



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

July 18, 2013

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 050-00133/13-009

Dear Mr. Halpin:

This refers to the inspection conducted on June 18-21, 2013, at the Humboldt Bay Power Plant, Unit 3 facility in Eureka, California. Additional information supplied on July 9, 2013 regarding second shift operation was also reviewed. The enclosed report presents the results of this inspection. This inspection was an examination of activities conducted under your license as they relate to safety and 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. In summary, the inspectors determined that you were conducting decommissioning activities in accordance with license and regulatory requirements. The preliminary inspection results were presented to your staff at the conclusion of the onsite inspection.

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

-2-

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,

***/RJTorres for RA/***

D. Blair Spitzberg, PhD, Chief  
Repository and Spent Fuel Safety Branch  
Division of Nuclear Materials Safety

Docket: 050-00133

License: DPR-7

Enclosure:

NRC Inspection Report 050-00133/13-009

cc w/encl: See next page

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E. Halpin

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U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket: 050-00133

License: DPR-7

Report: 050-00133/13-009

Licensee: Pacific Gas and Electric Company

Facility: Humboldt Bay Power Plant, Unit 3

Location: 1000 King Salmon Avenue  
Eureka, California 95503

Dates: June 18-21, 2013

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

Donald L. Stearns, Health Physicist  
Nuclear Materials Safety Branch A

Approved by: D. Blair Spitzberg, PhD, Chief  
Repository and Spent Fuel Safety Branch

Attachment: Supplemental Inspection Information

Enclosure

## **EXECUTIVE SUMMARY**

### Humboldt Bay Power Plant, Unit 3 NRC Inspection Report 050-00133/13-009

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.

#### Decommissioning Performance and Status Review

At the time of the inspection, decommissioning was progressing at a slower rate than what was initially planned. The sequence of some activities has required adjustment to accommodate the challenges of scheduling. A License Termination Plan (LTP) was submitted to the U.S. Nuclear Regulatory Commission (NRC) on May 3, 2013 and currently is under review. This plan will further define the end state of the site, refine decommissioning cost estimates and thereby provide a new baseline for cost and schedule considerations. The licensee conducted decommissioning activities in accordance with license and regulatory requirements. (Section 1)

#### Safety Reviews and Design Changes

The licensee conducted safety reviews and design changes in accordance with procedures and regulatory requirements. (Section 2)

#### Solid Waste Management and Transportation

The licensee conducted solid waste management and transportation activities in accordance with procedures and regulatory requirements. (Section 3)

#### Occupational Exposure

The licensee continues to follow as low as reasonably achievable (ALARA) principles, maintaining personnel exposures well below applicable limits. Radioactive postings and boundaries were maintained in accordance with regulatory requirements. Occupational exposures were monitored in accordance with procedures and regulatory requirements. (Section 4)

#### Radioactive Waste Treatment and Environmental Monitoring

The licensee conducts radioactive waste treatment and environmental monitoring in accordance with regulatory requirements. (Section 5)

## Report Details

### Summary of Plant Status - Unit 3

During the inspection, the HBPP, Unit 3, was being decommissioned by the licensee in accordance with commitments made in its Post Shutdown Decommissioning Activities Report, dated June 30, 2009. The licensee continues to transport waste to appropriate sites. The licensee continues the process of analyzing the feasibility and cost of removing subsurface structures as part of the decommissioning process.

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

##### **1.1 Inspection Scope**

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

##### **1.2 Observations**

Primary efforts for the remainder of calendar year 2013 are to load all greater than class C waste in a welded and sealed multipurpose cask and transfer this cask to storage as the sixth cask in the on-site independent spent fuel storage installation (ISFSI), load class B and class C waste for transport to burial at an approved site in Texas, segment and package the reactor vessel for burial, remove the control rod drive mechanisms and complete demolition of the turbine building. Decommissioning efforts to date have emphasized the removal of systems and components where, due to high levels of alpha contamination, the potential for elevated internal exposures resulting from intake of radioactive material dictated slow and methodical disassembly with removal of contaminated systems. Engineering controls were implemented in order to maintain safety of the workers and public. Once these components and systems are removed, work then moves to demolition of major structures.

