



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E LAMAR BLVD
ARLINGTON, TX 76011-4511

August 20, 2014

Einar T. Ronningen, Superintendent
Rancho Seco Assets Power Generation
MS N493
14440 Twin Cities Road
Herald, CA 95638

SUBJECT: NRC INSPECTION REPORT 050-00312/14-007

Dear Mr. Ronningen:

This refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on June 23-25 and July 28-30, 2014, at your former Rancho Seco Nuclear Generating Station near Herald, California. The preliminary inspection findings were presented to your staff at the conclusion of the first onsite inspection. At the conclusion of the second onsite week an exit briefing was conducted with you and other members of your staff. The enclosed report presents the scope and results of the inspection.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of reviews of selected procedures and representative records, observations of activities, and interviews with personnel.

The inspection included a review of transportation-related activities. As part of this review, the inspector ascertained whether you had sufficient plant staff, approved procedures, and support equipment available for packaging and shipping liners containing highly radioactive material. In summary, the inspector determined that you had established and implemented effective programs for packaging and shipping this radioactive material. No violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans, Senior Health Physicist, at 817-200-1234 or the undersigned at 817-200-1191.

Sincerely,

/RA/

Ray L. Kellar, P.E., Chief
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Docket No.: 050-00312
License No.: DPR-54

Enclosure:
NRC Inspection Report 050-00312/14-007

Cc: Gonzalo Perez, Chief
California Dept. of Public Health (CDPH)
Radiologic Health Branch
P.O. Box 997414, MS 7610
Sacramento, CA 95899-7414

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 050-00312

License: DPR-54

Report: 050-00312/14-007

Licensee: Sacramento Municipal Utility District

Location: 14440 Twin Cities Road
Herald, CA 95638-9799

Dates: June 23-25 and July 28-30, 2014

Inspector: Robert Evans, Ph.D., P.E., C.H.P., Senior Health Physicist
Repository and Spent Fuel Safety Branch

Approved by: Ray L. Kellar, P.E., Chief
Repository and Spent Fuel Safety Branch
Division of Nuclear Materials Safety

Attachment: Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

Rancho Seco Nuclear Generating Station NRC Inspection Report 050-00312/14-007

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of activities being conducted at the former Rancho Seco Nuclear Generating Station near Herald, California. In summary, the inspector concluded that the licensee was conducting site activities in accordance with license and regulatory requirements.

Organization, Management, and Cost Controls

- The licensee's staffing was in agreement with license and procedural requirements. The licensee had sufficient staff for the transportation-related work in progress. The licensee provided training to site staff in accordance with NRC and U.S. Department of Transportation requirements. (Section 1.2)

Safety Reviews, Design Changes, and Modifications

- The licensee implemented its safety evaluation and safety screening program in accordance with regulatory and procedure requirements. An NRC-issued Non-cited Violation was reviewed and closed involving the licensee's previous failure to conduct a safety review prior to changing the fire protection program. The licensee subsequently added this failure to its corrective action program and conducted the required safety review. (Section 2.2)

Self Assessment, Auditing, and Corrective Action

- The licensee implemented a quality assurance program as stipulated in the Rancho Seco Quality Manual. The licensee's quality assurance program included routine audits and surveillances of transportation activities. (Section 3.2)

Decommissioning Performance and Status Review

- The licensee packaged and shipped radioactive material in accordance with regulatory and procedure requirements. The licensee conducted package loading operations with an emphasis on industrial and radiation protection safety. (Section 4.2)

Occupational Exposures

- The licensee implemented a radiation safety program that was in compliance with regulatory and license requirements. Occupational exposures for 2013 were well below regulatory limits. The licensee implemented radiological controls to help reduce occupational exposures during cask loading operations. (Section 5.2)

Radioactive Waste Treatment, and Effluent and Environmental Monitoring

- The licensee continued to monitor radiation exposures to members of the public from the radioactive material in storage at the site. Public doses from licensed operations continued to remain below regulatory limits. The licensee continued to report the effluent and environmental monitoring programs to the NRC in accordance with license requirements.

