UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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September 11, 2000

Gregory M. Rueger, Senior Vice President
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SUBJECT: NRC INSPECTION REPORT 50-133/00-02; 72-27/00-01

Dear Mr. Rueger:

An NRC team inspection was conducted July 17-21 and August 14-17, 2000, at your Humboldt Bay Power Plant, Unit 3 facility. The enclosed report presents the scope and results of that inspection.

Areas reviewed during the inspection included fuel mover training, safety reviews, design changes and modifications, corrective action program, spent fuel pool safety, radwaste treatment and transportation, effluents and environmental monitoring, radiation protection program and verification of compliance with selected technical specifications (TS). In addition, review of spent fuel inspection activities was performed.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis of your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region IV and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 50-133; 72-27
License No.: DPR-7

Enclosure:
NRC Inspection Report
50-133/00–02; 72-27/00-01

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-133; 72-27
License No.:	DPR-7
Report No.:	50-133/00-02; 72-27/00-01
Licensee:	Pacific Gas and Electric Company (PG&E)
Facility:	Humboldt Bay Power Plant, Unit 3
Location:	1000 King Salmon Avenue Eureka, California 95503
Dates:	July 17-21 and August 14-17, 2000
Inspectors:	J. Vincent Everett, Senior Health Physicist Duke Wheeler, Senior Project Manager, NRR Dennis Reid, Spent Fuel Projects Office, NMSS Rachel S. Carr, Health Physicist (Inspector-in-Training)
Approved By:	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle and Decommissioning Branch
ADAMS Entry:	IR 05000133-00-02, IR 07200133-00-01; on 07/17-07/21/2000, 08/14-08/17/2000; Pacific Gas & Electric Co.; Humboldt Bay, Unit 3. Decommissioning Report; Tech Spec surveillance.

EXECUTIVE SUMMARY

Humboldt Bay Power Plant, Unit 3
NRC Inspection Report 50-133/00-02; 72-27/00-01

The Humboldt Bay Power Plant Unit 3 was shutdown in 1976. The facility has been in a SAFSTOR status since shutdown with minimal decommissioning activity. The spent fuel is stored in the spent fuel pool located in the refueling building. Based on observations made during the site tour, the facility and fuel were being maintained in a safe condition.

During the inspection, the licensee began the spent fuel examination project which was to continue through approximately January 2001. There were 390 spent fuel assemblies to be inspected. The inspection effort was to document the condition of each assembly in preparation for eventual dry cask storage. The spent fuel assemblies had a reddish coating. This coating was due to carbon steel piping used throughout the reactor system. There had been no decommissioning efforts conducted since the stack removal project during 1998. The licensee's efforts were currently focused on the spent fuel examination project.

The licensee continued to maintain good oversight of Unit 3. Required technical specification (TS) surveillances were being conducted and the licensee's staff was maintaining an alert attitude toward potential problems with Unit 3. The staffing at the site was adequate for the SAFSTOR condition of the facility.

Organization, Management and Cost Controls

- The certified fuel handler training met the procedural and technical specification requirements (Section 1).

- The spent fuel mover qualification training was adequate. The temporary procedure was good and incorporated all of the requirements for spent fuel examination into one document (Section 1).

- The decommissioning funding report was reviewed against the reporting requirements of 10 CFR 50.75, and was found to meet the requirements of the regulations (Section 1).

- The emergency medical training for contamination victims was provided to the local agreement hospitals and local emergency support services. The training was comprehensive and provided adequate demonstration and hands-on-learning. There was good attendance from the local emergency support service organizations (Section 1).

Safety Review, Design Changes and Modifications

- Acceptable programs were implemented to ensure that activities, changes, tests and experiments were properly evaluated for compliance with NRC requirements in 10 CFR 50.59 concerning safety evaluations and that no unreviewed safety questions were involved with such activities (Section 2).

Self Assessments, Auditing and Corrective Actions

- The licensee had a formal self-assessment and corrective action program that documented problems, brought the problems to the attention of management and tracked the resolution and completion of corrective actions. Management of the issues and corrective actions were considered satisfactory (Section 3).

Spent Fuel Pool Safety

- The licensee was maintaining the spent fuel pool water level, liner water level and spent fuel pool water quality in accordance with applicable technical specifications (Section 4).

- The negative ventilation of the refueling building was being maintained in accordance with TS IV.B.1 (Section 4).

Maintenance and Surveillance

- The licensee was implementing a program to comply with the requirements of the new maintenance rule in 10 CFR 50.65. The program was modeled after Diablo Canyon's program. An internal quality assurance assessment completed in early 2000 found the program to be effectively implemented (Section 5).

Decommissioning Performance and Status Review

- The licensee had maintained an adequate level of control over safety hazards, fire loading, housekeeping, posting of radiological areas and maintenance of field radiation detection equipment. Required control room alarms and indicators were functional (Section 6).

