



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

January 27, 2023

John Sauger
President and Chief Nuclear Officer
Zion Restoration Project
ZionSolutions, LLC
121 West Trade Street, Suite 2700
Charlotte, NC 28202

SUBJECT: NRC INSPECTION REPORT NO. 05000295/2022001(DRSS);
05000304/2022001(DRSS) – ZION NUCLEAR POWER STATION

Dear John Sauger:

On December 29, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed onsite inspection activities for January 11, 2022, through December 29, 2022, at the permanently shutdown Zion Nuclear Power Station in Zion, Illinois. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of this inspection, which were discussed with G. V. Noordennen and other members of your staff on December 29, 2022.

During the inspection period, the NRC inspectors reviewed the following aspects of onsite activities: safety review, design changes, and modification; problem identifications and resolutions at permanently shutdown reactors; fire protection; decommissioning performance; occupational radiation exposure; radiological surveys; and inspection of final surveys at permanently shut down reactors; radioactive waste treatment, effluent, and environmental monitoring; and solid radioactive waste management and transportation of radioactive materials. The inspection consisted of an examination of activities at the site as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, reviewing work activities onsite and remotely, and interviews with personnel.

Based on the results of this inspection, the NRC identified one Severity Level (SL) IV violation of NRC regulatory requirements. However, because of the very low safety significance and because the issue was entered into your Corrective Action Program, the NRC is treating the issues as Non-Cited Violation (NCV) in accordance with Section 2.3.2 of the NRC's Enforcement Policy.

No response is required for the NCV. However, if you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III; and the Director, Office of Enforcement.

J. Sauger

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This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the Code of Federal Regulations (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

David E. Hills, Chief
Decommissioning, Reactor, and ISFSI
Health Physics Branch
Division of Radiological Safety and Security

Docket No: 50-295; 50-304
License No: DPR-39; DPR-48

Enclosure:
IR Nos. 05000295/2022001(DRSS);
05000304/2022001(DRSS)

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Letter to J. Sauger from D. Hills dated January 27, 2023.

SUBJECT: NRC INSPECTION REPORT NO. 05000295/2022001(DRSS);
05000304/2022001(DRSS) – ZION NUCLEAR POWER STATION

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U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Docket No: 50-295; 50-304

License No: DPR-39; DPR-48

Report No: 05000295/2022001(DRSS);
05000304/2022001(DRSS)

Enterprise Identifier: I-2022-001-0075

Licensee: Zion*Solutions*, LLC

Facility: Zion Nuclear Power Station, Units 1 and 2

Location: Zion, Illinois

Dates: January 11, 2022, to December 29, 2022

Inspectors: Peter C. Lee, Health Physicist
Bill Lin, Health Physicist

Approved by: David E. Hills, Chief
Decommissioning, Reactor, and ISFSI
Health Physics Branch
Division of Radiological Safety and Security

Enclosure

EXECUTIVE SUMMARY

Zion Nuclear Power Station, Units 1 and 2 NRC Inspection Report 05000295/2021001(DRSS); 05000304/2021001(DRSS)

The Zion Nuclear Power Station (ZNPS) is a permanently shut-down and defueled power reactor facility that was maintained in a safe storage condition from 1998 through 2010. Active decommissioning began in 2011. Active decommissioning activities are complete, and the site is only performing additional final status surveys, discrete particle surveys, excavation of concrete footers, and visual surveillance of the ZNPS. This periodic safety inspection reviewed licensed activities associated with safety review, design changes, and modification; problem identifications and resolutions at permanently shutdown reactors; fire protection; decommissioning performance; occupational radiation exposure; radiological surveys; and inspection of final surveys at permanently shut down reactors; radioactive waste treatment, effluent, and environmental monitoring; and solid radioactive waste management and transportation of radioactive materials.

Safety Review, Design Changes, and Modification

- The licensee performed adequate safety evaluations or screenings, completed design change evaluations, and properly assessed decommissioning impacts of various work activities as required by Title 10 of the Code of Federal Regulations (CFR) 50.59, "Changes, Tests, and Experiments," and its safety review process.

Problem Identification and Resolution

- Issues were identified by the licensee at appropriate thresholds and entered into the Corrective Action Program (CAP). Issues were screened and prioritized commensurate with safety significance. Licensee evaluations determined the significance of issues and included appropriate remedial corrective actions.