The licensee voluntarily sampled the Interim Onsite Storage Building exhaust air to confirm that handling operations involving radioactive material were not creating an airborne radiological hazard. (Section 6.2)

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee selected cask packages that were appropriate for the material being shipped. The licensee maintained and shipped these cask packages consistent with procedure and regulatory requirements. The licensee developed and maintained comprehensive sets of shipping papers that complied with procedure and regulatory requirements. (Section 7.2)

Report Details

Summary of Plant Status

The NRC approved the License Termination Plan (LTP) by Amendment 133 to NRC License DPR-54 dated November 27, 2007. The LTP, in conjunction with the Rancho Seco Post-Shutdown Decommissioning Activities Report (PSDAR), describe the decommissioning strategies for the site. The licensee conducted decommissioning to reduce the residual radioactivity to levels necessary to allow for the release of the site for unrestricted use and to allow the licensee to terminate the 10 CFR Part 50 license.

The licensee intended to release the site for unrestricted use in two phases. The first phase included the release of the main plant site, and the second phase included the release of the Interim Onsite Storage Building (IOSB). The licensee completed Phase I remediation during early 2009. Phase I remediation included decommissioning, final status survey, and unrestricted release of the majority of the plant site. In September 2009, the footprint of the 10 CFR Part 50 licensed site was reduced by the NRC to the area of the IOSB. Since 2009, the licensee continued to store canisters/liners containing Class B and C wastes in the IOSB.

Section 3.3.6 of the LTP identified the remaining decommissioning activities to be completed during the second phase of decommissioning. These activities include removal of the remaining Class B and C wastes from the IOSB, remediation of any residual radioactivity in the building, performance of a final status survey of the building, and submittal of an amendment request to release the IOSB from the license.

By letter dated April 1, 2014, the licensee notified the NRC of a change in its decommissioning schedule. The licensee informed the NRC that it planned to ship its Class B and C wastes to a disposal site in Texas during calendar year 2014. Attached to the licensee's letter was an updated PSDAR.

The licensee had 23 liners in storage that contained radioactive wastes. Five high integrity container liners contained radioactive resins, 17 liners contained activated metals, and one liner contained miscellaneous filters, valves, and piping. The licensee also had two resin liner over-packs in storage. The licensee planned to investigate the radiological status of these two over-packs after the 23 liners have been removed from the IOSB.

During the first inspection in late-June 2014, the licensee was preparing for shipment of the Class B and C wastes for offsite processing and disposal. The licensee was conducting training, developing procedures, and repairing the building crane for future shipment activities. The licensee completed staff training, updated the procedures, and repaired the crane by mid-July 2014. The licensee subsequently began shipping Class B and C wastes on July 21, 2014. At the time of the second onsite inspection in late-July 2014, the licensee had shipped four liners to the disposal site in Texas.

The licensee plans to complete all Class B and C waste shipment activities by the end of 2014. After completion of these shipment activities, the licensee plans to characterize the remaining residual contamination in the IOSB, conduct remediation of any residual contamination, and conduct final status surveys in and around the building. There are at least two areas that have the potential for surface contamination in the IOSB, and the licensee plans to thoroughly investigate both areas. The first area is the holding cell adjacent to the truck bay, and the

second area is the building sump. The licensee plans to complete the decommissioning project and terminate the Part 50 license by 2017.

1 Organization, Management, and Cost Controls (36801)

1.1 Inspection Scope

The inspector reviewed the licensee's organizational structure to ensure that the licensee had sufficient staff and adequate managerial oversight for the work in progress.

1.2 Observations and Findings

The organizational requirements are described in Section 6.1, Facility Organization, of the Radioactive Materials Storage and Decommissioning Safety Analysis Report (RADSAR) and Section 4.0, Organization and Requirements, of the Rancho Seco Quality Manual (RSQM). Regulation 10 CFR 50.71 requires the licensee to maintain the RADSAR, while Technical Specifications require the licensee to implement the RSQM. In addition, the licensee developed Administrative Procedure RSAP-0101, "Nuclear Organization Responsibilities and Authorities," which included an organizational chart. The inspector compared the onsite organization to the requirements provided in the RADSAR, RSQM, and site administrative procedure. In summary, the inspector noted that site staffing was in compliance with license and procedure requirements.

At the time of the inspection, there were four onsite employees. The superintendent, Rancho Seco assets, was the highest ranking manager onsite. The remainder of the onsite staff included the assistant superintendent, senior project manager, and dosimetry technician. The superintendent also filled the position of radiation protection manager, while the assistant superintendent filled the position of alternate radiation protection manager. The manager, audit and quality services, was responsible for implementing the nuclear quality assurance (QA) program. The QA staff was located offsite but provided onsite support as necessary.

