



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

May 31, 2013

Mr. Edward D. Halpin, Senior Vice President
and Chief Nuclear Officer
Pacific Gas and Electric Company
P. O. Box 3
Mail Code 104/6/601
Avila Beach, CA 93424

SUBJECT: HUMBOLDT BAY POWER PLANT INDEPENDENT SPENT FUEL STORAGE
INSTALLATION (ISFSI) INSPECTION REPORT 05000133/2013008 AND
07200027/2013001

Dear Mr. Halpin:

An inspection was completed of your dry cask storage activities associated with your Independent Spent Fuel Storage Installation (ISFSI) on April 30 through May 1, 2013. An exit was conducted with your staff to discuss the findings of the inspection on May 1, 2013. The inspection was conducted to confirm compliance with the requirements specified in your site specific Materials License No. SNM-2514 associated Technical Specifications, the Humboldt Bay ISFSI Final Safety Analysis Report (FSAR), and the regulations in 10 CFR Part 20 and Part 72.

The inspection reviewed the areas of radiation safety, quality assurance, corrective action program, safety evaluations, cask maintenance, and how you addressed industry issues that affected your ISFSI program. The inspection reviewed changes made to your ISFSI program since the last U.S. Nuclear Regulatory Commission (NRC) ISFSI inspection. Your ISFSI operations were found to be in compliance with the applicable NRC regulations and requirements and your storage casks were found to be in good physical condition. No violations of NRC regulations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal, privacy or proprietary information so that it can be made available to the public without redaction.

Should you have any questions concerning this inspection, please contact the undersigned at 817-200-1191 or Mr. Lee Brookhart at 817-200-1549.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Repository & Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Dockets: 50-133, 72-27
Licenses: DPR-07, SNM-2514

Enclosure:
Inspection Report 05000133/2013008;
07200027/2013001

w/attachments:

1. Supplemental Information
2. Loaded Casks at the Humboldt Bay ISFSI

cc w/encls: See next page

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Letter to Edward Halpin from D. Blair Spitzberg, dated May 31, 2013.

SUBJECT: HUMBOLDT BAY POWER PLANT INDEPENDENT SPENT FUEL
STORAGE INSTALLATION (ISFSI) INSPECTION REPORT
05000133/2013008 AND 07200027/2013001

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets: 05000133, 07200027

Licenses: DPR-07, SNM-2514

Report Nos.: 05000133/2013008 and 07200027/2013001

Licensee: Pacific Gas and Electric Company (PG&E)

Facility: Humboldt Bay Power Plant, Unit 3, and
Independent Spent Fuel Storage Installation (ISFSI)

Location: 1000 King Salmon Avenue
Eureka, California 95503

Dates: April 30 through May 1, 2013

Inspector: Lee Brookhart, Inspector
Repository & Spent Fuel Safety Branch

Accompanying
Personnel: Eric Simpson, Inspector-in-Training,
Repository & Spent Fuel Safety Branch

Approved By: D. Blair Spitzberg, Ph.D., Chief
Repository & Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Humboldt Bay Power Plant, Unit 3
NRC Inspection Report 05000133/2013008 and 07200027/2013001

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine inspection of the licensee's programs and activities for safe handling and storage of spent fuel at the Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI) on April 30 through May 1, 2013. The inspection reviewed a number of topics to evaluate compliance with the applicable NRC regulations and the provisions of their site specific license SMN-2514 which utilized the Holtec International Storage, Transport, and Repository Cask System (HI-STAR) design. Five HI-STAR HB casks were currently loaded and stored on the Humboldt Bay ISFSI pad. All spent nuclear fuel was moved to the ISFSI between August 2008 and December 2008 and had been safely stored in underground casks. One additional cask was purchased by the licensee for storage of radioactive components from the reactor vessel and the spent fuel pool. The ISFSI facility was well maintained and dose rates around the perimeter were being monitored. Perimeter dose rates measured since the fuel was loaded into the ISFSI have remained at near background levels due to the shielding provided by the ISFSI structure and the old age of the spent fuel. A review of the environmental monitoring program demonstrated that radiological exposures to offsite locations were not occurring from the storage of the spent fuel at Humboldt Bay's ISFSI. The quality assurance program and corrective action program were being effectively implemented to capture and correct issues related to the dry cask storage program.