Fire Protection Program

- An effective decommissioning Fire Protection Program was maintained and implemented that reasonably prevented fires and the capability to extinguish fires that could result in radiological hazards; and ensured the risk of fire-induced hazards to the public, environment, and plant personnel were minimized.

Decommissioning Performance and Status Review

- The inspectors determined that decommissioning activities were performed in accordance with the regulations and license requirements.

Occupational Radiation Exposure

- Adequate protection of worker health and safety from exposure to radiation and radioactive material was provided. Radiation surveys were performed adequately to identify the hazards present.

Inspection of Remedial and Final Surveys

- The NRC inspectors identified a non-cited Severity Level IV violation of 10 CFR 20.1501 regarding the discrete radioactive particles (DRPs) identified during a risk informed, narrow scope NRC confirmatory survey in April 2021. In particular, these DRPs were found after the licensee had submitted final status surveys. Hence, licensee surveys had not been sufficient to identify and cause the licensee to address the DRPs.

Radioactive Waste Treatment, and Effluent and Environmental Monitoring

- Changes to the environmental monitoring program were consistent with regulatory requirements.

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee effectively processed, handled, stored radioactive material. The inspectors reviewed the licensee radioactive material shipping papers.

Report Details

Summary of Plant Activities

During the inspection period, the licensee performed discrete particle surveys, visual surveillance of the plant footprint, and concrete footer excavation.

1.0 Safety Reviews, Design Changes, and Modifications (IP 37801)

1.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Whether the licensee's safety review process and procedures identified potential changes to Technical Specification (TS) results from proposed changes, tests, experiments, or modifications;
- Whether the licensee's training program effectively trained and assesses qualified personnel for performing safety evaluations;
- Changes to design basis documentation are updated consistent with design changes;
- Design changes or modifications were effectively evaluated to maintain safety; Maintenance and/or work activities appropriately considered whether the activity resulted in a change or modification and was assessed in accordance with 10 CFR 50.59; and
- Verification that changes made under 10 CFR 50.59 did not require prior NRC approval.

1.2 Observations and Findings

The licensee did not have any changes to its TS during this inspection period. The inspectors reviewed the licensee's 10 CFR 50.59 evaluation and safety review process. The inspectors interviewed licensee personnel regarding the process the licensee implemented to determine whether prior NRC approval is needed for any proposed changes. The inspectors also reviewed the licensee's training program and determined that it is able to train personnel for performing safety evaluations. There were no changes or modification performed during this period.

No findings were identified.

1.3 Conclusions

The licensee performed adequate safety evaluations or screenings, completed design change evaluations, and properly assessed decommissioning impacts of various work activities as required by 10 CFR 50.59 and its safety review process.

2.0 Problem Identification and Resolution at Permanently Shutdown Reactors (IP 40801)

2.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Effectiveness at preventing, detecting, and correcting issues;
- Identifying and evaluating potential 10 CFR Part 21, "Reporting of Defects and Non-Compliance Issues;"
- Audits and assessments evaluating the CAP and Quality Assurance Program; and
- The licensee's safety culture

The inspectors verified that when issues were identified, licensee personnel appropriately documented the issue in the CAP.

2.2 Observations and Findings

The inspectors reviewed the licensee's CAP. The licensee was able to successfully identify and screen issues and prioritized them commensurate with the appropriate safety significance. The licensee correctly entered the issues into the CAP with appropriate corrective actions. There were no Part 21 issues since all decommissioning activities were completed. The inspectors reviewed CAP entries throughout the year and evaluated the corrective actions for each one. The inspectors reviewed several CAP entries for follow-up. For example, the inspectors followed up on Condition Report (CR) 2021-0087. CR 2021-0087 documented that the licensee discovered an obstruction 2 inches below grade. The obstruction was the footers for the condensate storage tanks. The inspectors reviewed licensee documents describing how the footers were left behind and observed the licensee extract, survey, and backfill the concrete footers and the associated areas. The concrete footers were surveyed, and no radioactive materials were found. The inspectors also observed the surveys of the excavated areas and then the subsequent backfill. The surveys were performed in accordance with the licensee's procedures.

