



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
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ARLINGTON, TEXAS 76011-8064

August 31, 1999

Richard Ferreira, Assistant General Manager
Energy Supply and Chief Engineer
Sacramento Municipal Utility District
6201 'S' Street
Sacramento, California 95852

SUBJECT: NRC INSPECTION REPORT 50-312/99-03

Dear Mr. Ferreira:

On August 6, 1999, the NRC completed an inspection at your shutdown Rancho Seco nuclear reactor facility. On August 30, 1999, a followup telephonic exit was held with your staff. The enclosed report presents the scope and results of this inspection.

Areas reviewed as part of this inspection included decommissioning and dismantlement activities, verification of compliance with selected technical specifications, review of completed safety evaluations, evaluation of maintenance and surveillance activities, verification of fuel handler training and verification of agreements with local hospitals.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

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

Sincerely,

/s/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 50-312
License No.: DPR-54

Enclosure:
NRC Inspection Report
50-312/99-03

4 - 1999 - 011

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ENCLOSURE

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket No.: 50-312
License No.: DPR-54
Report No.: 50-312/99-03
Licensee: Sacramento Municipal Utility District
Facility: Rancho Seco Nuclear Generating Station
Location: 14440 Twin Cities Road
Herald, California
Dates: August 2-6, 1999
Inspectors: Danny L. Rice, CHP, Radiation Specialist
Rachel S. Carr, Health Physicist
J. Vincent Everett, Senior Health Physicist
Approved By: D. Blair Spitzberg, Ph. D., Chief
Fuel Cycle and Decommissioning Branch
Attachment: Supplemental Information

EXECUTIVE SUMMARY

Rancho Seco Nuclear Generating Station NRC Inspection Report 50-312/99-03

The Rancho Seco nuclear facility is currently undergoing decommissioning and dismantlement. The licensee had completed removal of the piping, tanks, conduit and equipment from the turbine building, except for the turbine generator, and had subsequently begun work on the tank farm and auxiliary building. The post shutdown decommissioning activities report (PSDAR) submitted by the licensee on March 20, 1997, had described plans to maintain the facility in SAFSTOR with some limited dismantlement, primarily of secondary systems that were either not contaminated or had minimal contamination. In its letter dated July 7, 1999, the licensee informed the NRC of their plans to change from SAFSTOR to full decommissioning of the Rancho Seco site. Completion of the decommissioning activities and the final site survey was projected for 2008.

Work was progressing at the site for the eventual placement of the spent fuel into the onsite independent spent fuel storage installation (ISFSI). The licensee planned to conduct a practice exercise this fall with movement of actual spent fuel to start at the end of 1999 or early 2000. The training schedule and the projected delivery date of the storage baskets supported the licensee's schedule. The spent fuel is currently stored in the spent fuel pool. The spent fuel pool water clarity and condition of the facility was found to be excellent. A new cooling and demineralizer system had been installed to allow for dismantlement of the original system, which was interconnected with numerous other plant systems. The new system provided a stand alone system isolated from other plant systems that will undergo dismantlement.

Decommissioning Performance and Status Review

- The licensee's decommissioning and dismantlement efforts were proceeding consistent with the PSDAR and supplementary information provided by the licensee in a letter dated July 7, 1999. Decommissioning activities were being planned, conducted and supervised with appropriate considerations for occupational and radiological safety (Section 1).

Organization, Management, and Cost Controls

- The certified fuel handler training program was being implemented consistent with the requirements of the technical specifications and defueled safety analysis report. Contracts with the local hospital and ambulance services were reviewed and found to be current. Recent changes to the reactor facility emergency plan and procedures to incorporate the emergency planning considerations for the ISFSI were reviewed. Changes made to the reactor facility emergency plan were determined to be appropriate for the current condition of the facility and the potential for an emergency condition (Section 2).

Safety Reviews, Design Changes, and Modifications

- Acceptable programs were being implemented to ensure facility modifications, procedure changes, tests and experiments were properly evaluated for compliance with NRC regulations in 10 CFR 50.59 and Technical Specification 6.5. No unreviewed safety questions were identified by the licensee. Safety committees were meeting and functioning as required. One Non-Cited Violation (NCV) was identified related to failure to complete required documentation for a difference between installation of a security radio and design drawing documents (Section 3).

Spent Fuel Pool Safety

- The spent fuel pool water chemistry, water level and temperature were found to be in compliance with technical specifications. The licensee had completed a major modification to the spent fuel pool pursuant to 10 CFR 50.59 by installing a new cooling, filtration and demineralizer system. This allows for dismantlement of a number of systems that interconnected with the original spent fuel pool systems. No unreviewed safety questions were identified by the licensee (Section 4).

