay ISFSI TS is included in Attachment 2. Attachment 4 provides a clean "Amendment 5" version of the TS incorporating the proposed changes for NRC approval.

A mark-up of the Humboldt Bay TS Bases is included in Attachment 5 for information only. After NRC approval of the LAR, this update will be incorporated into the Humboldt Bay ISFSI TS Bases in accordance with TS 5.1.1.

2. PROPOSED CHANGES

2.1 License SNM-2514

- a) License Information Block 2 and License Condition 10

PG&E proposes deleting references to the HBPP site in the Humboldt Bay ISFSI License. On November 18, 2021, the NRC terminated the HBPP 10 CFR Part 50 license. Therefore, HBPP no longer exists.

License Information Block 2 lists the address and location of the Humboldt Bay ISFSI as the Humboldt Bay Power Plant. PG&E proposes changing Humboldt Bay Power Plant to Humboldt Bay Independent Spent Fuel Storage Installation.

License Condition 10 states "...the Humboldt Bay ISFSI located on the Humboldt Bay Power Plant site in Humboldt County,..." The revised License Condition 10 would be "...the Humboldt Bay ISFSI located in Humboldt County,..."

The proposed revisions to License Information Block 2 and License Condition 10 are administrative and have no impact on the safe storage of spent nuclear fuel and GTCC waste at the Humboldt Bay ISFSI.

b) License Conditions 13 and 17

PG&E proposes that License Conditions 13 and 17 be removed from the Humboldt Bay ISFSI License since the conditions have been satisfied.

License Condition 13 references HBPP fuel and cask movement activities that were performed in the HBPP refueling building. License Condition 17 references test requirements prior to loading spent fuel into spent fuel storage casks (SFSCs).

The activities described in License Conditions 13 and 17 (which were completed in 2008 and 2013, respectively) are no longer applicable since all of the HBPP spent nuclear fuel and GTCC waste have been transferred to the Humboldt Bay ISFSI. In addition, all HBPP nuclear structures, systems, and components associated with spent fuel and GTCC waste cask loading, movement, and handling have been decommissioned and removed from the HBPP site.

The proposed deletion of License Conditions 13 and 17 is administrative since License Conditions 13 and 17 have been satisfied and are no longer applicable after spent nuclear fuel and GTCC waste have been transferred to the Humboldt Bay ISFSI.

c) License Condition 14

PG&E proposes that License Condition 14 be deleted from the Humboldt Bay ISFSI License since the condition has been satisfied.

License Condition 14 requires that PG&E submit, for NRC approval, a QA Program for the Humboldt Bay ISFSI that satisfies 10 CFR 72, Subpart G, prior to the termination of the 10 CFR Part 50 license for HBPP, Unit 3.

In February 2019, PG&E submitted to the NRC Revision 0 of the Humboldt Bay ISFSI QA Plan that satisfies the requirements in 10 CFR 72 Subpart G (Reference 6.2). The NRC approved the Humboldt Bay ISFSI QA Plan on April 17, 2020 (Reference 6.3). Deletion of License Condition 14 is administrative and has no impact on the safe storage of spent nuclear fuel and GTCC waste at the Humboldt Bay ISFSI.

d) License Condition 15

PG&E proposes that License Condition 15 be removed from the Humboldt Bay ISFSI License since the condition restates an NRC requirement. License Condition 15 states that PG&E shall follow the Humboldt Bay ISFSI Emergency Plan, as revised or supplemented. In accordance with 10 CFR 72.32(a), the Humboldt Bay ISFSI is required to have an emergency plan. In addition, 10 CFR 72.44(f) specifies the requirements for making changes to the ISFSI emergency plan. As such, having a license condition that restates the regulations is not necessary. Deletion of License Condition 15 is administrative and has no impact on the safe storage of spent nuclear fuel and GTCC waste at the Humboldt Bay ISFSI.

2.2 Technical Specifications

PG&E proposes to delete references to HBPP regulations, structures, and activities that are no longer applicable due to the decommissioning status of HBPP. Also, PG&E proposes to delete Humboldt Bay ISFSI related activities, Limiting Conditions for Operation (LCOs), and surveillances that are no longer applicable because all spent nuclear fuel and GTCC waste have been transferred to the Humboldt Bay ISFSI.

a) Section 3.1.1, Multi-Purpose Canister (MPC-HB)

PG&E proposes to revise TS 3.1.1 to remove Condition D. Condition D requires removal of all spent fuel assemblies from the MPC when the required actions and associated completion times for Conditions A, B, or C are not met.

b) Section 3.1.3, Fuel Cool-Down

PG&E proposes to delete TS 3.1.3 in its entirety since it is no longer applicable. Wet unloading of an MPC is no longer possible since the HBPP spent fuel pool was decommissioned.

c) Section 4.0, Design Features

PG&E proposes to revise TS 4.3.1, "Cask Transporter," to remove references to the power plant and the rail dolly used to move the SFSC to and from the refueling building. Spent nuclear fuel and GTCC waste have been transferred to the Humboldt Bay ISFSI. There are no remaining structures at HBPP to support cask transport as described in this section. Therefore, references to the power plant and the rail dolly are no longer applicable. The proposed changes are administrative and have no impact on the safe storage of spent nuclear fuel and GTCC waste.

PG&E also proposes to revise TS 4.3.3, "SFSC Load Handling Equipment," to remove the reference to 10 CFR 50. There are no remaining structures at HBPP and now after termination of the HBPP 10 CFR Part 50 License, references to 10 CFR 50 no longer apply. The proposed change is administrative and has no impact on the safe storage of spent nuclear fuel and GTCC waste.

d) Section 5.0, Administrative Controls

PG&E proposes to revise TS 5.1.2.a, under "Radioactive Effluent Control Program," to clarify that there are no liquid or gaseous radioactive effluents emitted from the Humboldt Bay ISFSI.

PG&E proposes to delete TS 5.1.2.b. Verifications of the OVERPACK and GTCC cask surface contamination are no longer applicable after spent nuclear fuel and GTCC waste have been transferred to the ISFSI. The proposed changes are administrative and have no impact on the safe storage of spent nuclear fuel and GTCC waste.

PG&E proposes to delete TS 5.1.3, "MPC-HB and SFSC Loading, Unloading, and Preparation Program." The described activities were associated with fuel movement and cask handling operations in the HBPP refueling building and are no longer applicable. The

proposed change is administrative and has no impact on the safe storage of spent nuclear fuel and GTCC waste.

