



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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November 30, 2009

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 050-00133/09-003

Dear Mr. Conway:

This refers to the inspection conducted on October 26-29, 2009, at the Humboldt Bay Power Plant, Unit 3 facility. 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. The enclosed report presents the results of this inspection. In summary, the inspector determined that you were conducting decommissioning activities in compliance with regulatory and license requirements.

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 document system (ADAMS), accessible from the NRC's Web site at <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 Mr. Robert Evans, Senior Health Physicist, at (817) 860-8234 or the undersigned at (817) 860-8197.

Sincerely,

/RA Roberto J. Torres for/

Jack E. Whitten, Chief
Nuclear Materials Safety Branch B

Docket: 050-00133
License: DPR-7

Enclosure:
NRC Inspection Report 050-00133/09-003

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 050-00133

License: DPR-7

Report: 050-00133/09-003

Licensee: Pacific Gas and Electric Company

Facility: Humboldt Bay Power Plant, Unit 3

Location: 1000 King Salmon Avenue
Eureka, California 95503

Dates: October 26-29, 2009

Inspector: Robert Evans, PE, CHP, Senior Health Physicist
Nuclear Materials Safety Branch B

Approved By: Jack E. Whitten, Chief
Nuclear Materials Safety Branch B

Attachment: Supplemental Inspection Information

ENCLOSURE

EXECUTIVE SUMMARY

Humboldt Bay Power Plant, Unit 3 NRC Inspection Report 050-00133/09-003

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

Decommissioning Performance and Status Review

- Radioactive postings and boundaries were being maintained in accordance with regulatory requirements (Section 1.2.a).
- In response to a number of minor incidences, the licensee issued a stand-down order in an effort to ensure that the decommissioning staff understood management expectations. The stand-down order was a proactive effort on the part of the licensee to ensure that decommissioning was being conducted in accordance with procedural requirements (Section 1.2.b).
- The licensee continued to implement a cross-contamination plan in accordance with license requirements (Section 1.2.c).
- The licensee implemented a training program in accordance with procedure requirements (Section 1.2.d).
- Finally, the licensee continued to implement programs in accordance with site procedures in an effort to control worker exposures to alpha contamination (Section 1.2.e).

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee conducted transportation related activities in accordance with U.S. Department of Transportation regulatory requirements (Section 2).

Report Details

Summary of Plant Status

Humboldt Bay Power Plant (HBPP), Unit 3, was being decommissioned in accordance with its Post-Shutdown Decommissioning Activities Report dated June 30, 2009. The licensee commenced with decommissioning during May 2009. At the time of this inspection, the licensee had roughly 120 contractors and 80 employees assigned to the project.

Since May 2009, the licensee removed the Unit 3 transformers from service and disassembled the generator. The reactor cavity shield plug was cut into sections and was staged for disposal. The licensee prepared an area outside of the restricted area for temporary storage of intermodals. The intermodals will be used for shipping of radioactive wastes to an out-of-state disposal facility. The licensee also started construction of a new environmental count room. The licensee upgraded the plant ventilation systems to support the removal of contaminated equipment from within the buildings. The fuel oil storage tank was disassembled and sectioned for disposal. The emergency diesel generator propane tank was permanently removed from service. The licensee will utilize an uninterruptable power system in lieu of the diesel generator for emergency power.

The licensee was conducting a study of the reactor pressure vessel. The study will help the licensee decide how to decommission the reactor pressure vessel, including assessment of waste disposal classifications. The study will also help the licensee decide whether to segment the vessel and its internals.

In the near future, the licensee plans to install a reactor pressure vessel water level indicator and install a new stack monitor. The licensee plans to flood the reactor pressure vessel for shielding. The reactor pressure vessel water level indicator will be used to help control water level in the vessel. The stack monitor will be used to monitor radioactivity in the ventilation effluent. The licensee also plans to survey the drywell head area for future removal of asbestos and highly radioactive components. Finally, the licensee intends to update its electronic dosimetry system in the near future.

The licensee continued to construct a new power generating plant on site property. Following the construction of the new power generating plant, the licensee plans to commence with the decommissioning of Units 1 and 2. The licensee plans to submit an exemption request to the NRC for alternate disposal of building rubble and soil collected during the demolition of Units 1, 2, and a small portion of Unit 3. If approved by the NRC, the licensee would be allowed to dispose of the waste material at a facility authorized to accept material.

