



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
2056 WESTINGS AVENUE, SUITE 400
NAPERVILLE, IL 60563-2657

September 4, 2024

David Rhoades
Senior Vice President
Constellation Energy Generation, LLC
President and Chief Nuclear Officer (CNO)
Constellation Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: NRC INSPECTION REPORT NO. 07201037/2024001; 05000295/2024001 AND
05000304/2024001 – ZION NUCLEAR POWER STATION

Dear David Rhoades:

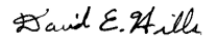
On August 9, 2024, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Zion Nuclear Power Station in Zion, Illinois. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of this inspection, which were discussed with you and other members of your staff on August 9, 2024.

During the inspection period, the NRC inspectors reviewed the following aspects of onsite activities: design changes, radiation protection, emergency preparedness, maintenance and surveillances, environmental monitoring, and quality assurance. 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, and interviews with personnel.

Based on the results of this inspection, the inspectors did not identify any violations of NRC requirements.

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,



Signed by Hills, David
on 09/04/24

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

Docket No: 72-1037; 50-0295; 50-0304
License No: DPR-39; DPR-48

Enclosure:

IR Nos. 07201037/2024001
05000295/2024001
05000304/2024001

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Letter to D. Rhoades from D. Hills dated September 4, 2024.

SUBJECT: NRC INSPECTION REPORT NO. 07201037/2024001; 05000295/2024001 AND 05000304/2024001 – ZION NUCLEAR POWER STATION

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ADAMS ACCESSION NUMBER: ML24247A295

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OFFICIAL RECORD

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

Docket No: 72-1037; 50-0295; 50-0304

License No: DPR-39; DPR-48

Report No: 07201037/2024001
05000295/2024001
05000304/2024001

Enterprise Identifier: I-2024-001-0131

Licensee: Constellation Energy Generation, LLC

Facility: Zion Nuclear Power Station

Location: Zion, IL

Dates: July 24, 2024 to August 9, 2024

Inspectors: Daniel Sargis, Health Physicist

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

Enclosure

EXECUTIVE SUMMARY

Zion Nuclear Power Station

NRC Inspection Report 07201037/2024001; 05000295/2024001 and 05000304/2024001

The inspection consisted of interviews of site personnel, onsite walkdowns, observation of the biennial emergency exercise, reviews of facility changes, observations of licensed activities at the independent spent fuel storage installation (ISFSI) and evaluation of the licensee's programs and recent changes to those programs using inspection procedure (IP) 60858

Changes, Tests, and Experiments

- The licensee implemented changes to the site and controlling documents in accordance with applicable regulations. (Section 1.1)

Radiation Protection Program

- The licensee has maintained and implemented the radiation protection program in accordance with applicable regulations and the license. (Section 1.2)

Emergency Preparedness Program

- The licensee has maintained and implemented the emergency preparedness program in accordance with applicable regulations and the license. (Section 1.3)

Maintenance and Surveillance Program

- The licensee has maintained and implemented the maintenance and surveillance programs in accordance with applicable regulations and the license. (Section 1.4)

Environmental Monitoring Program

- The licensee has maintained and implemented the environmental monitoring program in accordance with the applicable regulations and the license. (Section 1.5)

Quality Assurance Program

- The licensee has maintained and implemented the quality assurance and corrective action programs in accordance with applicable regulations and the license. (Section 1.6)

Report Details

1.0 IP 60858 – Away-from-Reactor ISFSI Inspection Guidance

1.1 Changes, Tests, and Experiments

a. Inspection Scope

The inspectors reviewed selected changes associated with the ISFSI under 10 CFR 72.48 to verify that the changes could be implemented without a license amendment.

The inspector reviewed selected changes to the 10 CFR 72.212 evaluation since the last ISFSI inspection.

b. Observations and Findings

The licensee implemented several changes through the 10 CFR 72.48 process. The inspector reviewed a selection of risk significant screenings for the changes. The site did not have any full evaluations noted since the previous inspection. The screenings for 10 CFR 72.48 were completed in accordance with site procedures and industry guidance.

Changes to the 10 CFR 72.212 report were completed in accordance with site procedures and accurately reflected the site status.

