



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

December 16, 2015

Mr. Thomas J. Palmisano, Vice President
and Chief Nuclear Officer
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INSPECTION
REPORT 050-00361/15-011; 050-00362/15-011

Dear Mr. Palmisano:

This refers to the inspection conducted from November 16-19, 2015, at your permanently shut down San Onofre Nuclear Generating Station facility, Units 2 and 3. The purpose of the inspection was to determine whether decommissioning activities were being conducted safely and in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements. The inspection results were discussed with you and members of your staff at the conclusion of the onsite inspection on November 19, 2015.

During this inspection, the NRC staff examined activities conducted under your license as they relate to public health and safety to confirm compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of this inspection. No violations were identified and no response to this letter is required.

In accordance with Title 10 *Code of Federal Regulations* 2.390 (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 document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

If you have any questions concerning this inspection, please contact Dr. Robert Evans, Senior Health Physicist, at 817-200-1234, or the undersigned at 817-200-1106.

Sincerely,

/RA/

Mark R. Shaffer, Director
Division of Nuclear Materials Safety

Docket No. 50-361, 50-362
License No. NPF-10, NPF-15

Enclosure:
NRC Inspection Report 050-00361/15-011;
050-00362/15-011
w/Attachment: Supplemental Information

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NAME	RJEvans	RSBrowder	RLKellar	MRShaffer
SIGNATURE	<i>/RA/</i>	<i>/RA/</i>	<i>/RA/E-Browder</i>	<i>/RA/</i>
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Letter to Thomas J. Palmisano from Mark R. Shaffer, dated December 15, 2015

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION – NRC INSPECTION
REPORT 050-00361/15-011; 050-00362/15-011

DISTRIBUTION:

Regional Administrator (Marc.Dapas@nrc.gov)
Deputy Regional Administrator (Kriss.Kennedy@nrc.gov)
DNMS Director (Mark. Shaffer@nrc.gov)
DNMS Deputy Director (Linda.Howell@nrc.gov)
Branch Chief, DNMS/FCDB (Ray. Kellar@nrc.gov)
Senior Health Physicist, FCDB (Robert.Evans@nrc.gov)
Senior Health Physicist, FCDB (Rachel.Browder@nrc.gov)
RIV Public Affairs Officer (Victor.Dricks@nrc.gov)
NMSS/DUWP/RDB Project Manager (Marlayna.Vaaler@nrc.gov)
Branch Chief, NMSS/DUWP/RDB (Bruce.Watson@nrc.gov)
RIV RITS Coordinator (Marisa.Herrera@nrc.gov)
RIV Regional Counsel (Karla.Fuller@nrc.gov)
Congressional Affairs Officer (Jenny.Weil@nrc.gov)
RIV Congressional Affairs Officer (Angel.Moreno@nrc.gov)
RIV/ETA: OEDO (Cindy.Rosales-Cooper@nrc.gov)
RIV RSLO (Bill.Maier@nrc.gov)

cc: w/enclosure:

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

Dr. Robert B. Weisenmiller, Chair
California Energy Commission
1516 Ninth Street (MS 34)
Sacramento, CA 95814

Mr. Lou Bosch, Plant Manager
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

Mr. W. Mathews III, Esquire
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

Mr. Jim Madigan, Technical Advisor
Oversight & Nuclear Safety Concerns
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

Mr. Jim Kay, Regulatory Affairs
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

Ms. Kelli Gallion, Manager, EP Planning
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, CA 92674-0128

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

Dockets: 50-361, 50-362

Licenses: NPF-10, NPF-15

Reports: 050-00361/15-011; 050-00362/15-011

Licensee: Southern California Edison

Facility: San Onofre Nuclear Generating Station, Units 2 and 3

Location: 5000 S. Pacific Coast Highway
San Clemente, California 92674

Dates: November 16-19, 2015

Inspectors: Robert J. Evans, Ph.D., C.H.P., P.E., Senior Health Physicist
Fuel Cycle & Decommissioning Branch
Division of Nuclear Materials Safety

Rachel S. Browder, C.H.P., Senior Health Physicist
Fuel Cycle & Decommissioning Branch
Division of Nuclear Materials Safety

Approved By: Ray L. Kellar, P. E., Chief
Fuel Cycle & Decommissioning Branch
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Southern California Edison
NRC Inspection Report 050-00361/15-011; 050-00362/15-011

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the San Onofre Nuclear Generating Station. In summary, the licensee was conducting decommissioning activities in accordance with site procedures, license requirements, and regulations.

