



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
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June 3, 2016

Mr. Edward D. Halpin, Senior Vice President
& Chief Nuclear Officer
Pacific Gas and Electric Company
P.O. Box 3
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Avila Beach, CA 93424

SUBJECT: NRC INSPECTION REPORT 050-00133/2016-002, 072-00027/2016-001

Dear Mr. Halpin:

On April 21, 2016, the Nuclear Regulatory Commission (NRC) completed an inspection at the permanently shut down Humboldt Bay Power Plant, Unit 3 facility, near Eureka, California. The purpose of the inspection was to determine whether decommissioning and independent fuel storage activities were being conducted safely and in conformance with NRC requirements. At the conclusion of on-site inspection April 19-21, 2016, the results were discussed with you and members of your staff

During this inspection, NRC staff examined activities conducted under your licenses as they relate to public health and safety to confirm compliance with the Commission's rules and regulations, and with the conditions of your license(s). Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of this inspection. No violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you choose to provide one, 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.

E. Halpin

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If you have any questions concerning this inspection, please contact Dr. Gerald Schlapper, Health Physicist, at 817-200-1273, or the undersigned at 817-200-1197.

Sincerely,

/RA/

Jack E. Whitten, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No: 050-00133; 072-00027
License No: DPR-7; SNM-2514

Enclosure:
NRC Inspection Report 050-00133/2016-002,
072-00027/2016-001

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket: 050-00133

Licenses: DPR-7, SNM-2514

Report: 050-00133/2016-002, 072-00027/2016-001

Licensee: Pacific Gas & Electric Company

Facility: Humboldt Bay Power Plant, Unit 3

Location: 1000 King Salmon Avenue Eureka,
California 95503

Dates: April 19-21, 2016

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SUMMARY

Humboldt Bay Power Plant, Unit 3 NRC Inspection Report 050-00133/2016-002, 072-00027/2016-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning and independent spent fuel storage activities being conducted at the Humboldt Bay Power Plant, Unit 3 facility. In summary, the licensee was conducting site activities in compliance with regulatory and license requirements.

Decommissioning Performance and Status Review

- The inspectors observed various decommissioning activities in progress. The inspectors concluded that the licensee was conducting decommissioning in accordance with the general guidance provided in the Post-Shutdown Decommissioning Activities Report. The work was being conducted in accordance with approved work plans and with an emphasis on industrial and radiological safety. The work plans provided sufficient detail for the work being performed. (Section 1.2.a)
- The licensee has shifted from self-performance of high risk activities to oversight of a civil works project. While there were lessons learned during the changeover, the contractor has applied the lessons learned and shows a high level of confidence in completing projects on time and within budget. (Section 1.2.b)

Safety Reviews, Design Changes and Modifications

- The licensee implemented its safety review, design change and modification program in accordance with 10 CFR Part 50, and 10 CFR Part 72, licenses, and procedural requirements. The licensee continues to implement safety reviews by the plant staff review committee. (Section 2.2)

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee was characterizing, packaging, and shipping exemption wastes in accordance with procedural requirements and restrictions established in three alternate disposal requests previously approved by the NRC. (Section 3.2)

Maintenance and Surveillance

- The licensee was conducting a program for maintenance and calibration of portable radiation survey instruments in accordance with applicable procedures, license and regulatory requirements. (Section 4.2)

Radioactive Waste Treatment and Effluent Monitoring

- The licensee was monitoring and disposing of excavated material and groundwater following requirements of their license, discharge permits and regulatory requirements. (Section 5.2)

Away-From-Reactor Independent Spent Fuel Storage (ISFSI) Guidance

- The licensee was conducting activities and documentation at the ISFSI in compliance with requirements of the license and regulatory requirements. (Section 6.2)

Review of 10 CFR 72.48 Evaluations

- The licensee was conducting reviews and evaluations of changes to the ISFSI program in accordance with requirements of the license and regulatory requirements. (Section 7.2)

REPORT DETAILS

Site Status

At the time of the inspection, the licensee continued to decommission the site in accordance with the general guidance provided in the Post-Shutdown Decommissioning Activities Report (PSDAR) dated July 19, 2013, (ADAMS Accession No. ML13213A160) Revision 11 to the Defueled Safety Analysis Report (DSAR) and Revision 33 to the Humboldt Bay Quality Assurance Plan (HBQAP) (ML16029A508). The decommissioning work in progress included construction of the subsurface cutter soil mixture (CSM) wall, movement of the excavated soil to the former discharge canal, removal of potentially contaminated soil, concrete, piping, and preparation for decommissioning of the intake canal and continued demolition of the refuel building.