Maintenance and Surveillance

- The licensee had conducted an assessment to identify the structures, systems and components that should be included in the scope of the maintenance rule. Policies and procedures had been established to define the licensee's interpretation of the applicability of the maintenance rule to the Rancho Seco site (Section 5).

Occupational Radiation Exposure

- The annual report of individual radiation monitoring documented the occupational doses received at Rancho Seco. Radiation doses were being tracked and were within the limits established in 10 CFR 20. Analysis of the report revealed that occupational doses had been reasonably distributed amongst the worker population. The licensee was tracking and trending radiological exposure-rate data to maintain an exposure profile of selected plant areas as dismantlement activities progressed (Section 6).

Radioactive Waste Treatment, Effluent and Environmental Monitoring

- The radiological environmental and effluent monitoring program provided for an adequate assessment of the environmental conditions around the facility. Required reports to the NRC had been made and provided information concerning the results of the environmental sampling and analysis program. The land use census identified the change in agriculture use near the site with the addition of the vineyards. Additional environmental sampling to account for this new food pathway was being made by the licensee (Section 7).

Report Details

Summary of Plant Status

Rancho Seco was actively undergoing plant decommissioning and dismantlement. Current decommissioning work was underway in the auxiliary building and tank farm. Decommissioning of the turbine building had essentially been completed. The licensee had commenced limited decommissioning of selected areas of the Rancho Seco facility in February 1997 as a pilot effort to determine the feasibility of proceeding with full site decommissioning earlier than previously planned and documented in the Post Shutdown Decommissioning Activities Report (PSDAR). The turbine building was selected for the initial dismantlement effort based on low contamination levels, ease of removal of components and ease of decontamination of the systems in the building. In a letter dated July 7, 1999, the licensee informed the NRC of the successful progress of their incremental decommissioning effort and their plans to change the PSDAR from SAFSTOR to DECON and to actively proceed with site decommissioning. The projected completion of plant decommissioning and the final site survey, based on this change in decommissioning strategy, is 2008.

In addition to the major activities at Rancho Seco to decommission the reactor facility, preparations were continuing for dry storage of the spent nuclear fuel. Training was in progress for personnel assigned to the independent spent fuel storage installation (ISFSI). The licensee expected delivery of their first storage basket in the fall of 1999. All concrete casks had been constructed and were in-place on the ISFSI pad. A dry run exercise was being planned for the October 1999 time frame with loading of the first cask in December 1999.

1 Decommissioning Performance and Status Review (71801)

1.1 Inspection Scope

The licensee's programs for conducting decommissioning work activities were reviewed to verify adequate controls were being implemented to provide for an acceptable level of safety. Plant tours, attendance at morning and weekly decommissioning planning meetings, and discussions with licensee staff were conducted to review the status of the dismantlement activities underway.

1.2 Observations and Findings

Decommissioning activities underway during this inspection included dismantlement and decontamination of the auxiliary building and tank farm systems. Removal of insulation from the borated water storage tank and removal of the main circulating pumps were complete. Lead paint and asbestos insulation abatement work continued in the auxiliary building in preparation for future system dismantlement. Concrete cutting to enlarge several doorways to allow easier component removal continued. The level of radioactivity being encountered in the auxiliary building and tank farm systems undergoing dismantlement were higher than those found during dismantlement of the turbine building systems; however, the level of radioactivity was still relatively low. Higher levels of radioactivity were anticipated as dismantlement activities progressed.

Approximately 25 tons of uncontaminated metal was released from the site for scrap metal recycling during the week of this inspection.

Daily decommissioning planning meetings and the weekly incremental decommissioning meeting were attended. These meetings provided for coordination of activities and ensured that all significant work tasks were being monitored. Areas discussed included safety and administrative concerns, status of dismantlement work, proposed design changes, status of the dry cask storage activities, surveillance tests and maintenance activities.

The annual report dated May 27, 1999, was reviewed for compliance with Technical Specifications D6.9.4 and D6.9.5b. The report covered the period from May 7, 1998, to May 6, 1999. Information contained in the report included shutdown status, shutdown experience, environmental report information, and a tabulation of facility changes, tests and experiments required pursuant to 10 CFR 50.59(b). No issues or concerns were identified during the review of the report.

Tours were conducted of the work areas in the turbine building, tank farm and auxiliary building. Radiological postings and controls were observed and determined to be adequate. Fire loading, area cleanliness and housekeeping were good.

