



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

April 30, 2002

James Shetler, Assistant General Manager
Energy Supply
Sacramento Municipal Utility District
6201 'S' Street
P. O. Box 15830
Sacramento, California 95852

SUBJECT: NRC INSPECTION REPORT 50-312/2002-02; 72-11/2002-01

Dear Mr. Shetler:

An NRC inspection was conducted March 25 through April 3, 2002, at your Rancho Seco nuclear reactor facility. The enclosed report presents the scope and results of that inspection.

The purpose of the inspection was to review compliance with federal regulations, your license and technical specifications concerning safe storage of spent fuel. No violations of NRC regulations were identified during the inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you provide one, will be made 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/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact D. Blair Spitzberg, Ph.D. at (817) 860-8191 or Emilio M. Garcia at (530) 756-3910.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket Nos.: 50-312; 72-11
License Nos.: DPR-54; SNM-2510

Enclosure:
NRC Inspection Report
50-312/2002-02;72-11/2002-01

cc w/enclosure:

Thomas A. Baxter, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N. Street, N.W.
Washington, D.C. 20037

Jerry Delezenski, Licensing Supervisor
Sacramento Municipal Utility District
Rancho Seco Nuclear Generating Station
14440 Twin Cities Road
Herald, California 95638-9799

Sacramento County
Board of Supervisors
700 H. Street, Suite 2450
Sacramento, California 95814

Cindy Buchanan, Site Document
Control Supervisor
Sacramento Municipal Utility District
Rancho Seco Nuclear Generating Station
14440 Twin Cities Road
Herald, California 95638-9799

Ms. Helen Hubbard
P.O. Box 63
Sunol, California 94586

Ed Bailey, Radiation Program Director
Radiologic Health Branch
P.O. Box 942732 (MS 178)
Sacramento, California 94327-7320

Mr. Steve Hsu
Radiologic Health Branch
State Department of Health Services
P.O. Box 942732
Sacramento, California 94327-7320

Robert A. Laurie, Commissioner
California Energy Commission
1516 Ninth Street (MS 31)
Sacramento, California 95814

Dana Appling, General Counsel
Sacramento Municipal Utility District
6201 'S' Street
P.O. Box 15830
Sacramento, California 95813

bcc w/enclosure (via ADAMS distrib):

EW Merschoff

JB Hickman, NRR/DLPM/PDIV-2

DT Diec, NRR/DSSA/SPLB

AC McMurtray, NRR/DSSA/SPLB

DD Chamberlain

DB Spitzberg

JV Everett

EM Garcia

MIS System

FCDB File

RIV Files-4th floor file room (50-312 Docket)

DOCUMENT NAME: s:\dnms\fcdb\emg\rs02-02emg.wpd

R:_rs\

RIV:DNMS:FCDB	C:FCDB	D:DNMS
EMGarcia	DBSpitzberg	DDChamberlain
/DBSpitzberg for via E/	/RA/	/RA/
04/29/02	04/29/02	04/29/02

OFFICIAL RECORD

T=Telephone E=E-Mail

F=Fax

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.: 50-312; 72-11

License Nos.: DPR-54; SNM-2510

Report No.: 50-312/2002-02; 72-11/2002-01

Licensee: Sacramento Municipal Utility District

Facility: Rancho Seco Nuclear Generating Station

Location: 14440 Twin Cities Road
Herald, California

Dates: March 25 through April 3, 2002

Inspector: Emilio M. Garcia, Health Physicist
Fuel Cycle and Decommissioning Branch

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

ADAMS Entry : IR 05000312-02-02/072000011-02-01; on 03/25/02-04/03/02;
Sacramento Municipal Utility District; Rancho Seco Nuclear
Generating Station. Decommissioning Report; No Violations.

EXECUTIVE SUMMARY

Rancho Seco Nuclear Generating Station NRC Inspection Report 50-312/2002-02;72-11/2002-01

Movement of spent fuel to dry cask storage at the Independent Spent Fuel Storage Installation (ISFSI) was continuing successfully. Thirteen canisters have been loaded and placed in the ISFSI. Critical path to completing the project was the loading and movement of the canisters to the ISFSI. The Reactor Coolant Pump (RCP) B and the associated cold leg section had been removed from the reactor building. The licensee was preparing for the removal of RCP A.

Spent Fuel Pool Safety

- The licensee was maintaining the spent fuel pool water level, and temperature within technical specification limits (Section 1).

Operations of an Independent Spent Fuel Storage Installation

- The licensee had successfully loaded 13 canisters with spent fuel and placed them in the ISFSI. No significant problems had been encountered (Section 2).
- Review of records and observations made during the inspection found that technical specification requirements were being met (Section 2).

Occupational Radiation Exposure

- The licensee had submitted their 2001 Annual Individual Monitoring Report and their 2001 Annual Exposure Report on a timely basis. The information was completed on the appropriate forms and copies had been provided to individuals that were monitored. All occupational exposures were below the limits specified in 10 CFR 20.1201 (Section 3).

Decommissioning Performance and Status Review

- The licensee was continuing their dismantling activities in the reactor and auxiliary buildings (Section 4).