PG&E proposes to revise TS 5.1.5, "Cask Transportation Evaluation Program," to remove references to the HBPP refueling building. The refueling building has been demolished, and spent nuclear fuel and GTCC waste transfer to the ISFSI is complete. The proposed deletion of the reference to the HBPP refueling building is administrative and has no impact on the safe storage of spent nuclear fuel and GTCC waste.

PG&E proposes to delete TS 5.1.6, "GTCC Cask Loading and Preparation Program." These activities were associated with GTCC cask operations in the HBPP refueling building. The refueling building has been demolished and GTCC waste transfer to the Humboldt Bay ISFSI is complete. Therefore, TS 5.1.6 is no longer applicable. The proposed change is administrative and has no impact on the safe storage of spent nuclear fuel and GTCC waste.

PG&E proposes to add TS 5.1.7, "Quality Assurance Program Changes," to describe the proposed process for making administrative changes to the Humboldt Bay ISFSI 10 CFR Part 72 QA Program that do not require prior NRC approval.

3. TECHNICAL EVALUATION

3.1 License SNM-2514

The proposed changes to Humboldt Bay ISFSI License Number 2514 are administrative and do not require a technical evaluation.

3.2 Technical Specifications

a) Section 3.1.1, Multi-Purpose Canister (MPC-HB)

Condition D requires removal of all spent fuel assemblies from the MPC when the required actions and associated completion times for Conditions A, B, or C are not met. Fuel movement and cask handling operations were performed in the HBPP refueling building and spent fuel pool in accordance with the HBPP 10 CFR Part 50 License. In 2013, the Humboldt Bay ISFSI loading operations were completed and the HBPP refueling building and spent fuel pool were subsequently

decommissioned. With the spent fuel pool no longer available, the capability to unload the MPC contents no longer exists. Therefore, Condition D is no longer applicable.

b) Section 3.1.3, Fuel Cool-Down

The fuel cool-down TS was applicable during wet UNLOADING OPERATIONS. Wet unloading of an MPC would have been performed in the spent fuel pool in accordance with the HBPP 10 CFR Part 50 License. The spent fuel pool has been decommissioned and the 10 CFR Part 50 license has been terminated. Therefore, this specification is no longer applicable.

c) Section 4.0, Design Features

The proposed changes to remove references to HBPP structures, systems, and components, and the reference to 10 CFR 50 from the Humboldt Bay ISFSI TS Sections 4.3.1 and 4.3.3 are administrative and do not require a technical evaluation.

d) Section 5.0, Administrative Controls

The proposed changes to the Humboldt Bay ISFSI TS Sections 5.1.2.b, 5.1.3, 5.1.5, and 5.1.6 are administrative and do not require a technical evaluation.

e) Section 5.1.2.a, Radioactive Effluent Control Program

Descriptive information was added in TS 5.1.2.a to clarify there are no radioactive gaseous or liquid effluents released from the Humboldt Bay ISFSI and ensure consistency between Section 5.1.2 and the Humboldt Bay ISFSI Updated Final Safety Analysis Report (UFSAR) Section 7.7. The Humboldt Bay ISFSI UFSAR Section 7.7 states that there are no liquid or gaseous radioactive effluents emitted from the Humboldt Bay ISFSI. Therefore, a radioactive effluent monitoring system is not required, routine monitoring for effluents is not performed, and the reporting requirements of 10 CFR 72.44(d)(3) do not apply.

In the NRC Humboldt Bay ISFSI Safety Evaluation Report (SER), Section 11.1.4.2, the NRC acknowledges that the Humboldt Bay ISFSI Environmental Monitoring Program includes the use of dosimetry to determine dose rates at the restricted area and owner-controlled area

boundaries, and that compliance with the dose limits in 10 CFR 72.104(a) will be demonstrated through the Humboldt Bay ISFSI Environmental Monitoring Program using direct radiation measurements. The NRC also indicated that no additional effluent monitoring is required because no radioactive effluents are expected during ISFSI operations. (Reference 6.1)

f) Section 5.1.7, Quality Assurance Program Changes

Currently, 10 CFR Part 72 requires prior NRC approval for all changes made to a previously approved ISFSI QA Program. New Section 5.1.7 is being proposed to describe a process for making administrative changes to the Humboldt Bay ISFSI QA Program that do not require prior NRC approval.

The Humboldt Bay ISFSI is an underground and passive fuel storage facility that does not rely on active operation of equipment or instrumentation for safe operations. As stated in the NRC SER (Sections 3.1.1, 11.1.2.1, and 15.2), the casks are designed such that no radiological release is expected. As a result, the radiological risk associated with ISFSI operations is low.

The Humboldt Bay ISFSI was previously covered under a 10 CFR Part 50 QA program. Three Independent Management Reviews (IMRs) were performed over the past five years that assessed the effectiveness of the Humboldt Bay ISFSI implementation of the QA Program. The IMR results were reviewed to identify previous weaknesses with the implementation of the Humboldt Bay ISFSI's 10 CFR 50.54(a) process. NRC inspection reports issued over the past three years were also reviewed. Although certain issues were identified, there were no issues identified with Humboldt Bay ISFSI's implementation of the 10 CFR 50.54(a) process.

Therefore, obtaining prior NRC approval for administrative changes that do not reduce commitments, impact the ISFSI license, or impact safe operations:

- is not efficient; and
- increases the regulatory and administrative burden of the licensee and NRC staff.

Reductions in commitments will be defined in QA Program implementing procedures. The scope of changes that will not be

considered reductions in commitments will be consistent with the changes allowed by 10 CFR 71.106 and 10 CFR 50.54(a)(3).

4. PRECEDENTS

4.1 License SNM-2514

a) License Information Block 2 and License Condition 10

Trojan submitted to the NRC a License Change Application to change Trojan Nuclear Plant to Portland Electric Company in the ISFSI License (License Condition 10). Trojan cited that after termination of the 10 CFR Part 50 license, the Trojan Nuclear Plant would no longer apply. (Reference 6.5) Reference 6.6 shows that the NRC approved the changes to Trojan License Information Block 2 and License Condition 10. A similar change to license information block 2 was proposed in the Rancho Seco Renewed ISFSI License and approved by the NRC. (Reference 6.4)

b) License Conditions 13 and 17

In the Rancho Seco ISFSI Renewed License, previous License Condition 20, related to fuel and cask movement and handling activities, was removed. The NRC approved removal of License Condition 20 in the Rancho Seco ISFSI Renewed License that was issued March 9, 2020 (Reference 6.4).

c) License Condition 15

The Humboldt Bay, Trojan, and Rancho Seco ISFSIs are each licensed as a site-specific 10 CFR Part 72 ISFSI. As such, the emergency planning requirements for the Humboldt Bay ISFSI are the same as those for the Trojan and Rancho Seco ISFSIs. However, neither the Trojan nor Rancho Seco ISFSI Renewed Licenses include a license condition analogous to License Condition 15 in the Humboldt Bay ISFSI Renewed License. (References 6.6, 6.4 and 6.7, for Trojan, Rancho Seco, and Humboldt Bay, respectively.)