In addition to the four onsite employees, eight contractors provided support for the shipment of radioactive wastes. The contractors included three waste handlers, three radiation protection technicians, and two shipment facilitators. The licensee's corporate facilities group provided site support as needed including routine site maintenance, janitorial services, emergency preparedness support, and fire protection support. Finally, an onsite security staff continuously monitored the ISOB and the Independent Spent Fuel Storage Facility (ISFSI). The inspector confirmed that the licensee had sufficient staff for the work in progress including transportation and license compliance activities.

The training requirements are provided, in part, in the RADSAR. Section 6.2 of the RADSAR states that plant personnel are trained for their assigned duties. The inspector reviewed the training that the licensee provided to workers involved with waste handling and transportation activities. The training consisted of reading assignments, industrial safety reviews, general employee training for radiation protection, on the job training for cask handling, and function specific training for hazardous materials transportation. The licensee chose not to offer respiratory protection training because the radioactive material was contained within sealed liners. The licensee will reactivate its respiratory protection program if site staff has to handle loose radioactive material.

At the time of the June 2014 inspection, the licensee was in the process of training its staff. The inspector observed staff training for cask handling operations. Also, the licensee provided function specific training as required by U.S. Department of Transportation (DOT) regulation 49 CFR 172.704. The licensee completed and documented all training by mid-July 2014. The inspector confirmed that the licensee had conducted and documented training that met the intent of the NRC license and DOT regulations.

During the review of various management programs, the inspector noted that a significant number of the potential deviations to quality and QA audit findings appeared to remain open for extended periods of time. None of the open items appeared to be safety significant, but collectively, the number of open items suggests that the licensee's programs may require additional management attention. The licensee was aware of the problem and has taken steps to resolve the problem. The licensee developed a procedure to centralize the various program reviews. The licensee updated its corrective action program, and the licensee assigned additional staff to conduct technical reviews of the open items.

1.3 Conclusions

The licensee's staffing was in agreement with license and procedural requirements. The licensee had sufficient staff for the transportation-related work in progress. The licensee provided training to site staff in accordance with NRC and DOT requirements.

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

2.1 Inspection Scope

The inspector ascertained whether facility design changes, tests, experiments, and modifications are effectively conducted, managed, and controlled by the licensee.

2.2 Observations and Findings

a. Safety Screens and Evaluations

The inspector reviewed the licensee's safety evaluation program, conducted in accordance with 10 CFR 50.59 requirements. The licensee developed Nuclear Administrative Procedure RSNAP-091, Revision 0, "Safety Review of Proposed Changes, Tests, and Experiments," to control the evaluation process. The inspector reviewed three safety evaluations and various safety screens that the licensee had conducted in 2014.

The first evaluation involved a change to the PSDAR which was revised in March 2014. The licensee updated the decommissioning schedule and submitted the revised PSDAR to the NRC by letter dated April 1, 2014, in accordance with the requirements of 10 CFR 50.82(a)(7). The second evaluation included an administrative change to the RSQM. The third evaluation included a safety review of the revised radioactive material and waste shipment procedure. This procedure was updated to include current requirements for shipping Class B and C wastes. In all three situations, the licensee confirmed that it could make these changes without prior approval by the NRC.

The inspector also reviewed a number of safety screens. The licensee conducted these screens, in part, to determine if a full evaluation was necessary. Most safety screens involved procedure revisions. The inspector did not identify any screen that should have been a full evaluation. Further, the inspector noted that the licensee maintained a list of qualified reviewers, and this list was updated annually. In summary, the licensee conducted safety evaluations in accordance with regulatory and procedural requirements.

- b. (Closed) Non-cited Violation 050-00312/1307-01: Failure to perform 10 CFR 50.59 review on changes made to the fire protection system

During the June 2013 inspection, the NRC identified a non-cited violation associated with the licensee's failure to perform a safety evaluation in accordance with 10 CFR 50.59 requirements for changes made to the fire protection system. As documented in the RADSAR, one of the remaining analyzed accidents includes fires. The licensee entered this failure into its corrective action program as a potential deviation to quality. This potential deviation to quality (13-012) was issued in July 2013 and was closed in July 2014.

