



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION IV  
1600 E LAMAR BLVD  
ARLINGTON, TX 76011-4511

May 22, 2015

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

SUBJECT: NRC INSPECTION REPORT 050-00133/15-008

Dear Mr. Halpin:

This letter refers to the inspection conducted on April 20 - 23, 2015, at your permanently shut down Humboldt Bay Power Plant, Unit 3 facility in Eureka, California. The purpose of the inspection was to determine whether decommissioning activities were being conducted safely and in conformance with the U.S. Nuclear Regulatory Commission (NRC) requirements. The results of the inspection were discussed with members of your staff at the conclusion of the onsite inspection on April 23, 2015.

During this inspection, NRC staff examined activities conducted under your license 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. 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," 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 documents system (ADAMS), accessible from the NRC's Web site at <https://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

E. Halpin

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Should you have any questions concerning this inspection, please contact Dr. Gerald Schlapper, Health Physicist, at 817-200-1273 or the undersigned at 817-200-1191.

Sincerely,

***/RA JEWhitten for/***

Ray L. Kellar, P. E., Chief  
Repository and Spent Fuel Safety Branch  
Division of Nuclear Materials Safety

Docket No: 050-00133

License No: DPR-7

Enclosure:

NRC Inspection Report 050-00133/15-008

cc: Attached

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U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket: 050-00133

License: DPR-7

Report: 050-00133/15-008

Licensee: Pacific Gas and Electric Company

Facility: Humboldt Bay Power Plant, Unit 3

Location: 1000 King Salmon Avenue  
Eureka, California 95503

Dates: April 20-23, 2015

Inspector: Gerald A. Schlapper, PhD, CHP, Health Physicist  
Repository and Spent Fuel Safety Branch

Donald L. Stearns, Health Physicist, Inspector  
Repository and Spent Fuel Safety Branch

Approved by: Ray L. Kellar, P. E., Chief  
Repository and Spent Fuel Safety Branch  
Division of Nuclear Material Safety

Attachment: Supplemental Inspection Information

Enclosure

## **EXECUTIVE SUMMARY**

Humboldt Bay Power Plant, Unit 3  
NRC Inspection Report 050-00133/15-008

This inspection was a routine, announced inspection of decommissioning activities being conducted at the Humboldt Bay Power Plant (HBPP), Unit 3 facility. In summary, the licensee was conducting site activities in compliance with regulatory and license requirements.

### Organization, Management, and Cost Controls

The licensee organization and management reflects a change from self-directed work to that of oversight of contractor activities. License and regulatory compliance are maintained. The licensee conducted audits, self-assessments and corrective actions in accordance with procedures and regulatory requirements. (Section 1.2)

### Decommissioning Performance and Status Review

The licensee conducted decommissioning activities in accordance with license and regulatory requirements. (Section 2.2)

### Solid Radioactive Waste Management and Transportation of Radioactive Materials

The licensee conducted solid waste management and transportation activities in accordance with procedures and regulatory requirements. Transportation of liquid waste was also reviewed and found to be in compliance. (Section 3.2)

### Occupational Exposure During SAFSTOR and DECON

The inspector concluded that the licensee had adequate calibrated instrumentation to ensure compliance with monitoring requirements. The inspector also reviewed the licensee's approach to control of occupational exposure during current work. Exposure controls were effective in maintaining exposures as low as reasonably achievable (ALARA). (Section 4.2)

### Radioactive Waste Treatment, and Effluent and Environmental Monitoring

The inspector concluded that the licensee was conducting an effluent and environmental monitoring program in accordance with procedures and regulatory requirements. (Section 5.2)

## Report Details

### Summary of Plant Status - Unit 3

At the time of the inspection, the licensee continued to conduct decommissioning of remaining structures and areas around the site, including equipment removal, building demolition, and excavation. Decommissioning was performed in accordance with the general guidance provided in the Post-Shutdown Decommissioning Activities Report (PSDAR) dated July 19, 2013, (ML13213A160).