The NRC routine inspection reviewed documentation relevant to ISFSI activities and operations that have occurred at Humboldt Bay since the last ISFSI inspection that was performed in January of 2010. The documentation reviewed included quality assurance, radiological conditions, corrective actions, compliance to technical specifications, compliance to Final Safety Analysis Report (FSAR) requirements, and industry ISFSI issues that affected your site. In summary, the licensee was conducting ISFSI activities in compliance with regulatory and license requirements.

Away-From-Reactor ISFSI Inspection Guidance (60858)

- The licensee was conducting quality assurance audits of the ISFSI program. A review of three audit reports determined that the audits were covering a broad range of topics. A number of issues were identified in the audits and entered into the corrective action program for resolution. (Section 1.2.a)
- Radiation levels around the ISFSI pad was consistent with background doses for the site. Radiation data reviewed from the 2009 through 2012 environmental reports determined that radiation levels offsite were not being significantly impacted by the ISFSI. (Section 1.2.b)
- Required records were maintained that described the specific fuel parameters for the spent fuel stored in each of the licensee's loaded casks. (Section 1.2.c)
- Since the last NRC ISFSI inspection, Humboldt Bay had revised their FSAR in Revision 3 dated November 16, 2011. No issues were identified in review of the changes associated with the revision. (Section 1.2.d)

- Selected condition reports were reviewed for the period January 2010 through April 2013. A wide range of issues had been identified and resolved. Resolutions of the condition reports were appropriate for the safety significance of the issue. No adverse trends were identified during the review. (Section 1.2.e)
- Final Safety Analysis Report Section 4.4.3.8 requirements for a monthly vault inspection for intrusion of water were performed monthly as required. The licensee had identified that some surveillances documented the intrusion of rainwater into the underground vault. A design change was completed to resolve this issue by sealing the small area between the concrete vault and the vault lids using an elastomeric caulk. (Section 1.2.f)
- Changes to the licensee's emergency planning program since the last NRC inspection in January 2010 were reviewed. The inspector verified that these changes had not reduced the effectiveness of the emergency response or plan and were consistent with the requirements in 10 CFR Part 50 and 72. The inspector verified that an annual site drill had been performed for the period of 2010 through 2012 in compliance with the emergency plan and 10 CFR 72.32 (a)(12) requirements. (Section 1.2.g)
- Humboldt Bay submitted their ISFSI Decommissioning Funding Plan in compliance with 10 CFR 72.30(b) on the submittal deadline of December 17, 2012. (Section 1.2.h)
- Humboldt Bay's response to NRC Information Notice 2012-20 has been adequately captured and documented in their corrective action program. (Section 1.2.i)

Review of 10 CFR 72.48 Evaluations (60857)

- All required safety screenings and safety evaluations had been performed in accordance with procedures and 10 CFR 72.48 requirements. All screenings and safety evaluations reviewed were determined to be adequately evaluated. (Section 2)

Report Details

Summary of Facility Status

Holtec developed a modified Holtec International Storage, Transport, and Repository Cask System (HI-STAR) overpack and Multi-Purpose Canister (MPC) for Humboldt Bay, designated as the HI-STAR Version HB and MPC HB, due to the smaller fuel assemblies that were utilized by their reactor. The Humboldt Bay ISFSI was loaded with five HI-STAR HB casks between August 2008 and December 2008 containing all the spent nuclear fuel stored onsite at the Humboldt Bay Unit 3 Power Plant. This removed all spent fuel assemblies from the spent fuel pool. Each HI-STAR HB cask contained a MPC HB which held up to eighty Boiling Water Reactor (BWR) fuel assemblies. The HI-STAR HB casks are transportable under Holtec Certificate of Compliance (CoC) Number 71-9261, Revision 7. A sixth HI-STAR HB cask was available at the site for eventual use in storing the Greater Than Class C (GTCC) waste associated the dismantlement of the reactor vessel and debris stored in the spent fuel pool. The GTCC Waste Container (GWC) is intended to store activated metals and process wastes from reactor operation and decommissioning. Humboldt Bay is waiting on NRC approval of Amendment 3 to their site specific license to begin loading the GWC and place it within a HI-STAR HB for storage at the ISFSI. A Processed Waste Container (PWC) had already been loaded with resin and other miscellaneous special nuclear material wastes by Humboldt personnel and sent to Energy Solutions for processing. The PWC, containing the process waste, was placed in an industrial oven and baked to remove all organic material and then helium backfilled to provide an inert atmosphere. The PWC was then shipped back to Humboldt Bay and has been stored in the spent fuel pool awaiting permanent storage in the GWC.