During the inspection, the CSM wall was eighty percent complete (200 of 255 panels) although some panels in the outer ring will be reworked to ensure they reach the clay layer. The licensee's contractor plans to complete the construction of the wall in the June 2016 time frame. The licensee plans to begin excavating the caisson structure in the last quarter of 2016. Other projects planned for 2016 include final demolition of the refueling and liquid radwaste buildings and remediation of the intake canal. After completion of site decommissioning, the licensee plans to conduct final status surveys and site restoration work. The licensee currently plans to complete all field work by 2018.

A License Termination Plan (LTP) was submitted to the U. S. Nuclear Regulatory Commission (NRC) on May 3, 2013 (ML13130A009, ML13130A011). To address requests for additional information the licensee submitted LTP Revision 1 on August 13, 2014 (ML14246A157, ML14246A158, and ML14246A159). The plan defines the end state of the site, refines decommissioning cost estimates and provides a detailed baseline for cost and schedule considerations. On May 4, 2016 the NRC issued Amendment No. 45 to Facility Operating License No. DPR-7 (ML15090A339). The amendment revises the Humboldt Bay Unit 3 License to add License Condition 2.C.(5) which incorporates the NRC approved LTP and specifies limits on the changes the licensee is allowed to make to the approved LTP without prior NRC approval.

1. Decommissioning Performance and Status Review (71801)

.1 Inspection Scope

The inspectors evaluated whether the licensee and its contracted workforce were conducting decommissioning activities in accordance with license and regulatory requirements.

.2 Observations and Findings

a. Construction of Subsurface CSM Wall

The inspectors reviewed various work in progress on construction of the cutter soil mixture (CSM) wall, one of the critical path elements in the overall decommissioning effort. The

work included construction of the CSM wall and, after monitoring for potential radioactive contaminants, transfer of the resultant excavated materials to the discharge canal for future use as backfill material. Material not meeting the criteria for reuse on site are packaged and shipped to the appropriate waste site.

The CSM wall consists of five concentric rings of various depth to allow for excavation to a depth of approximately 95 feet. The innermost ring is approximately 110 feet inside diameter and 105 feet deep. Succeeding rings increase depth by approximately 4 foot per ring. The outermost layer of the ring (denoted as the E ring) will penetrate into an underlying clay layer at approximately 175 feet depth. Individual panels of the wall are 3 feet thick and 9 feet long. The total thickness of the wall will be approximately 13 feet. The inspectors concluded that the licensee was conducting work in accordance with work plan requirements, and the licensee was sampling the excavated material sufficiently to ensure that it met the criteria for eventual use as backfill material.

At the time of the inspection, the licensee's contractor had installed about eighty percent of the cutoff wall. The inspectors toured the work area and discussed efforts with workers who proved to be very knowledgeable of the work plan and the activities in process. Construction of the CSM wall is expected to be complete in the late June 2016 time-frame.

After the completed construction of the CSM wall and due to the potential for some water intrusion, the contractor plans to install four dewatering wells at a depth of 126 feet. The wells will pump effluent to the ground water treatment system (GWTS) for characterization and treatment followed by discharge to Humboldt Bay.

After the CSM wall has cured, the contractor is planning to begin the excavation work in the last quarter of 2016. Access control will be implemented to restrict entry into the area. Radiological controls to include air monitoring, HEPA ventilation, and area TLD badge placement will be initiated as appropriate for the anticipated levels of radioactivity that will be encountered in the soils and construction materials.

The inspectors reviewed the licensee's procedures for ensuring that the excavated materials were not contaminated with radioactive and non-radioactive contaminants and were thus acceptable for use on-site as backfill. The licensee and its contractor implemented several controls including collection of samples and bulk container monitoring. The inspectors verified that the licensee was ensuring that concentrations any contaminants were below the soil cleanup derived concentration guideline levels in use by the licensee.

The contractor implemented a sampling program during CSM wall construction. The excavated materials were sampled in accordance with guidance provided in the Waste Sampling and Analysis Plan, Revision 0, an attachment to Work Plan WP/EE-40. The number of samples collected and analyzed depended on the amount of spoils removed during the CSM wall construction process. The work plan specified that eight samples would be collected from the first 3,000 cubic yards of material removed.

