



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

February 7, 2012

Mr. John T. Conway
Senior Vice President-Energy Supply
& Chief Nuclear Officer
Pacific Gas and Electric Company
P. O. Box 3
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SUBJECT: NRC INSPECTION REPORT 050-00133/11-008

Dear Mr. Conway:

This refers to the inspection conducted on December 5-9, 2011, 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. Following receipt of information requested, additional results were discussed with your staff on January 9, 2012.

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 & Spent Fuel Safety Branch

Docket: 050-00133
License: DPR-7

Enclosure:
NRC Inspection Report 050-00133/11-008

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U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 050-00133

License: DPR-7

Report: 050-00133/11-008
Licensee: Pacific Gas and Electric Company

Facility: Humboldt Bay Power Plant, Unit 3

Location: 1000 King Salmon Avenue
Eureka, California 95503

Dates: December 5-9, 2011

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

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

Attachment: Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

Humboldt Bay Power Plant, Unit 3 NRC Inspection Report 050-00133/11-008

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.

Safety Reviews, Design Changes and Modifications

The licensee conducted safety reviews, design changes and modifications in accordance with license and regulatory requirements. (Section 1)

Decommissioning Performance and Status Review

At the time of the inspection, decommissioning remains on schedule and within budget. There are decisions to be made in the near term that could impact schedule and costs. The licensee conducted decommissioning activities in accordance with license and regulatory requirements. Radioactive postings and boundaries were maintained in accordance with regulatory requirements. (Section 2)

Occupational Exposure During SAFSTOR and DECON

The licensee monitored occupational exposures in accordance with procedures and regulatory requirements. Personnel exposures remain less than estimates and reflect application of ALARA to work activities. (Section 3)

Radioactive Waste Treatment and Effluent and Environmental Monitoring

The licensee conducted effluent and environmental monitoring in accordance with license and regulatory requirements. (Section 4)

Solid Radioactive Waste Management and Transportation

The licensee conducted radioactive waste management and transportation activities in accordance with regulatory limits. (Section 5)

Follow-up on Traditional Enforcement Actions

The licensee completed all corrective actions to violations identified in the Notice of Violation EA-11-211 dated January 13, 2012 (ADAMS ML 11354A215), related to packaging of Safeguards Information and control of Safeguards material. These actions are considered closed. (Section 6)

Report Details

Summary of Plant Status - Unit 3

During the inspection, the Humboldt Bay Power Plant (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 has completed the process of analyzing options and has decided to section the reactor vessel prior to disposal. Sectioning of the vessel is currently projected for calendar year 2013.

Decommissioning of the adjacent fossil plants, Units 1 and 2, is complete. The removal of Units 1 and 2 was done concurrent with the ongoing Unit 3 decommissioning activities.

During the inspection, the inspector was informed that Mr. Paul Roller was retiring from the position of Director and Nuclear Plant Manager of Humboldt Bay Power Plant. Mr. Kerry Rod was serving in the role as Acting Director at the time of the onsite inspection. Effective December 12, 2011, Mr. Loren Sharp took over management of the Humboldt Bay Power Plant site.

1 Safety Reviews, Design Changes and Modifications (37801)

1.1 Inspection Scope

The inspector evaluated whether the licensee conduct of safety reviews, design changes and modifications were in accordance with license and regulatory requirements.

1.2 Observations

In 2010, the licensee accidentally spilled radioactive liquid inside the restricted area. Independent review of the problem and analysis of corrective actions determined that operations personnel need to be more involved in the design process and that there needs to be a stronger coupling of engineering design changes to procedural changes. Detailed procedures were developed to ensure these actions occurred. The inspector reviewed implementation of these procedures as applied to replacement of the Radioactive Effluent Liquid Process Monitor System (RLEMS), with a system that maintains the functions of the past while improving the availability and reliability of the equipment. This evolution involves installation of a new detection system and a change in system location. The modification when complete, tested and placed into service replaces the detector, preamplifier and cable between the preamplifier and ratemeter. The inspector reviewed documentation applicable to this change to include the design change notice, design package follower, acceptance tests to include post maintenance testing procedures and noted that the licensee was following the revised design and operational implementation procedures. At the time of the inspection, full acceptance had not been completed and this system will be reviewed as part of a future inspection.