Emergency Planning

- On March 28, 2002, a medical emergency occurred in the reactor building involving a worker who suffered a fatal heart attack. The licensee's response to the emergency was observed to be prompt and thorough despite the unfortunate tragedy of the event.

Effluent and Environmental Monitoring

- The licensee had submitted the annual radiological environmental operating report for calendar year 2000 on a timely basis (Section 6).

- The annual radiological environmental operating report concluded that the results of the 2000 Radiological Environmental Monitoring Program showed that the operation of Rancho Seco Nuclear Station had no significant radiological impact on the environment (Section 6).
- The annual radioactive effluent release report for 2001 was submitted on a timely basis (Section 6).
- The annual radioactive effluent release report for 2001 concluded that the releases of radioactivity in gaseous and liquid effluents did not exceed the limits of 10 CFR 20 or the numerical guidelines of 10 CFR 50, Appendix I (Section 6).

Follow-up

- Non-Cited Violation 050-00312/0201-01 was closed. This violation related to the instrument channel check on the spent fuel storage area radiation monitor not being performed at the frequency required by Technical Specification D 4.4.1 (Section 7).
- The licensee's actions related to Unresolved Item 50-312/0103-01 was discussed. This item related to the adequacy of the Licensee's Safety Evaluation of Fuel Storage Building Walls (Section 7).

Report Details

Summary of Facility Status

The Rancho Seco facility was undergoing active decommissioning with dismantlement work in the auxiliary and reactor buildings. In addition, 13 canisters had been loaded with spent fuel and transferred to the ISFSI.

Overall, site decommissioning work was progressing safely with significant work completed since the last NRC inspection. Good radiological controls by the health physics personnel in the auxiliary building were observed during the tours of work activities. The amount of material awaiting removal from the work areas was adequately controlled with no backlog of scrap observed that would present a safety hazard to workers in the area.

1 Spent Fuel Pool Safety (60801)

1.1 Inspection Scope

Compliance with technical specification limits for the spent fuel pool water level and temperature were reviewed.

1.2 Observations and Findings

Technical Specification D 3.1.2 required the spent fuel pool water level to be maintained at 23 feet 3 inches or greater. Technical specification D 3.1.1 required the water level to be maintained at 37 feet or greater when fuel handling operations were occurring. The water level for the spent fuel pool was observed on March 27, 2002, to be 37 feet 7 inches. Technical Specification D 3.2 required the temperature of the spent fuel pool to be maintained below 140°F. The spent fuel pool temperature was 73.4°F on March 27, 2002.

1.3 Conclusion

The licensee was maintaining the spent fuel pool water level and temperature within technical specification limits.

2 Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855)

2.1 Inspection Scope

The inspector reviewed the status of canister loading storage activities and compliance with selected ISFSI license technical specifications.

2.2 Observations and Findings

a. Technical Specification compliance

The inspector reviewed the licensee's compliance with several technical specification requirements related to ISFSI operations.

On April 3, 2002, the inspector observed the licensee load the 13th canister into the ISFSI. The inspector confirmed the serial number of the canister as FC24P-P13, and that it was loaded in horizontal storage module (HSM) 5.

Technical Specification 2.1.1a establishes the limits for intact spent fuel assemblies stored at each HSM to be as characterized in Table 1 below:

Table 1
Rancho Seco ISFSI
Technical Specification 2.1.1a Limits

CHARACTERISTIC	VALUE
Fuel Design	B&W 15x15
Minimum Cooling Time after Discharge	7 years
Maximum Decay Heat per cannister	13.5 Kilowatt (Kw)
Maximum Enrichment	3.43 percent
Maximum Burn-up	38,268 megawatt-days (MWd)/Metric Ton Uranium (MTU)
Cladding Material	Zircaloy-4

At Rancho Seco all fuel used was B&W 15x15 with Zircaloy-4 cladding material. The reactor last operated in 1989, so all fuel exceeded the minimum 7-year cooling. Therefore, the only variables for each canister were the maximum decay heat, maximum enrichment and the maximum burn-up rate. The licensee used procedure RSAP-0238, Control and Accountability of Special Nuclear Material(ISFSI) and Calculation No. Z-SFC-M2557, Decay Heat Value of Spent Fuel and Control Components (December 31, 1989 through December 31, 2012), to ensure that these limits were not exceeded. The engineering superintendent provided the inspector with a summary sheet of these values for each canister. A summary of the spent fuel characteristics for the canisters currently loaded at Rancho Seco is included as Attachment 3 to this report. All 13 canisters have been loaded with spent fuel that met the requirements of Technical Specification 2.1.1a.

Technical Specification 3.1.1 requires that the Dry Storage Cask (DSC) Vacuum Pressure during drying shall be ≤ 3 Torr for at least 30 minutes. Technical Specification 3.1.2 requires that the DSC Helium leakage rate of primary inner seal weld shall be $\leq 10^{-5}$ std-cc/sec. Technical Specification (TS) 3.1.3 requires DSC helium backfill pressure shall be 0 to 2.5 psig. The licensee used procedure DFC-001, ISFSI Loading, in part to verify and document that the TS requirements were met. The

inspector reviewed portions of the DFC-001 data sheets for canisters FC24P-P07 through FC24P-P13, and confirmed that the TS requirements had been met.