At the time of the inspection, Humboldt Bay personnel were actively performing many activities associated with the decommissioning of their Unit 3 reactor. All internals had been removed from the reactor pressure vessel and placed in the spent fuel pool. Operations under way included draining the reactor vessel and segregation of the activated equipment within the spent fuel pool for future placement in the GWC or shipment for disposal offsite.

The HI-STAR HB casks were loaded using SNM-2514 License Amendment 1 and FSAR Revision 1 but were all currently maintained under SNM-2514 License Amendment 2 and the FSAR Revision 3.

1 Away-From-Reactor ISFSI Inspection Guidance (60858)

1.1 Inspection Scope

An inspection of the status of the loaded casks at Humboldt Bay was completed to verify compliance with requirements of their SNM-2514 License, their ISFSI FSAR, and federal regulations. The inspection reviewed a broad range of topics including audits conducted by the licensee, condition reports related to the ISFSI, environmental radiological data collected around the ISFSI for the past several years, review of the cask maintenance records, and review of industry issues that affected the site's ISFSI program. A tour of the ISFSI area was performed and radiological dose rates measured by the licensee around the perimeter of the ISFSI pad and near the casks.

1.2 Observations and Findings

a. Quality Assurance Audits and Surveillances

The Pacific Gas and Electric Company (PG&E) Quality Verification Department had issued a number of audit reports since the last inspection in January 2010. Many of these audits involved ISFSI program related items, including records keeping, documentation, functions, and program activities. Three quality assurance audit reports were reviewed as part of the inspection: 2010 Humboldt Bay Power Plant (HBPP) Audit, dated April 21, 2011; 2011 Integrated Program Audit, dated April 17, 2012; and 2012 Integrated Program Audit, dated April 16, 2013.

The 2010 HBPP Audit reviewed areas such as the implementation and maintenance of ISFSI Technical Specifications, the ISFSI Annual Radioactive Effluent Release Report documentation, and the ISFSI Security and Unescorted Access Authorization Program. No significant issues were found in any of those program areas.

The 2011 Integrated Program Audit looked at the implementation of the HBPP Security and Access Authorization Program, Quality Assurance Program, Fire Protection and Loss Prevention Program, and the Emergency Plan. The most notable ISFSI related observation of the 2011 audit was the identification that control of vegetation growth within a 50 foot perimeter of the ISFSI restricted area fence was not being implemented in a timely manner. The Humboldt Bay ISFSI Final Safety Analysis Report (FSAR) Update, Rev. 2 (currently Rev. 3), Section 2.2.2.2.1, "Hazards from Fires – Existing Structures and Facilities," stated that the "maintenance programs will prevent uncontrolled growth of the vegetation within a 50 feet perimeter around the ISFSI restricted area fence." Vegetation to the north of the ISFSI pad outside of the owner controlled area (OCA) fence was identified in the audit as not meeting the criteria of the FSAR. This issue resulted in the issuance of a condition report system application and process notification (SAPN) 1276942 on September 19, 2011. That report noted that the vegetation growth outside of the OCA, but within 50 feet of the ISFSI restricted area, was not being maintained to a height of less than two feet by the maintenance program. When this was identified, NRC HQ and Region IV were notified by telephone and compensatory measures in regards to fire-watch were put into place. Humboldt Bay contacted the California Coastal Commission and the removal of vegetation took place on October 10 - 12, 2011, closing the issue. This issue was identified in the audits of two programs, Security and Access Authorization and Fire Protection and Loss Prevention. This issue was self-identified and resolved satisfactorily. The audit did not find any other notable Quality Assurance Program or Emergency Plan issues related to the ISFSI.

The 2012 Integrated Program Audit targeted the ISFSI program areas of Training and Qualification of Workers, Technical Specifications and Licensing, Radiation Protection, and Corrective Actions. There were no findings of significance in review of the ISFSI Training and Qualification Program. The audit of the ISFSI Technical Specifications and License Program noted that ISFSI Vault Number 1 was missing its concrete plug from the vault lid view port. The vault lid view port is used to inspect the vault for water intrusion. The concrete plug is a small plug approximately two to three inches in diameter and approximately fifteen inches long. The concrete plug had broken when it was being removed during a monthly inspection. SAPN 1287282 July 19, 2012 was entered into the corrective action program, proposing that the impact of the missing

concrete plug on the effectiveness of the vault lid's shielding ability should be formally evaluated and documented. The response to SAPN 1287282 documented that the open view port was surveyed and that dose rates were unchanged and showed no evidence of radiation streaming. Also the development of a replacement plug was being tracked under SAPN 1276954, dated April 19, 2011.

