



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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January 3, 2013

Mr. Edward D. Halpin
Senior Vice President
& Chief Nuclear Officer
Pacific Gas and Electric Company
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SUBJECT: NRC INSPECTION REPORT 050-00133/12-012

Dear Mr. Halpin:

This refers to the inspection conducted on December 3-7, 2012, at the Humboldt Bay Power Plant, Unit 3, facility in Eureka, California. 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 inspector 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 [HTTP://www.nrc.gov/reading-rm/adams.html](http://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.

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/

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

Docket: 050-00133
License: DPR-7

Enclosure:
NRC Inspection Report 050-00133/12-012

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U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 050-00133

License: DPR-7

Report: 050-00133/12-012

Licensee: Pacific Gas and Electric Company

Facility: Humboldt Bay Power Plant, Unit 3

Location: 1000 King Salmon Avenue
Eureka, California 95503

Dates: December 3-7, 2012

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

Accompanied by: Eric Simpson, Health Physicist
Repository and Spent Fuel Safety Branch

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 050-00133/12-012

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 is progressing at a slower rate than what was planned. The sequence of some activities has required adjustment to accommodate the challenges of scheduling. While progress continues, costs have begun to increase slightly above levels that were budgeted for the amount of work completed to date however overall projected costs remain within docketed decommissioning cost estimates. A License Termination Plan (LTP) is to be submitted to the NRC for approval in the spring of 2013 that will further define the end state of the site and refine decommissioning cost estimates. The licensee conducted decommissioning activities in accordance with license and regulatory requirements. The licensee continues to assess the final site status to include analysis of structures and components that are below ground level. (Section 1)

Safety Reviews and Design Changes

The licensee conducted safety reviews and design changes in accordance with procedures and regulatory requirements. Radioactive postings and boundaries were maintained in accordance with 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)

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

The licensee's project team continues to work to determine key assumptions and costs associated with various options. Decommissioning efforts to date have emphasized the removal of systems and components where, due to high levels of alpha contamination, the potential for elevated exposures 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, which the licensee describes as civil works projects. Use of more fixed price contracts is anticipated for removal of structures and buildings. The licensee in their budget update for November 2012 noted a cost performance index (CPI) of 0.90 and a schedule performance index (SPI) of 0.87. The CPI is defined as the project's earned value divided by actual costs of work performed and since the CPI is less than unity, physical progress is being accomplished at a slightly greater cost than budgeted. The SPI is defined as the project's earned value divided by the planned value and, since the SPI is less than one, physical progress is slower than what was planned. The licensee has initiated programs to reduce costs to include reduction of manpower on-site. The licensee remains within early cost estimates for decommissioning. Further refinement of cost estimates that depend on the desired end state of the site will be submitted as part of the licensee's License Termination Plan.

The licensee's project team has defined five major project areas that will encompass the completion of the effort. These areas are demolition of the turbine building, remediation of the intake and discharge canals, excavation and demolition of remaining permanent plant structures and facilities, demobilization of office facilities, and final site restoration. The effort to remove underground structures to include the reactor caisson will involve construction of a clay and concrete slurry wall surrounding the Unit 3 area that will act to improve soil stability and also limit ingress of water as the structures are removed.

Demolition of the Turbine Building is to begin in the near future with turnover of the building to the contractor already completed. It is anticipated that building demolition will be completed by mid-year 2013. Concrete rubble from the turbine building is expected to contain low levels of radioactive material. Based on initial assessment and information on the potential source of contamination, length of time since shutdown of the facility and process knowledge, the isotopes Cesium-137 (Cs-137) and Cobalt-60 (Co-60) were selected as the isotopes of concern. In-situ assays using gamma scanning techniques were performed within the Turbine Building to determine locations and variations in the concentrations of radionuclides. Results showed that most contamination was located on floors and lower walls of the building. Core samples of concrete sufficient in size to allow quantification of radionuclide concentrations were taken at randomly selected and also biased locations. Five concrete core samples were forwarded for verification to NRC's contracted laboratory, Oak Ridge Associated Universities (ORAU) in Oak Ridge, TN. Sample analysis at ORAU was performed in accordance with ORAU Procedures and results documented in a letter report. Results of the ORAU analysis agree reasonably well with results obtained by the licensee and confirm that concrete from the turbine bay can be disposed of at the Idaho facility as it meets the disposal criteria established in the NRC letter of December 19, 2012. The full letter report will be made publicly available in NRC's Agency wide Documents Access and Management System (ADAMS).