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 and Findings

a. Site Tours

The inspector toured the fuel handling building, Unit 3 control room, and the other radiologically restricted areas of the facility. Radiological postings were clearly visible, and postings met the requirements of 10 CFR Part 20. Housekeeping was being controlled in these areas. During the site tours, the inspector conducted radiological surveys to verify the accuracy of radiation area postings. The inspector did not identify any radiation area that was incorrectly posted by the licensee.

b. Decommissioning Performance

In recent weeks, the licensee experienced a number of minor incidents that impacted site decommissioning. Although none of the incidents were violations of NRC regulations or reportable to the NRC, the inspector reviewed and discussed these incidents with licensee representatives to ensure that that licensee had taken prompt and effective corrective actions in each situation:

- During 2007, the radwaste trash compactor was disconnected and moved to allow for the transfer of spent resins from the resin disposal tank. However, the compactor was never reinstalled and was subsequently disposed. During June 2009, the licensee recognized that the trash compactor was still listed in the Defueled Safety Analysis Report as an active system. In hindsight, the licensee recognized that a design change notice should have been created and an open work order should have been closed prior to the licensee permanently removing the compactor from service.
- On July 16, 2009, a contractor cut a sensing line in the former seal oil room that subsequently appeared to have contained mercury. (Although the licensee did not confirm that the line actually contained mercury, the incident was treated as if it was a mercury spill.) In response, workers secured the area, and a dedicated crew cleaned up the spill. The licensee conducted a follow up review and determined that the work order did not indicate that the line may have contained mercury. Corrective actions included development of generic work instructions that all capillary lines were to be treated as if they contained mercury. Work training was provided, including mock exercises.
- On or about August 20, 2009, the licensee discovered that electrical field work had been completed prior to formal approval of the work order.
- On September 25, 2009, a contractor accidentally cut through a ½-inch instrument air line, resulting in a loss of spent fuel pool liner level indication. Since the spent fuel pool liner level was a technical specifications required surveillance, the licensee implemented prompt corrective actions to repair the line. The licensee determined that the contractor did not see the instrument air line while cutting ventilation duct sheet metal. Corrective actions included development of new generic work order instructions prohibiting blind cuts and requiring use of work spotters when necessary.
- Also on September 25, 2009, a small electrical junction box was crushed by the movement of a construction vehicle without a vehicle spotter being present.

- Finally, on October 13, 2009, a live 24-volt sprinkler alarm circuit was cut in error by a decommissioning contractor.

In response to the above incidents, the licensee issued a stand-down order during mid-October 2009. Decommissioning work was halted to allow for review of the work control process and worker understanding of the process. In addition, the licensee issued a non-conformance report to thoroughly investigate this potentially negative trend.

Supplemental training was provided to site workers. Training included plant walk-downs and reviews of work performance, work order process, and lessons learned from industry experience. Feedback from training was used as input for future program changes. In addition, the licensee planned to re-mark plant systems in the field in an effort to clearly delineate between systems that were scheduled to be removed and systems that were still in service.

An all-hands meeting was held on October 28, 2009, to discuss the results of the corrective actions taken in response to the stand-down. The purpose of the meeting was to explain how the licensee plans to strengthen the work control processes. In addition, management expectations were reinforced. The licensee intended to lift the stand-down order during early-November 2009.

The inspector reviewed the incidents, and discussed the incidents with site staff. The corrective actions taken by the licensee for each individual incident appeared to be appropriate. The inspector determined that the licensee's decisions to issue a stand-down order and to retrain the staff were proactive actions on the part of licensee management. The impact of the retraining efforts will be reviewed by the NRC during future inspections.

c. Cross-Contamination Plan

License Condition 2.C.4 specifies that a cross-contamination prevention and monitoring plan be maintained for the new fossil generation facility. The inspector reviewed the licensee's implementation of its cross contamination plan. During the previous inspection, the inspector noted that the site procedure lacked specificity for the implementation of the cross-contamination program. During this inspection, a licensee representative stated that procedure upgrades would be implemented in the near future.