General labor during decommissioning of Unit 3 is now supplied by a new subcontractor, Fluor. The inspector met with the site manager and staff of the contractor and observed a commitment to safe operations.

Major high risk activities on-site are reviewed by the Site Readiness Review Board to ensure that planning is complete, required equipment is available and that work is ready to proceed. The Board, a site decision making entity, is led by the Site Director with all major site managers or their designees in attendance. The inspector reviewed minutes of the Readiness Review Board for the period August through November of 2011. Details of the efforts, specific requirements and concerns were presented and discussed. Attendees and participants were noted and action items assigned as appropriate.

1.3 Conclusions

The licensee conducted safety reviews, design changes and modifications in accordance with license and regulatory requirements.

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

Currently the project is on time and within budget. Based on data supplied by the licensee through October 2011, the Cost Performance Index (CPI) was equal to 1.00 which means that physical progress was being accomplished at the cost that was budgeted. In addition the Schedule Performance Index (SPI) was equal to 0.96. A SPI of 1.00 would indicate that the physical progress was exactly on schedule, the value provided indicates that progress is only very slightly behind schedule. Significant events scheduled for 2012 include lifting of the reactor chimney, preparation for reactor vessel sectioning, processing and packaging of greater than class C waste (ISC-18), and a characterization for the fuel oil tank area.

The inspector observed ongoing work in the reactor building and other locations on-site. Workers were observed to be in compliance with requirements of the applicable Radiation Work Permit (RWP). Radiological postings on fences and at entrances to the restricted area were clearly visible, and postings met the requirements of 10 CFR Part 20. Use of ventilation and glove bag enclosures were also noted.

2.3 Conclusions

The licensee conducted decommissioning activities in accordance with license and regulatory requirements. Radiation postings and boundaries were maintained in accordance with regulatory requirements. Ongoing work was

conducted following applicable procedures and in accordance with license and regulatory requirements.

3 Occupational Exposure During SAFSTOR and DECON (83100)

3.1 Inspection Scope

The inspector evaluated the licensee's program for monitoring and tracking occupational exposure of occupational workers to ensure that the program was in accordance with license and regulatory requirements.

3.2 Observations

The HBPP maintains a series of trending documents to allow for assessment of radiation protection performance. The inspector emphasized review of data since the last inspection for external and internal exposures related to decommissioning activities. Through November 2011, actual exposures were 15.0 man-rem compared to an estimate of 29.0 man-rem for the same timeframe of work. Essentially all of the exposure was external. The reduction in actual exposure is due in part to safety standowns and changes in the support contractor which delayed removal of reactor vessel internals and segmentation and removal of the vessel along with delaying removal of various tanks and piping. Due to the potential for exposure to airborne alpha emitters, the licensee routinely conducts airborne radioactivity monitoring (RCP-2C, Sampling and Analysis of Airborne Radioactive Materials.) The licensee relies on lapel air samplers to assess the level of airborne exposure of workers. For example, based on data supplied by the licensee, the inspector noted that in the month of October 2011, 417 lapel samplers were issued. Bioassay data provides a direct measure of the quantity of radioactive material in the body but because of the very low internal exposures levels resulting from implementation of engineered safeguards and use of personal protective equipment by the licensee, direct measurements using bioassay techniques cannot always be used to assess routine exposure. Calculation of exposure levels based on lapel air sampling results is normally required. The licensee assesses internal exposures based on concepts outlined in Regulatory Guidance (RG 8.9, Acceptable Concepts, Models, Equations, and Assumptions For a Bioassay Program), following models and limits based on ICRP-68 (TBD-207, Internal Exposure Limits Based on ICRP-68). The licensee by procedure (RCP-2D, Evaluation of Internal Deposition of Radioactive Material) notes that routine bioassays shall be performed as appropriate to evaluate internal exposure and evaluate success of the respiratory protection program. The frequency of bioassay is determined by the Radiation Protection Manager based on the workers potential for internal exposure (HBRCS-5, Medical and Bioassays). All personnel who are authorized access to the Restricted Area shall be given a minimum of one whole body count per year. If the whole body count is not completed as scheduled, the worker is automatically restricted from entry into the Restricted Area via the Sentinel Access System. Personnel terminating access to the Restricted Area are given a whole body count if there is reason to suspect significant intakes of radioactive material. In-vivo counts were also conducted for selected individuals to verify that intakes had remained at the non-detectable level. Individuals chosen were selected based on exposure to the highest derived air concentration exposure

without a respirator, most time wearing a respirator, most time in a controlled area without a respirator and individuals known to not be exposed as baselines. All bioassay samples were counted and analyzed with no detectable activity found.