In addition to spoils sampling, the licensee had implemented a bulk sampling program. The bulk sampling program consists of surveying truckloads of excavated material using

the onsite GUARDIAN detector system. A truck/trailer scan was conducted just prior to transfer of the spoils to the onsite discharge canal. Further discussion of the use of this system is presented in a later section of this report.

b. Civil works project status

The contractor for the civil works portion of the decommissioning, Chicago Bridge and Iron (CB&I), continues to prepare the remaining portions of site buildings for demolition. From 2012 through 2015, the licensee shifted from self-performance of high risk activities to oversight of the civil works projects. The licensee noted that the civil works project is approximately fifty percent complete after two and one-half years of work execution. Discussions with the licensee and the civil works contractor noted that alternative approaches to decommissioning proposed by CB&I enhanced completion of work and resulted in a projected contract completion date of December 2018 rather than an earlier estimate of May 2019. The inspectors also noted a higher level of confidence in performing the remainder of the work.

On March 31, 2016, the licensee submitted the Decommissioning Funding Report for HBPP Unit 3 pursuant to the requirements of 10 CFR 50.75 and 10 CFR 50.82 (ML15090A774, ML16090A20, ML16090A21, ML16090A22). The report noted that funds were underspent in 2015, primarily due to waste disposal shipments to an alternate, less expensive site. Also noted were savings in staffing due to consolidation of portions of the radiation protection program and engineering support to the civil works contractor with oversight maintained by the licensee. The report incorporated site-specific decommissioning tasks and detailed plans that have been identified during implementation of phases of the decommissioning effort. The site faces challenges of site congestion, contaminated underground systems and utilities, frequent adverse weather, soil and water management, below grade obstructions, limited site access, and proximity to the surrounding community and the active Humboldt Bay Power Generating Station (HBGS).

.3 Conclusions

The inspectors observed various decommissioning activities in progress. The inspectors concluded that the licensee was conducting decommissioning in accordance with the general guidance provided in the PSDAR, DSAR and HBQAP. The work was being conducted in accordance with approved work plans and with an emphasis on industrial and radiation safety.

2. Safety Reviews, Design Changes and Modifications (37801)

.1 Inspection Scope

The inspectors reviewed the licensee's implementation of its safety review, design change and modification program as required by 10 CFR Part 50, 10 CFR Part 72, licenses, and procedural requirements. The licensee's implementation of these reviews rests primarily on action of the Plant Staff Review Committee (PSRC). The inspectors reviewed actions taken by this committee.

.2 Observations and Findings

Many decommissioning activities involve quality-related structures, systems, and components (SSC). These activities are governed by the Humboldt Bay Quality Assurance Plan (HBQAP) and are therefore subject to independent quality assurance audits. Activities audited include radiation protection controls, effluent monitoring, radioactive waste shipping, site characterizations, fire loss protection and prevention program, Emergency Plan, Security Plan and Off-site Dose Calculation Manual. The inspectors reviewed audits conducted as specified in the current HBQAP, HBQAP Revision 33, effective November 20, 2015, and noted that the audits conducted satisfy the requirements of 10 CFR 50 Appendix B and 10 CFR 72 Subpart G.

The QAP includes a requirement for an Independent Management Review function, the implementation of which is through Procedure HBAP A-6, effective September 4, 2014. The procedure notes that the Chief Nuclear Officer is responsible for designating the reviewer(s) to assess the effectiveness of the QAP and other appropriate oversight activities at the site. The licensee is committed to conducting a review at a minimum of every two years. As of the dates of the inspection, a review had not been conducted and the reviewer(s) had not been appointed. The lack of an independent management review had been noted in a previous inspection report, NRC Inspection Report 050-00133/15-009 (ML15232A138). The appointment of a qualified reviewer and conduct of the review will be of continuing interest in future inspections.