Organization, Management, and Cost Controls

- The licensee's organization was being maintained in accordance with regulatory and license requirements. The licensee had established oversight and controls of the contractor's programs to ensure that activities were being conducted in accordance with regulatory requirements and license conditions. (Section 1.2)

Spent Fuel Pool Safety

- The Units 2 and 3 spent fuel pools were being maintained in accordance with technical specifications and procedural requirements. The licensee discovered that it may have operated one spent fuel pool in an unanalyzed condition due to low pool water temperature. The licensee formally notified the NRC about the incident. The licensee plans to implement corrective actions including reanalysis of the low temperature limitation. The inspectors will review the licensee's corrective actions during a future inspection. (Section 2.2)

Decommissioning Performance and Status Review

- The licensee continued to implement the cold & dark modifications in accordance with Post-Shutdown Decommissioning Activities Report requirements. The licensee also continued to install the spent fuel pool islanding equipment, although the licensee cannot remove the permanent plant equipment from service until the NRC has reviewed and approved a proposed change in system seismic qualifications. (Section 3.2.a)
- The licensee continues to install and implement the mitigation strategies as required by the two licenses. The licensee has staged equipment and conducted timed tests, to demonstrate that it can implement the mitigation strategies in response to an initiating event. The licensee also established and implemented surveillances to ensure that equipment is available in response to an event. (Section 3.2.b)
- The licensee continued to plan for the construction of the synchronous condenser. The licensee established survey plans and implementing procedures based on NRC-accepted guidance for final status surveys. The construction work is expected to begin in early 2016, and the NRC will review the licensee's implementation of its survey plans during future inspections. (Section 3.2.c)
- The inspectors conducted site tours within the radiologically restricted areas and concluded that the licensee was maintaining the areas in accordance with radiation protection procedures and regulatory requirements. (Section 3.2.d)

Radioactive Material Handling

- The licensee continued to implement technical specifications requirements for radioactivity in outdoor storage tanks. The licensee established and implemented a surveillance program to ensure that the outdoor storage tanks contained less radioactivity than allowed by technical specifications. The inspectors confirmed that the licensee had established and implemented a conservative action level for ensuring that outdoor tanks contained radioactivity limits within technical specification limits. (Section 4.2)

Transportation Activities

- The licensee continued to perform transportation activities in accordance with regulatory requirements. (Section 5.2)

REPORT DETAILS

Site Status

The licensee elected to permanently shut down the SONGS facility in June 2013. At the time of this inspection, the licensee continued to prepare for future site decommissioning in accordance with guidance provided in the Post-Shutdown Decommissioning Activities Report (PSDAR) dated September 23, 2014 (ADAMS accession number ML14269A033). Current work in progress included construction of “cold & dark” modifications that incorporated a stand-alone electrical ring bus, a new switchgear room, and approximately 70,000 feet of cabling to support electrical power needs during decommissioning. The licensee also continued to construct the spent fuel pool (SFP) islanding equipment in accordance with the PSDAR and with the commitments made in its license amendment request dated August 20, 2015 (ML15236A018). During the onsite inspection, the licensee was preparing for fuel examination activities, work that was scheduled to begin in late-November 2015. Further, the licensee continued to conduct routine operations, maintenance and surveillance activities, and environmental monitoring as required by the two licenses.

1 Organization, Management, and Cost Controls (36801)

1.1 Inspection Scope

The inspectors reviewed management organization and controls to ensure that the licensee was maintaining effective oversight of decommissioning activities.

1.2 Observations and Findings

The organizational structure is provided in Figure 13.1-2, Nuclear Site Management, from the Updated Final Safety Analysis Report (UFSAR) and in the Decommissioning Quality Assurance Program, Appendix A. The licensee has an organizational structure that reflects the organization in these licensing documents. The licensee has filled the positions identified in its organizational structure.

The licensee is transitioning towards a structure that allows a contracted workforce to perform the work activities with licensee oversight. For some of the contractor organizations currently onsite, they maintain their own training program, radiological coverage and monitoring, corrective action program, event response, and/or quality assurance program. The licensee has reviewed and approved these programs to ensure there is adequate interface with the licensee’s program to ensure continued compliance with regulatory requirements and license conditions.

For example, the licensee reviewed and approved the cold & dark project contractor’s corrective action program. The licensee initially identified some implementation and coordination issues. These issues were resolved by assigning an individual the responsibility of directly interfacing with the contractor’s representative to ensure corrective actions were identified at the same threshold as the licensee’s criteria, and that the actions were captured in the licensee’s corrective action program in a timely manner. Therefore, all contractor’s corrective actions were assigned a Nuclear Notification number under the licensee’s program for tracking purposes.