4.2 Technical Specifications

Section 5.1.7, Quality Assurance Program Changes

The TMI-2 ISFSI administrative TS (at Section 5.5.2) contains a similar provision that allows administrative changes to the QA Program without prior NRC approval. (Reference 6.8.)

5. ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.41, PG&E has reviewed the environmental impact of the proposed amendment. The proposed changes do not significantly change the types or significantly increase the amounts of any effluents that may be released offsite. In addition, there is no significant increase in individual or cumulative occupational radiation exposure. The proposed changes do not involve construction of any kind. Therefore, there is no significant construction impact. The proposed changes do not involve an increase in the potential for consequences from radiological accidents. The total offsite doses remain below the 10 CFR 72.104 limits and are considered acceptable. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(11). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6. REFERENCES

- 6.1 NRC Safety Evaluation Report, Humboldt Bay ISFSI, dated November 2005. ML053140041
- 6.2 PG&E Letter, HIL-19-001, Humboldt Bay ISFSI Quality Assurance Program, dated February 14, 2019. ML19045A700
- 6.3 NRC Letter, Humboldt Bay ISFSI QA Plan Approval, dated April 17, 2020. ML20092L173.
- 6.4 Rancho Seco ISFSI Renewed License, Amendment 4, dated March 9, 2020. ML20065N282
- 6.5 License Change Application for Trojan ISFSI License No. SNM-2509, LCA 72-02, VPN-044-2001, Enclosure 1, dated October 26, 2001. ML013060107

- 6.6 Trojan ISFSI Renewed License, Amendment 7, dated August 9, 2019.
ML19221B649
- 6.7 Humboldt Bay ISFSI Renewed License, Amendment 4, dated June 10,
2020. ML20161A027
- 6.8 NRC Issuance of TMI-2 ISFSI License, dated March 19, 1999.
ML060970083

Proposed Changes to SNM-2514 – Page Markups

LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Part 72, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, and possess the power reactor spent fuel and other radioactive materials associated with spent fuel storage designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified herein.

<p style="text-align: center;">Licensee</p> <p>1. Pacific Gas and Electric Company</p>	<p>3. License No. SNM-2514</p> <p>Amendment No. 45</p> <p>Renewed on June 10, 2020</p>
<p>2. Humboldt Bay Power Plant Independent Spent Fuel Storage Installation</p> <p>1000 King Salmon Avenue Eureka, CA 95503</p>	<p>4. Expiration Date November 17, 2065</p> <p>5. Docket or Reference No. 72-27</p>

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical or Physical Form	8. Maximum Amount That Licensee May Possess at Any One Time Under This License
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A. Spent nuclear fuel from the Humboldt Bay Power Plant, Unit 3, and associated radioactive materials related to receipt, transfer and storage of the fuel assemblies.	A. Spent fuel assemblies as UO ₂ , clad with zirconium alloy. Damaged fuel assemblies, or fuel debris as UO ₂ , zirconium alloy cladding or stainless steel cladding contained in Damaged Fuel Containers.	A. 31 MTU of intact spent fuel assemblies, damaged fuel assemblies and fuel debris.
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B. Greater Than Class C Waste; non-fuel related radioactive material generated as a result of reactor operation and decommissioning, where radionuclide concentrations exceed the limits of 10 CFR 61.55 for Class C Waste.	B. Greater Than Class C Waste, as activated metals and process wastes comprised of miscellaneous solid waste resulting from reactor operation and decommissioning.	B. 11 MT of Greater Than Class C Waste
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9. Authorized Use: The material identified in 6.A., 6.B., 7.A. and 7.B., above is authorized for receipt, possession, storage and transfer using the HI-STAR HB dry cask storage system design as described in the Humboldt Bay ISFSI Safety Analysis Report dated December 15, 2003, as revised or supplemented on October 1, 2004, October 4, 2012 and as further supplemented and amended in accordance with 10 CFR 72.70 and 10 CFR 72.48.

10. Authorized Place of Use: The licensed material is to be received, possessed, transferred and stored at the Humboldt Bay ISFSI located [on the Humboldt Bay Power Plant site](#) in Humboldt County, California, near Eureka, California.

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LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTAL SHEET		License No. SNM-2514	Amendment No. 45
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11. The Technical Specifications contained in the Appendix attached hereto are incorporated into the license. The licensee shall operate the installation in accordance with the Technical Specifications in the Appendix. The Appendix contains Technical Specifications related to environmental protection to satisfy the requirements of 10 CFR 72.44(d)(2).
12. The licensee shall follow the physical protection plan entitled, "Humboldt Bay Independent Spent Fuel Storage Installation Physical Security Plan," the "Humboldt Bay Independent Spent Fuel Storage Installation Safeguards Contingency Plan," and the "Humboldt Bay Independent Spent Fuel Storage Installation Security Training and Qualification Plan," dated December 9, 2003, as revised July 11, 2005, and as they may be further amended under the provisions of 10 CFR 72.44(e) and 10 CFR 72.180.
13. ~~Fuel and cask movement and handling activities that are to be performed in the Humboldt Bay Power Plant refueling building will be governed by the requirements of the Humboldt Bay Power Plant Unit 3 Facility Operating License (DPR-7) and associated Technical Specifications. Deleted~~
14. ~~The Commission's finding that the Quality Assurance Program complies with the requirements of 10 CFR Part 72, Subpart G is based on the existence of a Quality Assurance Program accepted by the Commission as satisfying the requirements of 10 CFR 50, Appendix B. The portion of the Commission approved Quality Assurance Program that is applicable to the Humboldt Bay ISFSI is contained in the Humboldt Bay Quality Assurance Plan and is under the control of the Humboldt Bay Power Plant, Unit 3 -Part 50 license. Prior to the termination of the Part 50 license for the Humboldt Bay Power Plant, Unit 3, the licensee must submit, for Commission approval, a Quality Assurance Program for the Humboldt Bay ISFSI that satisfies each of the elements of Subpart G. Deleted~~
15. ~~The licensee shall follow the Humboldt Bay ISFSI Emergency Plan dated December 15, 2003, as revised or supplemented on October 1, 2004, March 27, 2015 and as further supplemented and revised in accordance with 10 CFR 72.44(f). Deleted~~
16. Pursuant to 10 CFR 72.7 the licensee is hereby exempted from the provisions of 10 CFR 72.72(d), with respect to maintaining a duplicate set of spent fuel storage records. The licensee may maintain records of spent fuel and high level radioactive waste in storage either in duplicate, as required by 10 CFR 72.72(d), or, alternatively, a single set of records may be maintained at a records storage facility that satisfies the standards of ANSI N45.2.9-1974. All other requirements of 10 CFR 72.72(d) must be met.
17. ~~Prior to loading spent nuclear fuel into any dry storage cask, the following testing must be successfully completed: Deleted~~