The PSRC performs reviews, investigations or analysis, and prepares reports as requested by and Independent Management Review or the Nuclear Plant Manager. The inspectors reviewed minutes of the PSRC meetings conducted in October, November, and December of 2015 and during February of 2016. The chair of the committee verified that a quorum of technically qualified members was present for all meetings. The meetings addressed areas of Emergency Planning, revisions to the Humboldt Bay Quality Assurance Plan, the ISFSI Procedure Control Program, changes to the ISFSI Physical Security Plan, the Final Safety Analysis Report, the Off-Site Dose Calculation Manual, ISFSI Conduct of Radiation Protection, the Fire Loss Prevention Program, components of the Site Emergency Plan, Qualification and Training Requirements of Personnel, and proposed revisions of NRC License DPR-7 and associated Technical Specifications. Most of the changes in the documents reflect changes to the licensee's Nuclear Power Generation organization, the current decommissioning status of Unit 3 and the transition to the Humboldt Bay ISFSI becoming a stand-alone organization. The inspectors noted based on the minutes of the meetings that PSRC members asked inquiring questions and that discussions were held prior to voting on proposed changes.

On March 24, 2016, the licensee submitted the Annual Radioactive Effluent Release Report for 2015, as required by Appendix B of the HBPP QA Plan and the Off-site Dose Calculation Manual (ODCM) (ML16089A201). The report summarizes gaseous and liquid effluent releases from HBPP Unit 3 for 2015 and compares the data to the numerical guidelines of 10 CFR 50 Appendix I. The report also contains a summary of shipments of solid radioactive waste. The report notes that the last batch discharge of liquid process effluent occurred on December 11, 2013. Subsequent batches of process liquids were transported to the U.S. Ecology site in Idaho for disposal under a 10 CFR 20.2002

exemption. Data from monitoring stations at the site boundary indicate an exposure level of 0.022 mrem/year to the highest average individual, well below the 10 CFR 20.1302(b)(2)(ii) limit of 50 mrem from external sources necessary to demonstrate compliance with the 10 CFR 20.1301 dose limit for individual members of the public. The report notes changes in the ODCM that result from removal of the Main Plant Stack which was permanently shutdown on October 14, 2015. Small intermittent incidental releases will continue through portable, monitored modular High Efficiency Particulate Air Filters (HEPA). The inspectors reviewed data applicable to the exposure pathways of airborne and direct radiation. The airborne pathway exposures are based on measurements at five on-site locations and one off-site location. Direct radiation exposure levels are measured using thermoluminescent dosimeter (TLD) monitoring stations. These include a minimum of eight on-site locations, four off-site locations and one off-site control location.

.3 Conclusions

The licensee implemented its program of safety reviews, design changes and modifications in accordance with requirements of 10 CFR Part 50, 10 CFR Part 72, licenses, and procedural requirements. Establishment of a program for the Independent Management Review function is in progress and will be reviewed in future inspections.

3. Solid Radioactive Waste Management and Transportation of Radioactive Materials (86750)

.1 Inspection Scope

The inspectors reviewed documentation associated with shipments of material to their respective burial sites. The shipments included solid waste shipments of exempt material to a site approved for Resource Conservation and Recovery Act (RCRA) waste in Idaho, low specific activity solid waste shipment to a Utah burial site, and shipments of low specific activity waste to Waste Control Specialists (WCS) in Texas. The review included documentation required by Department of Transportation regulations, and documentation of waste classification required by 10 CFR Part 20.

.2 Observations

To ensure compliance with applicable NRC and Department of Transportation (DOT) regulations, the licensee continues to utilize a shipping compliance checklist. The checklist requires that the licensee have documentation on file that certifies that any container used meets package qualifications and that vendor provided procedures for use of the container were followed. The package includes documentation that manifest information is consistent with the approved waste profile. Other documents supplied in the package indicated that the containers had been inspected by the licensee and determined to be in compliance with DOT packaging requirements. Radiation/contamination survey data sheets verified compliance with applicable limits outlined in 10 CFR 71.47. Emergency response information was supplied with all shipments. Prior to departure, a signature by the licensee indicated that all documents associated with the shipment had been completed in accordance with licensee procedures and that the material was packaged, characterized, classified, marked, labeled, placarded and transported in

accordance with regulatory requirements of US NRC and the US Department of Transportation. A review of documents for the selected shipments indicated that license and DOT regulatory requirements were met.

During the month of September, 2015, the licensee conducted a trial program to evaluate acceptability of shipping low specific activity material to Waste Control Specialists in Andrews, Texas. Beginning the week of April 10, 2016, a second shipping campaign to Waste Control Specialists began. This was a 4 week campaign with 20 shipments per week. Proper transportation and waste classification documentation accompanied the shipments to the WCS burial site near Andrews, Texas. During the week of April 10, 2016, the licensee's oversight personnel traveled to Redding, California to review the loading of two rail cars headed to WCS in Andrews, Texas.