Incident and accident reports from December 1998 thru July 1999 were reviewed. The licensee had documented and conducted an investigation of an onsite incident involving a crane tipping and falling approximately 20 feet to a lower level. The accident occurred on December 8, 1998 and involved an 8.5 ton crane that had been positioned on the turbine deck to hoist piping out of a hole. During the movement of a 2,160 pound section of pipe, the crane tipped and fell into the hole and onto its side. The crane operator was slightly injured. Investigation of the incident concluded that several factors may have contributed to the accident including placing the outrigger pads on a steel to steel surface which created a poor friction surface for the pads, placement of one of the outriggers on a protruding stud, and the swinging and telescoping movement of the boom. The licensee determined that to prevent similar accidents from occurring personnel involved with crane operations would review proper crane placement requirements; hold daily tailgate meetings prior to commencement of work; prepare, discuss, and review pre-job hazard analyses each time a crane is set up, lifting activities change, or a crane is moved to a different location. Additionally, crane operators are required to fill out a daily crane inspection report before each shift, and the start of operations.

1.3 Conclusion

The licensee's decommissioning and dismantlement efforts were proceeding consistent with the PSDAR and supplementary information provided by the licensee in a letter dated July 7, 1999. The licensee had appropriately investigated and followed up on an industrial crane accident which had occurred on the turbine deck. Otherwise, decommissioning activities were being planned, conducted and supervised with appropriate considerations for occupational and radiological safety.

2 Organization, Management, and Cost Controls (36801)

2.1 Inspection Scope

Implementation of the certified fuel handler training program was reviewed. Contracts with the local hospital and ambulance services were verified as current. Recent changes to the emergency plan and procedures, effective June 24, 1999, were evaluated to confirm that the changes did not reduce the licensee's ability to effectively respond to an emergency condition.

2.2 Observations and Findings

Certified fuel handler training requirements were established in the Defueled Safety Analysis Report Sections 12.2.2 and 12.2.3 and Technical Specification D6.2.2. The shift supervisors and the individual who directly supervised the shift supervisors was required to be certified as a fuel handler. Procedure A-13, "Fuel and Component Handling" Revision 35, established requirements for moving fuel. This procedure required the direct supervision of all fuel handling operations by a certified fuel handler as specified in Technical Specification D6.2.2.d. The status of the certified fuel handler training program was reviewed with the operations training supervisor and the operations superintendent. Training records for selected qualified fuel handlers were reviewed. The training records documented that required biennial training for the certified fuel handlers had been completed. Nineteen personnel were qualified as certified fuel handlers. Ten were assigned to the operation crews in the control room as shift supervisors or control room operators. The fuel handler training program was found to meet the requirements in the technical specifications and defueled safety analysis report.

On May 27, 1999, the licensee issued an updated and revised emergency plan and procedures to be effective June 24, 1999. The primary purpose of the changes was to incorporate provisions for responding to an emergency at the ISFSI. Requirements for emergency planning for the ISFSI are specified in 10 CFR 72.32. A review of the adequacy of the licensee's emergency plan for response to emergency conditions at the ISFSI is underway by NRC headquarters as part of the licensee's application for a Part 72 license to store spent fuel in dry storage. Changes made to the emergency plan and procedures were reviewed during this inspection related to the reactor facility and the Part 50 license. Changes ranged from editorial corrections to consolidation of a number of sections in order to simplify the emergency plan. All changes reviewed were determined to be appropriate for the current condition of the reactor facility and the potential for an emergency condition.

The Emergency Plan, Section 4, identified three offsite agencies which provided medical support to the licensee. These included the Galt Fire District, Herald Fire District and U.C. Davis Medical Center. Attachment 4-1 to the emergency plan stated that contracts were maintained with the three organizations. These contracts were reviewed and found to be current. U.C. Davis Medical Center provided medical treatment for contaminated and injured personnel, including the capability to provide treatment for major head trauma. Operations procedure OP-C.53, "Medical Emergency" provided instructions to direct any injured persons contaminated with radioactive material to the

U. C. Davis Medical Center. The memorandum of understanding with the Galt Fire District established provisions for transporting injured, contaminated persons to U. C. Davis Medical Center. Emergency plan implementing procedure EPIP-5330, "Transportation of Contaminated and Injured Personnel," Revision 5, provided specific directions for the radiation protection technician to follow upon arriving at the hospital. If a radiation protection technician was not available at the Rancho Seco site when the ambulance arrived, EPIP-5330 required that the duty radiological assessment coordinator be contacted at home and directed to dispatch a radiation protection technician directly to the hospital emergency room.