~~For all fixed neutron absorbers:~~

- ~~(i) Each plate of neutron absorbers shall be visually inspected for damage (e.g., scratches, cracks, burrs, pitted cladding, foreign materials embedded in the surface, voids, delamination, and surface finish) as applicable.~~
- ~~(ii) The required Boron-10 content (areal density) of the neutron absorber panels for the MPC-HB shall be verified to be greater than or equal to 0.01 gm/cm².~~

~~For BORAL[®]:~~

~~After manufacturing, a statistical sample of each lot of BORAL[®] neutron absorber shall be tested using wet chemistry and/or neutron attenuation testing to verify the minimum Boron-10 content (areal density) in samples taken from the ends of the panel.~~

~~For METAMIC[®]:~~

- ~~(i) Verification that the boron carbide (B₄C) content in the METAMIC[®] is not more than 33.0 weight percent.~~
- ~~(ii) Verification that all lots of B₄C powder shall meet particle size distribution requirements.~~

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LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTAL SHEET		License No. SNM-2514	Amendment No. 45
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(iii) ~~Qualification testing shall be performed on the first production run of METAMIC® panels to be used in a Holtec MPC to validate the acceptability and consistency of the manufacturing process and verify the acceptability of the METAMIC® panels for neutron absorbing capability.~~

1. ~~————— The B₄C powder weight percent shall be verified by testing a sample from 40 different mixed batches. (A mixed batch is defined as a single mixture of aluminum powder and B₄C powder used to make one or more billets. Each billet will produce several panels.) The samples shall be drawn from the mixing containers after mixing operations have been completed. Testing shall be performed using the wet chemistry method.~~
2. ~~————— The Boron-10 areal density shall be verified by testing a sample from one panel from each of 40 different mixed batches. The samples shall be drawn from areas contiguous to the manufactured panels of METAMIC® and shall be tested using the wet chemistry method. Alternatively, neutron attenuation tests on the samples may be performed to quantify the actual Boron-10 areal density.~~
3. ~~————— To verify the local uniformity of the boron particle dispersal, neutron attenuation measurements of random test coupons shall be performed. These test coupons may come from the production run or from pre-production trial runs.~~
4. ~~————— To verify the macroscopic uniformity of the boron particle distribution, test samples shall be taken from the sides of one panel from five different mixed batches before the panels are cut to their final sizes. The sample locations shall be chosen to be representative of the final product. Wet chemistry or neutron attenuation shall be performed on each of the samples.~~

(iv) ~~For production runs of the panels to be used in the MPC-HB canisters, the following tests shall be performed:~~

1. ~~————— Testing of mixed batches shall be performed on a statistical basis to verify that the correct B₄C weight percent is being mixed.~~
2. ~~————— Samples from random METAMIC® panels taken from areas contiguous to the manufactured panels shall be tested via wet chemistry and/or neutron attenuation testing to verify the Boron-10 areal density. This testing shall be performed to verify the continued acceptability of the manufacturing process.~~

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LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTAL SHEET		License No. SNM-2514	Amendment No. 45
		Docket or Reference No. 72-27	Renewed

18. Within 90 days after issuance of the renewed license, PG&E shall submit an updated final safety analysis report (FSAR) to the U.S. Nuclear Regulatory Commission (NRC), in accordance with 10 CFR 72.70(a)(1) and (2). PG&E shall continue to update the FSAR, pursuant to the requirements in 10 CFR 72.70(a), (b), and (c). PG&E will follow the procedures in 10 CFR 72.4 for submitting the FSAR. The updated FSAR shall reflect the information provided in Appendix D of the Humboldt Bay ISFSI License Renewal Application, Revision 4, dated November 4, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19337C634). The licensee may make changes to the updated FSAR, consistent with 10 CFR 72.48(c).

19. At least one year prior to the period of extended operation, PG&E shall create, update, or revise procedures for implementing the activities in the Aging Management Programs (AMPs) summarized in Appendix D of the license renewal application, and maintained in the updated FSAR. PG&E shall maintain procedures that implement the AMPs throughout the term of this license.

Each procedure for implementing the AMPs shall contain a reference to the specific AMP provision the procedure is intended to implement. The reference shall be maintained if procedures are modified.

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. MPC-HB helium leak rate limit for vent and drain port cover plate welds not met.	C.1 Perform an engineering evaluation to determine the impact of increased helium leak rate on heat removal capacity.	24 hours
	<u>AND</u> C.2 Develop and initiate corrective actions necessary to return the MPC-HB to an analyzed condition.	7 days
D. Required Actions and associated Completion Times not met.	D.1 Remove all fuel assemblies from the MPC-HB.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify MPC-HB cavity vacuum drying pressure is ≤ 3 torr for ≥ 30 min. <u>OR</u> While recirculating helium through the MPC-HB cavity, verify that the gas temperature exiting the demohurizer is $\leq 21^{\circ}\text{F}$ for ≥ 30 min or the dew point of the gas exiting the MPC is $\leq 22.9^{\circ}\text{F}$ for ≥ 30 min.	Once, prior to TRANSPORT OPERATIONS.
SR 3.1.1.2 Verify MPC-HB helium backfill pressure is ≥ 45.2 psig and ≤ 48.8 psig at a reference temperature of 70°F .	Once, prior to TRANSPORT OPERATIONS.
SR 3.1.1.3 Verify that the total helium leak rate through the MPC-HB vent and drain port cover plate welds is $\leq 1.0\text{E-}7$ atm-cc/sec (He).	Once, prior to TRANSPORT OPERATIONS.

3.1 SFSC INTEGRITY

3.1.3 ~~Fuel Cool-Down~~~~Deleted~~

~~LCO 3.1.3 ————— The MPC-HB cavity bulk helium temperature shall be $\leq 200^{\circ}\text{F}$.~~

~~NOTE~~

~~The LCO is only applicable to wet UNLOADING OPERATIONS.~~

~~APPLICABILITY: ————— During UNLOADING OPERATIONS prior to re-flooding.~~

~~ACTIONS~~

~~NOTE~~

~~Separate Condition entry is allowed for each MPC-HB~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. — MPC-HB cavity bulk Helium temperature not within limit.	A.1 — Establish MPC-HB cavity bulk Helium temperature within limit. AND A.2 — Ensure adequate heat transfer from the MPC-HB to the environment	Prior to initiating MPC-HB re-flooding operations. 24 hours

~~SURVEILLANCE REQUIREMENTS~~

SURVEILLANCE	FREQUENCY
SR 3.1.3.1 — Ensure via analysis or direct measurement that the MPC-HB cavity bulk helium temperature is $\leq 200^{\circ}\text{F}$.	Prior to MPC-HB re-flooding operations.