No findings of significance were identified.

c. Conclusion

The licensee implemented changes to the site and controlling documents in accordance with applicable regulations.

1.2 Radiation Protection Program

a. Inspection Scope

The inspector reviewed the licensee's plans and preparation for controlling radiologically significant events.

The inspector verified by independent measurement and review of records that the ISFSI radiation dose and contamination levels are within limits of 10 CFR Part 20 and 10 CFR 72.104.

The inspector verified that radioactive material, including special nuclear material, was stored properly and accounted for by the licensee.

b. Observations and Findings

The inspector determined that the occupational doses for radiation workers were reasonable when evaluated against the work performed by site personnel, and under the regulatory occupational dose limits. The inspectors observed appropriately controlled and posted radiological areas of the facility.

The inspector determined that special nuclear materials stored at the site were accounted for and that the types and quantities of radioactive materials stored on site were in conformance with the license.

The inspector did not identify any deficiencies in the site's ALARA practices and did not identify any worker dose that approached regulatory limits. The inspectors verified that the licensee had access to appropriate radiological monitoring and survey instruments and that they were calibrated. The inspector's independent radiological surveys were consistent with surveys conducted by the licensee.

No findings of significance were identified.

c. Conclusion

The licensee has maintained and implemented the radiation protection program in accordance with the applicable regulations and the license.

1.3 Emergency Preparedness Program

a. Inspection Scope

The inspector verified that changes to the emergency preparedness program did not decrease the effectiveness of the program and were coordinated with offsite responders.

The inspector observed an onsite emergency preparedness exercise and reviewed documentation for past exercises to assess the effectiveness of the program.

The inspector reviewed emergency preparedness audit and assessment reports conducted since the last inspection.

b. Observations and Findings

The inspector reviewed the most recent emergency plan and noted that the site did not make any changes since the last inspection.

The inspector observed all significant portions of the site's emergency preparedness exercise. The site appropriately identified the emergency, declared the correct emergency action level, and notified stakeholders within the required time frame. The site coordinated with offsite responders and protected the health and safety of site personnel and off-site personnel. The licensee reviewed and critiqued their performance following the exercise and documented any deficiencies that they identified.

The inspector reviewed previously performed drills and audits associated with the emergency preparedness plan. The site conducted drills in accordance with timeliness requirements and documented deficiencies in their corrective action program.

No findings of significance were identified.

c. Conclusion

The licensee has maintained and implemented the emergency preparedness program in accordance with applicable regulations and the license.

1.4 Maintenance and Surveillance Program

a. Inspection Scope

The inspector verified that maintenance and surveillance activities were performed within regulatory requirements to support reliable operation of the ISFSI facility.

The inspector performed walkdowns to assess the overall material condition of the ISFSI facility and to verify that combustible materials were properly stored at the facility.

b. Observations and Findings

The site conducted routine structural monitoring in accordance with procedures and at the prescribed frequency. The inspector verified that the material condition of the ISFSI pad matched the documented condition in the licensee's reports. Combustible materials were stored sufficiently away from the ISFSI and in appropriate locations.

Routine surveys of the ISFSI pad radiation levels were conducted in accordance with procedures and at the prescribed frequency. The inspector verified that radiation readings on the pad were consistent with the licensee's documentation.

No findings of significance were identified.

c. Conclusion

The licensee has maintained and implemented the maintenance and surveillance programs in accordance with applicable regulations and the license.

1.5 Environmental Monitoring Program

a. Inspection Scope

The inspector verified that doses to the nearest real individual were within the limits prescribed by 10 CFR 72.104

b. Observations and Findings

The licensee's environmental monitoring program defines the methodology for determining the maximum potential public dose from direct radiation sources. The site consists of sealed canisters so effluent monitoring was not required. The licensee performed direct reading radiation measurements in accordance with their program to calculate direct dose to a member of the public at the site boundary fence. The inspector determined that the licensee is appropriately accounting for direct radiation dose to the public in accordance with the dose limits in 10 CFR 72.104.

No findings of significance were identified.

c. Conclusion

The licensee has maintained and implemented the environmental monitoring program in accordance with applicable regulations and the license.