2.3 Conclusion

The certified fuel handler training program was being implemented consistent with the requirements of the technical specifications and defueled safety analysis report. Contracts with the local hospital and ambulance services were reviewed and found to be current. Recent changes to the reactor facility emergency plan and procedures to incorporate the emergency planning considerations for the ISFSI were reviewed. Changes made to the reactor facility emergency plan were determined to be appropriate for the current condition of the facility and the potential for an emergency condition.

3 **Safety Reviews, Design Changes, and Modifications (37801)**

3.1 Inspection Scope

Technical Specification D6.5 and 10 CFR 50.59 required the licensee to maintain a functional safety review program that controlled facility design changes, temporary modifications, procedure changes, tests and experiments. This inspection reviewed selected safety evaluations that had been completed since the last inspection.

3.2 Observations and Findings

Technical Specification D6.5.1, established the requirements for the plant review committee. Technical Specification D6.5.1.6, established the scope of activities to be reviewed by the committee. The plant review committee was required to meet at least monthly in accordance with Technical Specification D6.5.1.4. Meeting minutes for the plant review committee were reviewed for the period between March 1999 and July 1999. Meetings had been held more frequently than monthly and included a review of procedure changes, facility design changes, corrective actions and completed 10 CFR 50.59 safety evaluations. A review of the meeting minutes found the plant review committee to be functioning in compliance with the technical specifications.

Safety reviews conducted under the provisions of 10 CFR 50.59 provided the licensee with a process to make changes to the facility during decommissioning, as long as the changes were consistent with the existing technical specifications and did not involve an unreviewed safety question. Implementation of the safety review process used by the licensee was reviewed, including a review of the following four selected design change packages (DCP):

- DCP-R99-0002, "Remove Bruce Diesel Walls and Obstructions"
- DCP-R99-0005, "Replacement of SFP Level Monitoring Instrumentation"
- DCP-R99-0009, "Isolate Reactor Building Hydrogen Monitoring System"
- STP-1348A, "SFP Chiller Verification Test"

The design change packages were found to adequately document the required safety evaluations. Additionally, the inspector reviewed the licensee's list of qualified 10 CFR 50.59 safety evaluation reviewers. The latest list was dated January 20, 1999, and stated that the safety evaluation refresher training was conducted in accordance with Technical Specification D6.5.3(d). Thirty-two individuals were qualified to conduct 10 CFR 50.59 safety evaluations.

The licensee had established Procedure RSAP-0305, "Field Problem Report," Revision 6 as a procedural process for identifying and documenting problems found in the field during implementation of design change packages. This procedure was used by the licensee to implement the requirements of 10 CFR 50 Appendix B.VI concerning the control of documents when problems were encountered for work performed under a design change package. As specified in Appendix B.VI, measures shall be established to control the issuance of documents, such as instructions, procedures and drawings, including changes thereto, which prescribed all activities affecting quality. The licensee, in their quality assurance plan, Attachment II-1, "Application of Rancho Seco Quality Program Criteria," Revision 9 identified the quality assurance requirements for document control as being applicable to security.

Procedure RSAP-0305, Step 6.2.1 required that upon identification of the need for a field problem report, the originator shall complete the first section of the field problem report form and forward the form to the originator's supervisor for review. Step 4.2 defined a field problem report as a document that provided a means of describing and resolving design and construction problems encountered during design change package implementation or testing.

Procedure RSAP-1308, "Potential Deviation from Quality," Revision 12 established requirements for initiating a potential deviation from quality (PDQ) form. Step 2.1 of RSAP-1308 specified that a PDQ form was to be initiated for deviations from licensing document requirements, state and federal regulations, codes, standards, specifications, quality assurance requirements or administrative controls, including RSAP and sub-tier procedures. The licensee had issued PDQ-0038 on May 14, 1999 concerning the failure to document on a field problem report that a security radio had been installed in a manner different than specified in the design change package. Specifically, the location of the radio in the console was different than the design drawings because the radio would not fit into the space initially selected. This problem had originally been identified in March, 1997 by an employee and reported to management, however the employee had failed to initiate a field problem report form as required by procedure RSAP-0305. No action concerning the updating of the as-built drawing for the security console had been initiated to reflect the new location of the radio. The issuance of the PDQ form on May 14, 1999 was over two years later. Despite this lengthy period of time between identification of the problem and the issuance of a PDQ form, no criteria was found in the procedures concerning timeliness requirements for documenting problems. The

difference between the design location of the radio in the console and the "as installed" location was determined by the NRC to have no safety significance. However, failure by the employee to initially document the problem on a field problem report and submit the report to his supervisor is a violation of procedure RSAP-1305. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as PDQ-0038 (NCV 50-312/9901-01).