4.0 DESIGN FEATURES (continued)

4.3 Cask Handling

4.3.1 Cask Transporter

A cask transporter is used to transport the SFSC ~~between the power plant and the ISFSI~~. The requirements for the cask transporter are as follows:

- a. ~~Except for the period of time in which the loaded SFSC is being moved on the rail dolly,~~ TRANSPORT OPERATIONS shall be conducted using the cask transporter.
- b. The cask transporter fuel tank shall not contain > 50 gallons of diesel fuel at any time.
- c. The cask transporter shall be designed, fabricated, inspected, maintained, operated, and tested in accordance with the applicable guidelines of NUREG-0612.
- d. The cask transporter lifting towers shall have redundant drop protection features.

4.3.2 Storage Capacity

The Humboldt Bay ISFSI can accommodate up to 400 spent fuel assemblies. The ISFSI storage capacity can accommodate up to six SFSCs.

4.3.3 SFSC Load Handling Equipment

Lifting of a SFSC ~~outside of structures governed by 10 CFR 50~~ shall be performed with load handling equipment that is designed, fabricated, inspected, maintained, operated and tested in accordance with the applicable guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants".

 5.0 ADMINISTRATIVE CONTROLS

5.1 Administrative Programs

The following programs shall be established, implemented, and maintained:

5.1.1 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these TS.

- a. Changes to the TS Bases shall be made under appropriate administrative controls and reviews.
- b. Changes to the TS Bases may be made without prior NRC approval in accordance with the criteria in 10 CFR 72.48.
- c. The TS Bases Control Program shall contain provisions to ensure that the TS Bases are maintained consistent with the Humboldt Bay ISFSI SAR.
- d. Proposed changes that do not meet the criteria of 5.1.1.b above shall be reviewed and approved by the NRC prior to implementation. Changes to the TS Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 72.48 (d) (2).

5.1.2 Radioactive Effluent Control Program

- a. This program is established and maintained to implement the requirements of 10 CFR 72.44 (d) or 72.126, as appropriate. There are no radioactive gaseous or liquid effluents released from the Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI) during operation. Therefore, a radioactive effluent monitoring system is not required, routine monitoring for effluents is not performed, and the reporting requirements of 10 CFR 72.44(d)(3) do not apply.
- b. This program will provide limits on surface contamination of the OVERPACK and GTCC cask and verification of meeting those limits prior to removal of a loaded OVERPACK or GTCC cask from the refueling building. Deleted

5.1.3 MPC-HB and SFSC Loading, Unloading, and Preparation Program Deleted

This program shall be established and maintained to implement Humboldt Bay ISFSI SAR Section 10.2 requirements for loading fuel and components into MPC-HBs, unloading fuel and components from MPC-HBs, and preparing the MPC-HBs for storage in the SFSCs. The requirements of the program for loading and preparing the MPC-HB shall be complete prior to removing the MPC-HB from the Refueling Building. The program provides for evaluation and control of the following requirements during the applicable operation:

- a. Verify that the acceptance criteria for drying are met to ensure short term fuel temperature limits are not violated and the MPC-HB and OVERPACK are adequately dry.
- b. Verify that the MPC-HB and OVERPACK inerting backfill pressures and purity assure adequate heat transfer and corrosion control.
- c. Verify that leak testing assures adequate OVERPACK integrity.
- d. Verify surface dose rates on the SFSCs are consistent with the offsite dose analysis.
- e. During MPC-HB re-flooding, verify the MPC cavity bulk helium temperature is such that water quenching or flashing does not occur.
- f. Loading is to be independently verified by a cognizant engineer to ensure that the fuel assemblies in the MPCs are placed in accordance with the original loading plan.

 (continued)

5.1.4 ISFSI Operations Program

This program will implement the Humboldt Bay ISFSI SAR requirements for ISFSI operations. It will include criteria to be verified and controlled:

- a. SFSC cask storage location.
- b. Design features listed in Section 4.0 and design basis ISFSI parameters consistent with the Humboldt Bay ISFSI SAR analysis.

5.1.5 Cask Transportation Evaluation Program

This program will evaluate and control the transportation of loaded SFSCs ~~between the HBPP Refueling Building and the ISFSI storage vault~~. Included in this program will be pre-transport evaluation and control during transportation of the following:

- Transportation route road surface conditions.
- Onsite hazards along the transportation route.
- Security, including control of the 100 meter boundary.
- Transporter control functions and operability.
- Offsite marine hazards from barge transport.
- Severe weather.

5.1.6 ~~GTCC Cask Loading and Preparation Program Deleted~~

~~This program shall be established and maintained to implement Humboldt Bay ISFSI SAR Section 3.1 requirements for loading a GTCC cask and preparing the GTCC cask for storage in the ISFSI. The requirements of the program for loading and preparing the GTCC cask shall be complete prior to removing the GTCC cask from the refueling building. The program provides for evaluation and control of the following requirements during the applicable operation:~~

- ~~a. Verify surface dose rates on the GTCC cask are consistent with the offsite dose analysis.~~
- ~~b. Verify that any effluents from the GTCC cask comply with 10 CFR 20 requirements.~~

5.1.7 Quality Assurance Program Changes

- a. Changes to the Quality Assurance Program shall be reviewed and approved in accordance with administrative procedures.
- b. Changes may be made to the Quality Assurance Program without prior NRC approval provided the changes do not:
 - Reduce the commitments in the quality assurance program previously approved by the NRC.
 - Involve a change to the Humboldt Bay ISFSI License or Technical Specifications.
- c. Changes made to the Quality Assurance Program without prior NRC approval shall be submitted to the NRC consistent with the frequency in 10 CFR 72.70(c)(6).
- d. Proposed changes which do not meet the criteria in 5.1.7.b shall be approved by the NRC prior to implementation.

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**LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND
HIGH-LEVEL RADIOACTIVE WASTE**

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Part 72, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, and possess the power reactor spent fuel and other radioactive materials associated with spent fuel storage designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified herein.