The audit of the ISFSI Radiation Protection program noted minor inconsistencies in two survey records and a procedure that was not kept up to date with FSAR requirements. These resulted in two SAPNs 1290891, dated October 12, 2012 and SAPN 1291756, dated November 6, 2012. Both of these issues were handled satisfactorily by the HBPP Unit 3 corrective action program. The 2012 audit of the ISFSI Corrective Action Program did not result in any notable issues.

b. Radiological Conditions Related to Stored Casks

A tour of the ISFSI pad was performed during the inspection. The tour found the five loaded underground HI-STAR HB casks to be in good condition. No flammable or combustible materials were observed inside the ISFSI protected area. A recent radiological survey of the ISFSI pad was provided to NRC inspectors prior to their arrival on-site. One radiation protection (RP) technician accompanied the NRC inspectors during the pad tour. A radiological survey was performed by the RP technician with a sodium iodide detector for gamma radiation. General area background readings before reaching the ISFSI were 6 $\mu\text{R/hr}$ gamma. Survey measurements were taken around the ISFSI pad, at storage vault lid locations, and at environmental thermo-luminescent dosimeter (TLD) monitoring locations on the ISFSI protected area fence. Survey instrument readings did not exceed 6 $\mu\text{R/hr}$ gamma at any measured location on the ISFSI pad, upper storage vault area, or along the ISFSI fence.

Offsite and onsite monitoring data from the 2009, 2010, 2011, and 2012 *Humboldt Bay Power Plant (HBPP) Unit 3 Annual Radiological Environmental Monitoring Reports* were reviewed. The reports were generated by the Radiological Environmental Monitoring Program (REMP). REMP had a total of 20 environmental TLD monitoring locations onsite. Of these, four were located outside the ISFSI perimeter fence to monitor the radiological impact of the ISFSI on the environment. Humboldt Bay also had five offsite TLD monitoring locations to provide the control TLDs for calculating dose impacts above background.

The four TLDs mounted on the ISFSI perimeter fence were at locations to the east, north, west, and south. Those locations are listed in the HBPP Unit 3 Annual Radiological Environmental Monitoring Reports as T18, T19, T20, and T21, respectively. During the tour of the ISFSI pad, the gamma exposure rates at these four ISFSI TLD monitoring locations measured 6 $\mu\text{R/hr}$ at T18, 5 $\mu\text{R/hr}$ at T19, 6 $\mu\text{R/hr}$ at T20, and 6 $\mu\text{R/hr}$ at T21. Those measurements would equal roughly 54 mrem per year. As can be seen in Table 1, below, the surveyed values are statistically consistent with the TLD monitoring data for those locations over the previous three years.

Table 1, ISFSI TLD Monitoring Annual Gamma Dose in mrem

Location	2010¹	2011	2012	Average
T18	55.5	56.5	53.9	55.3
T19	58.1	58.6	56.1	57.6
T20	56.8	57.3	55.8	56.6
T21	54.0	54.6	55.4	54.7

The average value for the 2012 TLD monitoring data for locations T18 – T21 was 55.3 mrem per year. The five offsite TLD monitoring data, which measured background dose for the 2012 year, averaged 49.3 mrem. The exposure at the ISFSI protected area fence for the calendar year 2012 was approximately 6 mrem above background. This was below the 25 mrem per year requirement of 10 CFR 72.104. Therefore, the offsite radiological dose impact due to the HBPP ISFSI was minimal.