The inspectors reviewed the licensee's management of exemption wastes shipped to a facility in Idaho. The NRC granted the licensee three exemptions under alternate disposal provisions allowed under 10 CFR 20.2002. As of April 14, 2014, the licensee had shipped a total of 705,960 cubic feet (32.1 percent of allowed volume) under exemptions 1 and 2, and a total of 29,646 cubic feet (19.76 percent of allowed volume) under exemption 3.

The inspectors also reviewed documentation for five recently completed shipments for compliance with procedure requirements and NRC regulations. The review included shipments to Energy Solutions, Waste Control Specialists, and US Ecology. The inspectors observed licensee staff personnel load the material, perform surveys of the transport containers, and complete shipment documentation.

From January 1, 2016, through April 14, 2016, the licensee made 278 shipments to US Ecology in Idaho, 37 shipments to Energy Solutions in Clive, Utah, 1 shipment to Permafrix in Richland, Washington, and 4 shipments to WCS in Andrews, Texas, for a total of 320 shipments.

.3 Conclusions

The licensee's program for transportation of solid waste material for off-site burial was being performed in accordance with license and regulatory requirements.

4. Maintenance and Surveillance (62801)

.1 Inspection Scope

The inspectors reviewed calibration and maintenance of portable radiation survey instruments.

.2 Observations

The licensee continued to require use of portable radiation survey instrumentation. The inspectors observed the staging, calibration, and use of instruments.

The licensee utilized a color coding system to track calibration due dates of each instrument. For example, “green” indicates the instrument is calibrated and available for use, “yellow” indicates the instrument is within 30 days of the calibration due date, and “red” indicates the instrument is past due for calibration or unavailable for use.

The licensee continued calibrating its count-rate instrumentation at the site, but sends dose-rate instrumentation to either a vendor licensed to calibrate instruments or to the Diablo Canyon Nuclear Station. The inspectors reviewed the licensee’s procedures for calibration of count-rate instruments and calibration of the MGPI Alpha Continuous Air Monitor. The inspectors determined that the methodologies are consistent with ANSI guidance.

.3 Conclusions

The inspectors noted that the licensee programs for maintenance and calibration of portable radiation survey instruments were in compliance with applicable procedures and regulatory requirements. The inspectors also checked selected instruments and noted that instruments in use were within calibration dates.

5. Radioactive Waste Treatment, and Effluent and Environmental Monitoring

.1 Inspection Scope

The inspectors reviewed the licensee’s processes for monitoring material excavated from the site and processes for treatment of groundwater prior to discharge to the environment.

.2 Observations

Material excavated from the site was monitored for radioactive contaminants to determine if the material is acceptable for re-use onsite, or if it must be shipped to an offsite burial site for disposal. The excavated material was loaded in dump trucks and monitored via a system (GUARDIAN) to measure the radiological contaminants. If the material had very low levels of contaminants, the material was placed in a staging area for reuse. If the levels of contaminants were above a specific level, the material was placed in a temporary covered area and was packaged for shipment to a burial site. Excavation of the material surrounding the reactor caisson will significantly increase the use of the GUARDIAN system. Due to the anticipated increase of volume of material processed through the GUARDIAN system, the licensee is obtaining a second GUARDIAN system to be installed adjacent to the existing system. The second system is planned to be in place and operational in the June, 2016 time frame.

Groundwater from the site was processed through a Groundwater Treatment System (GWTS) and was discharged to the bay. The water processed through this system does not contain radioactive contaminants. The GWTS monitors the water pH and adjusts the pH to a specified range acceptable for discharge. The system also monitors the water for turbidity and adds a flocculate chemical to cause the silt materials to settle out prior to discharge.

The inspectors observed trucks of material processed through the GUARDIAN system and observed the operation of that system. Daily checks were performed on the detectors to ensure performance is consistent with the performance at the time of system calibration. Control charts were utilized to track the daily performance. The inspectors also discussed the installation, setup, and calibration of the second GUARDIAN system. The technicians responsible for setup and operation of the systems had sufficient knowledge and experience to perform those tasks.

The inspectors toured the GWTS and discussed the operation of the system with the individual responsible for operation. Recently a second set of pumps and larger piping was added to the system to increase the flow capacity and to allow maintenance of the pumps and motors without shutdown of the entire system.