Radwaste Treatment, Effluents and Environmental Monitoring

- The nuclear quality service's radiological, environmental and effluent audit and subsequent assessment was thorough and comprehensive (Section 7).

- The annual 1998 and 1999 facility report and radioactive effluent release reports were reviewed. There were no problems identified which were not already noted internally (Section 7).

Solid Radwaste and Transportation

- Radwaste management and transportation activities met requirements. Only minor changes had been made to the radwaste shipping procedures since previous revisions (Section 8).

Fuel Examinations

- The licensee had developed and implemented a program to perform a visual examination of the 390 fuel assemblies. The licensee had established an acceptable process for performing fuel examination(s) and determining the condition of the fuel in accordance with Department of Energy criteria. At the completion of the inspection, the licensee had competed their inspection and video-recording of 56 fuel assemblies. The licensee anticipated completing the inspection of all 390 fuel assemblies by January 2001 (Section 9).

- The licensee had received several bids from vendors for a spent fuel storage cask system. The licensee plans to make a selection by the end of August. Completion of licensing activities were expected to require the next 2-3 years. Construction of the ISFSI would not start until licensing was completed (Section 9).

Report Details

Summary of Plant Status

Humboldt Bay has been shutdown since 1976. The facility has been in a SAFSTOR status since shutdown with minimal decommissioning activity. The licensee had received bids from several vendors to provide a spent fuel storage cask system for the Humboldt Bay site. Unique issues which had to be addressed related to the load capacity of the crane in the refueling building, high earthquake potential at the site and offsite transportation difficulties due to the mountainous roads that would be eventually used for transporting the casks offsite. The licensee felt that these issues had been successfully addressed by the vendors. A contract award was projected for late August. The licensee was developing a proposed schedule that would include submitting a site specific application for an ISFSI to the NRC in 2001, with construction of the ISFSI starting in 2003, upon completion of licensing activities. Fuel loading would be conducted during 2005.

In preparation for the eventual storage of the fuel at the ISFSI, the licensee was performing a visual inspection, examination and classification of the spent fuel in accordance with Department of Energy criteria. The fuel assemblies were totally covered with an oxide film, which had a pronounced red color. The oxide build-up was due to carbon steel piping used throughout the reactor system. Historical records indicated the licensee had previously evaluated the oxide coating in order to monitor its chemical composition. The analysis indicated the coating contained copper, zinc, iron and nickel. Currently, the licensee plans to submit new samples to General Electric (GE) for analyses to determine the current composition of the deposit on the fuel assemblies and to assess possible impacts for long-term storage and transportation.

1 Organization, Management and Cost Controls (36801)

1.1 Inspection Scope

Certified fuel handler (CFH) and spent fuel mover training was reviewed to verify certification and training of all personnel assigned fuel movement activities were current. The decommissioning fund report, which was submitted to the NRC on March 31, 2000, was reviewed against the requirements in 10 CFR 50.75. Coordination activities and training offered to the local agreement hospitals since the last inspection in February 2000 was evaluated.

1.2 Observations and Findings

Two different training qualification program areas were reviewed. One program area was certified fuel handler training, which is required by T.S.VII.C.4.a. The licensee's administrative procedure HBAP B-100, "Certified Fuel Handler Training," Revision 10, satisfactorily implemented the technical specifications requirement. The continued qualification training was conducted over a 2-year cycle, as required by T.S.VII.C.4.b. The licensee had 21 individuals qualified as certified fuel handlers and their training records were current and maintained in the training database computer.

The second training qualification program area reviewed was spent fuel mover training. The training incorporated procedures EDOI B-4 “Fuel Handling Equipment,” Revision 20, and EDOI B-5 “Fuel Handling Procedure,” Revision 17. Spent fuel mover training required radiation worker qualification and a job performance measure which demonstrated grappling/moving/ungrappling a dummy fuel bundle. The job performance measure was documented on a task evaluation checklist for each individual. Procedure B-5, “Fuel Handling Procedure.” required that spent fuel moving operations were conducted under the direct supervision of a certified fuel handler, which met the requirements of T.S.VII.C.1.d. There were 19 individuals qualified as spent fuel movers. Ten of the 19 individuals were also qualified as certified fuel handlers and had previously moved fuel at the licensee’s facility.

The decommissioning fund report was reviewed against the reporting requirements of 10 CFR 50.75, and found to meet the requirements of the regulations. It was observed that there was more money in the fund than was estimated to meet the NRC decommissioning requirements. However, funding for dry cask storage was not included in the estimate.

The licensee’s emergency plan, Section 8.1.2, stated that the licensee will provide training, if requested by the hospital on handling contaminated and injured persons. With the potential for limited site dismantlement activities to continue, the licensee offered emergency medical training for handling contaminated victims to the local agreement hospitals and other emergency service organizations. Training sessions were conducted on June 7-8, 2000. Approximately 27 people attended from the local agreement hospitals and 15 from the local fire departments. Additionally, there were several attendees from local clinic hospitals, city ambulance services and a disaster planner from the Hoopo Valley Indian Tribe. The licensee subsequently offered tours of the facility.