In addition, the inspectors followed up on CR 2021-0041 and CR 2021-0017. In each of these CRs, the inspectors reviewed the licensee's corrective actions, interviewed the appropriate personnel, and determined the licensee's corrective actions were appropriate.

The inspectors also determined that the licensee was performing the appropriate audits and assessments in accordance with the licensee's Quality Assurance Program Plan (QAPP) by interviewing licensee personnel and review of licensee's QAPP, audit and assessment records, and the applicable procedures.

The inspectors interviewed the current licensee personnel onsite. The personnel felt comfortable regarding the current safety culture that exist onsite and were comfortable in bringing any safety concerns to the onsite management team.

No findings were identified.

2.3 Conclusions

Issues were identified by the licensee at appropriate thresholds and entered into the CAP. Issues were screened and prioritized commensurate with safety significance. Licensee evaluations determined the significance of issues and included appropriate remedial corrective actions.

3.0 **Fire Protection Program at Permanently Shutdown Reactors (IP 64704)**

3.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Firefighting equipment was properly inventoried, inspected, tested, and maintained;
- Administrative controls were in place to minimize the occurrence of a fire; and
- Staffing and training requirements were consistent with the Fire Protection Program and Emergency Plan.

The inspectors verified that when issues were identified, licensee personnel appropriately documented the issue in the CAP.

3.2 Observations and Findings

The inspectors reviewed the licensee's Fire Protection Plans and Fire Hazard Analysis. The inspectors walked down the facility and verified that firefighting equipment was properly inventoried, inspect, tested, and maintained. The inspector in addition interviewed the staff and reviewed the staff and training requirements were consistent with the Fire Protection Program and Emergency Plan.

3.3 Conclusions

An effective decommissioning Fire Protection Program was maintained and implemented that reasonably prevented fires and extinguish fires that could result in radiological hazards; and ensured the risk of fire-induced hazards to the public, environment, and plant personnel were minimized.

4.0 **Decommissioning Performance and Status Review (IP 71801)**

4.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Whether maintenance was conducted at an appropriate frequency;
- Updates to FSAR and DSAR were made consistent with 10 CFR 50.71 Post Shutdown Activities Report (PSDAR) or License Termination Plan (LTP);
- Records important to decommissioning were kept consistent with 10 CFR 50.75(g);
- Commitments and requirements in the TSs, PSDAR, LTP, ODCM, or Emergency Plan were effective and being met;

- Appropriate administrative and/or engineering controls were identified and implemented in work plans;
- Organization and staffing were appropriately adjusted for changes in the status of decommissioning; and
- Changes to decommissioning schedule or costs were made consistent with the requirements in 10 CFR 50.82(a)(7).

The inspectors verified that when issues were identified, licensee personnel appropriately documented the issue in the CAP.

4.2 Observations and Findings

The inspectors performed walkdowns of the site during the 2022 inspections. The licensee had completed all active decommission work and was mainly only performing discrete particle surveys, surveillance of the plant to ensure that ZNPS property postings and fencings remained legible, and concrete footer excavations. There were no changes to the commitments to the requirements of the TSs, PSDAR, ODCM, or Emergency Plans. The licensee submitted one change to the LTP which currently being reviewed by NRC Headquarter personnel. The licensee kept records important to decommissioning consistent with 10 CFR 50.75(g). The licensee was implementing administrative controls in documenting and surveying personnel into and out of FSS areas. The inspectors also interviewed the licensee and ensured that the licensee had appropriate personnel to support FSS and surveillance activities. The inspectors also reviewed the licensee's training program. In addition, the licensee had provided the NRC with the FSS, discrete particle surveys schedule, and excavation of the footer schedule.

No findings were identified.

4.3 Conclusions

The inspectors determined that decommissioning activities were in accordance with the regulations and license requirements. Decommissioning staffing, qualifications, and training were appropriate to the requirements and current decommissioning status.