A License Termination Plan (LTP) was submitted to the U.S. Nuclear Regulatory Commission (NRC) on May 3, 2013, and was followed with submittals in response to NRC requests for additional information. On August 13, 2014, LTP Revision 1, which included information included in the above submittals, was submitted by the licensee. This plan will further define the end state of the site, refine decommissioning cost estimates and thereby provide a detailed baseline for cost and schedule considerations.

In the Refueling and Reactor Buildings, the contractor for the civil works portion of the decommissioning continues to prepare the remaining portions of the reactor pressure vessel for removal. Many segments of the pressure vessel have been removed from the reactor building and shipped to a waste site for burial. The spent fuel pool liner has been removed and shipped to the appropriate burial site. The surfaces of the spent fuel pool have been scabbled to remove surface contamination. Water in the spent fuel pool is processed through an ion exchange system, transferred to onsite temporary liquid holding tanks, sampled, and analyzed for acceptable levels of radioactivity, and then shipped for disposal.

Demolition of the liquid waste building and tunnels and piping connecting it to the reactor building was underway with emphasis on the Secondary Alarm Station (SAS) structure and associated off-gas tunnel.

The licensee continues to transport waste to appropriate disposal sites. The licensee continues the process of analyzing the feasibility and cost associated with removal of subsurface structures as part of the decommissioning process.

## **1 Organization, Management, and Cost Controls (36801)**

### **1.1 Inspection Scope**

The inspector evaluated the licensee's organization and the management's program of review, assessment, and planning for decommissioning.

### **1.2 Observations**

The inspector reviewed the current organizational structure of the licensee and the primary support contractor. The licensee has instituted a program of observation and coaching with the objective of providing adequate oversight as the site moves from a program of licensee directed efforts to a program of contractor directed activities coupled with licensee oversight. The program consists of management observations of contractor work activities with items rated as exceptional,

adequate, or deficient. The observer focus was concentrated in areas of Independent Spent Fuel Storage Installation (ISFSI), security, general operations, north yard demolition and site-wide packaging and handling. The inspector reviewed the observations for March, 2015, which identified a deficiency in 11% of the performance area items observed. When deficiencies were found they were entered into the licensee's corrective action program.

The inspector reviewed the programs for conduct of audits, safety reviews, corrective actions and changes to the Humboldt Bay Quality Assurance Plan (QAP) and found them to be in accordance with procedures and regulatory requirements.

The Humboldt Bay QAP addresses requirements of the Humboldt Bay Unit 3 Part 50 License and the Part 72 ISFSI License. By letter dated June 10, 2014, (ML14176A080) the licensee submitted revision 32 to the QAP which changed the oversight of the QA Program from the Nuclear Safety Oversight Committee (NSOC) to a requirement for an Independent Management Review function. In response to a request from NRC the licensee submitted additional information by letter dated August 15, 2014 (ML14227A958). The NRC approved the request for change to the QAP on September 4, 2014 (ML14238A627). Implementation of the change is through Procedure "HBPP, Independent Management Review," effective September 4, 2014, that state 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 conduct of a review at a minimum of every two years. As of the dates of this inspection a review had not been conducted and the reviewer(s) had not been appointed. This will be an item followed in future inspections.

### 1.3 Conclusions

The inspector concluded that there is adequate qualified staff to conduct decommissioning activities at the site. The licensee continues to maintain an adequate organization for decommissioning in compliance with the license and quality assurance plan.

## **2 Decommissioning Performance and Status Review (71801)**

### 2.1 Inspection Scope

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

### 2.2 Observations

Primary efforts for the calendar year 2015 are to complete segmentation and packaging of the remaining portions of the reactor vessel for shipment and burial, remediate the discharge canal, remove the remaining water from the spent fuel pool, begin trenching for study of excavation for containment wall installation, and transport of construction debris to proper burial sites. Previously the licensee had considered the installation of a slurry wall surrounding the reactor and



turbine buildings in order to complete excavation of the materials in those areas. That plan has been modified with the proposed installation of Cutter Soil Mixture Wall instead of the slurry wall. Decommissioning efforts to date have emphasized the removal of systems and components where the potential for elevated internal exposures resulting from intake of radioactive material dictated slow and methodical disassembly during the removal of contaminated systems. Engineering controls continue to be implemented in order to maintain safety of the workers and public.