c. Cask Records of Fuel Contents

Permanent records describing the spent fuel stored in the casks are required by 10 CFR 72.212(b) (12). A review of the HBPP ISFSI records was performed to determine if an adequate description of the spent fuel loaded in the Holtec HI-STAR HB casks was documented as a permanent and retrievable record. Holtec configured a special multi-purpose canister (MPC) for use with the BWR fuel used at HBPP, the MPC HB. The MPC HB was configured to hold up to 80 spent fuel assemblies. The fuel assembly contents of each MPC HB loaded into the HI-STAR HB casks used at HBPP were documented on Form HBAP D-7, Attachment 7.2, "SNM Movement Authorization," Rev. 23. Those forms were used to document the fuel movement from locations in the spent fuel pool to the fuel slot locations in each of the MPC HBs. In addition, two spreadsheets were reviewed that contained information including decay heat in watts, fuel unload date, original U-235 enrichment percentage, total uranium in grams, and fuel burn-up in megawatt days per metric ton uranium (MWD/MTU) for each of the spent fuel assemblies stored in the HBPP ISFSI. The spreadsheets were labeled "Input Data for Calculation HI 2033023" and "Output from HI-2033023." The complete set of fuel movement forms and fuel bundle data was reviewed for all five casks that were loaded at the ISFSI.

d. Changes to the SNM-2514 License and FSAR

At the time of the last inspection in January of 2010, Humboldt Bay was utilizing SNM-2514 License Amendment 2 and FSAR Revision 2. Since then, Humboldt Bay has revised the FSAR once in Revision 3, dated November 16, 2011.

The major changes associated with Revision 3 of the FSAR were the updating of the Humboldt Bay facility to include the associated hazards from the new natural gas powered generating station located onsite. Humboldt Bay had installed a new plant consisting of ten natural gas-fired 16.3 MW reciprocating engine generators, arrayed in two groups of five engines each. The new generating facility was located approximately 450 ft east of the ISFSI. The primary operation of the new facility was with natural gas, with a low-sulfur diesel fuel that can be used as a backup fuel during time of natural gas curtailment.

¹ TLD values given for 2010 only include values reported for the second, third, and fourth quarters. Those values were normalized to give the yearly values shown in the table.

Natural gas for the facility was supplied via an underground pipeline, which was connected to a main line running parallel with Highway Route 101. The natural gas line into the facility was routed through a building on the east edge of the owner-controlled area at approximately 1100 ft from the ISFSI. From there a ten inch diameter pipe ran into the eastern side of the power building, where natural gas was distributed to the reciprocating engines. The diesel fuel oil was stored in a 634,000 gallon tank as a backup fuel for operation of the reciprocating engines at a distance of approximately 900 ft from the ISFSI vault. All new hazards associated with the new facility were evaluated and were found to be bounded by the previous events analyzed for the older, removed Unit 1 and Unit 2 natural gas facilities which were located closer to the ISFSI than the new facility. The volume and distance of the new equipment was bounded by existing ISFSI evaluations due to the old facility and, as a result, there was no affect on the Fire Protection Program for the ISFSI. No issues were identified during the review of FSAR Revision 3 changes.

e. Corrective Action Program

A list of condition reports issued since the last NRC inspection in January of 2010 was provided by the licensee for ISFSI activities. Issues were processed in accordance with Procedure HBAP C-12 "Problem Identification and Resolution," Revision 36. When a problem was identified the licensee would document the issue as a condition report in the Systems Application and Process Notification (SAPN) database and assign a SAPN number to track the issue.

Of the list of condition reports (SAPNs) provided relating to the ISFSI, approximately 45 SAPNs were selected by the NRC for further review. The SAPNs related to a number of different topics including: damage to an environmental TLD, vegetation growth around the ISFSI which required removal, issues found during quality assurance audits, emergency response enhancements, enhancements to site procedures, a broken concrete shield plug from vault lid number 1's view port that was awaiting replacement, and water found in the standpipe that the vaults drain into (see Section 1.2.f).

The SAPNs reviewed were well documented and properly categorized based on the significance of the issue. The corrective actions taken were appropriate for the situations. No NRC concerns were identified related to the condition reports reviewed.

f. Monthly Vault Inspections per FSAR Section 4.4.3.8

The Humboldt Bay ISFSI FSAR Section 4.4.3.8 "Vault Inspections," in part, stated the vault is essentially weather tight, and is not subject to any expected degradation. Inspection for water in the vault drain system will be performed on a monthly basis. The inspection method will be visual inspection of the drain collection point, combined with remote camera inspection through the vault view ports. If any water is found, additional inspection of the vault cells will be performed to determine the source, and corrective action will be taken.