A meeting of the commitment management review group was attended to observe the committee activities. The group was chaired by the plant manager with membership from the management level of technical services, operations, licensing, radiation protection, quality assurance and maintenance. The committee reviewed, prioritized, assigned responsibility and set the completion schedule for eighteen potential deviations from quality.

3.3 Conclusion

Acceptable programs were being implemented to ensure facility modifications, procedure changes, tests and experiments were properly evaluated for compliance with NRC regulations in 10 CFR 50.59 and Technical Specification D6.5. No unreviewed safety questions were identified by the licensee. Safety committees were meeting and functioning as required. One Non-Cited Violation (NCV) was identified related to failure to complete required documentation for a difference between installation of a security radio and design drawing documents.

4 **Spent Fuel Pool Safety (60801)**

4.1 Inspection Scope

Technical Specification D3/4 established specific requirements for spent fuel pool water level, temperature, chemistry and area radiation monitoring. This inspection included a review of the licensee's compliance with these technical specifications. In addition, the recently issued design changes for the new spent fuel pool cooling system, water level and spent fuel pool temperature indicator were reviewed.

4.2 Observations and Findings

Technical Specification D3.1.2 required the water level in the spent fuel pool to be maintained to greater than 23 feet 3 inches when fuel handling operations were not in progress. Daily surveillance logs were reviewed between the period June 1 and June 30, 1999. The water level was maintained at approximately 38 feet 5 inches. The spent fuel pool water level was also recorded in the operations shift log. The level marker for the spent fuel pool water level was visibly displayed in the control room by video camera.

Spent fuel pool temperature was required to be maintained below 140°F per Technical Specification D3.2. The spent fuel pool daily temperature surveillance, as recorded on

the operations surveillance log, SP.002, Revision 20, was reviewed for the period between June 1 and June 30, 1999. During the inspection period the temperature varied between 82° and 85° Fahrenheit.

Chloride and fluoride levels were required by Technical Specification D3.5 to be maintained below 0.15 ppm (parts per million). The chloride and fluoride levels were less than 0.010 ppm, for the period August 3, 1998, to August 2, 1999. The pH for the spent fuel pool on August 2, 1999, was 5.28. Radionuclides identified in the spent fuel pool water samples were cobalt, cesium and tritium. The spent fuel pool area radiation monitor indicated approximately 2 mR/hr. The alert setting on the monitor was 10 mR/hr. The high alarm was set at 100 mR/hr, as indicated on the control room annunciator panel. The spent fuel area radiation monitor monthly surveillance records for July 1 and August 4, 1999, were reviewed. The records were completed in a timely manner and indicated the correct alert and high alarm set points.

The spent fuel pool leakage was checked daily and tracked by the engineering department. A graphical representation for the average spent fuel pool leakage was reviewed for the period April 1998 through July 27, 1999. The leakage was from the liner into the gap with the spent fuel pool structural wall. The data indicated a leakage of approximately 20-30 gallons/day. This was consistent with historical levels documented in NRC inspections in previous years.

The licensee recently completed a major modification to the spent fuel pool. In order to isolate the spent fuel pool cooling, filter and demineralizer systems from other plant systems that will undergo dismantlement, the licensee established a separate stand alone system to provide these key functions. The system changes were reviewed along with changes made to the water level indicator and the temperature indicator. In particular, the following three design change packages were reviewed:

- DCP R99-0005, "Spent Fuel Pool Level Instrumentation" and STP-1347, Rev. 0
- DCP R94-0002, Rev. 3, "Spent Fuel Pool Temperature Indicator"
- DCP DCO R98-0011, "Spent Fuel Pool Island-Chiller, Filter & Demineralizer"

Special Test Procedure, STP-1347, Rev. 0, "Spent Fuel Pool Level Instrumentation Test," was initiated under DCP R99-0005. The test procedure was referenced in the safety review as a test or experiment not described in a licensing basis document. The safety evaluation determined the activity did not require a change in the technical specifications or involve an unreviewed safety question. The test for the level indicator was successfully conducted on May 13, 1999.

Design change package DCP R94-0002, Revision 3, provided installation of a new spent fuel pool temperature indicator to replace a failed one. The new temperature indicator provided a digital display mounted on the southwest wall of the spent fuel pool building. The data was transmitted to the new plant integrated computer system which maintained a 24-hour trend of the parameter. The computer system was a modification to the control room, which previously had an alarm function for the spent fuel pool temperature, but not a digital display. The 24-hour trend of the spent fuel pool temperature in the control room was reviewed and compared to the digital display in the spent fuel pool building. The data was consistent.