At the time of the inspection segmentation of the reactor vessel was complete with the exception of the remaining nozzle tendons, the upper vessel flange, and the lower vessel head. Reactor vessel removal is the last major effort that is considered to be self-performed/self-directed. The project then transitions to demolition of remaining structures, site remediation, and waste disposal phases conducted by the civil works contractor under licensee oversight.

The spent fuel pool liner has been removed and shipped to the appropriate burial site. The surfaces of the spent fuel pool have been scabbled to remove surface contamination. Water in the spent fuel pool is processed through an ion exchange system, transferred to onsite temporary liquid holding tanks, sampled, analyzed for acceptable levels of radioactivity, and then shipped for disposal.

Demolition of the liquid waste building and tunnels and piping connecting it to the reactor building was underway with emphasis on the secondary alarm station structure and associated off-gas tunnel. This structure was initially designed as the secondary alarm station but was never utilized as such by the licensee. The inspectors reviewed the conduct of radiation surveys of the debris to allow for recycle on-site or disposal as waste at the appropriate site.

The discharge canal has been isolated from the bay by installation of a cofferdam and plugging of the culvert pipes connecting the discharge canal to the bay. The licensee notified the inspector that cofferdam installation was completed on October 8, 2014. Water which remained in the discharge bay due to the flooding has been processed through the groundwater cleanup system and released to the bay. Additional groundwater slowly seeps into the canal and is periodically processed through the cleanup system and also discharged to the bay. At the time of the inspection the licensee began removal of the rip rap material along the sides of the canal. The rip rap material is loaded into dump trucks, monitored for radioactivity, and characterized for reuse or disposal as waste. Material that is characterized for reuse is placed in a designated area onsite. Material not designated for reuse is placed in a separate designated area for future shipment and disposal.

## 2.3 Conclusions

The licensee conducted decommissioning activities in accordance with license and regulatory requirements. Ongoing work was conducted following applicable procedures and in accordance with license and regulatory requirements.

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

#### **3.1 Inspection Scope**

The inspector reviewed the licensee's waste management and radioactive material transportation programs to ensure compliance with license and regulatory requirements.

#### **3.2 Observations**

During the inspection, the inspectorS observed three shipments of material to their respective burial sites. The shipments included one liquid shipment and one solid waste shipment of exempt material to a site approved for Resource Conservation and Recovery Act (RCRA) in Idaho, and one low specific activity solid waste shipment to a Utah site. Documentation was reviewed to evaluate compliance with applicable Department of Transportation (DOT) requirements. The inspector also reviewed documentation for one shipment of segments of the reactor pressure vessel. The vessel segments were shipped as low specific activity material after evaluation of the radioactive contamination and radioactive activation of vessel materials. Documentation applicable to shipments of water containing low levels of radioactivity to the RCRA site was also examined.

For the period of January 1, through April 16, 2015, the licensee made 23 shipments containing 6,203 cubic feet of material to the Utah site. For the same time period a total of 151 shipments of solid waste with a volume of 45,734 cubic feet and 6 shipments of liquid waste with a volume of 3,993 cubic feet were made to the Idaho RCRA site. The total volume of material sent to the RCRA site since shipments were first initiated is less than ten percent of the total allowed volume.