Demolition of the Turbine Building is underway. Though some delays have been experienced due to the need for asbestos abatement, it is anticipated that building demolition will be completed by the end of the third quarter 2013. Concrete rubble from the turbine building is expected to contain low levels of radioactive material and most of the rubble will meet criteria for disposal at the Idaho Resource Conservation and Recovery Act (RCRA) disposal site. The licensee noted that at this time efforts in segmentation and size reduction have been slowed due to failure of subcontractor equipment. In order to accommodate these delays and minimize impact on the overall schedule, the licensee is initiating a second shift to support work in the refuel building for reactor pressure vessel segmentation efforts. Licensee, contractor and subcontractor employees will participate in this work. The schedule is for two twelve hour shifts with one-half hour overlap for shift change. This work schedule was initiated on July 8 and is anticipated to continue through October 31, 2013.

Removal of material and components internal to the reactor vessel began in March of 2012 and will continue through 2013. The reactor vessel has been drained and a fixative applied to the surfaces of the vessel to limit airborne releases. The inspectors reviewed licensee's dry run efforts in preparation for removal of the control rod drive mechanisms (CRDM). Removal of CRDM is projected to begin in the third quarter of 2013. Work on vessel segmentation is scheduled to continue into 2014.

During tours of the site the inspector performed independent gamma surveys (ThermoScientific Model RadEye B20, NRC Serial Number 096533, calibration due 07/20/2013). For all the locations that were surveyed, the inspector found that the licensee was meeting the posting requirements of 10 CFR 20.1902.

### 1.3 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.

## **2 Safety Reviews and Design Changes (37801)**

### 2.1 Inspection Scope

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

### 2.2 Observations

During a previous inspection the inspector noted, based on a contractor document, PWC Closure Evaluation, dated February 2, 2012 that the Process Waste Container (PWC), that contains processed greater than class C waste, was tested and verified via a vacuum drying and inerting operation to be leak tight for water intrusion when stored for one year in the spent fuel pool. The inspector raised the question that if the period of one year is exceeded, will the integrity of the seal be maintained. The licensee initiated a technical evaluation to assess performance of the seal of the PWC. The ethylene propylene diene monomer (EPDM) seal is a flat gasket used as a seal between the vacuum drying insert and the PWC body. The seal along with the body and insert provide primary containment of helium gas used to provide an inert atmosphere in the PWC. Results of the evaluation are presented in TE-D 164, Rev 0, "Performance of EPDM Seal in the Process Waste Container." The evaluation concludes that the EPDM Seal in the PWC will perform its function while stored in the HBPP Spent Fuel Pool for up to five years. This conclusion is based on compilation and evaluation of information from literature sources.

The inspectors attended a meeting of the Plant Safety Review Committee (PSRC) conducted on June 18, 2013. The chair of the committee verified that a quorum of technically qualified members was present for the meeting. The PSRC review on this date discussed a licensing basis impact evaluation (LBIE) screen. The PSRC determined that they could proceed with approval of the document.



### 2.3 Conclusions

The inspector reviewed the programs for conduct of safety reviews and design changes and found them to be in accordance with procedures and regulatory requirements.

## **3 Solid Waste Management and Transportation (86750)**

### 3.1 Inspection Scope

The inspector reviewed site procedures for shipment of solid waste material containing Class A waste and for shipment of solid waste material to a site approved for Resource Conservation and Recovery Act (RCRA) waste material to evaluate compliance with applicable transportation requirements. The inspector also reviewed methods used by the licensee to ensure continued compliance with requirements of three exemption requests.

### 3.2 Observations

To ensure compliance with applicable NRC and Department of Transportation (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 noted that verified compliance with applicable limits as outlined in 10 CFR 71.47.

The inspector reviewed shipping checklists and documentation for two shipments to the US Ecology RCRA site located in Idaho. The two shipments reviewed consisted of concrete rubble with very low levels of radioactivity. Information supplied confirmed that the disposal site criteria and classification was determined by established procedures. Documentation also noted that exemption conditions as approved by NRC were reviewed and followed. The licensee verified that the intermodal container utilized for this shipment met the general design packaging requirements of 49 CFR 173.410. Required direct radiation and contamination surveys were conducted and results were acceptable for this shipment. A vehicle inspection checklist was completed prior to approval for the vehicle to depart the site. A review of documents for these 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.

### 3.3 Conclusions

The licensee program for transportation of material for off-site burial was found to be performed in accordance with license and regulatory requirements.

## **4 Occupational Exposure During Safstor and Decommissioning (83101)**

### **4.1 Inspection Scope**

The inspector reviewed site procedures for 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 the radiological hazards at the site. The inspector reviewed the calibration records of selected instruments to verify proper calibration methodologies. Noted was the fact that 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, and that are past due for calibration and removed from service. During tours of the site the inspectors checked calibration dates on instruments in use in the field and determined that all were within calibration.