The licensee conducted the initial radiological survey during July 2009 as required by the cross contamination plan. The radiological survey results indicated that all measurements were indistinguishable from background levels. The licensee conducted the second quarterly survey during early September 2009. The results of the second survey also indicated that all measurements were indistinguishable from background levels.

d. Site Training Program

The inspector reviewed the licensee's training program for compliance with the requirements of 10 CFR 19.12, the Defueled Safety Analysis Report, and site procedures. The training programs include general employee training, program-specific training, and respiratory protection training. Details of the training program are included

in HBPP procedures B-2, "General Training Requirements for On-Site Personnel," and B-200, "Radiation Protection Training Program." The inspector noted that the licensee was in the process of significantly updating the training program, in part, to account for the actual radiological hazards that are present at the site.

The inspector reviewed the respiratory protection training and fit test program with the applicable supervisor. During the previous inspection, the fit test program was suspended pending receipt of new masks for fit testing. Previous fit test failures were attributed to improper sealing of the probe that penetrated the test respirator. New masks were received during August 2009. Fit testing was in progress during the inspection. Additional fit-test masks were being procured to increase the number of people that could be fit tested at one time. At the time of this inspection, the licensee had enough individuals who had been fit tested to support the work in progress.

Respiratory protection procedure revisions were in progress, in part, to include a new action level for alpha contamination. The licensee plans to swipe the masks for removable contamination at the points where the masks are removed from the workers. Highly contaminated masks will require special cleaning and handling. To support the cleaning of contaminated masks, the licensee planned to upgrade the respiratory cleaning station. A glove box assembly will be used for cleaning of alpha-contaminated respirators. To support these activities, respirator maintenance and cleaning training was provided to the designated site workers during mid-May 2009 by a vendor.

The inspector conducted a review of the last quality assurance audit of the training and qualification program. The last audit was conducted during May 2008. The audit concluded that overall performance was satisfactory. The inspector noted that this audit had been conducted prior to commencement of full-scale decommissioning. Since the audit is a biennial audit, the next audit is expected to be conducted during 2010. The inspector will review the quality assurance program audit of the HBPP training program during a future inspection.

e. Control of Exposures to Alpha Contamination

The inspector conducted a review of the licensee's plans to control occupational exposures to alpha contamination. The site has a unique radiological hazard due to alpha particulate contamination. Early fuel failures resulted in the internal contamination of plant systems with fission products and transuranic radionuclides. The alpha particulate hazard has increased over time from the decay of plutonium-241, while the gamma radiation hazards have decreased due to the decay of cobalt-60 and cesium-137.

The licensee plans to commence with work that has the potential for significant exposures to alpha particulate contamination during December 2009. To support this activity, the licensee developed a radiation protection procedure for performing and evaluating alpha particulate contamination postings and surveys. In addition, the procedure provides new controls for alpha zones. The implementation of this new procedure should help minimize the potential for worker exposures to alpha contamination.

To help assess the alpha contamination hazard inside of plant piping, the licensee recently collected a number of 'coupon' samples from various locations including turbine

and feedwater piping. These samples were submitted to an offsite laboratory for analysis. The results of these samples will be used, in part, to help characterize the material for waste disposal and for transportation. The coupon sample results indicate that the highest alpha contamination levels were located in the vicinity of the main steam isolation valves and main steam stop valves. Reduced contamination levels were identified in the crossover piping between the high and low pressure turbines. Finally, moderately elevated measurements were identified in the vicinity of the condenser.

The licensee plans to cut alpha contaminated pipes within glove boxes or containment tents. The use of glove boxes and tents is expected to reduce the potential for worker exposures to loose alpha contamination. In addition, the licensee plans to inject foam material into the pipes to fixate the alpha contamination prior to cutting the pipes. Site workers that enter a contaminated area will be required to wear lapel air samplers to help the licensee assess worker exposures to airborne radioactive particulate contamination.

The inspector reviewed the licensee's bioassay program. Routine whole-body counts are generally ineffective for identifying uptakes of alpha contamination. The licensee plans to implement an enhanced bioassay program that will include collection of urine and fecal samples for monitoring internally deposited alpha-emitting radionuclides. Lapel air sampler, general area sampling, and continuous air monitor results, in addition to loose surface contamination sampling, will be used to justify non-routine fecal sampling.