The licensee previously removed the electric fire pump from service, replaced the diesel fire pump, installed a new jockey pump and diesel fire pump day tank, and rerouted the fire alarms to the security alarm station. These changes were made, in part, to reflect the status of the site and reduced requirements for fire protection. For example, redundancy is no longer required since there are no remaining systems important to nuclear safety under the 10 CFR Part 50 license.

Since the previous inspection, the licensee updated the fire plan and conducted the 50.59 evaluation of the system changes. As part of its safety review, the licensee confirmed that the changes were in compliance with the 1995 Decommissioning Order and LTP. The licensee also confirmed that the current configuration complies with National Fire Protection Association codes and standards.

2.3 Conclusions

The licensee implemented its safety evaluation and safety screening program in accordance with regulatory and procedure requirements. An NRC-issued Non-cited Violation was reviewed and closed involving the licensee's previous failure to conduct a safety review prior to changing the fire protection program. The licensee subsequently added this failure to its corrective action program and conducted the required safety review.

3 **Self Assessment, Auditing, and Corrective Action (40801)**

3.1 Inspection Scope

The inspector evaluated the effectiveness of licensee controls for identifying, resolving, and preventing issues that degrade safety or the quality of decommissioning.

3.2 Observations and Findings

The inspector reviewed the licensee's implementation of its QA program including routine audits and surveillances. In addition, the inspector reviewed the licensee's planned implementation of its QA program during cask package loading and transportation activities.

The QA audit requirements are specified in Section XVIII of the RSQM. This section specifies the periodic audits to be conducted and the audit frequency. In addition, the RSQM states that regularly scheduled audits will be supplemented by special audits and surveillances when conditions exist that warrant special audits. Specific details for implementing the RSQM requirements are provided in site administrative procedures.

The inspector reviewed the licensee's implementation of its QA audit and surveillance program since the last inspection. The inspector noted that all required audits had been completed in a timely manner or were in progress. The licensee completed the radioactive waste audit during the inspection period, and the licensee started the radiation protection program audit.

The inspector reviewed two completed audits—the previous radiation protection program audit and the license/technical specifications compliance audit. The inspector noted that the radiation protection program audit was limited, commensurate with the reduced program requirements in effect at the time of the audit. The auditors did not identify any potential deviations from quality during these two audits.

The inspector reviewed the licensee's implementation of its QA surveillance program. Surveillances are used to supplement audits and are usually conducted to observe a certain activity related to quality. The licensee conducted three surveillances in 2013-2014. All three surveillances involved emergency preparedness exercises. The licensee also conducted one surveillance during the inspection period to review the first two radioactive shipments. The auditor did not identify any negative findings during the performance of this transportation-related surveillance.

The inspector reviewed the licensee's quality classifications for the shipping packages, because the quality classifications will dictate the QA requirements. The licensee plans to use up to three casks, two Type B casks that must comply with 10 CFR Part 71 requirements and one Type A cask that meets the General Design Requirements specified in 49 CFR 173.410. The licensee classified the Type B casks as QA Class 2, while the licensee classified the Type A cask as QA Class 3. The inspector noted that the licensee's classifications complied with the QA requirements specified in the RSQM.

Finally, the inspector noted that the licensee had developed and established a radioactive material shipment quality control checklist. The checklist will help ensure that all regulatory and procedure requirements had been met during each shipment. The inspector also reviewed a work plan that the licensee had developed to ensure that the loading and shipping operations were conducted in accordance with site procedures. The work plan provided the step-by-step sequence that the work has to be conducted. Although the work plan was not an approved document, the work plan provided value as a quality control check for the licensee's staff.

3.3 Conclusions

The licensee implemented a QA program as stipulated in the RSQM. The licensee's QA program included routine audits and surveillances of transportation activities.

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

4.1 Inspection Scope

The inspector evaluated whether the licensee and its contracted workforce were conducting decommissioning activities in accordance with regulatory and license requirements.

4.2 Observations and Findings

The inspector observed the licensee's staff conducting transportation-related work. The work included handling of the radioactive liners, packaging of the transportation casks, and preparing the cask packages for shipment. In summary, the licensee conducted the work in accordance with site procedures, and the work was conducted with an emphasis on industrial and radiation safety.