The training program was conducted by the licensee’s director of radiation protection and two contract personnel with extensive training and experience in nuclear power occupational/urgent care medical operations. One individual was a physician’s assistant with extensive experience managing the medical response program at another nuclear power facility. The remaining individual was an emergency medical technician (EMT) radiation & chemistry technician, who was also certified as a hazardous material instructor and volunteer fire training captain.

The training covered topics such as basic radiation and contamination, the recent Japanese criticality incident, containment of contamination and preventing the spread of contamination, decontamination techniques, transportation of victims and treatment options for victims. There were a couple of hours of hands-on-learning and demonstration. The work and effort put into the training was excellent. The licensee was planning to conduct a contaminated injured victim drill on August 16, 2000.

1.3 Conclusion

The certified fuel handler training met the procedural and technical specification requirements.

The spent fuel mover qualification training was adequate. The temporary procedure was good and incorporated all of the requirements for spent fuel examination into one document.

The decommissioning funding report was reviewed against the reporting requirements of 10 CFR 50.75, and was found to meet the requirements of the regulations.

The emergency medical training for contamination victims was provided to the local agreement hospitals and local emergency support services. The training was comprehensive and provided adequate demonstration and hands-on-learning. There was good attendance from the local emergency support service organizations.

2 Safety Reviews, Design Changes and Modifications (37801)

2.1 Inspection Scope

Selected documentation of activities, changes, tests and experiments were reviewed to verify that proper evaluations were completed for compliance with NRC regulations in 10 CFR 50.59 concerning safety evaluations and that no unreviewed safety questions were involved with such activities. The annual 10 CFR 50.59 report submitted to the NRC on May 16, 2000, was reviewed.

2.2 Observations and Findings

The licensee's administrative procedure HBAP C-19, "Licensing Bases Impact Evaluation," Revision 9, for performing safety evaluations was reviewed. The procedure contained screening criteria for determining if a safety evaluation would be required for a proposed change, test or experiment. The procedure also provided directions for performing safety evaluations in those cases where the screening process concluded that a safety evaluation was required. The licensee's procedure was appropriate in that it adequately established the process for determining the need for a safety evaluation and, if needed, the preparation, independent reviews and approval of safety evaluations to determine whether an unreviewed safety question was involved with a proposed change, test or experiment.

Six screening actions completed since the last inspection were randomly selected and reviewed. Four of the screening actions resulted in the determination that a safety evaluation was required. Specifically, the screening process determined that (1) a proposed change to HBAP-200, "Radiation Protection Training Manual," was a change to the facility as described in Section 6.0, "Health Physics, Occupational Health and Safety," of the DSAR; (2) a proposed change to TP 2000-5, "Fuel Handling Procedure

for Reorganizing Fuel in the Spent Fuel Pool," was a change to the fuel loading pattern as described in the DSAR; (3) TP 2000-8, "Fuel Handling Procedure for Fuel Assembly Visual Inspection," was a change to the accident analysis described in the DSAR; and (4) a proposed ventilation system modification was not described in the DSAR. These four safety evaluations were reviewed. The six screening evaluations and four safety evaluations were adequate and in compliance with applicable NRC regulations. The documentation had been prepared and reviewed by personnel who had received the training specified in HBAP C-19. One individual's training record had not been updated to reflect the training on the 10 CFR 50.59 process or his qualification to prepare safety reviews which he had received while employed at PG&E's Diablo Canyon Power Plant, prior to arriving at Humboldt Bay. The licensee's training records were subsequently updated to reflect the training received at Diablo Canyon Power Plant. This was found to be satisfactory.

Procedure HBAP C-19 contained provisions for the Plant Staff Review Committee (PSRC) to review the safety evaluations. A PSRC review had been documented for all the safety evaluations inspected.

2.3 Conclusions

Acceptable programs were being implemented to ensure that activities, changes, test and experiments were properly evaluated for compliance with NRC requirements in 10 CFR 50.59 concerning safety evaluations and that no unreviewed safety questions were involved with such activities.

3 Self-Assessments, Auditing and Corrective Actions (40801)

3.1 Inspection Scope

The licensee conducted periodic self-assessments and investigations into events that occurred during operations, maintenance and surveillance activities. These events were formally tracked and evaluated by management. Several selected items were analyzed to determine whether the licensee's system of tracking, evaluating and dispositioning potential problems was being effectively implemented.

