



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

January 18, 2007

Mr. John S. Keenan
Senior Vice President – Generation and Chief Nuclear Officer
Pacific Gas and Electric Company
P.O. Box 770000, Mail Code B32
San Francisco, California 94177-0001

SUBJECT: NRC INSPECTION REPORT 050-00133/06-004

Dear Mr. Keenan:

A special NRC inspection was conducted on December 18 - 22, 2006, at your 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 of the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection included reviews of your solid radioactive waste management and transportation of radioactive materials. On December 22, 2006, at the conclusion of the site visit, an exit briefing was conducted with Mr. Terry Nelson, Plant Manager, and other members of your staff. The enclosed report presents the scope and results of that inspection. The inspection 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 any) 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 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 the undersigned at (817) 860-8191 or Emilio M. Garcia at (530) 756-3910.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle and Decommissioning Branch

Docket No.: 050-00133
License No.: DPR-7

Enclosure:
NRC Inspection Report 050-00133/06-004

Pacific Gas and Electric Company

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cc w/enclosure:

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Pacific Gas and Electric Company

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SUNSI Review Complete: EMG

ADAMS: X Yes Initials: emg
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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 050-00133

License No.: DPR-7

Report No.: 050-00133/06-004

Licensee: Pacific Gas and Electric Company (PG&E)

Facility: Humboldt Bay Power Plant (HBPP), Unit 3

Location: 1000 King Salmon Avenue
Eureka, California 95503

Dates: December 18-22, 2006

Inspectors: Emilio M. Garcia, Health Physicist

Approved By: D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle and Decommissioning Branch

Attachments: Supplemental Inspection Information

ADAMS Entry: IR 05000133-06-04, on 12/18-22/06; Pacific Gas & Electric Co.;
Humboldt Bay, Unit 3. No violations.

EXECUTIVE SUMMARY

Humboldt Bay Power Plant, Unit 3
NRC Inspection Report 050-00133/06-004

The Humboldt Bay Power Plant (HBPP), Unit 3 was shutdown in 1976. The facility has been in a SAFSTOR status since shutdown with minimal decommissioning activity. This special inspection was conducted to review the licensee's practices during the Spent Fuel Pool (SFP) cleanup project. The inspector reviewed procedures and observed portions of the processing, packaging and preparation for shipping of miscellaneous and irradiated hardware from the HBPP SFP.

Solid Radwaste Management & Transportation of Radioactive Materials

- The licensee had successfully processed and loaded the first of three Class C waste liners with miscellaneous waste and irradiated hardware from the spent fuel pool. Personnel radiation exposures were below projections (Section 1).

Report Details

Summary of Plant Status

Humboldt Bay Power Plant, Unit 3, is currently in decommissioning SAFSTOR status. Unit 3 received an operating license from the Atomic Energy Commission on August 28, 1962. On July 2, 1976, Unit 3 was shutdown for annual refueling and seismic modifications. This work was suspended in December 1980 and in June 1983, PG&E announced its intention to decommission the unit. Unit 3 has been essentially in SAFSTOR since July 1985. On July 19, 1988, NRC approved the licensee's SAFSTOR plan and amended the license to a possess-but-not-operate status. The license will expire on November 9, 2015. The facility has undergone minimal decommissioning activity since shutdown. In preparation for the relocation of the spent fuel to an onsite Independent Spent Fuel Storage Installation (ISFSI), the licensee staff was conducting a removal and disposal campaign of miscellaneous and irradiated hardware in the spent fuel pool (SFP).

1.0 Solid Radioactive Waste Management and Transportation (86750)

1.1 Inspection Scope

The inspector reviewed the licensee's preparations and practices for the processing, inventorying and disposal of miscellaneous and irradiated hardware in the spent fuel pool. The inspector observed portions of the preparations, dry runs and actual loading of the first of three Class C waste liners to be disposed at a low level radioactive waste site.

1.2 Observations and Findings

In preparation for the relocation of the spent fuel to an ISFSI, the licensee staff was conducting a removal and disposal campaign of miscellaneous and irradiated hardware in the SFP. Due to the high levels of alpha contamination in the SFP and the need to move the highly irradiated hardware outside the pool and with limited shielding, this activity had the potential of high radiation exposures to the personnel involved. An inspection of preparations and loading of the first of three waste liners was conducted on December 18-22, 2006.