To ensure compliance with applicable NRC and the DOT regulations, the licensee utilized 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 manifested information is consistent with the approved waste profile. Documents supplied in the package indicated that the container had been inspected by the licensee and determined to be in compliance with DOT packaging requirements. Radiation/ contamination survey data sheets were reviewed that verified compliance with applicable limits as outlined in 10 CFR 71.47. Emergency response information was supplied with all shipments. Documentation also noted that exemption conditions as approved by NRC were reviewed and followed. Required radiation and contamination surveys were conducted and results were acceptable for those shipments. A vehicle inspection checklist was completed prior to approval for the vehicles to depart the site. A review of documents for the selected shipments indicated that license and regulatory requirements were met. The inspector also verified that individuals involved in the approval of the shipments were properly trained and that training was maintained within regulatory requirements. Prior to departure, a signature by the licensee, in their oversight role, is required that indicates that all documents associated with the shipment have been completed in accordance with licensee procedures and that the material is packaged, characterized, classified, marked,

labeled, placarded and transported in accordance with regulatory requirements of the NRC and the DOT.

### 3.3 Conclusions

The licensee's program for transportation of material for off-site burial was found to be performed in accordance with license and regulatory requirements. Transportation of liquid waste was also reviewed and found to be compliant.

## **4 Occupational Exposure During SAFSTOR and DECON (83100)**

### 4.1 Inspection Scope

The inspector reviewed the calibration and performance checks of portable survey and monitoring equipment. The inspector also reviewed data for estimated and actual exposure since the last inspection.

### 4.2 Observations

The inspector reviewed the database of instrumentation available for use by licensee personnel and determined that the licensee had an adequate supply and variety of instruments suitable for monitoring the radiological hazards at the site. The licensee continues to utilize a database that provides clear visual indication in the form of green, yellow and red color designations that apply to instruments that are in calibration, that are due calibration within 30 days, that are past due for calibration, and instruments, removed from service. During tours of the site the inspectors checked calibration dates on selected instruments in use in the field and determined that all were within calibration. Also while touring the site the inspector performed independent gamma surveys (Thermo Scientific Model Radeye B20 Survey Meter, NRC Serial Number 096533, calibration due date 8/24/2015). For all the locations that were surveyed, the inspectors found that the licensee was meeting the posting requirements of 10 CFR 20.1902. General site exposure values were essentially at background level.

The inspector reviewed summary data through January 2015 and noted that total radiological exposure for the period of decommissioning had reached 66.8 person-rem. Earlier ALARA projections for this time period had predicted a radiological exposure level of 108 person-rem, indicating a savings of 41.2 person-rem. The licensee was able to identify that 26.4 person-rem of the radiological exposure savings were due to enhanced ALARA efforts during specific evolutions of decommissioning. The licensee continues to utilize lapel air samples to assess the potential for internal exposure via inhalation. For 2014, a total of 3550 personnel airborne monitoring lapels had been issued. This number is less than that for the year 2013 when a total of 5,077 lapel air samples were analyzed. The total assigned Committed Effective Dose Equivalent (CEDE) for integrated internal exposures for calendar year 2014 was 8.33 person-mrem. Personnel contaminations were limited to 15 incidents in 2014. There were 77,936 entries into the radiologically controlled area (RCA) during 2014.

The reactor vessel segmentation effort was noted as an evolution that had a potential for higher personnel exposures. The inspector reviewed summary data

for this effort and noted that total integrated radiological exposure for the project to date was 5,668.5 person-millirem. The ALARA estimate for the job was 10,000 person-millirem. The licensee noted in the close out of the applicable Radiation Work Permit (RWP) for 2014 (RWP No. 20140116 Reactor Pressure Vessel Segmentation) that airborne levels were minimized as a result of ventilation modifications completed before vessel cutting was initiated. The highest airborne level observed during work in calendar year 2015 was a Derived Air Concentration (DAC) of 2.3 DAC. For 2015 the RWP was issued as RWP No. 20150016 and will be closed out at the end of the project with summary data provided.

#### 4.3 Conclusions

The inspector concluded that the licensee had adequate calibrated instrumentation to ensure compliance with monitoring requirements. The inspector also reviewed the licensee's approach to control of occupational exposure during current work. Exposure controls were effective in maintaining exposures ALARA.

### **5 Radioactive Waste Treatment, and Effluent and Environmental Monitoring (84750)**

#### 5.1 Inspection Scope

The inspector reviewed the licensee's program for effluent monitoring and efforts to reduce the impact of decommissioning activities on the environment.