The inspectors reviewed licensee external and internal exposure data summaries for April and May 2013. External exposure data from electronic dosimeters indicated a total integrated levels of 2.14 person-rem for April and 1.69 person-rem for May. Approximately 190 site personnel were monitored during each of these months. The maximum indicated external dose during April was 63.7 mrem while the maximum value for May was 39.2 mrem. The licensee continues to utilize lapel air samples to assess the potential for internal exposure via inhalation. During the month of April, 445 lapel air samples were analyzed with a maximum calculated/assigned exposure of 1.7 mrem CEDE. For the month of May a total of 452 samples were reviewed with no samples indicating a potential for internal exposure. There were no positive whole body counts during April and May. Note that the licensee requires a whole body count on an annual basis. Compliance with this requirement is tracked through the Sentinel database which prevents approval of entry into the radiological controlled area if an individual fails to comply with this requirement. The inspectors verified that the database will indeed indicate that a whole body count is required and that entry is not approved if the whole body count is not completed as required within the one year period.

The inspectors also reviewed bioassay data and internal dose assignment associated with a potential for intake during work in the refueling building that occurred in the last week of April 2013. Smoke was produced due to exposure of a plastic bag to heat from a light assembly as further detailed in the licensee's system application and process notification system as SAPN 1298594. Six individuals were present in the area at the time and stated that they did notice an odor. Because of the possibility for an inhalation intake, the licensee initiated collection of urine and fecal samples. The inspector reviewed sample collection requirements and dose assessment and noted that the licensee followed guidance presented in NUREG 4884, Internal Dosimetry. Doses assigned for

this event based on analysis of fecal samples ranged from zero to a maximum of 0.49 mrem. Urine samples taken from the same individuals when analyzed showed no detectable activity.

#### 4.3 Conclusions

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

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

#### 5.1 Inspection Scope

The inspector reviewed the licensee's program for environmental monitoring.

#### 5.2 Observations

The inspectors reviewed licensee procedures for the analysis of samples processes at the on-site counting laboratory. The inspectors also reviewed recent calibration records for two selected gamma analysis systems in use. It was noted that the systems are calibrated periodically to include daily determination of quality control limits. If the analysis system does not satisfy quality control limits, the system is recalibrated prior to further use. The inspector reviewed calibration data and quality control records and noted compliance with license and regulatory requirements.

The inspectors toured the location of and reviewed the status of the Stack Particulate Airborne Monitoring System (SPAMS). SPAMS is a continuous alpha-beta monitor installed in the exhaust stack that monitors gaseous release to the environment. The system also allows for collection of particulates on filter paper for subsequent isotopic analysis. The licensee presented to the inspectors a general description of how the system functioned and demonstrated knowledge of system operation and limitations. The licensee also discussed with the inspector the recent calibration of the system. Adherence to calibration procedure requirements was noted.

#### 5.3 Conclusions

The inspector reviewed selected areas of the licensee's environmental monitoring program and found the program to be in accordance with regulatory requirements.

## **6 Exit Meeting**

The inspector reviewed the scope and preliminary findings of the inspection during an exit meeting that was conducted at the conclusion of the onsite inspection on June 21, 2013. The licensee did not identify as proprietary any information provided to, or reviewed, by the inspector. Additional information was supplied by the licensee on July 9, 2013 that further detailed second shift operations.

## **SUPPLEMENTAL INSPECTION INFORMATION**

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

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### **INSPECTION PROCEDURES USED**

IP 37801 Safety Reviews, Design Changes and Modifications at Permanently Shutdown Reactors

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors

IP 83101 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
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CPI	cost performance index
CRDM	control rod drive mechanisms
DOT	Department of Transportation
DSAR	Decommissioning Safety Analysis Report
FSAR	Final Safety Analysis Report
FSS	Final Site Survey
HBPP	Humboldt Bay Power Plant
IP	NRC Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
kV	Kilo Volt
LSA	Lower Shroud Assembly
LTP	License Termination Plan
NRC	U.S. Nuclear Regulatory Commission
NSOC	Nuclear Safety Oversight Committee
RAU	Oak Ridge Associated Universities
PSRC	Plant Staff Review Committee
RCRA	Resource Conservation and Recovery Act
RPV	Reactor Pressure Vessel
SFP	Spent Fuel Pool
SNM	Special Nuclear Material
SPAMS	Stack Particulate Airborne Monitoring System
SPI	schedule performance index