Technical Specification 5.5.3.2 requires the air temperature difference between the ambient temperature and the roof vent temperature be measured 24 hours after canister insertion into the HSM and again 7 days after insertion. If the air temperature difference exceeds 100°F, the air inlets and exits should be checked for blockage. The fulfillment of this TS requirement is documented in Attachment 5, HSM Temperature Monitoring, to procedure DFC-001, ISFSI Loading. The inspector reviewed these records and noted that the temperature differences were measured with calibrated instruments, and at the approximate required time. The “24 hours” measurements for HSM 12, the 5th one loaded was made 22 hours and 21 minutes after insertion, but this time difference is not considered significant. Table 2 below summarizes the results of these surveillances for the canisters loaded:

Table 2
Surveillance Results
to Demonstrate Compliance with
Rancho Seco ISFSI
Technical Specification 5.5.3.2

DSC (canister) SERIAL #	HSM #	24 hour Temperature Difference ° F	7 day Temperature Difference ° F
FO24P-P01	20	18	23
FC24P-P03	18	23.3	37.2
FC24P-P04	16	21	14
FC24P-P05	14	14	15
FC24P-P02	12	19.9	22.2
FC24P-P06	10	31.4	12
FC24P-P07	8	16.5	30.1
FC24P-P08	6	25	34
FC24P-P09	4	13	17.3
FC24P-P10	2	7.1	21
FC24P-P11	1	15	31.8
FC24P-P12	3	17.3	12.9
FC24P-P13	5	Not yet performed	Not yet performed

The first 12 HSMs loaded met the 24-hour and 7-day ambient to roof vent temperature difference requirement. The data for the 13 HSM loaded had not been collected by the end of the inspection.

Technical Specification 5.5.3.1 requires daily HSM roof concrete temperature measurements to verify that temperatures have not risen by more than 80°F and that they are less than 225°F. Technical Specification 5.5.3.3 requires daily visual inspection of the air vents to ensure that the HSM air vents are not blocked for more than 40 hours. The licensee used surveillance procedure SP.10, ISFSI Daily Surveillance, to fulfill these TS requirements. On March 27, 2002, the inspector observed the performance of surveillance SP-10 by an auxiliary operator (AO). The air vents were not blocked. The highest daily temperature rise for any HSM was 4°F and the maximum temperature for any HSM was 92°F. The inspector selected the record for SP-10 conducted on January 13, 2002, and found similar results. The AO did not need to use a handheld thermometer, but had brought one along for demonstration. A cable to connect the handheld thermometer to the HSM temperature cabinet H-5SFSI was not immediately available, so the AO was not able to demonstrate this alternate approach. The licensee arranged to have the proper cable stored near the HSM temperature cabinet H-5SFSI. The licensee was meeting the requirements of TSs 5.5.3.1 and 5.5.3.3.

b. Schedule

Table 3 below lists the projected schedule for the remaining cannister loading:

Table 3
Rancho Seco ISFSI
Projected Schedule

LOADING ORDER	PROJECTED START DATE	PROJECTED END DATE
14	April 8, 2002	April 17, 2002
Required Surveillances	April 18, 2002	April 28, 2002
15	April 29, 2002	May 8, 2002
16	May 13, 2002	May 22, 2002
Sling Inspection	May 27, 2002	May 29, 2002
17	June 3, 2002	June 12, 2002
18	June 17, 2002	June 26, 2002
19	July 8, 2002	July 17, 2002
20	July 22, 2002	July 31, 2002
21	August 5, 2002	August 14, 2002

The schedule is subject to change. The licensee had three additional canisters onsite awaiting loading. The engineering superintendent stated that at the time of the inspection, the critical path to completing the movement of spent fuel to the ISFSI was how quickly they could load and move the canisters. Previously, the critical path had been fabrication of the damaged fuel canister. The licensee expected receipt of the damaged fuel canister in early July 2002, a month before needed for fuel loading and

thus the fabrication of the damage fuel canister was no longer considered the critical path.

2.3 Conclusion

The licensee had successfully loaded 13 canisters with spent fuel and placed them in the ISFSI. No significant problems had been encountered. Review of records and observations made during the inspection found that technical specification requirements were being met.

3 **Occupational Radiation Exposure (83750)**

3.1 Inspection Scope

The inspector reviewed the licensee's radiation exposure reports submitted per the requirements of 10 CFRs 20.2205 and 20.2206, and TSs D6.9.2.1 and D6.9.2.2. The radiation exposures for the dry cask storage project were also examined.

3.2 Observations and Findings

a. 10 CFR 20.2206 and Technical Specification D6.9.2.1 Individual Monitoring Report

10 CFR 20.2206(b) requires, in part, that the licensee submit an annual report of the results of individual monitoring carried out for each individual for whom monitoring was required by 10 CFR 20.1502 during the year. The licensee shall use NRC Form 5 or electronic media containing all the information required by NRC Form 5.

10 CFR 20.2206(c) requires that the report covering the preceding year be filed on or before April 30 of each year. The licensee's TS D6.9.2.1 reiterates this requirement.