Just prior to the onsite inspection, the licensee experienced a crane failure in the IOSB. The failure was discovered during a preoperational check. The crane vendor subsequently determined that the failure was attributed to an inadequate electrical connection between two circuit boards. The crane was repaired and returned to service in mid-July 2014. The inspector confirmed that the licensee conducted daily preoperational checks of the crane in accordance with site procedures. The licensee also conducted daily grapple inspections. These grapples were needed for certain liners and for lifting storage cell covers.

The first step in the shipment cycle was the receipt inspection of the incoming cask package. The licensee conducted this inspection, in part, to visually inspect the package for damage and to ensure that the package did not contain radioactivity in excess of DOT limits. After the cask package was staged in the IOSB truck bay, the licensee then lifted the designated storage cell covers. These covers weighed 44,000 pounds each, the heaviest lift that the crane would encounter.

After the cell covers were lifted, the crane operator lifted and moved the chosen liner from the storage cell into the cask package. This evolution was critical because of the radiation exposures emanating from the liners. During this evolution, the licensee would lock down the building, preventing accidental entries by unsuspecting workers. The licensee also established a temporary radiological boundary outside of the building due to the high exposure rates of the liners. After placement of the liner into the cask, the licensee then installed the cover on the cask package which reduced the radiation levels to manageable levels within the IOSB. The crane operator then reinstalled the cover over the storage cell.

The NRC inspector noted that the licensee placed heavy emphasis on industrial and radiation protection safety during work activities. For example, the licensee's staff used long-handled tools as much as possible, due to the high radiation levels in the vicinity of

the open cask, and the licensee's staff used fall protection to prevent accidental falls while working around the cask.

After the cask cover was in place, the licensee's staff secured the cover by tightening the cover bolts with a torque wrench. The inspector verified the calibration of the primary torque wrench. The Model 8-120B cask also had three seals that had to be pressure tested, to comply with the certification requirements for the package. After the package had been assembled, the package was radiologically surveyed for compliance with DOT transportation limits. Finally, the licensee conducted a truck and trailer survey prior to release of the cask package for offsite transport.

The inspector surveyed two loaded cask packages and confirmed that both met the DOT radiological shipping limits. The inspector's survey results, using a Ludlum Model 2401-EC2 survey meter (NRC No. 21450G, calibration due date of 11/07/14), was comparable to the licensee's measurements. The inspector also confirmed the placarding, marking, and labeling on each package and associated trailer were in compliance with procedure requirements. In summary, the inspector confirmed that the two cask packages had been packaged and prepared for shipment in accordance with regulatory requirements and site procedures.

4.3 Conclusions

The licensee packaged and shipped radioactive material in accordance with regulatory and procedure requirements. The licensee conducted package loading operations with an emphasis on industrial and radiation protection safety.

5 **Occupational Exposure (83100)**

5.1 Inspection Scope

The inspector reviewed occupational radiation exposures to verify compliance with regulatory requirements.

5.2 Observations and Findings

The radiation protection program requirements are provided in Section 5.9 of the RADSAR. The primary radiological hazard to site workers was external exposures from stored wastes. The principle radionuclides of concern included cobalt-60, cesium-134, and cesium-137. The radioactive wastes were stored in 23 canisters/liners in eight secured high-radiation areas at the IOSB. Access to the storage cells required the use of the overhead crane. For this reason, site workers had limited access to high radiation areas.

Regulation 10 CFR 20.1502 requires licensees to conduct individual monitoring of external and internal occupational doses if workers are likely to receive a dose in excess of 10-percent of the limits in a year. Prior to June 2014, the licensee monitored employees using self-reading pocket dosimeters since occupational exposures were not expected to exceed 25 millirems per year. The licensee also issued optically stimulated dosimeters to certain workers on an as-needed basis.

The inspector reviewed the licensee's occupational exposure records for 2013. The highest pocket dosimeter reading in 2013 was 10 millirem, a dose that was well below the 5,000 millirem (5 rem) annual total effective dose equivalent limit specified in 10 CFR 20.1201(a). In addition, three individuals were issued optically stimulated luminescence dosimeters in 2013. The dosimeters were exchanged quarterly and sent to the manufacturer for analysis. Based on the manufacturer's sample results, no individual received a measurable dose in 2013. In summary, the licensee's records for 2013 indicate that occupational exposures were small fractions of the regulatory limits.