The licensee performed the monthly vault water inspection per Procedure I-SP-500 "ISFSI Surveillances and Monitoring," Revision 2. The underground vault was divided in six sections which contained the five HI-STAR HBs and one empty area for the GWC HI-STAR HB. Each section of the vault was closed with the use of a shielded vault lid. The underground vault was built with a drainage system that collected in a standpipe at a lower elevation away from the vault area. Procedure I-SP-500 required that if greater

than 12 inches of water was identified in the standpipe or water was identified in the underground vault, a condition report was required to be initiated. The NRC inspectors reviewed monthly documentation for the months September 2010, December 2011, and May 2012. During those months no water was found greater than 12 inches within the standpipe. However, the licensee provided SAPN 1270941 dated April 4, 2011, SAPN 1272664 dated May 31, 2011, SAPN 1281962 dated February 6, 2012, SAPN 1283833 dated April 2, 2012, SAPN1293033 dated December 7, 2012, and SAPN 1294157 dated January 4, 2013 which documented the excess of 12 inches of water found in the standpipe during the monthly surveillance. The condition reports documented that rainwater was possibly entering the vault system between the vault lids and the vault concrete due to the degradation of a caulk which was installed per the original vault design. To resolve this issue the licensee developed Design Change Notice HB9-EC-773 "Seal ISFSI Vault Lids to Prevent Rainwater Inflow," Revision 0 to seal the perimeter of the ISFSI vault lids with an elastomeric caulk to prevent the inflow of rainwater during rain events. The Design Change Notice was completed in Work Order 579 on April 17, 2013. Since implementation of the design change no water has been observed in the standpipe.

g. Emergency Plan

Changes to the licensee's emergency planning program since the last NRC inspection in January 2010 were reviewed. At the time of the last inspection, Humboldt Bay was utilizing Procedure SITE EM PLN "Site Emergency Plan," Revision 2. Since that inspection the licensee had revised the emergency plan on three occasions in Revision 3 dated April 12, 2010, Revision 4 dated December 15, 2010, and Revision 5 dated September 23, 2011. The inspector verified that these changes had not reduced the effectiveness of the emergency response or plan and were consistent with the requirements in 10 CFR Part 50 and 72.

A select number of emergency plan annual drill packages from 2010 through 2013 were selected for additional review. Humboldt Bay conducts at least one site-wide annual emergency drill for a simulated emergency that includes radiological, medical, and fire aspects. On a biennial period the licensee conducts a site wide simulated security event that may be credited as the annual drill. The inspector verified that the annual drill had been performed for the period of 2010 through 2013 in compliance with the emergency plan and 10 CFR 72.32 (a)(12) requirements. The drill packages selected for review included an ISFSI fire drill conducted on October 17, 2011, a security drill conducted on December 2, 2011, and an earthquake and tsunami drill conducted on October 18, 2012. The drill packages included a description of the drill that was conducted, a timeline, a synopsis, and a drill critique. Off-site emergency response organizations participated in the fire and security drills. The Humboldt Fire District #1 participated in the ISFSI fire drill conducted on October 17, 2011 and the Humboldt Bay County Sheriff Department and the Eureka Police Department participated in the security drill performed on December 2, 2011. The inspector concluded that the drills were performed satisfactorily and that deficiencies or areas for improvement were identified, tracked, and corrected through the licensee's quality controlled corrective action program.

h. Decommission Funding Plan

Federal Register Notice 76FR35512, dated June 17, 2011, included a new rulemaking requirement that affected Part 72 licensees. The Federal Register documented a

change to 72.30(b) which required Part 72 licensees to submit to the NRC for review and approval an ISFSI decommissioning funding plan. The final rule made changes to the financial assurance requirements for Part 72 licensees to provide greater consistency with similar decommissioning requirements in the 10 CFR Part 50 regulations. Financial assurances are financial arrangements provided by the licensee to ensure funds for decommissioning will be available when needed. The effective date of the new rule was December 17, 2012. The new rule required all Part 72 licensees to submit a decommissioning funding plan to the NRC by the effective date of the rule. Humboldt Bay submitted their ISFSI Decommissioning Funding Plan to the NRC for review and approval on December 17, 2012 (Adams Accession No. ML12353A316) in compliance with the new rule.

i. NRC Information Notice 2012-20

NRC issued Information Notice (IN) 2012-20, Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters, on November 14, 2012 to all holders and applicants for an ISFSI license or CoC under 10 CFR 72. The notice required no action, but discussed the occurrence of chloride induced stress corrosion cracking in stainless steel welds on various piping components at four nuclear sites within a close proximity to salt water bodies. Those sites were San Onofre Nuclear Generating Station, St. Lucie Nuclear Power Plant, Turkey Point Nuclear Generating Station, and Koeberg Nuclear Power Station (South Africa).