The licensee's corrective action program was utilized for any action determined to be a level 1 (significant condition adverse to quality) or level 2 (condition adverse to quality) significance, as screened by the licensee's Management Review Committee (MRC) in accordance with licensee Procedure SO123-XV-50, "Corrective Action Program," Revision 34. For business issues identified as levels 3-5 significance by the MRC, the committee determined whether the issue would be processed through the licensee's corrective action program, or would be processed through the contractor's corrective action program. Once completed, the issued was closed in both programs.

The inspectors observed an MRC meeting. It was noted that the contractor's representative readily participated in the meeting. The licensee's attendees were prepared and knowledgeable of the actions being reviewed.

The inspectors reviewed Nuclear Notifications 203279449 and 203288536, which involved water intrusion into Switchboard 01 during the component installation phase. This switchboard supports the cold & dark project's new electrical system. The contractor identified the initial condition report in accordance with its Event Response Plan dated July 8, 2015. The condition report was entered into the licensee's corrective action program and assigned Nuclear Notification 203279449 on the same day. During the required MRC meeting, Nuclear Notification 203279449 was assigned a level 3 significance and assigned to the contractor to complete the corrective action. The inspectors observed that the corrective actions had been completed, including the re-routing of the cut piping to a functional floor drain, the source of the water intrusion. The licensee subsequently created Nuclear Notification 203288536, to address the material management issue of the equipment. Again, the MRC reviewed the package and assigned a level 3 significance, which is consistent with the licensee's Procedure SO123-XV-50.

The inspectors observed that the licensee's oversight of the contractor's corrective action program was closely monitored, reviewed and evaluated, through individual communications, the MRC, and by the corrective action program manager. The licensee is expected to continue to identify opportunities for improvements in the oversight of the contractor's programs. These efforts can be utilized in the future when overseeing the decommissioning general contractor.

The licensee continues to maintain an Onsite Review Committee and Nuclear Oversight Board. The licensee's procedures SO123-XV-60.1, "Onsite Review Committee (OSRC)" Revision 16, and SO123-XII-18.18, "Nuclear Oversight Board Functions and Responsibilities," Revision 7, address the responsibilities and functions of these two organizations. The inspectors reviewed the last meeting minutes of the Onsite Review Committee, conducted on August 19, 2015, and the last board meeting of the Nuclear Oversight Board dated September 14-17, 2015.

1.3 Conclusions

The licensee's organization was being maintained in accordance with regulatory and license requirements. The licensee had established oversight and controls of the contractor's programs to ensure that activities were being conducted in accordance with regulatory requirements and license conditions.

2 Spent Fuel Pool Safety (60801)

2.1 Inspection Scope

The inspectors conducted a review of Units 2 and 3 SFP water level, chemistry, and associated cooling systems to ensure that the licensee was maintaining the two pools in accordance with technical specifications and procedural requirements. The inspectors also reviewed the licensee's formal notification to the NRC about its discovery that it may have operated at least one SFP in an unanalyzed condition.

2.2 Observations and Findings

a. Review of SFP Water Level and Chemistry

Technical Specifications 3.1.1 and 3.1.2 provide the SFP water level requirement of greater than 23 feet over the top of irradiated fuel assemblies and boron concentration requirement of greater than or equal to 2,000 parts per million (ppm) for Units 2 and 3. Additional chemical control specifications for the SFPs are provided in Chemistry Procedure SO123-III-1.1.23, "Chemical Control of SONGS Plant Systems," Revision 64.

The inspectors conducted a walk down of the Units 2 and 3 SFPs. At the time of the inspection, both pools were greater than 23 feet over the top of the fuel. The boron concentration for Unit 2 was 2,802 ppm and Unit 3 was 2,777 ppm, which satisfactorily meets the technical specification limitation. In summary, the Units 2 and 3 SFPs were being maintained in accordance with technical specifications requirements.

The inspectors reviewed the licensee's chemical control of the SFPs. The licensee established a chemistry program for the SFP chemistry in accordance with Procedure SO123-III-1.1.23, "Chemistry Procedure," Revision 64, to maintain parameters within the Units 2 and 3 Permanently Defueled Technical Specifications. The licensee performs weekly samples for boron concentration. The inspectors reviewed the period from January 1 through November 17, 2015, and concluded that the samples were collected and the boron concentrations were maintained in the normal range of greater than 2,600 ppm, as specified by the procedure.

The licensee's Updated Final Safety Analysis Report (UFSAR) states that the radiation level of the SFP area is ≤ 2.5 millirem per hour. In support of this expectation, the licensee's Procedure SO123-III-1.1.23 provides an isotopic activity parameter for the SFPs, which is tested weekly. The inspectors reviewed the isotopic activity for the Units 2 and 3 pools. The procedure indicated that the normal range for the isotopic activity is $\leq 1.0 \text{ E-3}$ microcuries per milliliter ($\mu\text{Ci/ml}$). The data for both pools has trended upwards since February 2014, when the licensee discontinued use of the SFP cleanup system. The activity for Unit 2 was 1.5 E-3 $\mu\text{Ci/ml}$ and Unit 3 was 6 E-4 $\mu\text{Ci/ml}$. The inspectors noted that the area dose rates around each SFP was at background levels. The licensee plans to use portable, submersible skids to clean the pool water as needed; otherwise, the radiation levels around each of the SFPs remains ≤ 2.5 millirem per hour, as stipulated in the UFSAR.