1.6 Quality Assurance Program

a. Inspection Scope

The inspector evaluated the licensee's effectiveness in identifying, resolving, and preventing conditions adverse to quality. This included a review of condition reports, causal analyses, audits, and self-assessments of the corrective action program.

b. Observations and Findings

The licensee was effective at identifying and correcting issues. The licensee staff were using the corrective action program to resolve issues and issues were being entered at an appropriate level. Condition reports were assigned priority in accordance with their significance.

The licensee was performing audits and focused self-assessments in accordance with their quality assurance program.

No findings of significance were identified.

c. Conclusion

The licensee has maintained and implemented the quality assurance program in accordance with applicable regulations and the license.

2.0 Exit Meeting

The inspectors presented the inspection results to Daniel Kenny and other members of the licensee staff on August 9, 2024. The licensee acknowledged the results as presented and did not identify any of the potential report input as proprietary in nature.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

D. Kenny, ISFSI Manager
G. Vickers, Radiation Protection Manager
S. Quilling, Project Manager
M. Siebert, Training Coordinator

INSPECTION PROCEDURES (IPs) USED

IP 60858 Away-From-Reactor Independent Spent Fuel Storage Installation Inspection
Guidance

ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened, Closed, Discussed</u>	<u>Type</u>	<u>Summary</u>
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None

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.

- 10 CFR 72.212 Report; Revision 11
- 2023 ISFSI Pad and Vertical Concrete Cask (VCC) Inspection Report; 08/01/2023
- 50.59 Screening 2022-001; License Termination Plan; Revision 0
- 72.48 Screening 2021-003; ZNPS ISFSI 72.212 Evaluation Report; Revision 0
- 72.48 Screening 2022-001; Response to Analyzed Events at the ISFSI; Revision 0
- FP-1; ISFSI Fire Protection Program; Revision 5
- A-22-001; Zion Station Site Audit; 06/15/2022
- AD-11; Regulatory Reviews; Revision 5
- ES-Zion-CR-2022-0057; Environmental Controls in ISFSI Warehouse are Unsatisfactory for Some Continuing RP/LT Functionality; 06/20/2022
- ES-Zion-CR-2022-0067; Annual Performance Review Not Completed; 09/12/2022
- ES-Zion-CR-2022-0090; VCCs Found to Have Blockage During Scheduled Inspection Surveillance; 12/22/2022
- ES-Zion-CR-2023-0003; VCC Vent Blockage (Snow); 01/28/2023
- ES-Zion-CR-2023-0040; Instrument Source Check Below Minimum Value; 06/07/2023
- OP-3; VCC Screen Inspection at the ISFSI; Revision 8
- NO-DC-10; Decommissioning Quality Assurance Program; Revision 2
- RP-1; ISFSI Conduct of Radiation Protection; Revision 1
- RP-3; ISFSI Radiation Survey; Revision 3
- Survey 2023-1001; ISFSI Monitoring Building; 12/27/2023
- Survey 2024-01; ISFSI Boundary Survey; 04/03/2024
- Zion-CR-2024-0009; Lost Environmental Dosimeter; 04/13/2024
- Zion-CR-2024-0013; Considerations from the 2024 Independent Assessment of the Zion Zion-CR-2024-0021; 2024 Biennial EP Exercise Critique; 07/27/2024
- ZN-IEP-2024-01; 2024 Radiation Monitoring Drill; 04/24/2024
- Zion Station ISFSI Emergency Plan; Revision 0
- ZS-24-01; Zion Station Annual Special Nuclear Material Inventory; 06/24/2024
- ZS-IEP-2023-01; Radiation Monitoring Proficiency Drill; 04/24/2023
- ZS-IS-IEP-2023-02; 2023 ISFSI Proficiency Drills, Phase I; 05/24/2023
- Emergency Plan; 06/04/2024

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
ALARA	As Low As Is Reasonably Achievable
CFR	Code of Federal Regulations
CR	Condition Report
DRSS	Division of Radiological Safety and Security
IP	Inspection Procedure
IR	Inspection Report
ISFSI	Independent Spent Fuel Storage Installation
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	U.S. Nuclear Regulatory Commission
REMP	Radiological Effluent Monitoring Program
TLD	Thermoluminescent Dosimeter
VCC	Vertical Concrete Cask