The inspector reviewed the licensee's radiation work permits (RWPs) for 2012-2014. In accordance with the RADSAR, RWPs are used to administratively control access to the radiologically restricted area. The licensee also conducted quarterly surveys of the IOSB. The inspector reviewed two surveys that were conducted in 2014. No abnormal radiation or radioactivity levels were identified. No loose contamination was identified by the licensee in areas routinely accessible to workers.

The inspector reviewed the licensee's records for monitoring ambient environmental gamma radiation levels. The licensee measured ambient gamma radiation levels within the IOSB at 11 locations using optically stimulated luminescence dosimeters. The dosimeters were exchanged quarterly. The highest quarterly dose was 38 millirems. This measurement was obtained from a dosimeter located inside the IOSB near the radioactive waste storage cells, an area that was not routinely visited by site staff.

During June 2014, the licensee began issuing optically stimulated luminescence dosimeters to workers, in addition to pocket dosimeters, to monitor and record occupational doses during radioactive waste handling and shipping operations. The licensee plans to continue using dosimetry throughout the shipping campaign since the workers have the potential to receive greater than 10-percent of the occupational dose limits. The NRC inspector will review these occupational exposure measurements during a future inspection.

The licensee conservatively estimated that total exposures may reach 3.225 person-rem during shipping operations, although actual occupational exposures should remain below this predicted value. Most exposures are predicted to occur during evolutions involving a loaded cask prior to installing the cask lid.

The licensee developed RWP 14-105 to support the radioactive waste shipping and cask handling operations. The inspector reviewed the RWP and determined that it provided sufficient instructions for protecting employees. For example, the RWP includes instructions for using long-handled tools and requiring radiation protection staff support during liner movement and shipping preparations.

Prior to actually loading liners into cask packages, the licensee conducted a functional test with the most radioactive liner containing reactor vessel internals. The licensee lifted the liner and measured the dose rates inside and outside of the IOSB. Based on these measurements, the licensee decided to erect temporary radiological boundaries outside of the building during liner handling operations.

Although the licensee doesn't expect to encounter any loose radioactivity, the licensee elected to conduct particulate air sampling during cask and liner handling operations. The licensee installed a particulate air sampler adjacent to the cask to measure airborne

radioactivity during work activities. The licensee plans to exchange the air filter daily, to help ensure that any unanticipated airborne radioactivity in the vicinity of the work is quickly identified.

Finally, Appendix A, Section 1.5.2.2 of the RSQM states that the annual exposure report for the previous year shall be submitted to the NRC within the first calendar quarter of each calendar year. The licensee's report for 2012 was submitted to the NRC in late-April 2013, about one month late. This error was identified and corrected by the licensee. The report for 2013 was submitted to the NRC in a timely manner in late-March 2014.

5.3 Conclusions

The licensee implemented a radiation safety program that was in compliance with regulatory and license requirements. Occupational exposures for 2013 were well below regulatory limits. The licensee implemented radiological controls to help reduce occupational exposures during cask loading operations.

6 Radioactive Waste Treatment, and Effluent and Environmental Monitoring (84750)

6.1 Inspection Scope

The inspector reviewed the licensee's program to control, monitor, and quantify releases of radioactive materials to the environment in liquid, gaseous, and particulate forms.

6.2 Observations and Findings

The licensee is required to implement radioactive effluent controls and radiological environmental monitoring programs in accordance with Section D6.0 of Technical Specifications and Section 1.4.3 of Appendix A to the RSQM. Further, annual reports for each program are required to be submitted to the NRC in accordance with Section 1.5 of the RSQM.

The inspector reviewed the annual radioactive effluent release reports for calendar years 2012 and 2013. These reports provide a summary of gaseous and liquid effluent releases during the last two years. As noted earlier, the footprint of the 10 CFR Part 50 license was reduced to the IOSB and the land immediately adjacent to the IOSB. During 2012-2013, the licensee continued to store wastes in sealed liners in the building. Because there were no radioactive liquid or gaseous releases during the reporting period, the radiological limits specified in the Offsite Dose Calculation Manual (ODCM), 10 CFR Part 20, Appendix B and 10 CFR Part 50, Appendix I were not exceeded. The inspector noted that the licensee submitted the required reports by the deadline specified in the RSQM.