3.2 Observations and Findings

The process used at Humboldt Bay for identifying and tracking potential quality related problems and nonconformances was documented in procedure HBAP C-12, "Problem Identification and Resolution," Revision 12, dated March 23, 2000. Supplemental procedures HBAP C-12 #1, "Security Plant Problem Reports," Revision 21, dated June 24, 1999, and HBAP C-12 #2, "Technical Review Groups and Nonconformances," Revision 4, dated March 31, 2000, were also in effect. When an issue was identified that could be a problem, the individual identifying the problem would initiate a SAP notification. (SAP is the trade name of the licensee's automated data system for managing their problem identification and resolution program.) The SAP notification described the problem, provided information on its significance, served as a work

request and provided a place to document the resolution of the problem. If the problem was a potential nonconformance, the person identifying the condition would also take any appropriate corrective action, commensurate with his training and experience, which may be required to put the plant in a safe condition. The SAP notification would be reviewed by the operation's shift foreman and the director of engineering to ensure it was complete and accurate and reviewed for reportability. The notification would subsequently be forwarded to the proper organization for disposition. The nuclear quality services (NQS) supervisor reviewed all notifications to ensure that quality problems were properly identified and classified. Potential nonconformances and reportable items would also be reviewed by the technical review group. A monthly report was provided to the PSRC for their review to identify quality trends, repetitive problems, significant conditions adverse to quality and to assign severity levels in accordance with specified criteria.

Five SAP notification records were selected for review. The issues addressed in these notifications were (1) two inoperable radiation survey instruments were found in an emergency kit (identified by the NRC staff in a previous inspection) (SAPN 1209064), (2) several survey instruments appeared to not be properly calibrated (SAPN 1209740), (3) a failure to follow a test procedure was identified (SAPN 1210220), (4) a procedure change was not being followed after it had been approved (SAPN 1210422), and (5) a survey was performed with a dose rate meter that had an overdue calibration (SAPN 1210602). The SAP notification records provided a chronological account of the identification of the problems and reviews and substantive discussions by appropriate plant staff and management. Corrective actions and final dispositions were appropriate and documented in the notification records.

The minutes of two PSRC meetings held since the last inspection were reviewed. The inspector observed that both records included substantive discussions of several specific SAP notification records involving significant corrective actions. The minutes also contained data tables indicating the status of open nonconformance SAP notification records and the recent trends of quality problems for the radiation protection, operations, engineering, maintenance and plant support organizations.

3.3 Conclusions

The licensee had a formal self-assessment and corrective action program that documented problems, brought the problems to the attention of management and tracked the resolution and completion of corrective actions. Management of the issues and corrective actions were considered satisfactory.

4 Spent Fuel Pool Safety (60801)

4.1 Inspection Scope

Verify licensee compliance with technical specifications concerning spent fuel pool water level monitoring, water quality and sampling frequency.

4.2 Observations and Findings

Spent fuel pool safety was reviewed for compliance with TS III.B.2.a, which stated the pool water level shall be maintained at an elevation greater than 10.5 feet and the water level between the liner and the concrete walls shall be maintained below elevation +9 inches [0.75 feet].

The water level was observed during this inspection to be 10.9 feet. The liner indicated -0.2 feet on loop 1 and -0.4 feet on loop 2. The 3-month averages of the spent fuel pool liner pumping rate between April 1990 through July 2000, indicated an average of approximately 1-gallon per day. There were a couple of spikes in the line graph during July 1996 and again during the fourth quarter of 1998 of approximately 3 gallons per day and 5 gallons per day, respectively. The licensee indicated the increase in pumping rate occurred when the heating, ventilation and air conditioning (HVAC) system was shutdown and the condensation inside the reactor building increased significantly. When the HVAC was placed back into service, the liner pumping rate decreased to the average level again.

Water quality in the spent fuel pool was maintained in accordance with TS III.B.2.b. Table III-2 provided the limits for spent fuel storage pool water chemistry and activity during SAFSTOR, as follows:

- pH 5.3 to 6.5
- Chlorides[(a)] 0.005 ppm (maximum)
- Conductivity 10.0 μmho/cm (maximum)
- Cs-137 activity 1.0×10^{-4} μCi/ml (maximum)

[(a)] Chloride analysis is required only if conductivity exceeds 2.0 μmho/cm.

The licensee generated trend charts which were reviewed from the period 1995 through May 2000. The range of water quality values were:

- pH 5.6 - 5.9
- Conductivity 0.3 - 0.5 μmho/cm
- Cs-137 1.2×10^{-5} - 1.8×10^{-5} μCi/ml

The negative ventilation check of the refueling building was performed quarterly as required by TS IV.B.1.b, and prior to removal of the spent fuel pool cover. TS IV.B.1.a, required the refueling building ventilation system be operated to maintain a negative pressure of at least -0.25 inches of water. On July 18, 2000, one of the three spent fuel pool covers was removed to gain access to the I-beam support. The support was to be modified to allow clearance for placement of a spent fuel assembly into the channel stripping machine on the south end of the spent fuel pool. The abbreviated ventilation test was performed as required. The negative ventilation was recorded as -0.30 for the refueling building ventilation system, which satisfactorily met the TS IV.B.1 requirement.