3.3 Conclusions

The inspector observed techniques for control of occupational exposure during ongoing work and noted that exposure controls were implemented as described in appropriate procedures. The inspector also reviewed the licensee's program for assessing internal and external exposures and noted that the program met regulatory requirements.

4 Radioactive Waste Treatment and Effluent and Environmental Monitoring (84750)

4.1 Inspection Scope

The inspector reviewed effluent and environmental monitoring programs to determine whether the licensee conducted these efforts in accordance with license and regulatory requirements.

4.2 Observations

Monitoring efforts provide data on radiation levels and radioactive materials in exposure pathways for radionuclides that have the highest potential for exposure of the workers and public. For the purpose of protecting individuals from exposure to radiation and radioactive materials, the licensee has identified a restricted area boundary and radiological limitations for that boundary (RCP-4G, Restricted Area). The fence line is posted as a radiological restricted area, radiation dosimeter and RWP/SWP authorization required for entry, radioactive materials area. Radiation dose rates for whole body exposure at the boundary normally do not exceed 25 micro-R in an hour. If one assumes an individual member of the public is present on the boundary and exposed for 40 hours per week for 50 weeks at the above limit, their exposure would be 50 mrem per year. Thus, exposure of the public remains below the limit of 100 mrem per year as allowed by 10 CFR 20.1301. The boundary is surveyed on a weekly basis unless activities dictate a need for additional measurements. The boundary of the restricted area may be temporarily altered with approval of the Radiation Protection Manager for specific projects if the dose rate cannot be maintained at less than 25 micro-R in an hour. Altered boundaries are to be clearly marked. The inspector verified use of this approach through review of radiation survey data during the decommissioning of the fossil Units 1 and 2 (Survey 2010-1029, U-3 yard, 6/9/10, RWP/SWP 2010-003). The inspector also reviewed data from environmental thermal luminescent dosimeters (TLD), placed on the restricted boundary fence and validated that dose limits will be met at these locations. The TLD data is for 7 days a week, 24 hours per day. Thus, control of dose to a member of the public requires consideration of changes of general occupancy around the site. For times when higher than normal dose rates may occur due to specific decommissioning activities, additional controls are to be established.

Public dose rates are limited to less than 2 mrem in any one hour and exposure to members of the public is continues to meet the criteria specified above. For the surface water pathway, the Off-site Dose Calculation Manual Model is based on the average concentration of radioactivity released and diluted by the tidal flow of water in the outfall canal. Prior to shutdown and decommissioning of the two fossil units, dilution of water in the discharge canal was supplied by flow of coolant water through these units. Dilution now results from tidal flow in the canal. The licensee noted by observation of the discharge canal at low tide that there is an inflow of silt material. This inflow of silt acts to reduce the volume of the canal and thus the amount of weekly tidal flow. The licensee using a GPS system continues to map the buildup of silt and at the time of inspection presented data reviewed by the inspector that showed that sufficient volume was still available and that dilution factors used to determine the concentration of radionuclides through this monitored discharge pathway were still valid. Comparison of data from a GPS survey conducted in June 2011 with that in April of 2011 indicated a decrease of approximately 1.5 percent of mixing volume (Electronic Letter, Larry Dockins to John Albers, Discharge Canal Siltation, 9/8/2011). The licensee noted that such measurements will continue in order to establish a siltation rate and to validate use of appropriate dilution factors for releases of radioactive liquid waste into the discharge canal.

4.3 Conclusions

The licensee conducted effluent and environmental monitoring in accordance with license and regulatory requirements.