The inspector also reviewed the licensee's annual radiological environmental operating reports for 2012-2013. These reports provide the estimated doses to members of the public based on potential external exposures from radioactive material being stored in the IOSB and the nearby ISFSI. Because the radioactive material remained sealed within liners or canisters at the two locations, the only remaining exposure pathway from these two locations was the direct radiation pathway.

The licensee conducted environmental monitoring using optically stimulated luminescence dosimeters. The licensee also used control dosimeters to measure ambient exposures from background sources. The licensee's program consisted of dosimeters in 14 various locations within two miles of the site. The dosimeters were exchanged quarterly. The licensee's records indicate that all doses were within 1-2 millirems of background in 2012. During 2013, the doses ranged from background to about 20 millirems above background near the ISFSI fence. All dosimeter readings remained below the 100-millirem public dose limit specified in 10 CFR 20.1301(a).

The inspector discussed the licensee's discrepancies between background measurements for 2012 versus 2013. Procedure SP.861, "Quarterly Sampling of Direct Radiation," Revision 2, requires the monitoring control dosimeters to be stored in a low background area. The licensee used a steel-lined safe as the low background area in 2012. The licensee chose to use the steel-lined safe because the previous location was abandoned as part of site decommissioning. However, the licensee subsequently determined that the steel-lined safe was not as effective as lead-shielded storage. The licensee relocated the control dosimeters to lead-shielded storage in 2013. This change in storage locations resulted in a change in the background readings. Regardless, the continued storage of radioactive material in the IOSB and at the ISFSI resulted in little dose to members of the public.

Finally, the inspector reviewed the licensee's monitoring of building ventilation exhaust air during cask loading operations. Section 5.3 of the RADSAR states that, if processing or repackaging of radioactive material is required that has the potential for radioactive particulate releases, then the ventilation exhaust from the IOSB will be sampled in accordance with the ODCM. Because the licensee was handling sealed liners, the licensee concluded that building ventilation was not required to be monitored. However, the licensee voluntarily decided to monitor the exhaust air in accordance with the ODCM.

When sampling the IOSB building exhaust air, the ODCM requires that a particulate sampler and a sampler flow rate measuring device be in service. The inspector noted that the licensee had installed and was operating a particulate air sampler with flow measuring device on the mezzanine level of the IOSB. The licensee started air sampling in late-June 2014, prior to commencement of transportation activities. The licensee exchanged the air filters on a weekly basis. The licensee analyzed the filters for alpha particulate activity and beta-gamma radioactivity levels. At the conclusion of the onsite inspection, none of the air sample results had exceeded the lower limit of detection specified in the ODCM. The inspector will review the licensee's air sample results during a future inspection.

6.3 Conclusions

The licensee continued to monitor radiation exposures to members of the public from the radioactive material in storage at the site. Public doses from licensed operations continued to remain below regulatory limits. The licensee continued to report the effluent and environmental monitoring programs to the NRC in accordance with license requirements. The licensee voluntarily sampled the IOSB exhaust air to confirm that operations involving radioactive material were not creating an airborne radiological hazard.

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

7.1 Inspection Scope

The inspector reviewed the licensee's ability to properly process, package, store, and ship radioactive wastes.

7.2 Observations and Findings

a. Review of Transportation Casks

The inspector reviewed the licensee's selection of certain casks to ship the Class B and C wastes for processing and disposal at an authorized waste disposal site in Texas. The licensee had two casks onsite during the inspection, and a third cask was available as necessary to support transportation activities. In summary, the inspector confirmed that the cask packages selected by the licensee were qualified for the types of radioactive material to be shipped.

The first package was the Model 8-120B cask. This cask is licensed by the NRC under Certificate of Compliance No. 9168 as a Type B package in accordance with the requirements specified in 10 CFR Part 71. The licensee is a registered user of this cask. The cask packaging is a carbon steel-encased, lead-shielded cask with a pair of foam-filled impact limiters installed on each end of the cask.

To comply with the certification requirements as a Type B shipping container, the licensee had to follow the vendor procedure for package closure including performance of three pressure tests. The primary and secondary lids on the cask have O-rings that must be pressured tested prior to shipment of the cask. In addition, the vent port pressure seal had to be tested prior to shipment. The cask vendor provided on-the-job training to site workers during the inspection that demonstrated how to conduct these pressure tests.

The 8-120B cask can also be used as a Type A or industrial package per regulation 49 CFR 173.411(b)(2) as long as the respective package requirements are met, including the marking and labeling requirements.