Because of the limited size of the Humboldt Bay Power Plant, the licensee has found it necessary to survey decontaminated and decommissioned areas and then backfill, pave over areas, or construct temporary facilities to allow for other decommissioning activities, such as storage of materials. For example the area formerly known as the liquid fuel oil tank area was decommissioned and filled with soil to level this portion of the site and allow for construction of storage buildings and a lay down area. Prior to approving this area for an alternate use, the licensee characterized the area through use of data collected during walkover gamma measurements and soil sampling. The purpose of these surveys was to demonstrate that years of plant operation did not result in an accumulation of plant related radioactivity that exceeds release criteria. During the inspection, the inspectors reviewed the licensee's characterization survey planning to include touring of laboratory count room and sample storage facilities. The inspectors noted that surveys, though, used primarily for characterization purposes were planned to the rigors of a final site status survey so that data could be used for determination of the final status of this area. The inspectors also noted use of independent laboratories for comparison of measured results and corrective action on the part of the licensee when bias in results was noted.

Removal of material and components internal to the reactor vessel began in March of 2012 and will continue into early 2013. During the inspection, the inspectors reviewed video of and witnessed portions of the transfer of internal components from the reactor vessel into storage locations in the spent fuel pool. Use of a shielded transfer bell to reduce direct radiation exposure levels was noted, as well as restricting the number of personnel present in the refuel building during the transfer evolution. Subsequent to placement of the internal components into the spent fuel pool, the components will be further size reduced and packaged for shipment to a burial site. After removal of internal components

is completed, the reactor vessel will be drained, a fixative applied to limit airborne releases, and the vessel shell will be segmented. Removal of control rod drive mechanisms (CRDM) is projected to begin in March 2013, while work on vessel segmentation is scheduled to begin in mid-2013 and will continue into 2014.

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

The Quality Assurance Program for the Humboldt Bay Site includes an independent review function implemented by the Nuclear Safety Oversight Committee (NSOC). The NSOC provides an independent review of changes, tests, experiments, and procedures which constitute a change to the Humboldt Bay Independent Spent Fuel Storage Installation (ISFSI), as described in the Humboldt Bay ISFSI Final Safety Analysis Report (FSAR) or the Humboldt Bay Power Plant Unit 3 Decommissioning Safety Analysis Report (DSAR). Also, the NSOC verifies that reportable events are investigated in a timely manner and corrected in a manner that reduces the probability of recurrence of such events. The inspector reviewed minutes of the October 26, 2012, meeting of the NSOC. A sufficient number of voting members with required technical expertise were present to satisfy requirements for a quorum. The minutes reflect continuing updates of the committee on the status of decommissioning. The NSOC also reviewed recent meetings of the Plant Staff Review Committee (PSRC) and provided positive feedback on the PSRC review of changes of dilution factors in the Off-site Dose Calculation Manual (ODCM), but also noted concerns related to timeliness of self-assessment and resolution of issues. Past concerns of the NSOC related to the Corrective Action Program (CAP) at HBPP resulted in changes to the program that were put into effect November 15, 2012. The committee was also provided updates of ISFSI operations, the training program, and radiological and non-radiological compliance.

The inspector also reviewed minutes of the PSRC for October 23 and 31, 2012, and November 7, 2012. A quorum of technically qualified members was present for all meetings of the committee. A major item addressed by the PSRC during this period, based on suggestions from the NSOC, was the revision of the CAP as described in Procedure HBAP C-12, Problem Identification and Resolution, effective November 15, 2012. A major change in the CAP is the replacement of technical review groups with a single individual who serves as the CAP coordinator who ensures consistent evaluation and completion of actions. Terminology is also changed so that it is more consistent with industry norms.