5.0 Occupational Radiation Exposure at Permanently Shutdown Reactors (IP 83750)

5.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Changes made to organization, personnel, facilities, instrumentation, equipment, programs that impact occupational radiation protection (RP);
- Training and qualifications of members of the RP organization;
- Radiological hazards and worker protection in work activities;
- Planning identified appropriate dose reduction techniques, defined reasonable dose goals, and RP hold points;
- Radiological controls, postings, and material conditions inside the radiological control area;

- Contamination monitoring including release of radioactive materials from controlled areas;
- Accuracy and functionality of radiation monitoring instruments;
- Area radiation monitors and continuous air monitors were appropriately positioned;
- Temporary ventilation systems were correctly configured; and
- The characterization of the radiation type and energies were appropriate to the surveys and work practices; and staffing, posting, radiological controls, and changes met regulatory requirements.

The inspectors verified that when issues were identified, licensee personnel appropriately documented the issue in the CAP.

5.2 Observations and Findings

There were no changes to the organization staffing and instrumentation that would impact RP. The inspectors reviewed the licensee's radiation and contamination surveys, and source inventory. The licensee performed radiation and contamination surveys, air sampling, and source inventory in accordance with approved procedures and radiation survey instruments. The inspectors verified and confirmed that for each type of survey the licensee performed, its staff used the appropriate survey instrument to perform these surveys and verified that the licensee was updating its source term that reflected what was currently onsite due to source decay. The inspectors also observed the licensee perform source checks of radiological survey instrumentation. The licensee performed these source check in accordance with approved licensee procedures. The inspectors interviewed licensee personnel regarding the frequency of these source checks and the licensee's process and procedure on how everything was documented. The licensee personnel were knowledgeable regarding the process and procedures. Due to the current radiological status of the facility, there was no RP work that required any radiological procedures with RP holdpoints, dose reduction techniques, radiation and air monitoring, and temporary ventilation. All decommissioning activities were completed, and remaining surveys were performed outside with the appropriate RP practices to ensure safe handling of any radiological materials.

The inspectors also performed a walkdown of the facility. The inspectors observed that general housekeeping was maintained and that all signs within the facility were appropriately posted and legible. The inspectors also observed that all radioactive material was properly bagged, tagged, and controlled.

No findings were identified.

5.3 Conclusions

Adequate protection of worker health and safety from exposure to radiation and radioactive material was provided. Radiation surveys were performed adequately to identify the hazards present.

6.0 Inspection of Remedial and Final Surveys (IP 83801)

6.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Whether items for further review were identified in the LTP Safety Evaluation Report and whether the licensee adequately addressed these items, as applicable;
- Reviewed changes, as applicable, made to the LTP that did not require prior NRC approval;
- Whether radiological instruments used in support of Remedial Action Support Surveys or FSS were calibrated to detect the radionuclides of concern (ROC), appropriate for the ROC action levels and Derived Concentration Guideline Level, and sufficient to detect Minimum Detectable Concentrations (MDCs), action level concentrations, and scan MDCs;
- For laboratory instruments used by the licensee to count samples, reviewed the quality control charts for maintaining radiation measurement instrument status and actions taken for potential degrading detector performance; and
- Whether the licensee performed FSSs consistent with LTP, was performed by qualified individuals, and was conducted in accordance with the survey plan under required quality controls.

6.2 Observations and Findings

The licensee no longer had any sample analysis equipment onsite. All the sample analyses for Zion were shipped to an independent laboratory for analysis. The inspectors reviewed the licensee's quality control charts for maintaining radiation measurement instrument status. The inspectors interviewed licensee personnel regarding actions taken for potential degrading detector performance. The licensee personnel were knowledgeable regarding the necessary actions taken per licensee's approved procedures. The licensee submitted changes to its LTP, and that submittal was being reviewed by NRC headquarter personnel. The inspectors reviewed the licensee's radiological instruments that were used and determined they were calibrated to detect the radionuclides of concern (ROC) and applicable action levels consistent with the requirement in the LTP.