Licensee 1. Pacific Gas and Electric Company	3. License No. SNM-2514 Amendment No. 5 Renewed on June 10, 2020
2. Humboldt Bay Independent Spent Fuel Storage Installation 1000 King Salmon Avenue Eureka, CA 95503	4. Expiration Date November 17, 2065 5. Docket or Reference No. 72-27

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical or Physical Form	8. Maximum Amount That Licensee May Possess at Any One Time Under This License
A. Spent nuclear fuel from the Humboldt Bay Power Plant, Unit 3, and associated radioactive materials related to receipt, transfer and storage of the fuel assemblies.	A. Spent fuel assemblies as UO ₂ , clad with zirconium alloy. Damaged fuel assemblies, or fuel debris as UO ₂ , zirconium alloy cladding or stainless steel cladding contained in Damaged Fuel Containers.	A. 31 MTU of intact spent fuel assemblies, damaged fuel assemblies and fuel debris.
B. Greater Than Class C Waste; non-fuel related radioactive material generated as a result of reactor operation and decommissioning, where radionuclide concentrations exceed the limits of 10 CFR 61.55 for Class C Waste.	B. Greater Than Class C Waste, as activated metals and process wastes comprised of miscellaneous solid waste resulting from reactor operation and decommissioning.	B. 11 MT of Greater Than Class C Waste

9. Authorized Use: The material identified in 6.A., 6.B., 7.A. and 7.B., above is authorized for receipt, possession, storage and transfer using the HI-STAR HB dry cask storage system design as described in the Humboldt Bay ISFSI Safety Analysis Report dated December 15, 2003, as revised or supplemented on October 1, 2004, October 4, 2012 and as further supplemented and amended in accordance with 10 CFR 72.70 and 10 CFR 72.48.

10. Authorized Place of Use: The licensed material is to be received, possessed, transferred and stored at the Humboldt Bay ISFSI located in Humboldt County, California, near Eureka, California.

NRC FORM 588A <small>(10-2000) 10 CFR 72</small>	U. S. NUCLEAR REGULATORY COMMISSION	PAGE <u>2</u> OF <u>2</u> PAGES	
LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE SUPPLEMENTAL SHEET		License No. SNM-2514	Amendment No. 5
		Docket or Reference No. 72-27	Renewed

11. The Technical Specifications contained in the Appendix attached hereto are incorporated into the license. The licensee shall operate the installation in accordance with the Technical Specifications in the Appendix. The Appendix contains Technical Specifications related to environmental protection to satisfy the requirements of 10 CFR 72.44(d)(2).
12. The licensee shall follow the physical protection plan entitled, "Humboldt Bay Independent Spent Fuel Storage Installation Physical Security Plan," the "Humboldt Bay Independent Spent Fuel Storage Installation Safeguards Contingency Plan," and the "Humboldt Bay Independent Spent Fuel Storage Installation Security Training and Qualification Plan," dated December 9, 2003, as revised July 11, 2005, and as they may be further amended under the provisions of 10 CFR 72.44(e) and 10 CFR 72.180.
13. Deleted
14. Deleted
15. Deleted
16. Pursuant to 10 CFR 72.7 the licensee is hereby exempted from the provisions of 10 CFR 72.72(d), with respect to maintaining a duplicate set of spent fuel storage records. The licensee may maintain records of spent fuel and high level radioactive waste in storage either in duplicate, as required by 10 CFR 72.72(d), or, alternatively, a single set of records may be maintained at a records storage facility that satisfies the standards of ANSI N45.2.9-1974. All other requirements of 10 CFR 72.72(d) must be met.
17. Deleted
18. Within 90 days after issuance of the renewed license, PG&E shall submit an updated final safety analysis report (FSAR) to the U.S. Nuclear Regulatory Commission (NRC), in accordance with 10 CFR 72.70(a)(1) and (2). PG&E shall continue to update the FSAR, pursuant to the requirements in 10 CFR 72.70(a), (b), and (c). PG&E will follow the procedures in 10 CFR 72.4 for submitting the FSAR. The updated FSAR shall reflect the information provided in Appendix D of the Humboldt Bay ISFSI License Renewal Application, Revision 4, dated November 4, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19337C634). The licensee may make changes to the updated FSAR, consistent with 10 CFR 72.48(c).
19. At least one year prior to the period of extended operation, PG&E shall create, update, or revise procedures for implementing the activities in the Aging Management Programs (AMPs) summarized in Appendix D of the license renewal application, and maintained in the updated FSAR. PG&E shall maintain procedures that implement the AMPs throughout the term of this license.

Each procedure for implementing the AMPs shall contain a reference to the specific AMP provision the procedure is intended to implement. The reference shall be maintained if procedures are modified.

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. MPC-HB helium leak rate limit for vent and drain port cover plate welds not met.	C.1 Perform an engineering evaluation to determine the impact of increased helium leak rate on heat removal capacity.	24 hours
	<u>AND</u> C.2 Develop and initiate corrective actions necessary to return the MPC-HB to an analyzed condition.	7 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify MPC-HB cavity vacuum drying pressure is ≤ 3 torr for ≥ 30 min. <u>OR</u> While recirculating helium through the MPC-HB cavity, verify that the gas temperature exiting the demohstrizer is $\leq 21^{\circ}\text{F}$ for ≥ 30 min or the dew point of the gas exiting the MPC is $\leq 22.9^{\circ}\text{F}$ for ≥ 30 min.	Once, prior to TRANSPORT OPERATIONS.
SR 3.1.1.2 Verify MPC-HB helium backfill pressure is ≥ 45.2 psig and ≤ 48.8 psig at a reference temperature of 70°F .	Once, prior to TRANSPORT OPERATIONS.
SR 3.1.1.3 Verify that the total helium leak rate through the MPC-HB vent and drain port cover plate welds is $\leq 1.0\text{E-}7$ atm-cc/sec (He).	Once, prior to TRANSPORT OPERATIONS.

3.1 SFSC INTEGRITY

3.1.3 Deleted

4.0 DESIGN FEATURES (continued)

4.3 Cask Handling

4.3.1 Cask Transporter

A cask transporter is used to transport the SFSC. The requirements for the cask transporter are as follows:

- a. TRANSPORT OPERATIONS shall be conducted using the cask transporter.
- b. The cask transporter fuel tank shall not contain > 50 gallons of diesel fuel at any time.
- c. The cask transporter shall be designed, fabricated, inspected, maintained, operated, and tested in accordance with the applicable guidelines of NUREG-0612.
- d. The cask transporter lifting towers shall have redundant drop protection features.

4.3.2 Storage Capacity

The Humboldt Bay ISFSI can accommodate up to 400 spent fuel assemblies. The ISFSI storage capacity can accommodate up to six SFSCs.