Design change package DCP R98-0011 Revision 0, involved the installation of a chiller, filter and demineralizer spent fuel pool cooling stand alone system. The safety review and design bases report satisfactorily addressed the concerns in NRC Bulletin 94-01 "Potential Fuel Pool Drindown Caused by Inadequate Maintenance at Dresden Unit 1," dated April 14, 1994, concerning loss of coolant, leakage and siphoning. The safety review determined the design change was more conservative due to the location of the cooling system suction, which was approximately 5 feet below the water surface and located at a higher elevation than the previous cooling system suction. The liner leakage was directed to a collection tank in the auxiliary building, processed through a separate filter/demineralizer and subsequently pumped to the inlet of the spent fuel pool cooling system demineralizer. From there it was ultimately discharged back to the spent fuel pool. The flow rate of the system was approximately 108 gallons/minute.

The spent fuel pool cooling system demineralizer skid was located just inside the spent fuel building door, on the south side of the pool. There were "hooks" in place to hang lead blankets on the west side of the skid due to the close proximity of anticipated work activities involving the ISFSI. Additional hooks for lead blankets were being installed on the east side of the skid. A survey of the area measured general area dose rates at the boundary of the skid at approximately 2 mR/hr. Dose rates around the demineralizer were 50-60 mR/hr. The highest contact dose rate on the demineralizer was 100 mR/hr.

The new spent fuel pool cooling system began operation on April 20, 1999. The operational acceptance test required the cooling system to operate for 8 weeks with less than 72 hours downtime. The 8-week test started on May 18, 1999 and ended on July 15, 1999, for a total of 8 weeks and 2 days. The total time the unit was down for maintenance repair was 19.5 hours. A review of the documented acceptance test results found that the system had performed satisfactorily.

The spent fuel pool cooling system was not operating at the beginning of the inspection period due to an electrical ground problem. The problem involved cables installed under DCP R98-0018, which supported the cooling system. Electrical maintenance installed new cables and as of Thursday morning, August 5, 1999, one train was operable for the spent fuel pool cooling system.

4.3 Conclusion

The spent fuel pool water chemistry, water level and temperature were found to be in compliance with technical specifications. The licensee had completed a major modification to the spent fuel pool pursuant to 10 CFR 50.59 by installing a new cooling, filtration and demineralizer system. This allows for dismantlement of a number of systems that interconnected with the original spent fuel pool systems. No unreviewed safety questions were identified by the licensee.

5 Maintenance and Surveillance (62801)

5.1 Inspection Scope

The licensee's implementation of the maintenance rule requirements were reviewed; including the work identification process, maintenance backlog and work prioritization system. The licensee evaluation and assessment of the performance of structures, systems and components determined to be within the scope of the maintenance rule was reviewed. This area of inspection was conducted to document the licensee's implementation of the maintenance rule to a permanently shutdown reactor.

5.2 Observations and Findings

The licensee had established a maintenance rule assessment and implementing procedure for compliance with 10 CFR 50.65 "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The licensee had identified the following structures, systems and components as being within the scope of the maintenance rule:

- Spent fuel assemblies, including zircaloy cladding
- Spent fuel pool liner
- Spent fuel storage racks (including Boraflex)
- Fuel Storage Building

The licensee evaluated the existing maintenance, testing and trending programs being implemented and concluded that these programs provided adequate assurance that the condition and performance of the structures, systems and components covered by the maintenance rule were effectively controlled. Based on this determination, the licensee took credit for the existing preventive maintenance program, as allowed in 10 CFR 50.65(a)(2).

The licensee implemented the maintenance rule through procedure RSAP-1610 "Maintenance Rule Implementation," Revision 0, dated August 17, 1998. RSAP-1610 established responsibilities, general requirements, performance monitoring and records requirements for the licensee's maintenance rule implementation. RSAP-1610 required the performance of an evaluation of the effectiveness of the programs required to maintain the spent fuel in a safe condition on a 24-month interval. The evaluation was to be conducted by the technical services organization and provided to the commitment management review group for review and approval.

The licensee's work identification process was documented in procedure RSAP-0803 "Work Request," Revision 14, dated July 14, 1997. This procedure established the process for entering work items into the maintenance system. Work priority assignment criteria was established in plant operations manual, procedure B.10 "Defueled Condition," Revision 18, dated May 24, 1999. The priority criteria were:

- Priority 1: Actions to protect public health and safety and safe storage of nuclear fuel
- Priority 2: System dispatcher orders

The inspector reviewed open maintenance requests for the period from January to August 1999. The maintenance request data contained requests covering the full range of priorities. None of the maintenance requests involving Priority 1 or 2 items were open past their scheduled completion dates.