Failure to Perform Sufficient Surveys

NRC inspectors and an NRC contractor in April 2021, performed a risk-informed, narrow scope confirmatory survey (Agencywide Documents Access and Management System Accession No. ML21267A523). As documented in the report, discrete radioactive particles (DRPs) containing unexpected radionuclides were found in several areas that were previously scanned by the licensee. In particular, the NRC found DRPs in survey units SU10209E, SU10220I, SU12203D, SU12201B, SU12203A, SU10204B, and SU12201B including residual radioactive contamination such as Americium-241, Cobalt-60, and Cesium-137. The particles found during the April 21, 2021, surveys can be placed into four groups: (1) neutron activation of reactor corrosion products (e.g., Co-60, Ni-63, iron-55 [Fe-55]), (2) neutron activation of the reactor bioshield (e.g., Eu-152, Eu-154, Ba-133), (3) irradiated fuel fragment (e.g., transuranic and fission

products), and (4) unknown (thorium isotopes). NRC dose estimates for the DRPs had a wide range depending on assumptions. As a result of the particles and residual contamination found, the licensee performed additional surveys and discovered additional radioactive material and DRPs in June 2021, July of 2021, August 2021, and March 2022 in areas that were previously final status surveyed by the licensee. The following are examples of some of these instances but do not represent a comprehensive list.

- In June 2021, while performing a scan of SU12203B, the licensee found a metal shard containing Am-241 that was approximately 2.5 mrem/hr on contact;
- In July 2021, while performing a surveillance in SU12203B, the licensee found a radioactively contaminated piece of concrete resembling a small stone;
- In August 2021, the licensee found a DRP in SU12203C;
- In August 2021, the licensee found a DRP in SU12113;
- In March 2021, the licensee identified a DRP in SU12205A;
- In June 2022, the licensee found a small, radioactively contaminated pebble in SU17A;
- In July 2022, the licensee found a DRP in SU12103; and
- In July 2022, the licensee found a DRP in SU12102.

The discovery of these unexpected DRPs caused the NRC to issue requests for information to the licensee. The licensee provided a March 8, 2022, response (ML22069A329) to 11 resulting requests for additional information (RAIs) issued by the NRC staff on August 19, 2021 (ML21231A187) and October 14, 2021 (ML21238A067). By letter to the licensee dated July 19, 2022, (ML 22200A007), the NRC provided an NRC audit plan aimed at achieving a more effective and efficient overall review of the RAI responses with respect to its review of the licensee's request for site release.

The NRC inspectors completed their review of the circumstances surrounding the discovery of the unexpected DRPs including review of related documents, discussion with licensee personnel, and insights gained through the review of the licensee's RAI responses. The inspectors concluded that the number and characteristics of the DRPs found by the NRC during its April 2021, confirmatory survey and resulting additional surveys by the licensee were unusual and unexpected as they were identified after completion of all final status surveys. These final status surveys had been performed to support site release under the requirements in Part 20.

In accordance with Section 2.2 of the Enforcement Policy, reactor decommissioning facilities are not subject to the Reactor Oversight Process and traditional enforcement will be used for these facilities. The inspectors did not find an example in the NRC's enforcement guidance that was similar to this issue. However, the inspectors concluded that the concern was of more than minor significance as it could have resulted in incorrectly removing the land from the license without sufficient additional analysis had the NRC not discovered the unexpected DRPs by performing confirmatory surveys. The inspectors concluded the violation was not of higher significance because controls were still in place to preclude access to the site by a member of the public; therefore, the issue screened as a Severity Level IV.

Title 10 of the Code of Federal Regulations (CFR) 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present.

Title 10 CFR 20.1402 states that a site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and that the residual radioactivity has to be reduced to levels that are as low as reasonably achievable (ALARA).

Contrary to the above, as of April 21, 2021, the licensee did not make surveys that were reasonable under the circumstances to evaluate concentrations or quantities of radioactive materials and the potential radiological hazards that could be present. Specifically, licensee surveys required under Part 20 were not sufficient to identify and cause the licensee to sufficiently address the unexpected DRPs identified during an April 21, 2021, NRC confirmatory survey. This resulted in subsequent licensee surveys which identified additional DRPs and contaminated material, additional review and evaluation, and further site remediation.

The licensee entered this issue into the CAP as ES-ZION-CR-2021-0029. Ultimately, the licensee performed additional discrete particle surveys and final status surveys of various Zion Nuclear Power Station survey units, removed the identified DRPs and contaminated material, and provided additional evaluation in subsequent RAI responses. Because this issue was of very low safety significance (SL IV) and was entered into the CAP, this violation is being treated as an NCV consistent with section 2.3.2 of the NRC Enforcement Policy (NCV 05000295/2022001-01; 05000304/2022001-01; Failure to Perform Adequate Surveys).