4.3.3 SFSC Load Handling Equipment

Lifting of a SFSC shall be performed with load handling equipment that is designed, fabricated, inspected, maintained, operated and tested in accordance with the applicable guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants".

5.0 ADMINISTRATIVE CONTROLS

5.1 Administrative Programs

The following programs shall be established, implemented, and maintained:

5.1.1 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these TS.

- a. Changes to the TS Bases shall be made under appropriate administrative controls and reviews.
- b. Changes to the TS Bases may be made without prior NRC approval in accordance with the criteria in 10 CFR 72.48.
- c. The TS Bases Control Program shall contain provisions to ensure that the TS Bases are maintained consistent with the Humboldt Bay ISFSI SAR.
- d. Proposed changes that do not meet the criteria of 5.1.1.b above shall be reviewed and approved by the NRC prior to implementation. Changes to the TS Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 72.48 (d) (2).

5.1.2 Radioactive Effluent Control Program

- a. This program is established and maintained to implement the requirements of 10 CFR 72.44 (d) or 72.126, as appropriate. There are no radioactive gaseous or liquid effluents released from the Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI) during operation. Therefore, a radioactive effluent monitoring system is not required, routine monitoring for effluents is not performed, and the reporting requirements of 10 CFR 72.44(d)(3) do not apply.
- b. Deleted

5.1.3 Deleted

(continued)

5.1.4 ISFSI Operations Program

This program will implement the Humboldt Bay ISFSI SAR requirements for ISFSI operations. It will include criteria to be verified and controlled:

- a. SFSC cask storage location.
- b. Design features listed in Section 4.0 and design basis ISFSI parameters consistent with the Humboldt Bay ISFSI SAR analysis.

5.1.5 Cask Transportation Evaluation Program

This program will evaluate and control the transportation of loaded SFSCs. Included in this program will be pre-transport evaluation and control during transportation of the following:

- Transportation route road surface conditions.
- Onsite hazards along the transportation route.
- Security, including control of the 100 meter boundary.
- Transporter control functions and operability.
- Offsite marine hazards from barge transport.
- Severe weather.

5.1.6 Deleted

5.1.7 Quality Assurance Program Changes

- a. Changes to the Quality Assurance Program shall be reviewed and approved in accordance with administrative procedures.
- b. Changes may be made to the Quality Assurance Program without prior NRC approval provided the changes do not:
 - Reduce the commitments in the quality assurance program previously approved by the NRC.
 - Involve a change to the Humboldt Bay ISFSI License or Technical Specifications.
- c. Changes made to the Quality Assurance Program without prior NRC approval shall be submitted to the NRC consistent with the frequency in 10 CFR 72.70(c)(6).
- d. Proposed changes which do not meet the criteria in 5.1.7.b shall be approved by the NRC prior to implementation.

**Proposed Changes to Technical Specification Bases – Page Markups
(For Information Only)**

NOTE: **Editorial Change on Page B3.1-7-ACTIONS Section:** The attached mark-up includes an in-process change to the Technical Specification Bases on page B3.1-7 that is not related to License Amendment Request 21-02.



ISFSI TECHNICAL SPECIFICATION BASES

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BASES

ACTIONS
(continued)C.1

If the helium leak rate limit has been determined not to be met during TRANSPORT OPERATIONS or STORAGE OPERATIONS, an engineering evaluation is necessary to determine the impact of increased helium leak rate on heat removal. Since the HI-STAR OVERPACK is a sealed system, any leakage from the MPC is contained within the OVERPACK. Since an increased helium leak rate represents a potential challenge to MPC heat removal, reasonably rapid action is warranted. The Completion Time is sufficient to complete the engineering evaluation commensurate with the safety significance of the CONDITION.

C.2

Once the cause and consequences of the elevated leak rate from the MPC are determined, a corrective action plan shall be developed and initiated to the extent necessary to return the MPC to an analyzed condition. Since the recovery mechanisms can range over a broad scale based on the evaluation performed under Required Action C.1, different recovery strategies may be necessary. Since an elevated helium leak rate represents a challenge to heat removal rates, reasonably rapid action is required. The Completion Time is sufficient to develop and initiate the corrective actions commensurate with the safety significance of the CONDITION.

D.1

~~If the MPC fuel cavity cannot be successfully returned to a safe, analyzed condition, the fuel must be placed in a safe condition in the spent fuel pool. The Completion Time is reasonable based on the time required to perform fuel cool-down operations, re-flood the MPC, install the lid retention device, cut the MPC lid welds, move the SFSC into the spent fuel pool, remove the lid retention device and the MPC lid, and remove the spent fuel assemblies in an orderly manner and without challenging personnel.~~

(continued)



ISFSI TECHNICAL SPECIFICATION BASES

Overpack Heat Removal System B3.1.2

B 3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

B 3.1.2 OVERPACK Heat Removal System

BASES

BACKGROUND	The OVERPACK heat removal system is a passive heat transfer system that ensures heat from the MULTI-PURPOSE CANISTER (MPC) is transferred to the environs by conduction and radiation.
APPLICABLE SAFETY ANALYSIS	The thermal analyses of the SFSC take credit for the decay heat from the spent fuel assemblies being ultimately transferred to the ambient environment surrounding the OVERPACK. Transfer of heat away from the fuel assemblies ensures that the fuel cladding and other SFSC component temperatures do not exceed applicable limits.
LCO	The SFSC heat removal system must be verified to be operable to preserve the assumptions of the thermal analyses. The operability of the heat removal system ensures that the decay heat generated by the stored fuel assemblies is transferred to the environs at a sufficient rate to maintain fuel cladding and other SFSC component temperatures within design limits.
APPLICABILITY	The LCO is applicable during TRANSPORT and STORAGE OPERATIONS. Once a SFSC has been placed in storage, the heat removal system must be operable to ensure adequate heat transfer of the decay heat away from the fuel assemblies.
ACTIONS	A note has been added to the ACTIONS, which states that for this LCO, separate condition entry is allowed for each <u>MPC-HBOVERPACK</u> . This is acceptable since the Required Actions for each condition provide appropriate compensatory measures for each SFSC not meeting the LCO. Subsequent SFSCs that don't meet the LCO are governed by subsequent condition entry and application of associated Required Actions.

A.1

If the cavity pressure limit has been determined not to be met during TRANSPORT OPERATIONS or STORAGE OPERATIONS, an engineering evaluation is necessary to determine the potential quantity of moisture left within the OVERPACK cavity. Since moisture remaining in the cavity during these modes of operation may represent a long-term degradation concern, immediate action is not necessary. The Completion Time is sufficient to complete the engineering evaluation commensurate with the safety significance of the CONDITION.