4.3 Conclusion

The licensee was maintaining the spent fuel pool water level, liner water level, and spent fuel pool water quality in accordance with the applicable technical specifications. The negative ventilation of the refueling building was being maintained in accordance with TS IV.B.1.

5 Maintenance and Surveillance (62801)

5.1 Inspection Scope

The licensee's program to comply with 10 CFR 50.65 was reviewed, which included the current status of systems covered under the maintenance rule program and the results of a recent quality assurance assessment.

5.2 Observations and Findings

The licensee's program for implementing the requirements of 10 CFR 50.65 was described in procedure HBAP C-40#1 "NRC 10 CFR 50.65 Maintenance Rule Compliance," Revision 0. The program was modeled after the Diablo Canyon maintenance rule program to provide a consistent philosophy and regulatory interpretation between the two programs. The "expert panel" established at Humboldt Bay consisted of five individuals, including one member from Diablo Canyon. The following systems, structures and components were considered risk significant at Humboldt Bay and were included in the maintenance rule program:

- Spent fuel pool demineralizer system
- Heating and ventilation system
- Area radiation monitors (criticality monitors only)
- Stack gas monitor
- Refueling building
- Boral neutron absorbing cans

A scoping matrix plan identified 16 systems as part of the program. Of the 16 systems, the #2 fire pump engine had been elevated into the special monitoring category defined by 50.65(a)(1). The fire pump engine was part of the fire protection system. The engine was not consistently starting on the first attempt. The problem was isolated to a mechanical speed switch. A replacement solid state switch had been ordered. The #2 fire pump engine battery connectors had also been briefly moved to 50.65(a)(1) status, but at the time of this inspection, had been returned to the normal monitoring category as defined by 50.65(a)(2). All other systems were designated as 50.65(a)(2) systems.

Between December 15, 1999, and January 27, 2000, the licensee's quality assurance department conducted an assessment of the implementation of the maintenance rule. The assessment reviewed goal setting, training, periodic assessments, work priorities, industry operating experience reviews, function of the expert panel, systems that had been included in the maintenance rule program and the method for determining "risk

significant." The assessment included a review of the application of the maintenance rule program to the spent fuel lifting and handling equipment and the spent fuel storage racks. The maintenance rule program was determined by the licensee's self-assessment to be effective with several issues identified as minor in significance, which included the need to review several other systems for inclusion into the maintenance rule compliance program.

5.3 Conclusion

The licensee was implementing a program to comply with the requirements of the new maintenance rule in 10 CFR 50.65. The program was modeled after Diablo Canyon's program. An internal quality assurance assessment completed in early 2000 found the program to be effectively implemented.

6 Decommissioning Performance and Status Review (71801)

6.1 Inspection Scope

A facility tour was conducted with the licensee to observe housekeeping, potential safety hazards, fire loading problems, structural condition of the facility and adequacy of the radiological controls.

6.2 Observations and Findings

A plant tour was performed of the licensee's facility. There had not been any dismantlement work performed over the past year. The housekeeping and facility conditions were effectively controlled and continued to be satisfactory for the SAFSTOR designation of the plant. Area cleanliness was good and there were no identified problems with fire loading controls. The refueling building was effectively controlled. The boundaries between contaminated and non-contaminated areas were clearly marked. The spent fuel pool was marked as a contaminated area and foreign material control area. Postings were properly placed at all required locations. Instrumentation identified during the plant tour was calibrated and source checked. Control room indicators and alarms associated with monitoring spent fuel pool level and radiation levels in the refueling building were confirmed to be functional.

6.3 Conclusion

The licensee had maintained an adequate level of control over safety hazards, fire loading, housekeeping, posting of radiological areas and maintenance of field radiation detection equipment. Required control room alarms and indicators were functional.

7 Radwaste Treatment, Effluents and Environmental Monitoring (84750)

7.1 Inspection Scope

The annual facility survey report for 1998 and 1999, as required by TS VII.J.1, was reviewed. The annual radioactive effluent release report for both 1998 and 1999, as required by TS VII.J.3, was also reviewed. Audits of radwaste activities and the environmental monitoring program were reviewed.

7.2 Observations and Findings

The annual facility survey reports for 1998 and 1999 were submitted to the NRC as required by TS VII.J.1. Required monitoring results were documented for direct radiation, effluent and groundwater. Direct radiation monitoring was conducted using 16 thermoluminescent dosimeters (TLDs) located onsite and 4 TLDs located offsite. The onsite TLDs were analyzed on a quarterly basis and averaged 13 milliRoentgen (mR) quarter. The onsite TLD results were not significantly different from the four offsite TLDs, which were used as controls.

Effluent monitoring was performed by analyzing surface water samples at the discharge canal. The analyses conducted measured gamma isotopic and tritium levels. No radioactivity above background was measured in the surface water.