On March 13, 2002, the licensee submitted their annual report of individual monitoring for calendar year 2001. NRC Form 5 was attached for each individual that was monitored. The inspector noted that the report was submitted on a timely basis. The inspector reviewed the dosimetry files of 18 individuals to determine if the required report had been submitted. Sixteen of the individuals had been monitored in 2001 and their individual NRC Form 5 had been submitted with the report. Two of the individuals were new employees in 2002. The 16 NRC Form 5s reviewed were completed and included all the information required.

10 CFR 20.2205 requires, in part, that if the licensee is required by 10 CFR 2.2206 to report to the Commission any exposure of an identified occupationally exposed individual, then the licensee must provide a copy of the report submitted to the Commission to those individuals. The inspector determined that the licensee had met this requirement.

b. Technical Specification D6.9.2.2 Annual Exposure Report

Technical Specification D6.9.2.2 requires that an annual exposure report for the previous year shall be submitted to the Commission within the first quarter of each calendar year in accordance with the guidance contained in Regulatory Guide (RG) 1.16, Reporting of Operating Information - Appendix A Technical Specifications. Section 1.b.(3) of RG 1.16, Annual Operating Report, specifies a tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving greater than 100 millirem/yr and their associated man-rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The RG goes on to state that in the aggregate, at least 80 percent of the total whole body dose received from external sources should be assigned to specific major work functions. The licensee submitted its annual exposure report for 2001 on March 16, 2002. The inspector determined that the report met the requirements of TS D6.9.2.2. All exposures were below the applicable limits specified in 10 CFR Part 20.

c. Dry Cask Storage Project

The radiation exposures for personnel assigned to the dry cask storage project were reviewed. Thirteen canisters had been loaded and moved to the ISFSI. The licensee had divided exposures into 11 work groups involved with the dry cask storage project. Table 6 below summarizes the calculated statistics for each work group. The work group that received the highest exposures were the welders. The total dose to all workers during the loading of the first 13 canisters ranged from 0.605 person-rem for the tenth canister to 0.290 person-rem for the eleventh canister, with an average of 0.465 person-rem/canister for the 13th canister that had been loaded in the ISFSI. As Low As Reasonably Achievable (ALARA) estimates developed in 2000 for the dry cask storage project had estimated doses for the cask loading activities of 1.2 person-rem/canister with a goal of 0.960 person-rem/canister. Based on the experience in 2001, the licensee had develop new estimates based on the average of the first seven canisters loaded. The new estimate was 0.481 person-rem/canister with an ALARA goal of 0.385 person-rem/canister. Attachment 3 includes the total exposures for each canister.

Table 4
Rancho Seco DSC Project
Dose Statistics for First 13 Canisters Loaded
all values in person-rem/canister

Group	Mean	Medium	Lowest	Highest	Std. Deviation
Welders	0.157	0.167	0.097	0.218	0.034
Fuel Team Maintenance	0.077	0.078	0.060	0.109	0.013
Radiation Protection	0.074	0.068	0.045	0.115	0.018
Operations	0.012	0.011	0.001	0.023	0.006
Quality Control	0.059	0.062	0.023	0.084	0.018
Technical Engineering	0.006	0.004	0.000	0.020	0.005
Fuel Team Ldr./Asst.	0.060	0.060	0.030	0.087	0.015
Plant Supv./Vendors	0.004	0.001	0.000	0.020	0.006
Plant Support Maint.	0.004	0.000	0.000	0.028	0.008
I & C Support	0.003	0.003	0.001	0.010	0.003
Security Support	0.008	0.008	0.001	0.018	0.006
Totals	0.465	0.464	0.290	0.605	0.090

3.3 Conclusion

The licensee had submitted their 2001 Annual Individual Monitoring Report and their 2001 Annual Exposure Report on a timely basis. The information was completed on the appropriate forms and copies had been provided to individuals that were monitored. All occupational exposures were below the limits specified in 10 CFR 20.1201.

4 **Decommissioning Performance and Status Review (71801)**

4.1 Inspection Scope

The licensee's dismantlement activities were reviewed. Tours of the site were conducted to observe work activities underway, including observation of housekeeping, safety practices, fire loading and radiological controls.

4.2 Observations and Findings

Tours of the auxiliary building and interim onsite storage building were conducted. Radiological postings, fire loading, housekeeping and safety practices were found to be acceptable. Radiation survey instruments used were within their calibration interval and

operable. The licensee had removed the RCP B and the associated cold leg section from the reactor building the week prior to the inspection, and they were preparing for the removal of RCP A. The licensee was continuing dismantling and removal of equipment from the reactor and auxiliary buildings including electrical equipment, piping, ventilation ducting and other miscellaneous equipment. The licensee was preparing for cutting the stainless steel tanks in the underground tank farm.

4.3 Conclusion

The licensee was continuing their dismantling activities in the reactor and auxiliary buildings in a safe manner.

5 **Emergency Planning (36801)**

5.1 Inspection Scope

The inspector examined the licensee's response to a medical emergency that occurred during the inspection.

5.2 Observations and Findings

On March 28, 2002, an individual suffered a fatal heart attack while working in the reactor building in a designated radiologically contaminated area. The individual was not radiologically contaminated. The inspector observed the licensee's response to this unfortunate medical emergency.