5 **Solid Radioactive Waste Management and Transportation (86750)**

5.1 Inspection Scope

The inspector reviewed the licensee's programs for radioactive waste management and transportation of material for disposal.

5.2 Observations and Findings

For the period January through December 6, 2011 the site has made 42 shipments of Class A waste to the Energy Solutions site located in Clive, Utah. The total weight of these shipments is approximately 952,000 pounds in a volume of approximately 28,000 cubic feet. By letter of November 2, 2010, NRC approved of alternate disposal of Resource Conservation and Recovery Act (RCRA) waste containing low-activity radioactive material. Since that time, a total of 191 shipments consisting of RCRA waste primarily from the decommissioning of fossil Units 1,2 with only limited amounts from Unit 3 were made to the US Ecology site in Grand View, Idaho. These shipments totaled approximately 4.2 million pounds with a volume of approximately 102,000 cubic feet compared to the approved limit on volume of 200,000 cubic feet. In addition, there were 232 shipments of recycle waste sent to local recycle facilities and local landfills. This waste with a weight of approximately 8.4 million pounds, was generated during the decommissioning of areas of the fossil units that from historical information was known to not have had any radioactive material present. This knowledge was complemented by well documented surveys of the

material by radiation protection personnel. Once packaged, shipments are subjected to a final survey by radiation protection and waste packaging personnel for compliance with applicable limits. The inspector selected shipment documentation for review and determined from review of the information presented that regulatory criteria for shipment and waste acceptance were being met. Based on records reviewed by the inspector, required compliance training in general awareness, radioactive waste packaging and shipping, and shipper certification is provided on site to appropriate personnel. In order to ensure an awareness of requirements for all staff, transportation of waste materials was discussed in general at an all hands site-wide safety meeting which the inspector attended.

5.3 Conclusions

The licensee conducted radioactive waste management and transportation activities in accordance with license and regulatory requirements.

6 **Follow-up on Traditional Enforcement Actions (92702)**

6.1 Inspection Scope

The inspector reviewed the licensee's corrective actions implemented in Response to the Apparent Violations noted in an inspection report issued on October 21, 2011 (IR 050-00133/11-07; 072-00027/11-01).

6.2 Observations

The inspection report cited above identified apparent violation APV 072-00072/1101-01 for failure to properly package Safeguards Information (SGI) for shipment, and apparent violation APV 072-00027/1101-02 for two instances of failure to maintain control of SGI. The licensee reviewed the apparent violations and responded via letter on December 12, 2011. The licensee concurred with the NRC's conclusions, including the fact that the licensee had identified a negative trend, voluntarily notified the NRC and took corrective actions to prevent recurrence. The licensee proposed corrective actions to prevent the problems from reoccurring. Implementation of corrective actions was reviewed during the inspection.

6.3 Conclusion

As of the dates of inspection there have been no additional failures of maintaining control of SGI. The inspector determined that all corrective actions identified to the NRC were completed and these corrective actions are considered closed.

7 **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 15, 2011. Following review of additional information requested during the inspection and provided subsequent to the onsite

inspection, a final exit briefing was held with licensee representatives by telephone on January 9, 2012. The licensee did not identify as proprietary any information provided to, or reviewed, by the inspector.

SUPPLEMENTAL INSPECTION INFORMATION

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INSPECTION PROCEDURES USED

IP 37810 Safety Reviews, Design Changes and Modifications
IP 71810 Decommissioning Performance and Status Review
IP 83100 Occupational Exposure During SAFSTOR and DECOM
IP 84750 Radioactive Waste Treatment and Effluent and Environmental Monitoring
IP 92702 Followup on Traditional Enforcement Actions

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

072-00027/1101/01 APV Failure to properly package SGI for shipment

072-00027/1101-02 APV Failure to maintain control of SGI

Discussed

None

LIST OF ACRONYMS

CFR	<i>Code of Federal Regulations</i>
HBPP	Humboldt Bay Power Plant
IP	NRC Inspection Procedure
ISFSI	independent spent fuel storage installation
ODCM	Offsite Dose Calculation Manual
RCRA	Resource Conservation and Recovery Act
RWP	Radiation Work Permit