Groundwater analysis was measured by quarterly samples from five wells located onsite. This was the first year since the beginning of SAFSTOR decommissioning that tritium was not detected in well MW-11, continuing the decreasing trend shown by previous samples. Tritium was detected in one of four samples from well MW-1, at a level of 542 ± 199 pCi/l, which is slightly above the minimum detectable activity (MDA) of 500 pCi/l. This continues a trend for well MW-1 of occasional tritium results slightly above detection levels. All the results were significantly lower than regulatory limits.

PG&E's Technical and Ecological Services lab participated in Interlaboratory Cross-Check Program. Although the licensee made no formal comparison of the data, the inspector reviewed the results which indicated generally good agreement between the licensee's data and the control data for the 1998 and 1999 reports.

The annual radioactive effluent release report for 1998 identified no major changes to the liquid or solid radwaste treatment systems during 1998. There was a major change in the gaseous radwaste treatment system during 1998. The original Unit 3, 250-foot exhaust stack was replaced with a 50-foot stack as of October 9, 1998. The atmospheric dispersion factor was changed and documented in the offsite dose calculation manual, as a result of the reduced height of the gaseous radioactive effluent release point.

All ventilation and system vents were routed to the Unit 3 stack. The gaseous activity released from the Unit 3 stack was monitored by a continuous monitor equipped with a beta scintillator, calibrated to Kr-85. During 1998 there were 13 liquid releases and zero gaseous releases. The dose contribution as a result of the releases to the environment were less than 0.001 mrem/year. There were two shipments of waste during 1998 of approximately 20 m^3 and 0.044 Curies of activity.

There were 14 shipments by truck of dewatered sludge during 1999, totaling approximately 28 m^3 and 0.30 Curies of activity. There were six liquid batch releases and zero gaseous batch releases during 1999. The contribution from SAFSTOR activities during 1998 and 1999 was less than 0.001 mrem/year to the average individual at the maximally exposed location.

The licensee's report on the radiological environmental monitoring and radioactive effluents audit dated January 7, 2000, for the audit period November 2 through December 15, 1999, was a comprehensive and thorough evaluation. Nuclear quality services identified a number of problems; however, there were two areas in which performance needed improvement or was unsatisfactory. These were in the areas of the offsite dose calculation manual backlog of quality problems and implementation of Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Performance," respectively. The audit stated that prompt attention and appropriate actions to prevent further problems were given to these areas during the audit. Because nuclear quality services could not identify the effectiveness of these actions during the audit, it was determined to supplement the audit with a performance based assessment which was conducted during the period February 8 through July 19, 2000.

During the supplemental assessment, nuclear quality services determined performance had significantly improved in the laboratory quality assurance performance area. As part of the corrective action for the issues identified, all of the Regulatory Guide 4.15 laboratory responsibilities were consolidated under one radiation protection engineering position. Nuclear quality services considered this ownership change a strength.

7.3 Conclusion

Nuclear quality service's radiological, environmental and effluent audit and subsequent assessment was thorough and comprehensive. The annual 1998 and 1999 facility report and radioactive effluent release reports were reviewed. There were no problems identified which were not already noted internally.

8 Solid Radwaste and Transportation (86750)

8.1 Inspection Scope

A limited review of the licensee's radwaste program was performed which focused on a review of radwaste shipping activities and the licensee's program to characterize samples in accordance with 10 CFR Part 61 requirements.

8.2 Observations and Findings

During 1999, there were 14 radwaste shipments, which included shipments to secondary processors. During 2000, there had been four shipments, which included laundry, sources transferred to Diablo Canyon and sludge. Shipments were performed using procedure RCP-6P "Radioactive Material Shipments," Revision 4, dated July 8, 1999, and procedure RCP-6I "Collection, Labeling, Packaging, Storage and Accountability of Radioactive Material," Revision 37, dated January 29, 1999. Only minor editorial changes had been made to the procedures since previous revisions.

The licensee had sent one sample to an outside lab during March 2000 for characterization of the radioactive material in the sample. The sample was a crud sample from the bottom of the spent fuel pool. The 0.1 gram sample was a composition of three locations in the spent fuel pool. Predominant isotopes include cobalt-60, cesium-137, iron-55, nickel-63, americium-241, plutonium-238, 239, 240 and 241. The report provided a good list of the isotopes and the microCurie/gram quantities found in the bottom of the spent fuel pool.

8.3 Conclusion

Radwaste management and transportation activities met requirements. Only minor changes had been made to the radwaste shipping procedures since previous revisions.

9 Fuel Examination (60705)

9.1 Inspection Scope

The licensee was in the process of selecting a vendor to provide a spent fuel storage cask system for the spent reactor fuel currently stored in the spent fuel pool. An update was provided by the licensee of the current status of selecting a vendor and a proposed schedule for moving the fuel to an ISFSI.