The licensee procured equipment to conduct real-time monitoring of alpha contamination. The licensee recently placed into service a number of continuous air monitors that monitor for both beta-gamma and alpha contamination. Further, the licensee plans to install a monitor that detects alpha contamination in the plant ventilation stack. During the inspection, the operational procedure, setpoint calculations, and emergency plan procedure upgrades were still in progress. The stack monitor was in service outside of the restricted area to verify operability of the monitor and supporting equipment. This monitor was expected to be installed in the stack prior to the start of decommissioning work involving alpha contamination.

The inspector also reviewed the licensee's program for sampling and analyzing airborne radioactive materials. The licensee was recently granted authorization from the NRC to use updated annual limit on intake and derived air concentrations values. The licensee plans to use the 10 CFR Part 20, Appendix B values for analyzing air sample results, but the licensee will use the updated values for assessment of internal dose, if a deposition of radioactive materials were to occur. The licensee also plans to use Poisson statistics, instead of Gaussian statistics, for the analyses of air sample results. The use of Poisson statistics is a conservative approach for analyzing low level alpha sample results.

1.3 Conclusions

Radioactive postings and boundaries were being maintained in accordance with regulatory requirements. In response to a number of minor incidences, the licensee issued a stand-down order in an effort to ensure that the decommissioning staff understood management expectations. The stand-down order was a proactive effort on the part of the licensee to ensure that decommissioning was being conducted in accordance with procedural requirements. The licensee continued to implement a

cross-contamination plan in accordance with license requirements. The licensee implemented a training program in accordance with procedure requirements. Finally, the licensee continued to implement programs in accordance with site procedures in an effort to control worker exposures to alpha contamination.

2 Solid Radioactive Waste Management and Transportation of Radioactive Materials (86750)

2.1 Inspection Scope

The inspector reviewed the licensee's plans for characterizing and shipping the radioactive wastes that will be generated during decommissioning.

2.2 Observations and Findings

In recent months, the licensee conducted a review of its compliance with U.S. Department of Transportation (DOT) regulations for transportation security. Specifically, regulation 49 CFR 172.800 states, in part, that a transportation security plan is required for shipment of hazardous material that requires placarding. Regulation 49 CFR 172.802 states that the security plan must include the elements of personal security, unauthorized access, and en-route security. However, regulation 49 CFR 172.804 states that, to avoid unnecessary duplication of security requirements, security plans that conform to regulations, standards, protocols, or guidelines issued by other Federal agencies may be used to satisfy the requirements in this subpart, provided such security plans address the requirements specified in this subpart.

In response to these regulations, the licensee developed and implemented a new procedure entitled "Hazardous Waste/Radioactive Material Transportation Security Plan." The procedure became effective during early October 2009.

These DOT regulations went into effect during 2003. The licensee recently conducted a review of its compliance with these transportation security requirements for calendar years 2003-2009. During this time frame, the licensee shipped 40 shipments that required a security plan. The licensee concluded that the alternate security requirements were in effect as allowed by 49 CFR 172.804 during the 2003-2009 time frame. The personnel security requirements were met by NRC's requirements for worker screening and issuance of site access badges. The unauthorized access requirement was met by the licensee's implementation of access control requirements. Finally, the en-route security requirement was met by the hiring of carriers that certified compliance with DOT security plan requirements.

The NRC inspector discussed these security transportation regulations with the licensee, specifically, the licensee's en-route security controls. The licensee stated that it had hired only commonly used, national carriers for transportation of radioactive material. The licensee did not use local carriers or site staff to transport radioactive material. Further, the licensee previously established a procurement process that stipulates that only qualified suppliers can be used. During the procurement process, the licensee ensured that the common carriers certified their compliance with DOT requirements.

In summary, the inspector concluded that the licensee was in compliance with DOT requirements. The licensee used the duplicate security requirements, as allowed by

49 CFR 172.804, between calendar years 2003-2009. After October 2009, the licensee's approved security plan will be used to ensure compliance with 49 CFR 172.800 and 172.802 requirements.

2.3 Conclusions

The licensee conducted transportation related activities in accordance with DOT regulatory requirements.

3 Exit Meeting

The inspector reviewed the scope and findings of the inspection during an exit meeting that was conducted at the conclusion of the onsite inspection on October 29, 2009. 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 71801 Decommissioning Performance and Status Review
IP 86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
HBPP	Humboldt Bay Power Plant
IP	Inspection Procedure