.3 Conclusions

The inspectors noted that the licensee's processes for monitoring and disposal of excavated material and groundwater follow license and regulatory requirements.

6. Away-From-Reactor Independent Spent Fuel Storage Installation (ISFSI) Guidance (60858)

.1 Inspection Scope

A routine inspection was conducted of the Humboldt Bay Unit 3 (HB) ISFSI to verify ongoing compliance with its site specific Materials License No. SNM-2514, Amendment 4 and associated Technical Specifications, the Final Safety Analysis Report (FSAR), Revision 5, and the regulations in Title 10 of the Code of Federal Regulations (CFR) Part 20 and Part 72. The inspection included a visit to the ISFSI site to confirm the facility was being maintained in good physical condition for the safe storage of the spent nuclear fuel and greater than class C (GTCC) waste. The inspectors performed a review of documents related to dry fuel storage operations, including licensee performed quality assurance (QA) audits and surveillances, ISFSI related condition reports, survey records, monitoring data, and maintenance records.

.2 Observations and Findings

a. Quality Assurance Audits, Surveillances, and Corrective Actions

One QA surveillance and Six QA audit reports related to operations at the ISFSI were issued since the last full routine ISFSI inspection in April 2013. The audits assessed the performance of quality related programs and activities that impacted ISFSI operations and included Fire Protection and Loss Prevention; Engineering; Greater than Class C (GTCC) waste canister preparations; and Emergency Planning. The audits resulted in two ISFSI related Condition Reports. Condition Reports (CRs) at Humboldt Bay are referred to as SAP Notifications or SAPNs.

The inspectors observed that when a problem or condition was identified, the licensee would document the issue as a SAPN and track in its corrective action program (CAP).

The licensee provided the inspectors with a list of ISFSI related SAPNs issued since the last NRC inspection. The inspectors selected eight for further review. The selected SAPNs were well documented and properly categorized based on the safety significance of the identified conditions. Follow-up corrective actions were appropriately assigned. Based on the types of conditions described in the SAPNs, the licensee demonstrated a suitably low threshold for placement of issues into its CAP. The SAPNs reviewed by the inspectors exhibited great attention to detail in regard to the routine operations and maintenance of hn their ISFSI program. All of the ISFSI related SAPNs were of very limited safety significance. No significant negative trends were identified during the review. The identified conditions were processed in accordance with Procedure HBAP C-12, "Problem Identification and Resolution," Rev. 41A. No NRC concerns were identified in its review of condition reports during the ISFSI inspection.

b. Radiological Conditions Related to Stored Casks

The NRC inspectors verified the radiological conditions of the HB ISFSI through a review of TLD direct radiation monitoring data, the most recent radiological surveys, and a tour of the ISFSI pad. The NRC inspectors were accompanied by a representative of HB ISFSI Regulatory Assurance and a security guard during the inspection of the ISFSI pad. The ISFSI pad was securely fenced and locked inside its own protected area (PA) with a guarded gate and controlled access. The ISFSI was surrounded on all sides by many feet of gravel. The area was clear of any notable vegetative growth and there were not any flammable, combustible, or unexpected items present on or near to the ISFSI pad underground storage vaults. The ISFSI pad contained 6 Holtec International Storage, Transport, and Repository Cask System casks designed for Humboldt Bay (HI-STAR HB). Five were loaded with spent fuel and the sixth contained reactor related GTCC and process wastes from the Humboldt Bay Unit 3 reactor. The ISFSI pad and vault lids were in good physical condition. The inspectors observed as radiation level measurements were taken over the vaults by the licensee utilizing a Thermo Electron Corporation RadEye G Geiger-Mueller survey meter (PG&E ID #RP.03.32.034, calibration due November 1, 2016). The measurements taken confirmed those recorded on the most recent ISFSI site survey. The inspectors used a Ludlum Model 19 sodium-iodide gamma survey meter (NRC #016337, calibration due August 6, 2016) to record radiation levels at ISFSI fence boundary locations and noted results in the range of 5 – 14 μ R/h. The radiological conditions in and around the ISFSI were only slightly elevated compared with background measurements and were consistent with previous survey reports and the last routine NRC inspection performed onsite (ML13151A317). The ambient radiation levels were as expected, given the low heat load of the spent fuel, time spent in storage, and the storage configuration of the spent fuel in the HB ISFSI. The ISFSI vaults were each properly posted as radioactive material areas. Contents of the HB ISFSI are detailed in the previous NRC inspection report for this site (ML13350A481).