(continued)



ISFSI TECHNICAL SPECIFICATION BASES

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B 3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

Fuel Cool-Down B3.1.3

B 3.1.3 ~~Fuel Cool-Down Deleted~~

BASES

BACKGROUND

~~In the event that an MPC must be unloaded, the SFSC is returned to the cask preparation area to begin the process of fuel unloading. The MPC closure ring, and vent and drain port cover plates are removed. The MPC gas is sampled to determine the integrity of the spent fuel cladding. The MPC is attached to the Cool-Down System. The Cool-Down System is a closed loop forced ventilation gas cooling system that cools the fuel assemblies by cooling the surrounding helium gas.~~

~~Following fuel cool down, the MPC is then re-flooded with water, the lid retention device is installed, and the MPC lid weld is removed leaving the MPC lid in place. The SFSC is placed in the spent fuel pool and the lid retention device is removed, followed by the MPC lid. The fuel assemblies are removed from the MPC and the MPC and HI-STAR HB OVERPACK are removed from the spent fuel pool and decontaminated.~~

~~Reducing the fuel cladding temperatures significantly reduces the temperature gradients across the cladding, thus minimizing thermally induced stresses on the cladding during MPC re-flooding. Reducing the MPC internal temperatures eliminates the risk of high MPC pressure due to sudden generation of steam during re-flooding.~~

APPLICABLE SAFETY ANALYSIS

~~The confinement of radioactivity during the storage of spent fuel in the MPC is ensured by the multiple confinement boundaries and systems. The barriers relied on are the fuel pellet matrix, the metallic fuel cladding tubes in which the fuel pellets are contained, and the MPC in which the fuel assemblies are stored. Long-term integrity of the fuel and cladding depend on minimizing thermally induced stresses to the cladding.~~

~~This is accomplished during the unloading operations by lowering the MPC internal temperatures prior to MPC re-flooding. The integrity of the MPC depends on maintaining the internal cavity pressures within design limits. This is accomplished by reducing the MPC internal temperatures such that there is no sudden formation of steam during MPC re-flooding.~~

(continued)



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BASES (continued)

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LCO

~~Determining that the circulating MPC gas exit temperature is below the acceptance criteria ensures that there will be no large thermal gradient across the fuel assembly cladding during re-flooding which could be potentially harmful to the cladding. The temperature limit specified in the LCO was selected to ensure that the MPC gas exit temperature will closely match the desired fuel cladding temperature prior to re-flooding the MPC. The temperature was selected to be lower than the boiling temperature of water with an additional margin.~~

APPLICABILITY

~~The MPC helium bulk gas exit temperature is determined during UNLOADING OPERATIONS after the SFSC is back in the fuel building and is no longer suspended from, or secured in, the transporter. Therefore, the Fuel Cool-Down LCO does not apply during TRANSPORT OPERATIONS and STORAGE OPERATIONS.~~

~~A note has been added to the APPLICABILITY for LCO 3.1.3 which states that the Applicability is only applicable during wet UNLOADING OPERATIONS. This is acceptable since the intent of the LCO is to avoid uncontrolled MPC pressurization due to water flashing during re-flooding operations. This is not a concern for dry UNLOADING OPERATIONS.~~

ACTIONS

~~A note has been added to the ACTIONS which states that, for this LCO, separate Condition entry is allowed for each MPC. This is acceptable since the Required Actions for each Condition provide appropriate compensatory measures for each MPC not meeting the LCO. Subsequent MPCs that do not meet the LCO are governed by subsequent Condition entry and application of associated Required Actions.~~

A.1

~~If the MPC helium bulk gas exit temperature limit is not met, actions must be taken to restore the parameters to within the limits before re-flooding the MPC. Failure to successfully complete fuel cool-down could have several causes, such as failure of the cool-down system, inadequate cool-down, or clogging of the piping lines. The Completion Time is sufficient to determine and correct most failure mechanisms and proceeding with activities to flood the MPC cavity with water are prohibited.~~

(continued)



BASES

Fuel Cool-Down B3.1.3

ACTIONS

~~(continued)~~A.2

~~If the LCO is not met, in addition to performing Required Action A.1 to restore the bulk-gas temperature to within the limit, the proper conditions must exist for the transfer of heat from the MPC to the surrounding environs to ensure the fuel cladding remains below the short term temperature limit.~~

~~Ensure the annulus between the MPC and the HI-STAR HB OVERPACK is filled with water. This places the system in a heat removal configuration which is bounded by the SAR thermal evaluation of the system considering a vacuum in the MPC. The system is open to the ambient environment which limits the temperature of the ultimate heat sink (the water in the annulus) and, therefore, the MPC shell to 212°F.~~

~~Twenty four (24) hours is an acceptable time frame to allow for completion of Required Action A.2 and is conservatively based on a thermal evaluation of a HI-STAR HB OVERPACK located in a vault. In such a configuration, passive cooling mechanisms will be largely diminished. Eliminating 90 percent of the passive cooling mechanisms with the cask emplaced in the vault, the thermal inertia of the cask (approximately 20,000 Btu/°F) will limit the rate of temperature rise with design basis maximum heat load to less than 4°F per hour. Thus, the fuel cladding temperature rise in 24 hours will be less than 100°F. Large short term temperature margins exist to preclude any cladding integrity concerns under this temperature rise.~~

SURVEILLANCE
REQUIREMENTSSR 3.1.3.1

~~The long-term integrity of the stored fuel is dependent on the material condition of the fuel assembly cladding. By minimizing thermally-induced stresses across the cladding, the integrity of the fuel assembly cladding is maintained. The integrity of the MPC is dependent on controlling the internal MPC pressure. By controlling the MPC internal temperature prior to re-flooding the MPC there is no formation of steam during MPC re-flooding.~~

~~The MPC helium exit gas temperature limit ensures that there will be no large thermal gradients across the fuel assembly cladding during MPC re-flooding and no formation of steam which could potentially overpressurize the MPC.~~

~~Fuel cool down must be performed successfully on each SFSC before the initiation of MPC re-flooding operations to ensure that the design and analysis basis are preserved.~~



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~~BASES (continued)~~

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~~REFERENCES~~

- ~~1. Humboldt Bay ISFSI SAR Sections 4.2.3.3.5, 4.4.1, and 4.4.1.2.6~~
 - ~~2. Humboldt Bay ISFSI SAR Table 5.1-1~~
 - ~~3. Humboldt Bay ISFSI SAR Sections 9.4.1.1.2 and 9.4.1.1.4~~
 - ~~4. Humboldt Bay ISFSI SAR Sections 10.2.3 and 10.2.3.1~~
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