6.3 Conclusions

The inspectors identified a non-cited Severity Level IV violation of 10 CFR 20.1501 regarding the DRPs identified during a risk informed, narrow scope NRC confirmatory survey in April 2021. In particular, these DRPs were found after the licensee had submitted final status surveys. Hence, licensee surveys had not been sufficient to identify and cause the licensee to address the DRPs.

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

7.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Changes made to the Offsite Dose Calculation Manual (ODCM) or liquid, gaseous, and solid radwaste system design and operation were within the licensing basis and regulations;

- Effluent monitoring ventilation and discharge system configurations, flow paths, and operations were consistent with the licensing basis and procedures;
- Effluent monitors were calibrated;
- Radioactive liquid and gaseous waste discharge permits projected doses to members of the public that were based on representative samples in the discharge pathway and were within 10 CFR Part 50, Appendix I, and Technical Specification limits;
- The annual effluent release report was submitted as required, and any anomalous results, unexpected trends, or abnormal releases were identified and entered into the CAP;
- Environmental monitoring equipment was properly located, calibrated and maintained, and environmental samples were adequately collected;
- Whether the Groundwater Protection Initiative program was implemented as intended;
- The licensee's annual radiological environmental monitoring report was submitted as required, and any anomalous results, unexpected trends, or abnormal environmental impacts were identified and entered into the CAP;
- Whether the licensee's vendor laboratory analyzed environmental samples under an approved quality control program and the inter-laboratory comparison program was adequate; and
- Changes made to the environmental program.

The inspectors verified that when issues were identified, licensee personnel appropriately documented the issue in the CAP.

7.2 Observations and Findings

The inspectors reviewed the licensee's latest submittal of the ODCM and all applicable reports and all reports were documented in accordance with regulatory requirements. The licensee's effluent, environmental and groundwater monitoring no longer existed. The site had completed active decommissioning and no longer had any radioactive liquid and gaseous waste discharges. The licensee performed the necessary 50.59 review to ensure that the ODCM reflected the current radiological status onsite. The inspectors reviewed the licensee's 50.59 review and determined that the licensee followed the appropriate process and the change in the ODCM did not need prior NRC approval.

No findings were identified.

7.3 Conclusions

The licensee submitted the ODCM reports in accordance with NRC regulatory requirements. The licensee had changed the status of the site ODCM to reflect that no radiological discharges and monitoring was taking place and all active decommission activities were completed. Changes to the effluent and environmental monitoring program were consistent with regulatory requirements.

8.0 **Solid Radioactive Waste Management and Transportation of Radioactive Materials (IP 86750)**

8.1 Inspection Scope

The inspectors performed walkdowns, reviewed documents, and interviewed plant personnel to assess the licensee's performance in the following areas:

- Radioactive waste storage areas were appropriately controlled, labeled, posted and secured against unauthorized removal;
- Containers of radioactive material were inventoried, and their material condition was monitored;
- Sealed sources were accounted for and were appropriately leak tested;
- Waste processing systems were configured and operated consistent with the Decommissioning Safety Analysis Report (DSAR), ODCM, and Process Control Program;
- Temporary waste processing systems were adequately implemented;
- Shippers of radioactive material were adequately trained and met technical specifications, 10 CFR 71.5 and Department of Transportation (DOT) 49 CFR Part 172, Subpart H, requirements;
- Changes in organization, personnel, facilities, equipment, programs, and procedures affecting waste management and transportation of radioactive materials;
- Shipments of radioactive material were appropriately surveyed as well as marked, labeled, and placarded consistent with the shipping documentation; and
- Shipments were appropriately characterized, classified, and prepared in accordance with procedures.

The inspectors verified that when issues were identified, licensee personnel appropriately documented the issue in the CAP

8.2 Observations and Findings

During a walkdown of the facility, the inspectors verified radioactive waste was appropriately controlled, labeled, posted, and secured against unauthorized removal. Since all the active decommissioning activities were completed, there was no waste and no temporary waste processing system. The inspectors also reviewed the licensee's sealed source inventories and the appropriate leak tests. The licensee performed the inventory and leak tests in accordance with the approved procedures. The licensee performed two radioactive waste shipments. The NRC inspectors reviewed the licensee's shipping paperwork and the licensee's hazmat training records. The training for licensee personnel were current with their DOT training.