ISFSI direct radiation monitoring thermoluminescent dosimeter (TLD) data were reviewed for the previous three years. Results demonstrated stable ambient radiation levels near the ISFSI boundary of 6-7 mrem per year above offsite control locations. A change in the TLD vendor to a detector with greater sensitivity in 2014 resulted in an increase in ambient radiation readings onsite by about 6 mrem per year. However, the relative difference between the ISFSI area TLDs and control locations remained the same. Note that no

additional spent fuel or waste has been placed into the HB ISFSI since 2013 and thus consistent readings would be anticipated.

Annual radiological environmental monitoring program (REMP) data documented the dose equivalent to any real individual located beyond the site controlled area was well below the 10 CFR 72.104(a)(2) requirement of less than 25 mrem per year above background. Annual monitoring data near the ISFSI boundary locations show that all accessible areas of the ISFSI fall below the 10 CFR 20.1502(a)(1) dose limit for unmonitored workers, which is 500 mrem per year. Direct radiation impacts from the HB ISFSI met all regulatory requirements.

c. Routine/Annual ISFSI Maintenance

The HB FSAR Section 4.4.3.8, "Vault Inspections," requires periodic inspection of the interior of the ISFSI vault for water intrusion. FSAR Section 2.2.2.2.1, "Hazards from Fires— Existing Structures and Facilities," requires that the ISFSI maintenance program prevent the uncontrolled growth of vegetation in the immediate area and out to a distance of 50 feet from the ISFSI restricted area fence. The NRC inspectors reviewed two previous years of routine ISFSI maintenance records by requesting the documentation of HBPP Procedure I-SP-500, "ISFSI Inspections and Monitoring," Rev. 4 for 2014 and 2015. The records provided to the NRC showed that the required vegetation and vault drainage inspections had been proceduralized and were being routinely performed. The ISFSI inspection information provided by the licensee was complete. No FSAR compliance issues were identified.

d. Revisions to the Site Emergency Plan

At the time of the inspection, the current Humboldt Bay Power Plant Site Emergency Plan (E-Plan) was Revision 7. Revision 7 removed any Emergency Action Levels (EALs) for the HB Unit 3 reactor facility. These changes to the HB Site E-Plan were based on source term reductions and administrative controls implemented as a part of the ongoing decommissioning activities.

Changes to the ISFSI related EALs were also part of the current E-Plan revision and were driven by the regulations of 10 CFR Part 72 for classifying ISFSI only events as Alerts and the NRC endorsed guidance of NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Rev. 6. The HB ISFSI EALs (or initiating conditions) are damage to a loaded cask confinement boundary, E-HU1; confirmed security condition or threat, HU1; and conditions in which in the emergency coordinator's judgement warrants declaration of an Alert, HU2. There is now only one emergency classification level (ECL), Alert. The inspectors noted that all of these changes are consistent with Humboldt Bay's decommissioning progress to date and reflect that the only major source term remaining on the site is stored in its ISFSI.

The E-Plan requires that Radiological, Medical, and Fire drills shall be conducted annually. Records show that the licensee had been conducting drills and EP Exercises yearly, and thus the site was in full compliance with its E-Plan.

e. Changes to the SNM-2514 License and FSAR

At the time of the previous ISFSI inspection in April 2013, Humboldt Bay was utilizing ISFSI License SNM-2514, Amendment 2 and FSAR Revision 3. At the time of the current inspection, the site was operating under License Amendment 4, dated September 22, 2015, and FSAR Revision 5, dated November 2015.

For License Amendment 3, license conditions were updated to facilitate the placement of process waste and spent fuel fragments into the ISFSI along with other GTCC waste components. License Amendment 4 changes allowed HB to update its Emergency Plan to reflect the current physical and organizational status of the decommissioning reactor site.