5.3 Conclusion

The licensee had conducted an assessment to identify the structures, systems and components that should be included in the scope of the maintenance rule. Policies and procedures had been established to define the licensee's interpretation of the applicability of the maintenance rule to the Rancho Seco site.

6 **Occupational Radiation Exposure (83750)**

6.1 Inspection Scope

The licensee submitted an annual report of individual radiation monitoring for 1998 to the NRC on March 11, 1999. A review of this report and of radiological exposure-rate data used by the licensee to trend radiological conditions within the plant was completed.

6.2 Observations and Findings

The annual report of individual radiation exposure monitoring provided personnel exposure data for 1998. There were 431 personnel monitored for occupational exposure during 1998. The total occupational dose accumulated during 1998 was 3.579 man-rem. Five of the monitored personnel received occupational doses greater than 100 mrem during 1998. Three were from maintenance and two from health physics. The three maintenance workers received a significant portion of their accumulated 1,177 mrem dose while working on the installation of an impact limiter in the up-ender pit in the spent fuel pool. This work was needed to support the loading of spent fuel into casks for dry storage. The two health physics personnel received doses of 104 and 158 mrem. The doses for these two individuals were not attributable to any particular work activity. The maximum annual doses allowed for workers, as specified in 10 CFR 20.1201, is 5,000 mrem.

The occupational dose for 1998 was distributed across five job categories. The job categories, arranged in decreasing dose order were:

- Maintenance - 1.874 man-rem
- Health Physics - 1.122 man-rem
- Engineering - 0.286 man-rem

- Operations - 0.262 man-rem
- Supervisory - 0.035 man-rem

Thus far in 1999, the licensee had five workers with doses at or above 100 mrem. The high doses this year were the result of increased radioactive waste handling activities. Increases in worker doses will likely continue as the dismantlement effort progresses into more highly contaminated areas of the plant.

Radiation exposure-rate data collected per procedure RP 305.8D "Quarterly Radiation Trending Survey," was reviewed. This procedure required the collection of exposure-rate data at designated locations within the plant on a quarterly basis. The data was reviewed quarterly to identify any changes in the plant exposure-rate profile as dismantlement activities were performed. The licensee indicated they intended to use the data to support future site characterization surveys. The data reviewed covered the period from January 1998 to July 1999. The exposure-rate data indicated a decreasing trend for the period. The exposure-rates ranged from <0.2 mR/hr to 1.8 mR/hr for the period reviewed.

6.3 Conclusion

The annual report of individual radiation monitoring documented the occupational doses received at Rancho Seco. Radiation doses were being tracked and were within the limits established in 10 CFR 20. Analysis of the report revealed that occupational dose had been reasonably distributed amongst the worker population. The licensee was tracking and trending radiological exposure-rate data to maintain an exposure profile of selected plant areas as dismantlement activities progressed.

7 **Radioactive Waste Treatment, Effluent and Environmental Monitoring (84750)**

7.1 Inspection Scope

Technical Specifications D6.8 and D6.9 required a radiological environmental program to be established to monitor radiological conditions around the Rancho Seco facility and provide annual reporting to the NRC. A review of the annual environmental and effluent reports submitted to the NRC was completed.

7.2 Observations and Findings

The 1998 annual radiological environmental operating report was reviewed. The results presented in the report indicated the radiological impact of decommissioning activities at Rancho Seco were well below regulatory limits. The report covered atmospheric, direct radiation, terrestrial, aquatic life and water monitoring in the environment surrounding Rancho Seco.

A review of the most recent land use census completed for the area around the Rancho Seco site identified a transition to grape vineyards from pasture usage for the areas north, west and south of the site. The licensee was in the process of evaluating the extent of additional sampling locations that may be needed as the result of the change

in agriculture use near the site. Two irrigation wells had already been added as sampling locations. Both wells were used by the vineyard for irrigation. One well was up-gradient to the licensee's discharge canal and one well was down-gradient. The licensee had spoken with the owner of the vineyard and was in the process of making arrangements for sampling of the grapes, which were scheduled for harvesting during the fall of 1999.

The licensee had analyzed numerous sediment samples during 1998 as part of the site characterization program. Sediment sampling locations in Clay Creek near the discharge canal, within the licensee's property, had been analyzed in order to provide sediment data on the activity level from historical permitted releases and to correlate the data for future site characterization. These specific soil samples were collected in addition to the sampling required by the radiological environmental monitoring program. Gamma spectrometry analysis indicated the presence of Cs-137, Cs-134, and Co-60. All of these isotopes can be attributed to liquid effluent releases that occurred during operations with some contribution from fallout sources.