The licensee had established a program to perform a visual examination of the spent fuel and to classify the fuel based on the condition of the cladding. The inspection procedure and criteria for classifying fuel was reviewed. Observation of the licensee's fuel examination work-in-progress was completed by an NRC inspector.

9.2 Observations and Findings

The licensee had received bids from several vendors to provide a spent fuel storage cask system for the Humboldt Bay site. Unique issues had to be addressed related to the load capacity of the crane in the refueling building, high earthquake potential at the site and offsite transportation difficulties due to the mountainous roads that would be eventually used for transporting the casks offsite. The licensee felt that these issues had been successfully addressed by the vendors. A contract award was projected for late August. The licensee was developing a proposed schedule that would include

submitting a site specific application for an ISFSI to the NRC in 2001, with construction of the ISFSI starting in 2003. Fuel loading would be conducted during 2005.

In preparation for the eventual storage of the fuel at an ISFSI, the licensee was performing a visual inspection of the spent fuel. This effort was started July 25, 2000. During the week of August 14-17, 2000, an NRC inspector was onsite to observe the fuel examination process and to review the results of the examinations conducted to date. There were a total of 390 fuel assemblies stored in the Humboldt Bay spent fuel pool. Of these, 389 were stored in boral cans. The one remaining assembly, UD-6N had been dropped and damaged during removal from the reactor in 1975 and was stored in a special container. Storage outside a boral can for assembly UD-6N was provided for in TS III.A.2.

Three assemblies had degraded structural integrity and require special handling. These were assemblies HD-45, HD-46 and BO14. Of the 390 fuel assemblies, 191 were surrounded by channels. These channels will be removed during the fuel examination process to allow for visual inspection of the fuel rods. The licensee does not plan to place the fuel assemblies back into the channels after completion of the visual examination. Eventual storage of the fuel assemblies in the dry cask storage containers would not include the channels. The channels will be handled separately as radioactive waste.

The fuel examination project was performed using procedure TP-2000-08 “Fuel Handling Procedure for Fuel Assembly Visual Inspection,” Revision 1, dated August 14, 2000. The procedure provided detailed steps for conducting the fuel examinations. Attachments were included for documenting the examinations and classifying the fuel in accordance with Department of Energy criteria.

Detailed information sheets had been developed for each fuel assembly. This included information on the history of the fuel assembly, the type of fuel, the period of time the assembly had been in the reactor and whether fuel sipping had been performed on the bundle.

Fuel sipping was a process used during operations to measure radioactive gases being released from a fuel assembly to determine if the assembly had a leak in the cladding. Sipping consisted of placing a fuel assembly in an underwater canister called a sipper can and evacuating the water from the can. By measuring for radioactive gases being released into the sipper can, the potential for fuel rod cladding damage could be determined. Fuel sipping had been performed between 1971 and 1975 on 189 assemblies. Of these, 11 were found to have potential gross cladding failures with 22 additional assemblies having some cladding defect potential.

The fuel inspection was conducted inside the spent fuel pool with the aid of an inspection platform and video camera, which recorded each assembly as it was being evaluated. The fuel assemblies were totally covered with an oxide film, which had a pronounced red color. The oxide film was due to the use of carbon steel piping throughout the reactor system. The licensee reported that this phenomenon was observed at the very early stages of operation of the reactor. Historical records

indicated the licensee had previously evaluated the oxide coating in order to monitor its chemical composition. Specifically, memo Report RC 3/69, “Fuel Element Deposition,” dated October 1968, and prepared by GE, the reactor vendor for the Humboldt Bay reactor system, indicated that the red oxide was known as early as December 1966. The report stated that during a refueling outage, a number of abrasion samples were collected from two fuel assemblies. The samples were chemically analyzed to determine changes in the magnitude and composition of the deposit as a result of replacing copper-zinc feedwater heaters with stainless steel feedwater heaters. The analyses indicated that in addition to copper and zinc, the coating also contained iron and nickel. Currently, the licensee plans to submit new samples to GE for additional analyses to determine the current composition of the deposit on the fuel assemblies and to assess possible impacts for long-term storage and transportation.

Fuel inspection activities were observed during the licensee’s implementation of procedure TP-2000-08. In general, the project team members were knowledgeable of the procedure and executed their respective duties effectively. Procedure TP-2000-08 was thorough, easy to follow and sufficiently detailed. The procedure included a shift pre-fuel handling checklist, spent fuel visual inspection process table, fuel movement schedule, fuel initial and final classification criteria instructions, inspection sequence sheets and inspection results sheets for each face of a fuel assembly. The examination techniques utilized lighting and fuel assembly rotation in order to obtain sufficient shadow detail of broken pins or other unusual formations between the pins, as well as possible bowing of the exterior pins. The captured images were of high quality and subsequently recorded for further evaluation and final fuel characterization.