In addition, the licensee analyzed other chemical constituents on a monthly or quarterly basis, as required by Procedure SO123-III-1.1.23. The inspectors reviewed the sampling data from January 1 through November 17, 2015, and concluded that the

samples for the chemical constituents, such as chloride, fluoride, sulfate, aluminum, etc., were maintained within the normal ranges as stipulated in the chemistry procedure.

b. Operation of SFP in Unanalyzed Condition (Licensee Event Report EN 51554)

On November 19, 2015, the licensee formally notified the NRC that it may have operated at least one of two SFPs in an unanalyzed condition. The licensee notified the NRC in accordance with the requirements of 10 CFR 50.72(b)(3)(ii)(B). The licensee made the notification after it recognized that it had allowed the Unit 2 SFP temperature to drop below the temperature range analyzed in the UFSAR.

Regulation 10 CFR 50.68 provides the requirements for criticality accident analyses. Section 9.1.2.3, Safety Evaluation, in the UFSAR provides the criticality acceptance criteria and conditions that are assumed in meeting this design basis. One such condition is the analyzed range in pool temperature. The UFSAR provided a range of 68-160 degrees Fahrenheit.

The licensee recently recognized that it allowed the Unit 2 SFP temperature to drop below 68 degrees Fahrenheit, an unanalyzed condition. This problem was identified during the licensee's review of the SFP islanding equipment and how the system will control temperature, in particular, the temperature range (low to high) for routine operations. Due to low decay head load and cool ocean temperatures, the temperature in the Unit 2 SFP dropped to at least 66.5 degrees Fahrenheit. The licensee planned to review historical temperature records for both pools, to identify other instances when pool temperature dropped below 68 degrees Fahrenheit.

At the time of the inspection, the Unit 2 SFP temperature was 70 degrees Fahrenheit, while the Unit 2 SFP temperature was 69.5 degrees Fahrenheit. There is no procedural limit for low temperature, in part, because the licensee did not consider low temperature to be a credible operational event.

In the short term, the licensee plans to reanalyze the low temperature limit. Early reviews suggest that the lowest allowed temperature will be around 50 degrees Fahrenheit. According to the licensee's staff, this reanalysis should demonstrate that the criticality acceptance criteria specified in regulation 10 CFR 50.68 were met at all times.

Also in the short term, the licensee plans to revise site procedures to allow operators to secure the permanent plant SFP cooling system to maintain a temperature range from the low 70's to about 80 degrees Fahrenheit. In the longer term, the SFP islanding equipment is designed to control pool temperature in a pre-determined temperature band.

In accordance with regulation 10 CFR 50.73(a), the licensee plans to submit a 60-day licensee event report to the NRC on or about January 18, 2016. The NRC inspectors will review the licensee's analysis and written response to this unanalyzed condition during a future inspection, and evaluate the event against the NRC Enforcement Policy, as applicable.

2.3 Conclusions

The Units 2 and 3 spent fuel pools were being maintained in accordance with technical specifications and procedural requirements. The licensee discovered that it may have operated one spent fuel pool in an unanalyzed condition due to low pool water temperature. The licensee formally notified the NRC about the incident. The licensee plans to implement corrective actions including reanalysis of the low temperature limitation. The inspectors will review the licensee's corrective actions during a future inspection.

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

3.1 Inspection Scope

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

3.2 Observations and Findings

a. Review of Cold & Dark Modifications and SFP Islanding

Section II of the PSDAR provides an overview of the planned decommissioning activities. These activities include site modifications as necessary to support future decommissioning and decontamination efforts. One such modification specifically mentioned in Section II.A of the PSDAR is the planning, design, and implementation of cold & dark. The licensee plans to have all cold & dark modifications in place by March 2016. The inspectors reviewed the status of the licensee's efforts to implement the cold & dark modifications.

As of November 2015, the priority work included installation of the 12-kilovolt electrical ring bus, electrical switchgear, and SFP makeup system. The ring bus work included installation of electrical cables, panels, raceways, and cabinets. The 12-kilovolt line was mostly installed. The licensee had a target date of late-November 2015 for energizing the ring bus. Two backup diesel generators (500-kilowatt and 1500-kilowatt) were onsite but were not connected to the ring bus. In addition, the licensee was nearing completion of the installation of the electrical panels in the 37-foot elevation of the radwaste building. The electrical panels will convert the 12-kilovolt incoming power to 480/120-volt power for distribution into the plant. The new electrical distribution system is highlighted by orange cabling that easily stands apart from the permanent plant electrical distribution systems that will be decommissioned.