The IN discussed the stress corrosion cracking failures that have been documented thus far at nuclear facilities and the environmental and chemical conditions that contributed to the failures. Since the storage canisters use the same types of stainless steel and welding materials as the piping that was found to contain stress corrosion cracking, the IN provided information specific to ISFSI sites on the conditions that have led to those failures. The notice documented that no instances of stress corrosion cracking have been reported on spent fuel canisters by the industry or the NRC.

Humboldt Bay received the IN and entered it into their corrective action program by issuing SAPN 1292653 on November 29, 2012. SAPN 1292653 discussed how the cask design in use at the Humboldt Bay ISFSI does not allow the inner stainless steel fuel canister to be exposed to ambient environmental conditions. Humboldt Bay used sealed carbon steel outer casks to contain the stainless steel multi-purpose canister (MPC) in an inert helium environment. The stainless steel MPC is not subject to the ambient salt air conditions necessary to allow chloride-induced stress corrosion cracking as configured in the HBPP ISFSI.

Humboldt Bay's response to NRC Information Notice 2012-20 had been adequately captured and documented in the corrective action program.

1.3 Conclusions

The licensee was conducting quality assurance audits of the ISFSI program. A review of three audit reports determined that the audits were covering a broad range of topics. A number of issues were identified in the audits and entered into the corrective action program for resolution.

Radiation levels around the ISFSI pad was consistent with background doses for the site. Radiation data reviewed from the 2009 through 2012 environmental reports determined that radiation levels offsite were not being significantly impacted by the ISFSI.

Required records were maintained that described the specific fuel parameters for the spent fuel stored in each of the licensee's loaded casks.

Since the last NRC ISFSI inspection, Humboldt Bay had revised their FSAR in Revision 3 dated November 16, 2011. No issues were identified in review of the changes associated with the revision.

Selected condition reports were reviewed for the period January 2010 through April 2013. A wide range of issues had been identified and resolved. Resolutions of the condition reports were appropriate for the safety significance of the issue. No adverse trends were identified during the review.

Final Safety Analysis Report Section 4.4.3.8 requirements for a monthly vault inspection for intrusion of water were performed monthly as required. The licensee had identified that some surveillances documented the intrusion of rainwater into the underground vault. A design change was completed to resolve this issue by sealing the small area between the concrete vault and the vault lids using an elastomeric caulk.

Changes to the licensee's emergency planning program since the last NRC inspection in January 2010 were reviewed. The inspector verified that these changes had not reduced the effectiveness of the emergency response or plan and were consistent with the requirements in 10 CFR Part 50 and 72. The inspector verified that an annual site drill had been performed for the period of 2010 through 2012 in compliance with the emergency plan and 10 CFR 72.32 (a)(12) requirements.

Humboldt Bay submitted their ISFSI Decommissioning Funding Plan in compliance with 10 CFR 72.30(b) on the submittal deadline of December 17, 2012.

Humboldt Bay's response to NRC Information Notice 2012-20 has been adequately captured and documented in their corrective action program.

2 Review of 10 CFR 72.48 Evaluations (60857)

2.1 Inspection Scope

The licensee's 10 CFR 72.48 screenings and evaluations since the 2010 NRC ISFSI inspection were reviewed to determine compliance with regulatory requirements.

2.2 Observations and Findings

A list of modifications to the ISFSI program was provided by the licensee. Six 10 CFR 72.48 screenings were selected for further review and one 72.48 full evaluations was selected for review. The licensee utilized Procedure HBAP C-19 "Licensing Basis Impact Evaluations (LBIE)," Revision 32 to perform the 10 CFR 72.48/50.59 safety screenings or evaluations. The issues discussed in the screenings selected for review included the following: installation of a new access door in the ISFSI security building,

installation of a seismic detector at the ISFSI, replacement of the diesel generator that supported ISFSI security operations, improvements to the drainage on the bluff outside the ISFSI, sealing the perimeter of the vault lids to preclude rainwater, and removal of vegetation outside the ISFSI fence.