The licensee's principal applicable procedure is Operations Procedure, OP-C.53, Medical Emergency, Revision 12, effective November 7, 2001.

The inspector reviewed an internal memorandum from the emergency preparedness specialist to the manager, plant closure and decommissioning, titled "Review of the Medical Emergency on March 28, 2002, dated April 3, 2002." In this memorandum, the emergency preparedness specialist concluded that although the event was tragic and extremely difficult, the response and particularly the medical care was outstanding. The attachment to the memorandum goes on to discuss a number of areas to be reviewed for possible improvement. Some of these issues were also identified during interviews conducted by the inspector with onsite responders. Two in particular were 1) the apparent hesitation of some offsite responders to transport a contaminated injured individual in their ambulance or air ambulance; and 2) the lack of a written policy or procedure regarding radiological control practices during medical emergencies, such as signing in on a radiation work permit, wearing of anti-contamination clothing, and picking up dosimetry. In addition to the recommendations in the memorandum, two other issues surfaced: (1) the California Office of Emergencies Services (OES) learned about the event and called to inquire as to why they were not notified, and (2) the radiation safety staff at U. C. Davis Medical Center asked why they were notified first and not their emergency room. Since the individual was not contaminated these notifications were not required.

The list below summarizes the recommendations for follow-up identified by the emergency preparedness specialist:

1. A single radio frequency for emergency response coordination between various internal groups.
2. Improve enroute communication with offsite fire and medical responders.
3. Procurement of equipment to designate a helispot.
4. Expanding the coordination efforts to other fire/medical agencies likely to respond to the site, including arranging for annual tours, briefings and training, to help ensure outside agencies are comfortable and confident when responding to Rancho Seco.
5. Additional coordination training and exercises so that all onsite responders are more familiar and comfortable with the response process.
6. Review the practicality for an "Incident Command" vest system to identify the roles of onsite responders.
7. Review the need for organized training curriculum for outside agencies on radiation protection and the Rancho Seco response process.
8. Review the need for additional training modules and/or expansion of existing modules specifically for the procedures for emergency access into a radiological control area.
9. Review the need and means to maintain scene security and crowd control during medical emergencies.

The resolution of the emergency preparedness issues identified from the March 28, 2002, medical emergency will be reviewed during a future inspection and will be tracked as an Inspection Followup Item (IFI 50-312/0202-01)

5.3 Conclusion

On March 28, 2002, a medical emergency occurred in the reactor building involving a worker who suffered a fatal heart attack. The licensee's response to the emergency was observed to be prompt and thorough despite the unfortunate tragedy of the event.

6 Effluent and Environmental Monitoring (84750)

6.1 Inspection Scope

The inspector reviewed periodic effluent and environmental reports that the licensee is required to submit to NRC. The inspector reviewed selected surveillances associated with these reports.

6.2 Observations and Findings

a. Annual Radiological Environmental Operating Report for 2000

Technical Specification D6.9.2.3 requires that the annual radiological environmental operating report (AREOR) covering the previous year be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends from the results of the radiological environmental monitoring program. The material provided shall be consistent with the (1) offsite dose calculation manual (ODCM), (2) the radiological environmental monitoring program manual (REMP), and (3) Sections IV.B.2, IV.B.3, and IV.C of Appendix I, 10 CFR 50.

On April 9, 2001, the licensee submitted the AREOR for 2000 on a timely basis. The report indicates that atmospheric, terrestrial and aquatic environments and the land use adjacent to Rancho Seco Nuclear Station (RSNS) were monitored. Radioactivity levels in the sampled media were consistent with previous evaluations.

The inspector reviewed the surveillance data for SP.807, Biennial Land Use Census, completed on February 27, 2001. A biennial land use census is required by Technical Specification D6.8.3.b.2. This census was completed at the required interval and identified the continued transition to grape vineyards from pasture usage of the areas north, west, and south of the site.

b. Annual Radioactive Effluent Release Report for 2001

Technical Specification D6.9.3 requires that the annual radioactive effluent release report (ARERR) covering the previous 12 months be submitted within 60 days of January 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste release from the unit. The material provided shall be (1) consistent with the ODCM and Process Control Program, and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I, to 10 CFR Part 50.

On February 27, 2002, the licensee submitted the 2001 ARERR on a timely basis. The report included summaries of radioactive liquid releases from the regenerant holdup tanks (RHUT) and from the retention basins. The RHUT were released to the retention basins and the retention basins were discharged offsite. All calculations required by 10 CFR Part 50 were based on the retention basin discharges. In 2001, there were

24 RHUT batch releases and 20 retention basin discharges. There were no unplanned liquid releases.

The annual calculated total body dose commitment due to liquid effluents was $6.52\text{E-}02$ millirem or approximately 2.17 percent of the applicable limit. The maximum calculated annual organ dose commitment was $9.32\text{E-}02$ millirem to the child liver or approximately $9.32\text{E-}01$ percent of the applicable limit.

There were no fission or activation gases nor particulate airborne releases. The annual calculated dose at the site boundary due to tritium was $3.00\text{E-}02$ millirem which is 0.2 percent of the applicable limit.