The second package was a Model 14-215H, Type A shipping cask. This package is certified for use as a Type A, industrial, or General Design Requirements package. This cask does not require user registration but the licensee must maintain documentation of the performance criteria for the type of package being used. The licensee used the cask as a General Design Requirements package as specified in 49 CFR 173.410. This cask was previously licensed by the NRC under Certificate of Compliance No. 9176, but the certification expired in 1999 when the NRC stopped licensing Type A packages. The licensee has to comply with the vendor's closure requirements which include a container inspection and torquing requirements for the cover bolts. The 14-215H cask package also has primary and secondary lids, but there are no pressure test requirements for this package.

The licensee also has a third cask in standby, in case it's needed for shipment of wastes. This cask, a Model 10-160B cask, is registered with the NRC under Certificate

of Compliance No. 9204. This cask package is similar to the Model 8-120B package but is slightly larger in size. The licensee will use this cask for liners that may not fit properly in the 8-120B cask due to skewing. If the licensee elects to use the Model 10-160B cask, it will have to install shoring within the cask as necessary to keep the liner stabilized for shipment.

Finally, the inspector reviewed the licensee's assessment of the contents of the 23 liners, an assessment that was conducted to ascertain the waste classification, shipment type, and cask packaging requirements. Based on the licensee's analysis, 11 liners are scheduled to be shipped in the Model 14-215H cask package, and 12 liners are scheduled to be shipped in the Model 8-120B cask package. The licensee's decision was based, in part, on the liner radiation levels at three meters, to comply with the regulatory requirements of 49 CFR 173.427. The inspector reviewed the licensee's assessment and agreed with the licensee's conclusions for cask packages. In summary, the cask packages appear appropriate for the radioactive material being transported.

b. Review of Shipping Papers

The inspector reviewed two sets of shipping papers for compliance with DOT regulations and site procedures. One set of shipping papers consisted of the documentation prepared for a shipment in the Model 8-120B cask package, and the second set of shipping papers consisted of documentation prepared for a shipment in the Model 14-215H cask package. The inspector also reviewed the procedure that the licensee recently updated specifically to address the shipping requirements for Class B and C wastes. In summary, the inspector noted that the shipping papers were developed in accordance with procedure requirements, and the procedure provided guidance that was consistent with DOT and NRC regulations.

The inspector noted that each set of shipping papers included cask receipt inspections, loaded cask surveys, and truck/trailer surveys. The documentation included exclusive use shipment and emergency response instructions. The radiation levels were found to be in compliance with regulatory and procedure requirements for each type of package. Both packages were subsequently returned to the site as DOT "Empty" packages. In summary, the inspector concluded that the licensee's shipping papers complied with NRC and DOT regulatory requirements.

7.3 Conclusions

The licensee selected cask packages that were appropriate for the material being shipped. The licensee maintained and shipped these cask packages consistent with procedure and regulatory requirements. The licensee developed and maintained comprehensive sets of shipping papers that complied with procedure and regulatory requirements.

8 Exit Meeting

The inspector presented the preliminary inspection scope and findings at the conclusion of the first onsite inspection on June 25, 2014. At the conclusion of the second onsite week an exit briefing was conducted with you and other members of your staff on July 30, 2014. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Sacramento Municipal Utility District

P. Barringer, Facilitator, Newex
R. Gaines, Dosimetry Technician
R. Jones, Quality Assurance Engineer
D. Koontz, Senior Project Manager
E. Ronningen, Superintendent
R. Snyder, Facilitator, Newex
D. Tallman, Assistant Superintendent

INSPECTION PROCEDURES USED

IP 36801	Organization, Management, and Cost Controls at Permanently Shutdown Reactors
IP 37801	Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
IP 40801	Self Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors
IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83100	Occupational Exposure During SAFSTOR and DECON
IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 86750	Solid Radioactive Waste Management and Transportation of Radioactive Materials

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

050-00312/1307-01	NCV	Failure to perform 10 CFR 50.59 review on changes made to the fire protection system
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Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
IOSB	Interim Onsite Storage Building
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PSDAR	Post-Shutdown Decommissioning Activities Report
QA	quality assurance
RADSAR	Radioactive Materials Storage and Decommissioning Safety Analysis Report
RSQM	Rancho Seco Quality Manual
RWP	radiation work permit