In addition to the electrical distribution work, the licensee was installing a new SFP makeup system in each unit. The purpose of the SFP makeup system in each unit is to provide demineralized makeup water to the SFP from the existing primary makeup water tank. The planned work consisted of reusing two existing plant pumps, installing a new high-capacity makeup pump, and installing the associated piping, valves, and instrumentation.

Other cold & dark work in progress included the installation or modification of the command center, security power, telecommunications, fire detection, sump drainage,

salt water dilution, and building ventilation. Work that has been deferred include the modification of the health physics/chemistry laboratory and fire suppression system.

The inspectors reviewed the licensee's efforts to implement the SFP islanding equipment. The licensee planned to isolate each SFP by removing the permanent plant equipment from service and installing skid-mounted equipment to cool and clean the SFP water on an interim basis. The licensee was actively installing the two systems, one per unit, including system piping, electrical distribution, and instrumentation. The construction efforts appeared to be high quality, and the work was being conducted with an emphasis on safety. The inspectors noted that the licensee, the contractor, and the various crafts were conducting the work in an integrated manner.

By letter dated August 20, 2015 (ML15236A018), the licensee submitted a license amendment request, in part, to change the seismic design classification for the SFP islanding equipment. Although the SFP islanding equipment was still being constructed during the onsite inspection, the inspectors compared the proposed system design and operating parameters to the commitments made by the licensee in its letter to the NRC. The inspectors noted that the design parameters (flow, pressure, cooling capacity) were in agreement with the design specifications provided by the vendor for the equipment. However, the inspectors noted that the licensee's commitment for suction line design may not be the same as planned to be constructed in the field. In response, the licensee issued Nuclear Notification 203290098 to review the potential discrepancy in design and to identify corrective actions necessary to resolve the potential discrepancy. The inspectors will continue to review the licensee's construction of the SFP islanding equipment during future inspections.

The inspectors discussed operation of the SFP islanding equipment with licensee staff. The licensee plans to start using the SFP islanding equipment when construction and startup testing is complete. The licensee developed operating procedures for the systems, but the procedures were in draft during the onsite inspection. When the SFP islanding equipment is placed into service, the licensee plans to secure the permanent plant equipment. The permanent plant equipment will remain in a functional condition, ready for use as needed, until the NRC approves the license amendment request for the change in seismic classifications. After approval of the license amendment, the licensee plans to remove the permanent plant equipment from service, and SFP cooling will be provided by the SFP islanding skids until all fuel is removed from the respective pools.

b. Review of Mitigation Strategies

Each of the two licenses has a condition that requires the licensee to develop and maintain strategies for addressing large fires and explosions. The strategies include the fire-fighting response strategy, operations to mitigate fuel damage, and actions to minimize releases of radioactive material. The licensee developed Procedure SO23-V-5.100, "SONGS Mitigation Strategies," Revision 14, to implement the license requirements. This procedure provides instructions and strategies in response to a large fire, explosion, or other event that results in extensive plant damage. The inspectors conducted a review of the licensee's implementation of its mitigation strategies, in particular, the licensee's implementation of its mitigation strategies for the SFP and for fighting fires.

The licensee's fire-fighting response strategy includes an onsite incipient fire brigade. If a fire is discovered in the incipient phase, the onsite fire brigade will attempt to extinguish the fire. If the fire is beyond the incipient phase, the licensee will notify offsite sources (county or military) for onsite support. If the fire activates onsite fire suppression equipment or if water is needed for onsite use, the fire suppression header is sectionalized and certain sections can be isolated to separate damaged sections from functional sections. If a major event were to occur, the mitigation strategies site procedure stipulates that the onsite incident commander and incipient fire brigade leader will determine the priority of fire water use, depending on whether water is also needed for SFP mitigation strategies.

The inspectors toured the licensee's fire water equipment, including equipment staged for onsite use. The licensee plans to continue using the permanent plant equipment. The permanent equipment included two electrical fire pumps, one diesel-driven fire pump, and two fire water storage tanks. The licensee had two portable pumps available for use in response to an event. In addition, the licensee staged equipment in two metal containers in the plant yard. The containers housed emergency response equipment including spare fans (for smoke or steam removal) as well as fire hoses, fittings, nozzles, flow meters, and related tools. The inspectors observed the contents of both containers during site tours. In addition to the two outside containers, the licensee had firefighting equipment staged inside the plant at strategic locations for event response.