Section V of the ARERR describes the solid waste shipped offsite. In 2001, there were 37 shipments of solid waste made. All solid wastes was transported by highway to a licensed low level radioactive waste disposal facility. Based on the information provided, the inspector calculated that the total volume of waste shipped was 564.1 m^3 with a total activity of 5.04 curies.

The report concluded that the releases of radioactivity in gaseous and liquid effluents did not exceed the limits of 10 CFR 20 or the numerical guidelines of 10 CFR 50, Appendix I.

6.3 Conclusion

The licensee had submitted the annual radiological environmental operating report for calendar year 2000 on a timely basis. The report concluded that the results of the 2000 Radiological Environmental Monitoring Program showed that the operation of Rancho Seco Nuclear Station had no significant radiological impact on the environment. The annual radioactive effluent release report for 2001 was also submitted on a timely basis. This report concluded that the releases of radioactivity in gaseous and liquid effluents did not exceed the limits of 10 CFR 20 or the numerical guidelines of 10 CFR 50, Appendix I.

7 **Open Items (92701)**

- 7.1 (Closed) NCV 50-312/0201-01: Instrument Channel Check on Spent Fuel Storage Area Radiation Monitor not performed at the frequency required by Technical Specification D 4.4.1: The licensee had opened a potential deviation from quality report (PDQ) 02-0010 to evaluate this problem. The commitment management review group (CMRG) reviewed this PDQ on January 23, 2002, and determined that it was a deviation from quality (DQ) and assigned the operations department to develop an action to resolve the problem. On February 27, 2002, the CMRG reviewed and accepted the proposed DQ disposition. During the evaluation of this problem, the licensee identified an additional instance where the instrument channel check was not performed at the frequency required by the TS. The licensee's corrective action was to amend Surveillance Procedure SP-1, Shift Surveillance and Instrument Checks, to require that

Sections 3.0, Spent Fuel Storage Area Radiation Monitors, be performed once per shift as opposed to only during fuel handling operations. The licensee also modified SP-1 to require shiftly verification of the Spent Fuel Pool Temperature and Level.

The inspector reviewed the records of SP-1 conducted during the loading of DSC Canisters 9, 10, 11, 12, and 13, and found that the instrument channel check on spent fuel storage area radiation monitor were performed at the frequency required by Technical Specification D 4.4.1.

- 7.2 (Discussed) URI 50-312/0103-01: Adequacy of the Licensee's Safety Evaluation of Fuel Storage Building Walls: The licensee was continuing their evaluation of the fuel storage building walls to determine if the movement of the walls indicated that unusual stresses were occurring on the walls. The licensee used a routine test RT-PBS-004, Spent Fuel Building Wall and Crane Rail Monthly Visual Inspection, to conduct the collection of data related to the stresses on the walls. The procedure calls for initially marking the ends of any cracks identified, and on subsequent test, noting if the crack had grown from the previous examination. The licensee completed this procedure first on January 28, 2002, and records indicated that the procedure had been conducted on February 25 and March 25, 2002. Table 5 summarizes the results of the original test.

Table 5
Rancho Seco
Summary of January 28, 2002
Spent Fuel Building and Crane Rail Visual Inspection

Location	Finding	Comments
East Interior Wall North of Expansion Joint	12 Cracks	All cracks were very small and appear to be only surface cracks in the paint.
East Interior Wall South of Expansion Joint	No Cracks	No comments
East Exterior Wall	No Cracks	No cracks marked. However, some very small surface cracks were noted.
West Interior Wall North of Expansion Joint	14 Cracks	All cracks were very small and appear to be only surface cracks in the paint.
West Interior Wall South of Expansion Joint	No Cracks	No comments
West Exterior Wall	7 Cracks	All cracks were very small surface cracks.
Overhead Crane Rail Alignment		Both East and West rails were properly aligned in the North/South axis.

During the March 25, 2002, test, the cracks that had been identified during the January inspection had not grown beyond the original mark, and the overhead crane rails remained properly aligned. Further consultation with the independent structural engineer was planned if any unusual indications were found. The results of the monitoring program will be used by the licensee to support their position during future

discussions with the NRC concerning the adequacy of the original safety evaluation that evaluated the misalignment problem.

8 Exit Meeting

The inspector presented the inspection results to members of the licensee's management at the conclusion of the onsite inspection on April 3, 2002. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

E. Brandt, Security Specialist
J. Briggs, Emergency Preparedness Specialist
D. Brown, Health Physics
M. Bua, Radiation Protection/Chemistry Superintendent
J. Delezenski, Nuclear Quality Assurance/Licensing/Administrative Superintendent
T. Devine, Safety Officer
J. Fields, Technical Services Superintendent
M. Hieronimus, Operations Superintendent
S. Nicolls, Health Physics Supervisor
S. Porterfield, Health Physics
S. Redeker, Manager, Plant Closure and Decommissioning

INSPECTION PROCEDURES USED

60801	Spent Fuel Pool Safety at Permanently Shutdown Reactors
60855	Operations of an Independent Spent Fuel Storage Installation
71801	Decommissioning Performance and Status Review
83750	Occupational Radiation Exposure
84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
92701	Follow-up

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-312/0202-01	IFI	Resolution of the Emergency Preparedness issues identified from the March 28, 2002 medical emergency.
----------------	-----	---