The current fuel inspection effort was primarily an information gathering activity. Upon completion of all 390 spent fuel assembly inspections, the licensee indicated the video images would be evaluated and classified in accordance with Department of Energy guidelines. The licensee reported that final fuel characterization would be made using the video record, data collected on each assembly, Level III nondestructive examination personnel, certified fuel handlers, fuel vendors and industry consultants.

To assist in the fuel examination evaluation activities, the licensee had built a thermoluminescent dosimeter tree that will be used to measure actual dose rates along the entire length and at known distances from a fuel assembly. Measured dose rates would then be compared against calculated values to verify the accuracy of the calculations.

9.3 Conclusion

The licensee had developed and implemented a program to perform a visual examination of the 390 fuel assemblies. The licensee had established an acceptable process for performing fuel examinations and determining the condition of the fuel in accordance with Department of Energy criteria. At the completion of the inspection, the licensee had competed their inspection and video-recording of 56 fuel assemblies. The licensee anticipated completing the inspection of all 390 fuel assemblies by January 2001.

The licensee had received several bids from vendors for a spent fuel storage cask system. The licensee plans to make a selection by the end of August. Completion of licensing activities were expected to require the next 2-3 years. Construction of the ISFSI would not start until licensing was completed.

10 Follow-up of Open Items (92701)

10.1 (Closed) LER 2000-01 Testing of transfer of emergency 480 volt bus: TS IV.B.6.b required the licensee to conduct a quarterly test of the transfer of the emergency 480 volt ac power for proper operation. The technical specification also required the transfer to be functionally tested annually with all loads connected to simulate emergency operations. The licensee has been conducting quarterly and annual tests for 36 years to comply with this requirement. The transfer switch had never failed an annual test to transfer the load and was considered a highly reliable system. During a quality assurance audit on March 24, 2000, the audit team questioned the test procedure and whether the quarterly tests were fully meeting the requirements of the technical specification. The quarterly tests were being performed with the transfer switch blocked-out to prevent the transfer of emergency power to the load which, during the days the unit operated, had the potential to trip the unit. The quarterly test involved the activation of the transfer switch, but not the transfer of power across the switch to the load, since it was blocked-out. The quality assurance team and plant management determined that the performance of the quarterly test did not fully meet a strict interpretation of the technical specification requirement. The concern was entered into the action tracking system as SAPN 1209820 and as non-conformance report HB3-00-QC-N002. The immediate corrective action taken by the licensee was to begin performing the annual test on a quarterly schedule. The annual test included the full activation of the transfer switch and the transfer of power to the load. Failure to fully test the transfer switch on a quarterly basis has been determined to be a violation of technical specifications. This Severity Level IV violation is being treated as a Non-Cited Violation consistent with Section VI.A. of the NRC Enforcement Policy.

11 Exit Meeting

The inspection results were presented to members of the licensee management at an exit meeting held July 21 and August 17, 2000. The licensee acknowledged the inspection results presented. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Albers, Radiation Protection Manager
J. Brimble, Supervisor of Maintenance
J. Chadwick, Radiation Protection Engineer
J. Crow, Training Coordinator
M. Grossman, Operations Supervisor
V. Jensen, Nuclear Quality Supervisor
B. Kapus, Budget
T. Moulia, Plant Manager
R. Parker, Radiation Protection Staff
P. Rasmussen, Sr. Power Production Engineer
M. Smith, Sr. Design Engineer
D. Sokolsky, Supervisor of Licensing
R. Sorensen, Programs Coordinator
T. Tyler, Decommissioning Project Manager
M. Williams, Enercon Services, Coordinator Fuel Inspection
T. Williams, Environmental Coordinator
R. Willis, Director of Engineering

INSPECTION PROCEDURES USED

IP 36801	Organization, Management and Cost Controls
IP 37801	Safety Reviews, Design Changes and Modifications
IP 40801	Self Assessments, Auditing and Corrective Actions
IP 60705	Fuel Examination
IP 60801	Spent Fuel Pool Safety
IP 62801	Maintenance and Surveillance
IP 71801	Decommissioning Performance and Status Review
IP 84750	Radwaste Treatment, Effluents and Environmental Monitoring
IP 86750	Solid Radwaste and Transportation
IP 92701	Open Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Open
None

Discussed
None

Closed

2000-01	LER	Testing of Transfer of emergency 480 volt bus

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
CFH	Certified Fuel Handler
CFR	Code of Federal Regulations
EMT	Emergency Medical Technician
HVAC	Heating, Ventilation and Air Conditioning
ISFSI	Independent Spent Fuel Storage Installation
JPM	Job Performance Measure
LER	Licensee Event Report
NCV	Non-Cited Violation
NQS	Nuclear Quality Services
ODCM	Offsite Dose Calculation Manual
PSDAR	Post Shutdown Activity Report
RWP	Radiation Work Permit
STP	Surveillance Test Procedure