One 72.48 Safety Evaluation had been performed since the last inspection. Safety Evaluation LBIE "FSAR Change Request 4-04" dated December 4, 2012 documented the licensee change request that will be placed in Revision 4 of the FSAR. The change revised the Licensing Basis in FSAR Section 7.1.2 to delete the mention of occupied spaces being greater than 100 meters from the controlled area boundary to minimize dose. Most occupied structures are beyond 100 meters, however, the regularly occupied ISFSI security building is within 100 meters of the ISFSI. The evaluation stated that 10 CFR 72.106 required a controlled area with a minimum radius of 100 meters and sets limitations on accident doses at that distance. It does not preclude the presence of members of the public, provided that they can be excluded in the event of an accident, nor does it preclude normally occupied areas within the controlled area. The existing situation of where the security building was located was described in the ISFSI FSAR and was approved by the NRC when Humboldt Bay's license was issued. Additionally, environmental monitoring has shown that the use of the vault has minimized dose so that the dose to onsite personnel are maintained As Low As Reasonably Achievable (ALARA). The safety evaluation documented that the proposed change did not require NRC approval.

2.3 Conclusions

All required safety screenings and safety evaluations had been performed in accordance with procedures and 10 CFR 72.48 requirements. All screenings and safety evaluations reviewed were determined to be adequately evaluated.

3 **Exit Meeting**

The inspectors reviewed the scope and findings of the inspection during an exit conducted on May 1, 2013.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

J. Albers, Radiation Protection Manager, Radiation Protection
B. Arroyo, Site Services Manager
D. Gibbons, Engineer, Regulator Services
T. Hardwick, GTCC Project Engineer, Engineering
L. Pulley, Diablo Canyon Used Fuel Storage Manager, Strategic Projects
L. Sharp, Plant Manager
M. Smith, Engineering Manager, Engineering
D. Sokolsky, Supervisor of Licensing
M. Strehlow, Deputy Plant Manager

INSPECTION PROCEDURES USED

IP 60858 Away-From-Reactor ISFSI Inspection Guidance
IP 60857 Review of 10 CFR 72.48 Evaluations

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Discussed

None

Closed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
BWR	Boiling Water Reactor
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
DNMS	Division of Nuclear Material Safety
FSAR	Final Safety Analysis Report
GTCC	Greater Than Class C
GWC	GTCC Waste Container
HI-STAR	Holtec International Storage, Transport, and Repository Cask System
IN	Information Notice
ISFSI	Independent Spent Fuel Storage Installation
kW	kilo-watt
LBIE	Licensing Basis Impact Evaluations
MPC	multipurpose canister
mrem	milliRoentgen equivalent man
MWD/MTU	megawatt days/metric ton uranium
NRC	U.S. Nuclear Regulatory Commission
PG&E	Pacific Gas and Electric
PWC	Processed Waste Container
REMP	Radiological Environmental Monitoring Program
RP	radiation protection
SAPN	system application and process notification
TLD	thermoluminescent dosimeter

ATTACHMENT 2:

LOADED CASKS AT THE HUMBOLDT BAY POWER PLANT ISFSI

LOADING ORDER	CASK #	DATE PLACED ON PAD	HEAT LOAD (kW)	BURN-UP MWd/MTU	FUEL ENRICHMENT	DOSE (Person-Rem)
1	10	08/15/08	1.91	21,264	2.52	0.207
2	8	09/03/08	1.91	20,633	2.52	0.103
3	11	09/24/08	1.91	22,377	2.52	0.105
4	9	10/20/08	1.91	22,876	2.52	0.111
5	12	12/11/08	1.91	20,853	2.52	0.097

NOTES:

- (1) The Humboldt Bay campaign loaded all fuel into five HI-STAR HB casks, serial numbers 8 through 12.
- (2) Heat load (kW) is the sum of the heat load values for all 80 spent fuel assemblies in the cask.
- (3) Burn-up is the value for the spent fuel assembly with the highest individual burn-up. Average burn-up for all five casks is 14,774.
- (4) Fuel enrichment is the spent fuel assembly with the highest individual enrichment % of U-235. Minimum enrichment is 2.08% and average enrichment for all the fuel in all five casks is 2.35%.
- (5) Dose for loading all five casks was 0.623 person-rem. Breakdown per individual cask is a best estimate.

All casks are maintained under SNM-2514, License Amendment 2, and the Final Safety Analysis Report, Revision 3.