Closed

50-312/0201-01	NCV	Instrument Channel Check on Spent Fuel Storage Area Radiation Monitor not performed at the frequency required by Technical Specification D 4.4.1.
----------------	-----	---

Discussed

50-312/0103-01	URI	Adequacy of the Licensee's Safety Evaluation of Fuel Storage Building Walls
----------------	-----	---

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
AO	Auxiliary Operator
AREOR	Annual Radiological Environmental Operating Report
ARERR	Annual Radioactive Effluent Release Report
CFR	Code of Federal Regulations
Ci	Curie
CMRG	Commitment Management Review Group
CY	Calender Year
DSC	Dry Storage Cask
IFI	Inspection Followup Item
ISFSI	Independent Spent Fuel Storage Installation
MWd/MTU	Megawatt-days/metric ton Uranium
mR	milliRoentgen
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OES	California Office of Emergencies Services
PDQ	Potential Deviation from Quality
RCP	Reactor Coolant Pump
REMP	Radiological Environmental Monitoring Program
RHUT	Regenerant Holdup Tank
RSNS	Rancho Seco Nuclear Station
URI	Unresolved Item

ATTACHMENT 2

PARTIAL LIST OF DOCUMENTS REVIEWED

Correspondence

- Letter MPC&D 01-052 dated April 9, 2001, from Manager, Plant Closure & Decommissioning to USNRC, Attention: E. W. Merschoff. Subject: Rancho Seco Annual Radiological Environmental Operating Report for 2000.
- Letter MPC&D 01-053 dated April 9, 2001, from Manager, Plant Closure & Decommissioning to USNRC, Attention: E. W. Merschoff. Subject: Rancho Seco Annual Radioactive Effluent Release Report for 2000.
- Letter MPC&D 02-023 dated February 27, 2002, from Manager, Plant Closure & Decommissioning to USNRC Document Control Desk, Attention John Hickman. Subject: 2001 Annual Radioactive Effluent Release Report.
- Letter NQA 02-023 dated March 13, 2002, from Superintendent, Quality Assurance/Licensing/Administration to REIRS Project Manager, Office of Nuclear Regulatory Research, USNRC. Subject: Regulatory Guide 1.16 Annual Exposure Report.
- Letter NQA 02-024 dated March 13, 2002, from Superintendent, Quality Assurance/Licensing/Administration to REIRS Project Manager, Office of Nuclear Regulatory Research, USNRC. Subject: 10 CFR 20.2206 Annual Report of Individual Monitoring.

Internal Memorandums

- To: AJTF #01-105, Rev.-1, from D. Brown, Exposure Totals for Dry Shielded Cannister #1, April 23, 2001.
- To: AJTF #01-105, Rev.-2, from D. Brown, Exposure Totals for Dry Shielded Cannister #2, August 21, 2001.
- To: AJTF #01-105, Rev.-3, from D. Brown, Exposure Totals for Dry Shielded Cannister #3, September 04, 2001.
- To: AJTF #01-105, Rev.-4, from D. Brown, Exposure Totals for Dry Shielded Cannister #4, September 27, 2001.
- To: AJTF #01-105, Rev.-4, from D. Brown, Exposure Totals for Dry Shielded Cannister #5, October 11, 2001.
- To: AJTF #01-105, Rev.-4, from D. Brown, Exposure Totals for Dry Shielded Cannister #6, November 21, 2001.
- To: AJTF #01-105, Rev.-4, from D. Brown, Exposure Totals for Dry Shielded Cannister #7, December 19, 2001.

- To: AJTF #01-105, Rev.-4, from D. Brown, Exposure Totals for Dry Shielded Cannister #8, January 15, 2002.
- To: AJTF #01-105, Rev.-4, from D. Brown, Exposure Totals for Dry Shielded Cannister #9, January 29, 2002.
- To: RWP/AJTF #02-105, Rev.-0, from D. Brown, Exposure Totals for Dry Shielded Cannister #10, February 07, 2002.
- To: RWP/AJTF #02-105, Rev.-0, from D. Brown, Exposure Totals for Dry Shielded Cannister #11, March 05, 2002.
- To: RWP/AJTF #02-105, Rev.-0, from D. Brown, Exposure Totals for Dry Shielded Cannister #12, March 18, 2002.

Procedures and Data Sheets

- Routine Test Procedure Manual, RT-PBS-004, Spent Fuel Building Wall and Crane Rail Monthly Visual Inspection, Revision 0, effective January 15, 2002.
 - Data Sheet for test conducted on January 24, 2002.
 - Data Sheet for test conducted on February 25, 2002.
 - Data Sheet for test conducted on March 25, 2002.
- ADM-294, Revision 3, DSC Fuel Movement and Loading Schedule, No. 01-14, DSC ID No. FC24P-P08, Completed December 17, 2001.
- ADM-294, Revision 3, DSC Fuel Movement and Loading Schedule, No. 02-01, DSC ID No. FC24P-P09, Completed January 14, 2002.
- ADM-294, Revision 3, DSC Fuel Movement and Loading Schedule, No. 02-02, DSC ID No. FC24P-P10, Completed January 28, 2002.
- ADM-294, Revision 3, DSC Fuel Movement and Loading Schedule, No. 02-03, DSC ID No. FC24P-P11, Completed February 18, 2002.
- ADM-294, Revision 3, DSC Fuel Movement and Loading Schedule, No. 02-04, DSC ID No. FC24P-P12, Completed March 4, 2002.
- ADM-294, Revision 3, DSC Fuel Movement and Loading Schedule, No. 02-05, DSC ID No. FC24P-P13, not completed.
- Surveillance Procedure Manual, SP.1, Shift Surveillance and Instrument Checks, Revision 16, August 2, 2000.
 - Data Sheet for surveillance conducted on January 14, 2002, Shift 1
 - Data Sheet for surveillance conducted on January 14, 2002, Shift 2