The licensee had contracted with NUKEM Corporation, the Contractor, to plan, inventory, process, package and ship miscellaneous and irradiated hardware present in the SFP, that were considered waste and no longer required for either SAFSTOR nor ISFSI operations. The miscellaneous and irradiated hardware to be disposed consisted of:

- Poison Curtains
- Fuel Channels
- Stellite rollers and balls
- Non special nuclear material portion of the incore detector strings
- Miscellaneous hardware such as spring clips, cap screws, sample coupon racks and other reactor hardware and tools, and
- other contaminated materials.

The Contractor's tasks included:

- Procedural Development
- Equipment mobilization and setup
- Component dose profiling
- Component processing
- Loading and shipping of the miscellaneous waste and irradiated hardware, and
- Preparation of appropriate records.

To control these activities, the licensee and the Contractor had developed a number of procedures. The Contractor developed procedures that had been incorporated into the licensee's procedures after review and approval by the Plant Safety Review Committee (PSRC). These procedures are listed in Attachment 2 to this report.

During the inspection, the licensee completed processing the contents of the first of three packages being prepared for shipment. This first package consisted principally of crushed fuel channels and poison curtains. The second shipment would consist of Stellite rollers and balls, and other miscellaneous hardware such as spring clips, cap screws, and sample coupon racks. The final shipment would have the remaining crushed fuel channels.

The materials were to be shipped using a Type B package, a 10-142B certified cask, NRC Certificate of Compliance number 9208. The licensee and contractor crew had pre-loaded the waste liner into the cask. Inside the liner, a basket containing crushed fuel channels would be placed and in the center of the basket a transfer box would be loaded with the higher irradiated components for this shipment, the poison curtains. The loading of the liner/cask combination involved two lifts from the SFP, the basket with the crushed fuel channels and a second lift with the transfer box containing the poison curtains. Each lift involved a period of time when the load was suspended above the SFP to permit draining of the water until only incidental dripping occurred. The transfer box was lifted in a transfer shield in order to minimize the radiation exposure to personnel during the time when the transfer box was lifted from the SFP.

The inspector observed portions of the basket loading with the last pieces of crushed fuel channels. The poison curtains had been previously loaded into the transfer box. Once all material was ready for movement into the liner/cask combination, the licensee conducted a series of dry runs lifting and placing an uncontaminated and empty basket into the liner/cask combination. These dry runs were necessary to provide practice to the crew when moving and placing the loaded basket into the liner/cask combination, and to determine the best locations for personnel to assure that radiation exposures were maintained as low as reasonably achievable (ALARA). These dry runs resulted in a change in the locations of the crane operator.

The licensee issued radiation work permit (RWP) 2006-0133, for the transfer of the waste from the SFP to the transport cask. The requirements of this RWP were based on assessments of the direct radiation dose and airborne contamination that were expected. The direct radiation estimates were based on MicroShield computer code calculations based on the radioactive quantities of the crushed channels and poison

curtains. The airborne contamination estimates were based on prior experience with contamination on materials removed from the SFP and their likeliness to become airborne. These calculations estimated that the highest direct radiation dose rate was 590 millirem per hour at eight feet from the basket and that airborne contamination would exceed 650 derived air concentration (DAC), with a potential for 976 DAC-hour exposure to individuals. Besides the usual practice of placing individuals in Powered Air Purifying Respirator (PAPR) the licensee took two additional actions to minimize the likelihood of the airborne contamination. Specifically, the building ventilation was placed on a mode that provides minimum airflow, and the surfaces that were contaminated were sprayed with a solution to prevent drying. Other RWP requirements included the use of extremity dosimetry, placement of dosimeters on the highest likely exposure location on the body, and the use of lapel air samplers to evaluate individual airborne contamination exposure, as well as full anti contamination clothing and the use and change of multiple pairs of gloves. The inspector determined that the radiation safety measures specified under the RWP adequately addressed the range of potential radiation hazards anticipated.