The licensee established and implemented surveillance procedures for ensuring that portable firefighting equipment remained available. The equipment required for mitigation strategies was required to be inventoried on a quarterly basis. The inspectors reviewed the results of the last quarterly inventory, documented in accordance with instructions provided in Fire Protection Procedure SO123-XIII-54, "Surveillance Requirement Fire Equipment Inspection," Revision 34. The inventory was conducted in early November 2015. All required equipment was immediately available, although, flow meters were occasionally removed from storage for routine calibrations.

The inspectors reviewed the licensee's SFP cooling and level mitigation strategies. The licensee had established, or was in the process of establishing, two types of strategies for the SFP, internal strategies and external strategies. During normal operations, makeup water for either SFP will be provided by the associated SFP makeup system. (The makeup system for the two SFPs were under construction at the time of the onsite inspection.) In response to an event, makeup water can be provided from various sources. Procedure SO23-V-5.100 provides instructions for adding water to a SFP based on the availability of water sources and status of SFPs. The licensee also developed a mitigation strategies response notebook that included copies of all procedures necessary for responding to an event.

At the time of the onsite inspection, the licensee was still installing certain mitigation strategies inside the plant. For example, the licensee was installing external sprays and interconnected piping in the SFP operating deck rooms. These sprays will be used in the unlikely event that room cooling or radioactive material suppression is needed. The inspectors confirmed that the spray system equipment being installed in the plant was capable of providing the design flow rates.

The inspectors reviewed the licensee's implementation of its routine surveillance program to ensure that sources of water were available for use as mitigation strategies.

The inspectors confirmed that storage tank volumes were routinely monitored in accordance with the surveillance procedures. The inspectors confirmed that critical tanks contained more water than the minimum required volumes needed for implementing the mitigation strategies.

By letter dated August 26, 2013 (ML13240A130), the licensee committed to implement certain SFP mitigation strategies within 2 hours of an event. The licensee conducted a timed test to determine how long it would take to supply water for SFP makeup from a demineralized water storage tank (external SFP makeup mitigation strategy). The licensee conducted the timed test in September 2014. The test results are documented in Nuclear Notification 203043799. Based on the tests performed, the licensee demonstrated that it could implement its external mitigation strategy within the 2-hour commitment.

Finally, the inspectors reviewed the licensee's commitments to maintain mitigation strategy system capacities and flow rates. The licensee committed to certain system capacities and flow rates by letter dated January 2, 2014 (ML14007A164, publicly available version). The licensee committed to operate the portable equipment for a certain number of hours and minimum flow rates. These operational limitations were incorporated into the mitigation strategies Procedure SO23-V-5.100. The inspectors noted that the licensee had not clearly designated the quantity and source of fuel needed to operate the two portable fire water pumps. In response, the licensee issued Nuclear Notification 203290097 to implement corrective actions, as necessary, to ensure that sufficient fuel is available to operate the portable fire water pumps at the design flow rates for the analyzed time frame.

c. Radiological Surveys of Electrical Switchyard

The licensee notified the NRC by letter dated March 3, 2015 (ML15071A018), of its proposed plans to construct a synchronous condenser in the southern portion of the switchyard. To support this effort, the licensee's contractors developed a final status survey plan and cross-contamination prevention plan for the area where the synchronous condenser will be located. The licensee estimated that approximately 23,000 cubic yards of soil will be excavated and released as part of this construction project.

The licensee's contractor conducted a radiological characterization survey of the switchyard as part of the overall site characterization efforts. The Site Characterization Report dated June 2015 concluded that the switchyard area was free of radioactive contamination with the exception of sediment samples collected from nearby storm water drain gutters. These sediment samples indicated low but measurable quantities of cobalt-60 and cesium-137. The sample results were less than 10-percent of the NRC's screening levels as specified in Appendix B to NUREG-1757, Consolidated Decommissioning Guidance, Volume 1, Revision 2.

The licensee plans to implement a site-wide final status survey after completion of site decommissioning. Because the area underneath the synchronous condenser cannot be surveyed during the final status survey, the licensee established a multi-part survey to demonstrate that the area underneath the synchronous condenser will meet future license termination criteria. As part of this demonstration effort, the licensee plans to implement a pre-excavation surface scan survey and soil sampling effort, conduct soil

sampling during excavation, and conduct surface scans and soil sampling of the final graded area. Details of these survey efforts were provided in the contractor procedure entitled "Radiological Characterization Plan to Support Installation of a Synchronous Condenser Facility" dated September 2015.