No findings were identified.

8.3 Conclusions

The licensee effectively handled and stored radioactive materials.

9.0 **Exit Meeting**

The inspectors presented the results of the inspection to G. V. Noordennen and other members of the ZNPS staff at an exit meeting on December 29, 2022. The licensee acknowledged the results presented and did not identify any of the information discussed as proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

S. Roberts, Vice President Radiological Program
R. Yetter III, LT/FSS Project Manager
G. V. Noordennen, Senior Vice President Regulatory Affairs

INSPECTION PROCEDURES (IPs) USED

IP 37801 Safety Review, Design Changes, and Modification
IP 40801 Problem Identification and Resolution at Permanently Shutdown Reactors
IP 64704 Fire Protection Program at Permanently Shutdown Reactors
IP 71801 Decommissioning Performance and Status Reviews at Permanently Shutdown Plants
IP 83750 Occupational Radiation Exposure
IP 83801 Inspection of Remedial and Final Surveys
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

<u>Opened</u>	<u>Type</u>	<u>Summary</u>
05000295/2022001-01	NCV	Failure to make survey to meet 10 CFR 20.1402
<u>Closed</u>	<u>Type</u>	<u>Summary</u>
05000295/2022001-01	NCV	Failure to make survey to meet 10 CFR 20.1402

PARTIAL LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

- ES-ZION-CR-2022-0002; Winter Storms have Damaged Fencing in Northeast Corner of Site; Dated 01/04/2022
- GEL Laboratories; Energy Solutions ID Sample Analysis 568028001; Dated 1/20/2022
- Zion Solution Visual Walkdown for 9/01/2021 and 9/14/2021
- 10 CFR 50.59 Evaluation 2021-001; DSAR Change; Dated 03/01/2021
- 50.59 Review Cover Sheet Form; Revision 5
- Zion Instrument Calibrations for 2022
- Zion Technical and Safety Qualification Training for Personnel Onsite
- Zion Offsite Dose Calculation Manual; Rev 12; January 30, 2020
- ES-Zion-CR-2019-0152; 10 CFR 50.75(g) File Audits
- LS-JA-08; DSAR / LTP Change Technical Review Form
- Zion ODCM Change Technical Review Letter
- Zion QA Memo 2021-02
- Quality Assurance Project Plan; ZS QA-10; Revision 11
- Zion Nuclear Power Station Unit 1 and Unit 2, Pre-Notice of Disbursement from Decommission Trust; 11/30/2020
- ES-Zion-CR-2021-0053 and 2021-0087; Unexpected Obstruction at 2 Inches
- ES-ZION-CR-2021-0003; Breaches of Snow Fence in SU10212B and Potential Fence Line Barrier Degradation
- ES-ZION-CR-2022-0013; Site Personnel Lost Badge
- ES-ZION-CR-2022-0011; FSS Barrier on Shiloh Blvd. Out of Place
- ES-ZION-CR-2022-0009; Non UL Approved Electric Heaters
- ES-ZION-CR-2021-0049; FSS Finds a Small Stone-Like Piece of Concrete Reading 28K CPM in SU12203B
- ES-ZION-CR-2021-0052; DRP Found in SU12203A
- ES-ZION-CR-2021-0058; DRP Found in SU 12203C
- ES-ZION-CR-2021-0060; DRP Found in SU 12113
- ES-ZION-CR-2021-0087; Evaluation of Identified Buried Concrete
- 2022 Concrete Footer DOT Shipping Papers

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
ALARA	As Low As Is Reasonably Achievable
CAP	Corrective Action Program
CR	Condition Report
CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
DRPs	Discrete Radioactive Particles
DSAR	Decommissioning Safety Analysis Report
FSS	Final Status Survey
IP	Inspection Procedure
LTP	License Termination Plan
MDCs	Minimum Detectable Concentrations
NCVs	Non-Cited Violations
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
ORISE	Oak Ridge Institute of Science and Energy
PSDAR	Post Shutdown Activities Report
QAPP	Quality Assurance Program Plan
ROC	Radionuclides of Concerns
RP	Radiation Protection
TSs	Technical Specifications
ZNPS	Zion Nuclear Power Station