The 1998 sediment sample data results from Clay Creek were compared to the 1997 and 1996 annual sampling data. Correlation of the data from year to year for each individual sampling location resulted in some data showing a decrease in activity while several of the sampling locations showed increasing activity. Through further discussions with the licensee, it was explained that the referenced sample locations identified in the environmental report did not represent an exact specific sample location, but in fact, represented a general area of approximate 100 ft². Because sampling was not taken at the same exact point within the 100 ft² area each time, nor was the sample a composite from the 100 ft² area, the sample data results indicated a variance in the radiation levels from year to year. The variance from year to year was not significant and was determined to be the result of the sampling methodology being used by the licensee. The licensee planned to provide additional clarification in future environmental reports to explain the variances being observed at the sampling locations.

Thirty five locations were monitored by thermoluminescent dosimeters within the 10-mile radius of Rancho Seco. This included thermoluminescent dosimeters at the industrial area boundary, near the property boundary, several nearby residences and schools, four locations around the ISFSI pad and one location at Clay Creek near the discharge canal. All locations indicated background levels except dosimeter No. 66 at Clay Creek which was slightly less than twice background.

The 1998 annual radioactive effluent release report was reviewed. The report provided information concerning gaseous and liquid releases and solid waste shipped offsite for burial or disposal during 1998. There were no unplanned releases from the facility during 1998. Operational releases for airborne effluents included only tritium, which was less than 1 percent of the calculated maximum organ dose limit for Rancho Seco. Several liquid batch releases from the site occurred during 1998, which consisted of tritium, Co-60, and Cs-137. The calculated maximum total "body dose" from these releases was approximately 3 percent of the annual limit for Rancho Seco.

7.3 Conclusion

The radiological environmental and effluent monitoring program provided for an adequate assessment of the environmental conditions around the facility. Required reports to the NRC had been made and provided information concerning the results of the environmental sampling and analysis program. The land use census identified the change in agriculture use near the site with the addition of the vineyard. Additional environmental sampling to account for this new food pathway was being made by the licensee.

8 **Follow-up of Open Items (92701)**

- 8.1 (Discussed) IFI 50-312/9601-01: Incorporation of proposed License Amendment No.192 for heavy loads over the cask. This issue involved the need for a license amendment request to clarify Technical Specification D3/4.3 regarding the movement of heavy loads over the spent fuel pool such as a spent fuel shipping cask. The amendment request had been submitted to NRC headquarters and was under review.

9 **Exit Meeting**

The inspectors presented the inspection results to members of the licensee management at the exit meeting on August 6, 1999 and during a subsequent telephone exit on August 30, 1999. The licensee acknowledged the findings presented. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

D. Clark, Senior Mechanical Engineer
J. Delezenski, Nuclear Quality & Compliance Superintendent
J. Eilering, Senior Mechanical Engineer
J. Field, Technical Services Superintendent
D. Gardner, Decommissioning Project Leader
M. Hieronimus, Operations
W. Koepke, Quality and Safety Supervisor
D. Koontz, Control Room Operator
R. Mannheimer, Licensing Engineer
K. Miller, Project Manager
S. Nichols, Radiological Health Supervisor
S. Redeker, Plant Manager
J. Roberts, Maintenance Superintendent
T. Tucker, Operations Superintendent
W. Wilson, RP/Chemistry Superintendent

INSPECTION PROCEDURES USED

36801	Organization, Management, and Cost Controls
37801	Safety Reviews, Design Changes, and Modifications
60801	Spent Fuel Pool Safety
62801	Maintenance and Surveillance
71801	Decommissioning Performance and Status Review
83750	Occupational Radiation Exposure
84750	Radwaste Treatment, Effluents and Environmental Monitoring
92701	Followup on Open Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-312/9903-01	NCV	Failure to Initiate a Field Problem Report for the Security Radio
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Discussed

50-312/9601-01	IFI	Incorporation of proposed License Amendment No.192 for heavy loads over the cask
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Closed

50-312/9903-01	NCV	Failure to Initiate a Field Problem Report for the Security Radio
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LIST OF ACRONYMS

CFR	Code of Federal Regulations
DCP	Design Change Package
DSAR	Defueled Safety Analysis Report
ISFSI	Independent Spent Fuel Storage Installation
IFI	Inspection Followup Item
ppm	parts per million
PSDAR	Post Shutdown Decommissioning Activities Report