During a previous inspection, the NRC inspectors questioned whether the licensee had established an approved program for conducting final status surveys. In response, the licensee developed a design basis document and updated existing site procedures to implement a survey program based on NRC guidance documents. The NRC guidance included NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Revision 1, and NUREG-1575, Supplement 1, Multi-Agency Radiation Survey and Assessment of Materials and Equipment (MARSAME), dated January 2009.

In July 2015, the licensee issued an internal memorandum to file which provided a design basis for adding MARSSIM and MARSAME guidance to existing procedures. This document provided instructions for unconditional releases of materials and equipment located outside the radiologically controlled area and the restricted area but within the owner controlled property. The licensee also updated two procedures to incorporate MARSSIM and MARSAME guidance. Procedure SO123-VII-20.9.2, "Material Release Surveys," Revision 18, was revised to provide guidance based on MARSAME for release of materials and equipment. Similarly, Procedure SO123-VII-20.9.3, "Surveys for Release of Liquids, Sludges, Slurries, and Sands," Revision 12, was revised to provide guidance based on MARSSIM for release of bulk materials.

The inspectors questioned licensee staff about the free-release of the soil that will be excavated from the area of the synchronous condenser. The licensee's staff referenced Nuclear Notification 203283965 which described the survey plan for surveys needed to free-release the soil from the footprint of the synchronous condenser. This survey plan was issued in early November 2015. The survey plan included requirements for surface soil sampling and scan surveys. The soil will be released after completion of a MARSAME-style survey. The acceptance criteria for release will be no detectable activity. The survey plan noted that previous radiological samples collected in the area did not identify detectable quantities of licensed radioactivity, indicating that the soil could be unconditionally released from the switchyard.

In summary, the inspectors concluded that the licensee upgraded its radiological survey program using the guidance provided in NUREG-1575. The licensee's proposed survey plan and procedures for the synchronous condenser work were acceptable since they were based on NRC guidance documents. The licensee plans to start moving soil from the area of the synchronous condenser in early 2016. The final status survey of the excavated area is scheduled for April 2016. The NRC currently plans to conduct an independent confirmatory survey of the area where the synchronous condenser will be located, after completion of the excavation and prior to construction of the synchronous condenser.

d. Site Tours

During site tours within the radiologically restricted areas, the inspectors conducted independent gamma radiation measurements using a Ludlum Model 2401-EC2 survey meter (NRC No. 35484G, calibration due date of 03/13/16). The inspectors also observed the status of boundaries, postings, and labeling to ensure compliance with

regulatory and procedural requirements. The inspectors' survey measurements were comparable to the survey results as presented on area maps created by the licensee's health physics staff. In the areas toured, the licensee implemented radiation protection controls, including postings and labeling, that were in compliance with regulatory and procedure requirements.

3.3 Conclusions

The licensee continued to implement the cold & dark modifications in accordance with PSDAR requirements. The licensee also continued to install the SFP islanding equipment, although the licensee cannot remove the permanent plant equipment from service until the NRC has reviewed and approved a proposed change in system seismic qualifications.

The licensee continues to install and implement the mitigation strategies as required by the two licenses. The licensee has staged equipment and conducted timed tests, to demonstrate that it can implement the mitigation strategies in response to an initiating event. The licensee also established and implemented surveillances to ensure that equipment is available in response to an event.

The licensee continued to plan for the construction of the synchronous condenser. The licensee established survey plans and implementing procedures based on NRC-accepted guidance for final status surveys. The construction work is expected to begin in early 2016, and the NRC will review the licensee's implementation of its survey plans during future inspections.

The inspectors conducted site tours within the radiologically restricted areas and concluded that the licensee was maintaining the areas in accordance with radiation protection procedures and regulatory requirements.

4 Radioactive Material Handling (71124.08)

4.1 Inspection Scope

The inspectors reviewed the licensee's radioactive material handling program to determine whether the licensee properly processed, packaged, and stored radioactive materials.

4.2 Observations and Findings

Technical Specifications 5.5.2.7 for both licenses provide limitations for the quantity of radioactivity contained in unprotected outdoor liquid storage tanks. The technical specifications also require a surveillance program be implemented to ensure that the quantity of radioactivity contained in these tanks is less than the amount that would exceed regulatory effluent release limits in the event of an uncontrolled release of the tanks' contents. At the time of the inspection, this technical specification requirement applied to the full flow condensate polishing demineralizer hold-up tanks in each unit. During the inspection, there were no outdoor temporary tanks that met the requirement for monitoring. The inspectors reviewed the licensee's implementation of these technical specifications requirements and the technical bases for establishing the limiting quantity of radioactivity contained in the two outdoor tanks.