On Thursday, December 21, 2006, the liner/cask combination was successfully loaded with the basket and transfer box. The inspector remotely observed the entire process and noted that the requirements of the licensee's procedures and the RWP were followed. Electronic dosimeters on personnel indicated that the highest direct radiation exposure was 10.5 millirem and the combined exposures for all personnel involved in the loading of the liner/cask combination was 36.9 person millirem. Based on the lapel air sample results and the protection factor provided by the PAPR no committed dose was assigned. Subsequent to completing the loading of the first cask, the Senior Radiation Protection Engineer concluded that the lower than expected radiological conditions were due to the conservatism used in calculating the anticipated direct radiation levels and the effectiveness of the airborne contamination controls used.

Subsequent to the site visit, licensee personnel informed the inspector that the first cask had been shipped and that the second liner/cask combination had been successfully loaded.

1.3 Conclusions

The licensee had successfully processed and loaded the first of three Class C waste liners with miscellaneous waste and irradiated hardware from the spent fuel pool. Personnel radiation exposures were below projections.

1.0 **Exit Meeting**

On December 22, 2006, at the conclusion of the site visit, the inspector presented to the plant manager and other licensee staff members, the preliminary results of the inspection. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel:

J. Albers, Radiation Protection Manager
J. Atchley, Operator Specialist
J. Chadwick, Senior Radiation Protection Engineer
Z. Easley, Security Supervisor
V. Jensen, Quality Control Supervisor
T. Nelson, Plant Manager - Nuclear
L. Pulley, ISFSI Manager
D. Sokolsky, Licensing Supervisor

Contractor Personnel:

A Berry, Project Manager - AM Solutions
R. Koontz, Cask Supervisor - NUKEM Corporation
K. Milliken, Project Manager - NUKEM Corporation

INSPECTION PROCEDURES USED

IP 86750 Solid Radwaste Management & Transportation of Radioactive Materials

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
DAC	Derived Air Concentration
ISFSI	Independent Spent Fuel Storage Installation
PAPR	Powered Air Purifying Respirator
PSRC	Plant Safety Review Committee
RWP	Radiation Work Permit
SFP	Spent Fuel Pool

ATTACHMENT 2

PARTIAL LIST OF DOCUMENTS REVIEWED

Licenses and Certificates

- US Nuclear Regulatory Commission Certificate of Compliance Number 9208, Revision 16, issued September 27, 2006.

Procedures

- Humboldt Bay Temporary Procedure 2006-12, Processing Spent Fuel Pool Hardware, revision 2, effective December 6, 2006.
- Humboldt Bay Temporary Procedure 2006-15, Shipment of Solid Radioactive Waste to the Barnwell Disposal Facility, revision 0, effective November 22, 2006.
- Humboldt Bay Procedure B-3, Movement of Non-Fuel Material in Spent Fuel Pool, revision 28, effective June 23, 2005.
- Humboldt Bay Procedure B-10, Movement of SNM Articles in the Spent Fuel Pool, revision 1, effective October 3, 2006.
- Humboldt Bay -NUKEM Procedure 1009, Handling the 10-142B Transport Cask at the Humboldt Bay Power Plant, revision 0, effective December 11, 2006.
- Humboldt Bay -NUKEM Procedure 1064, Processing and Packaging Components at the Humboldt Bay Power Plant, revision 1, effective November 30, 2006.
- Humboldt Bay Power Plant Special Work Permit 2006-0130, Task 01, Revision 00, Approved October 27, 2006.
- Humboldt Bay Security Procedure SP-312, Vehicle Barrier System, Searches and Escort Requirements, revision 9, effective October 24, 2006.
- RWE NUKEM Corporation RSM-10-142B, User's Information Package for the 10-142B Shielded Transportation Cask,

Data Sheets

- ALARA Review and Job Planning Form for Special Work Permit (SWP) 2006-0130, dated October 24, 2006.
- Attachment 6.3, to SP-312, Exception to Standard Search Procedures, 142B #007 Cask, December 18, 2006.
- HBPP Area Survey Report 06-494, Receive Type-B Cask, 0800 hours, December 15, 2006.
- US NRC List of Register Users for Certificate 9208, for Model 10-142.