- Data Sheet for surveillance conducted on January 28, 2002, Shift 1
- Data Sheet for surveillance conducted on January 28, 2002, Shift 2
- Surveillance Procedure Manual, SP.1, Shift Surveillance and Instrument Checks, Revision 17, February 5, 2002.
 - Data Sheet for surveillance conducted on February 18, 2002, Shift 1
 - Data Sheet for surveillance conducted on February 18, 2002, Shift 2
 - Data Sheet for surveillance conducted on February 19, 2002, Shift 1
 - Data Sheet for surveillance conducted on March 4, 2002, Shift 1
 - Data Sheet for surveillance conducted on March 4, 2002, Shift 2
 - Data Sheet for surveillance conducted on March 5, 2002, Shift 1
 - Data Sheet for surveillance conducted on March 25, 2002, Shift 1
 - Data Sheet for surveillance conducted on March 25, 2002, Shift 2
- Surveillance Procedure Manual, SP.10, ISFSI Daily Surveillance, Revision 0,
 - Data Sheet for surveillance conducted on January 13, 2002
 - Data Sheet for surveillance conducted on March 27, 2002
- Dry Fuel Casking Manual procedure DFC-001, "ISFSI Loading," Revision 3
 - Attachment 5, HSM Temperature Monitoring, for DSC FO24P-P01
- Dry Fuel Casking Manual procedure DFC-001, "ISFSI Loading," Revision 4
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P03
- Dry Fuel Casking Manual procedure DFC-001, "ISFSI Loading," Revision 5
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P04
- Dry Fuel Casking Manual procedure DFC-001, "ISFSI Loading," Revision 6
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P05
 - Attachment 5, HSM Temperature Monitoring, for DSC FO24P-P02
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P06
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P07
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P08
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P09
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P10
- Dry Fuel Casking Manual procedure DFC-001, "ISFSI Loading," Revision 7
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P11
 - Attachment 5, HSM Temperature Monitoring, for DSC FC24P-P12

- RSAP-0238, Control and Accountability of Special Nuclear Material(ISFSI), Revision 3, effective July 12, 2001.

Other

- Potential Deviation from Quality Report # 02-0010, completed
- Deviation from Quality Report # 02-0010, completed

ATTACHMENT 3

LOADED NUHOMS CANISTERS AT THE RANCHO SECO ISFSI

LOADING ORDER	DSC (canister) SERIAL #	HSM #	DATE ON PAD	HEAT LOAD (Kw)	BURNUP MWd/mMTU	MAXIMUM FUEL ENRICHMENT	PERSON-HOURS TO LOAD	PERSON-REM DOSE
1	FO24P-P01	20	04/19/01	9.005	35,200	3.43 %	Not Available	0.601
2	FC24P-P03	18	07/19/01	8.145	37,911	3.43 %	1631	0.418
3	FC24P-P04	16	08/28/01	8.268	36,290	3.43 %	1549	0.552
4	FC24P-P05	14	09/26/01	8.149	37,911	3.43 %	1551	0.464
5	FC24P-P02	12	10/10/01	8.774	37,550	3.26 %	1547	0.361
6	FC24P-P06	10	11/20/01	8.152	36,707	3.43 %	1477	0.513
7	FC24P-P07	8	12/12/01	8.161	37,911	3.43 %	1504	0.461
8	FC24P-P08	6	01/07/02	8.151	36,707	3.43 %	1428	0.517
9	FC24P-P09	4	01/23/02	8.146	38,268	3.43 %	1705	0.472
10	FC24P-P10	2	02/07/02	8.137	38,268	3.43 %	1480	0.605
11	FC24P-P11	1	02/27/02	8.139	38,268	3.43 %	1506	0.290
12	FC24P-P12	3	03/12/02	8.162	37,827	3.43 %	1448	0.385
13	FC24P-P13	5	04/03/02	8.157	37,911	3.43 %	1414	0.402
ISFSI Technical Specification 2.1.1 Limits				≤ 13.5	≤ 38,268	≤ 3.43 %	AVERAGE DOSE	0.465

- Notes:
- Heat Load (kw) is the sum of the heat load values for all spent fuel assemblies in the cask based on 1999 decay
 - Burnup is the value for the spent fuel assembly with the highest individual discharge burnup
 - Fuel Enrichment is the spent fuel assembly with the highest individual enrichment per cent of U-235
 - HSM is the concrete horizontal storage module located at the ISFSI that holds the cask
 - Person-hours to load does not include cannister preparation. Clock starts when cannister placed in Spent Fuel Pool