The licensee established surveillance procedures for monitoring the two hold-up tanks. Section 6.13, "Unprotected Outdoor Tank Total Curie Content Determination," of Chemistry Procedure SO123-III-5.1.23, Revision 38, specified the surveillance requirements for the hold-up tanks and any outside temporary tanks containing radioactivity. This procedure required the tanks to be radiologically surveyed on a weekly basis. Attachment 8, "Unprotected Outdoor Tank Total Curie Content Determination," to Chemistry Procedure SO123-III-5.2.23, Revision 25, provided the detailed instructions for surveying the tanks, the action level (5 millirem per hour), and the supplemental sampling and analysis requirements if the as-found survey result exceeds the action level.

The inspectors reviewed the licensee's surveillance results for 2015. The records indicate that the licensee measured the exposure rate of the two tanks on a weekly basis, and the measurements were essentially at background levels (less than 0.2 millirem per hour) for both hold-up tanks. Because neither tank exceeded the action level, the licensee did not have to implement the supplemental sampling requirements specified in the site procedure. In summary, the licensee's records demonstrate that it complied with both the 10-curie tank radioactivity limit and weekly surveillance requirement for both tanks in 2015.

The inspectors reviewed the licensee's calculations to verify that the 5-millirem per hour action level was equivalent to 10 curies of radioactivity within a tank. The 10-curie limit is mentioned in NUREG-0800, Standard Review Plan, Section 15.7.3, "Postulated Radioactive Releases Due to Liquid-Containing Tank Failures." The licensee's 1996 analysis assumed that the radioactivity in an outdoor tank originating from the radioisotopes cobalt-60 and cesium-137 in the fluid. The licensee used the Microshield computer program and different tank geometries. The licensee documented that an exposure rate of 5 millirem per hour conservatively demonstrated that a tank contained less than 10 curies of radioactivity. In summary, the licensee maintained calculations demonstrating that the action level (5 millirem per hour) was conservatively established to validate that an outdoor tank contained less radioactivity than the 10-curie limit.

4.3 Conclusions

The licensee continued to implement technical specifications requirements for radioactivity in outdoor storage tanks. The licensee established and implemented a surveillance program to ensure that the outdoor storage tanks contained less radioactivity than allowed by technical specifications. The inspectors confirmed that the licensee had established and implemented a conservative action level for ensuring that outdoor tanks contained radioactivity limits within technical specification limits.

5 Transportation Activities (86740)

5.1 Inspection Scope

The inspectors reviewed the licensee's transportation activities to determine whether the licensee properly shipped and received radioactive materials.

5.2 Observations and Findings

The majority of legacy wastes, including spent resins and filters, have been removed from the plant during the past couple of years. Since the last inspection, the licensee had shipped laundry, empty containers, and two sources. The licensee received Westinghouse fuel inspection equipment on November 16, 2015, in preparation of its fuel inspection program. The inspectors reviewed radioactive material receipt records for the Westinghouse equipment, and the records were found to be adequate. The licensee continued to maintain adequate control over radioactive material in storage, post the areas where radioactive material was being stored, and maintain proper radioactive material labeling for each container.

5.3 Conclusions

The licensee continued to perform transportation activities in accordance with regulatory requirements.

6 Exit Meeting

The inspectors presented the inspection results to members of the licensee's staff at the conclusion of the onsite inspection on November 19, 2015. The inspectors confirmed that none of the information obtained during the inspection was proprietary information.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Palmisano, Vice President, Decommissioning, and Chief Nuclear Officer
L. Bosch, Plant Manager
J. Madigan, Technical Advisor, Oversight and Nuclear Safety Concerns
R. Pontes, Deputy Director, Decommissioning Projects
J. Peattie, Manager, Maintenance and Work Control
J. Davis, Operations and Training Manager
J. Kay, Manager, Regulatory Affairs
J. Appel, Licensing/Compliance Specialist
D. Evans, Licensing Engineer
M. Morgan, Licensing Engineer
D. Barrie, Manager, Operations Work Control
V. Barone, Senior Nuclear Engineer
G. Lemon, Project Manager, Decommissioning
J. Janke, Manager, Radiation Protection and Chemistry

INSPECTION PROCEDURES USED

IP 36801	Organization, Management, and Cost Controls at Permanently Shutdown Reactors
IP 60801	Spent Fuel Pool Safety at Permanently Shutdown Reactors
IP 71124.08	Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation
IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

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LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
IP	Inspection Procedure
MARSAME	Multi-Agency Radiation Survey and Assessment of Materials and Equipment
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
$\mu\text{Ci/ml}$	microcuries per milliliter
MRC	Management Review Committee
NRC	U.S. Nuclear Regulatory Commission
ppm	parts per million
PSDAR	Post-Shutdown Decommissioning Activities Report
SFP	spent fuel pool
UFSAR	Updated Final Safety Analysis Report