For example, nonconformance issues will now be termed significant conditions adverse to quality (SCAQ), a term more frequently utilized in the industry. The committee also reviewed monthly radiological dose summaries and actions in their role as the site ALARA Committee. The inspector attended a meeting of the PSRC on December 4, 2012, and observed that the committee performed its review function, addressing a requested change to the ISFSI SAR in order to better define the use of the ISFSI vault to minimize doses to onsite personnel. Also noted by the inspector was that, prior to any committee action, the Chair of the Committee ensured that a quorum was present. During the meeting when a required committee member was asked to step out to take a call, discussions ceased until a quorum was re-established.

During site tours, the inspector noted that silting of the discharge canal continues. Licensee data verifies that the amount of tidal volume available for dilution of treated, monitored effluents from the liquid radwaste treatment system continues to decrease. Based on measurements, the licensee revised the conservative dilution factor utilized in the ODCM to estimate radioactivity concentrations at the outfall canal and in the Humboldt Bay environment to a value of 50 (ODCM, Volume 4, Revision 22, effective July 22, 2012). Effluents being discharged continue to comply with dose limits for individual members of the public pursuant to 10 CFR 20.1302. With the reduction in dilution factors due to silting, the licensee is reviewing alternate means for disposal of plant liquid effluents to include shipment to an off-site disposal facility. The inspectors noted that installation of a water storage and treatment facility was underway, the facility to be used primarily to remove particulate matter and adjust pH to meet regulatory requirements prior to discharge to the environment of Humboldt Bay,

During site tours, the inspector measured ambient gamma exposure levels with a Ludlum Model 2401-EC2 survey meter (NRC Serial 257911, calibration due 01/09/2013). No areas were found that were inconsistent with observed postings made pursuant to 10 CFR 20.1902.

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.

3.2 Observations

To ensure compliance with applicable NRC and Department of Transportation (DOT) regulations, the licensee utilized shipping compliance checklists. The

inspector reviewed the shipping checklist and associated documentation for radioactive material in the form of non-compactable trash, Class A waste material, that was shipped in a Type A package to the Energy Solutions Utah site. The checklist requires in part that the licensee have documentation on file that certifies that the container used meets Type A package qualifications. The package also includes documentation that the package meets disposal site criteria for waste acceptance and 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. Emergency response information was supplied to include an emergency contact number that was validated by the inspector to be staffed on a 24-hour basis. The inspector also reviewed documentation for a shipment to the US Ecology RCRA site located in Idaho. Information supplied confirmed that the disposal site criteria and classification was determined by established procedures. Required direct radiation and contamination surveys were conducted and results were acceptable for this shipment. A review of documents for these selected shipments indicate that license and regulatory requirements were met.

The inspectors observed final preparation for a shipment of Class A waste destined for the Clive, Utah, site. Placement of an intermodal container on the transport trailer, securing the container to the trailer, and final radiation surveys were found to be compliant with requirements of site procedures. Waste manifest documentation was reviewed and the inspectors verified that placarding of the shipment matched information presented on the shipping manifest. Completion of the required outbound vehicle inspection checklist was observed to include verification that vehicle lights were operational, container tie-downs were in good condition, there were no apparent highway safety deficiencies, and the tractor-trailer configuration met length limitations. The shipment was found to meet regulatory requirements and was permitted to depart the site. During final checks on a later shipment, the inspectors noted that the licensee determined that the limit on tractor-trailer length was not met. Once the licensee noted the excessive length, further processing of the shipment was stopped by the licensee. Adjustments in the truck-to-trailer coupling were made, the length remeasured and found to meet criteria, and the final checks completed. The shipment was then allowed to depart the site.

3.3 Conclusions

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

4 **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 December 7, 2012. The licensee did not identify as proprietary any information provided to, or reviewed, by the inspector.

SUPPLEMENTAL INSPECTION INFORMATION

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L. Sharp, Director and Plant Manager
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INSPECTION PROCEDURES USED

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors

IP 37801 Safety Reviews and Design Changes

IP 86750 Solid Waste Management and Transportation

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

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
HBPP	Humboldt Bay Power Plant
IP	NRC Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
NSOC	Nuclear Safety Oversight Committee
ODCM	Off-site Dose Calculation Manual
ORAU	Oak Ridge Associated Universities
PSRC	Plant Staff Review Committee
RCRA	Resource Conservation and Recovery Act
SCAQ	significant conditions adverse to quality
SPI	schedule performance index