#### 5.2 Observations

The inspector reviewed environmental thermoluminescent dosimeter (TLD) data for the second, third, and fourth quarters of 2014. Data for the first quarter of calendar year 2015 had not been delivered as of the dates of the inspection. Results for off-site sample stations at locations prescribed in the HBPP Offsite Dose Calculation Manual (ODCM) are all at background levels. The inspector also reviewed data for on-site and off-site air samples. The on-site samplers are located near or on the boundary of the radiologically controlled area. The off-site sampler location is on Humboldt Hill at a location compliant with commitments in the ODCM. Results for all samples are at background levels confirming that there have been no airborne releases off-site. The inspector noted an increase in level at the off-site location during April 2014. Discussions with the licensee noted that the air sampler at that location had failed, reducing flow for that sampling period and thus leading to a higher level indication.

The inspector reviewed the Materials Management Strategy Document dated March, 2015, supplied by the civil works primary contractor, Chicago Bridge and Iron (CB&I). This document (Control No. 017401-CBI-PP-022-D) describes the overall material management plan for the HBPP decommissioning project. It is a guidance/strategy document that outlines a strategy to maximize the amount of material that is reused on-site, minimize the amount of material that is shipped to radioactive waste disposal facilities, and manages the stockpiling and flow of material. The document prescribes the analytical efforts necessary to evaluate

radiological hazards and chemical limits to determine if material is eligible for use on-site as fill or if the material must be disposed off-site as waste. The document also describes the use of the GARDIAN System to confirm levels acceptable for on-site use. The document contains standing work instructions that provide guidance for operation of facilities and equipment. Also included are hazards analyses for activities to include precautionary notes outlining actions taken to reduce the potential for airborne dust generation. Traffic management and flow patterns are presented for all phases of the decommissioning activities through May 2018.

### 5.3 Conclusions

The inspector concluded that regulatory and license limits for off-site releases to the environment were being achieved and that the licensee was developing a program for managing waste materials that would support continued compliance with regulatory requirements and ensure protection of the environment.

## **6 Exit Meeting**

The inspector presented the scope and preliminary findings of the inspection during an exit meeting that was conducted at the conclusion of the onsite inspection on April 23, 2015. The licensee did not identify any information as proprietary that was provided to, or reviewed, by the inspector.

## **SUPPLEMENTAL INSPECTION INFORMATION**

### **PARTIAL LIST OF PERSONS CONTACTED**

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D. LeBoeuf, CBI Deputy Program Manager  
J. Morris, Regulatory Services  
W. Parish, RP Engineer  
K. Rod, Decommissioning Manager  
J. Salmon, Environmental Manager  
S. Schlerf, RP Foreman  
L. Sharp, Director and Plant Manager  
M. Smith, Engineering Manager  
D. Sokolsky, Licensing Consultant  
M. Strehlow, Deputy Director

### **INSPECTION PROCEDURES USED**

IP 36801 Organization, Management and Cost Controls at Permanently Shutdown Reactors

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors

IP 83100 Occupational Exposure During SAFSTOR and DECON

IP 84750 Radioactive Waste Treatment and Effluent and Environmental Monitoring

IP 86750 Solid Waste Management and Transportation of Radioactive Materials

## 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
CB&I	Chicago Bridge and Iron
CFR	<i>Code of Federal Regulations</i>
CEDE	Committed Effective Dose Equivalent
DAC	derived air concentration
DOT	Department of Transportation
FSS	Final Site Survey
HBPP	Humboldt Bay Power Plant
IP	NRC Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
NRC	U.S. Nuclear Regulatory Commission
NSOC	Nuclear Safety Oversight Committee
ODCM	Offsite Dose Calculation Manual
PSDAR	Post Shutdown Decommissioning Activities Report
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
RPV	Reactor Pressure Vessel
RWP	Radiological Work Permit
TLD	thermoluminescent dosimeter