The move to FSAR Revision 4 included a change where Section 7.1.2 was revised to delete mention of the 100-meter controlled area requirement from 10 CFR 72.106. This requirement was not applicable to the HB ISFSI. FSAR Revision 5 was made primarily to incorporate information required as a result of the move to the NRC approved HB ISFSI License Amendment 4.

f. Damaged ISFSI Vault Lid Port Plug



Figure 1, Redesigned ISFSI Vault Lid Port Plug

The inspectors performed a follow-up inspection of a condition noted during the previous ISFSI inspection. The licensee had initiated SAPN #1276954 to track the replacement of a broken ISFSI vault inspection port radiation shield plug. The original SAPN had been opened in 2011. In 2012 the licensee decided that all six plugs should be replaced with a more durable design. Holtec International Drawing No. 4110, Sheet 3, "Dry Cask Vault Assembly" noted that the damaged port plug was an

important to safety component. Its function and construction requirements were described in the HB ISFSI FSAR. A design change notice, DCN HB3-EC-750, was initiated to improve the plug design while maintaining its radiation shielding qualities. The progress of the design change was tracked under SAPN #1276997, which had remained open during three NRC ISFSI inspection trips to the site in 2013. The inspectors found that the port plug had been redesigned and that all six of the port plugs (one for each ISFSI vault) had been replaced (see picture, inset left). Instead of a molded concrete plug with an imbedded rebar handle (the old design), the plug was a steel cylinder that was filled with grout that was slightly denser than the concrete it replaced. It met all of the density and shielding requirements as specified in the HB ISFSI FSAR Section 4.2.2.4, "Vault and Storage Cell Components." The inspectors reviewed the engineering design documents

associated with the replacement plug, including the Licensing Basis Impact Evaluation (LBIE) Screen. A full safety evaluation was not required for this modification. Humboldt Bay performed this modification in accordance with all regulatory requirements.

.3 Conclusion

The inspectors observed that the licensee had met the licensing requirements for the documents and activities reviewed associated with the dry cask storage activities at Humboldt Bay Unit 3 Independent Spent Fuel Storage Installation.

7. Review of 10 CFR 72.48 Evaluations (60857)

.1 Inspection Scope

The licensee's 10 CFR 72.48 screenings and evaluations since the 2014 NRC ISFSI inspection were reviewed to determine compliance with regulatory requirements

.2 Observations and Findings

The licensee's 10 CFR 72.48 screens and evaluations for changes to the ISFSI program since the last NRC inspection were reviewed to determine compliance with regulatory requirements. Humboldt Bay had performed 72.48 screens to cover updates to their final safety analysis report, procedural changes, and one engineering design change to an important to safety component of its ISFSI (the damaged ISFSI Vault Lid Port Plug). The licensee had not performed any 72.48 safety evaluations in the time since the last inspection.

.3 Conclusions

All of the 10 CFR Part 72.48 screens that were reviewed were determined by the inspectors to have been adequately evaluated and dispositioned by the licensee.

8. Exit Meeting

The inspectors presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on April 21, 2016. The licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Albers, Radiation Protection Manager
J. Chadwick, ALARA Supervisor
B. Costa, ISFSI Licensing
P. Coutts, Program Manager, CB&I
S. Jones, Quality Assurance Supervisor
E. Kahler, Engineering Supervisor
W. Parish, RP/FSS Engineer
B. Rittmer, ISFSI Manager
K. Rod, Decommissioning Manager
J. Salmon, Environmental Manager
L. Sharp, Director and Plant Manager
D. Sokolsky, Licensing
M. Strehlow, Deputy Director

INSPECTION PROCEDURES USED

IP 37801 Safety Reviews, Design Changes and Modifications at Permanently Shutdown Reactors
IP 60857 Review of 10 CFR 72.48 Evaluations
IP 60858 Away-From-Reactor Independent Fuel Storage Installation (ISFSI) Guidance
IP 62801 Maintenance and Surveillance at Permanently Shutdown Reactors
IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 84750 Radioactive Waste Treatment and Effluent Monitoring
IP 86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
CSM	cutter soil mix
IP	Inspection Procedure
μR/hr	micro Roentgens per hour
NRC	U.S. Nuclear Regulatory Commission pCi/g picocuries per gram
PSDAR	Post-Shutdown Decommissioning Activities Report
RCRA	Resource Conservation and Recovery Act

E. Halprin

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If you have any questions concerning this inspection, please contact Dr. Gerald Schlapper, Health Physicist, at 817-200-1273, or the undersigned at 817-200-1197.

Sincerely,

/RA/

Jack E. Whitten, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No: 050-00133; 072-00027
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Enclosure:
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DATE	5/26/16	6/3/16	5/27/16	6/3/16

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Letter to Edward D. Halpin from Jack E. Whitten dated June 3, 2016

SUBJECT: NRC INSPECTION REPORT 050-00133/2016-002, 072-00027/2016-001

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