



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

February 16, 2017

Mr. John Sauger  
General Manager  
Zion Restoration Project  
ZionSolutions, LLC  
101 Shiloh Boulevard  
Zion, IL 60099

SUBJECT: NRC INSPECTION REPORT NO. 05000295/2016003(DNMS);  
05000304/2016003(DNMS) – ZION NUCLEAR POWER STATION

Dear Mr. Sauger:

On January 12, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed onsite inspection activities from July 19, 2016 through January 12, 2017, at the permanently shut down Zion Nuclear Power Station (ZNPS), Units 1 and 2, 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 Mr. Jerry Houff and other members of your staff on January 12, 2017.

During the inspection period, the NRC inspectors reviewed the following aspects of onsite activities: design changes and modifications; self-assessments, audits, and corrective actions; maintenance and surveillance; occupational radiation exposure; inspection of final surveys at permanently shutdown 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, observation of work activities, and interviews with personnel.

Based on the results of this inspection, the NRC identified two Severity Level (SL) IV violations of NRC requirements. Because the issues were entered into your corrective action program (CAP), the NRC is treating them as Non-Cited Violations (NCVs), in accordance with Section 2.3.2.a of the NRC's Enforcement Policy. No response is required for the NCVs. However, if you contest these NCVs, 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

J. Sauger

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In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

**/RA/**

Michael A. Kunowski, Chief  
Materials Control, ISFSI, and  
Decommissioning Branch  
Division of Nuclear Materials Safety

Docket Nos. 05000295; 05000304  
License Nos. DPR-39; DPR-48

Enclosure:  
IR 05000295/2016003(DNMS);  
05000304/2016003(DNMS)

cc w/encl: ZionSolutions Service List

J. Sauger

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Letter to John Sauger from Michael Kunowski, dated February 16, 2017

SUBJECT: NRC INSPECTION REPORT NO. 05000295/2016003(DNMS);  
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U.S. NUCLEAR REGULATORY COMMISSION  
REGION III

Docket Nos: 05000295; 05000304

License Nos: DPR-39; DPR-48

Report Nos: 05000295/2016003(DNMS)  
05000304/2016003(DNMS)

Licensee: Zion *Solutions*, LLC

Facility: Zion Nuclear Power Station, Units 1 and 2

Location: Zion, Illinois

Dates: July 19, 2016, through January 12, 2017

Inspectors: Bill C. Lin, Health Physicist  
Peter J. Lee, Reactor (Decom) Inspector, Ph.D., CHP  
Matthew C. Learn, Reactor Engineer  
Rhex A. Edwards, Senior Health Physicist

Approved by: Michael A. Kunowski, Chief  
Materials Control, ISFSI, and  
Decommissioning Branch  
Division of Nuclear Materials Safety

Enclosure

## **EXECUTIVE SUMMARY**

### **Zion Nuclear Power Station, Units 1 and 2 NRC Inspection Report 05000295/2016003(DNMS); 05000304/2016003(DNMS)**

The Zion Nuclear Power Station (ZNPS) is a permanently shut-down and defueled power reactor facility that was maintained in a safe storage (SAFSTOR) condition from 1998 through 2010. Active decommissioning began in 2011, and continued throughout this quarterly inspection period. The spent fuel transfer campaign commenced in late 2013, and was successfully completed in January 2015. This routine safety inspection reviewed licensed activities associated with design changes and modification, self-assessment and corrective actions, final status surveys of the embedded pipping in the auxiliary building, environmental monitoring, effluent release, open air demolition, occupational radiation exposures, and waste transportation.

#### **Safety Reviews, Design Changes, and Modifications**

- 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. (Section 1.0)

#### **Self-Assessment, Auditing, and Corrective Action**

- The inspectors identified a SL IV NCV of 10 CFR 50.72(b)(2)(xi) for the licensee's failure to notify the NRC within four hours of an event for which the licensee notified or will be notifying other government agencies. (Section 2.0)

#### **Maintenance and Surveillance**

- Maintenance and surveillance for structures, systems, and components were adequate and resulted in the reliable operation of effluent control equipment. Workers followed work plans, surveillance procedures, and industrial safety protocols; and were aware of job controls specified in work instructions. (Section 3.0)

#### **Occupational Radiation Exposure**

- Radiation Work Permits (RWPs) and As Low As Is Reasonably Achievable (ALARA) controls provided contamination controls and dose reduction measures appropriate for the work activities. Workers adhered to the radiological controls provided in the RWPs and ALARA plans and followed the Radiation Protection (RP) staff instruction.
- Decommissioning activities were executed in general alignment with planning documents and as provided in RWPs and ALARA reviews. Radiation surveys were performed adequately to identify the hazards present. Command and control of radiologically significant activities was executed in a manner that was safe and achieved the desired result. (Section 4.0)

### **Final Status Surveys**

- The inspectors observed the licensee's performance of hydrolancing of the auxiliary building embedded pipping. The inspectors interviewed RP personnel and personnel that conducted the hydrolancing activity. The inspectors also reviewed the licensee's job hazard assessment for the activity and the final radiation survey (FRS) of the auxiliary building embedded pipping. (Section 5.0)

### **Radioactive Waste Treatment, and Effluent and Environmental Monitoring**

- The licensee controlled, monitored, and quantified releases of radioactive materials released to the environment to ensure offsite doses were within regulatory limits and ALARA. (Section 6.0)

### **Solid Radioactive Waste Management and Transportation of Radioactive Materials**

- The inspectors identified a SL IV NCV of 10 CFR 71.5(a) for the licensee's failure to meet the 49 CFR 173.427(a)(6)(ii) requirement that no radioactive material leak during exclusive use transport. The licensee failed to meet this requirement during the transportation of a Unit 1 steam generator (SG) from Zion to a burial site. (Section 7.0)

## Report Details

### Summary of Plant Activities

During the inspection period, the licensee continued numerous decommissioning activities, including the hydrolancing of the embedded piping of the auxiliary building, effluent release and environmental monitoring, transportation of a Unit 1 SG, and the preparation for open air demolition of the auxiliary building, fuel building, and Unit 1 and Unit 2 containments.

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

##### 1.1 Inspection Scope

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

- Determination that licensee procedures and processes conform to the regulation and guidance associated with 10 CFR 50.59;
- Procedures that control and implement design changes and modifications to assess that the procedures provided adequate guidance for implementation, review and approval;
- Implementation of a sampling of design change modifications to verify that procedures and controls were followed; and confirm that the applicable changes were effectively implemented in the field and in plant procedures, drawings, and training programs if applicable;
- Verification that changes made under 10 CFR 50.59 did not require prior NRC approval;
- Verification that changes to preventative maintenance, corrective maintenance, and operational procedures for required equipment were implemented in accordance with the licensee's processes and procedures; and
- Evaluations of emergency preparedness and response equipment, personnel and procedural changes were effectively reviewed, conducted, managed, and controlled during plant decommissioning as to maintain compliance with NRC regulations.
- The inspectors verified that licensee personnel appropriately documented issues in the CAP when they were identified.

##### 1.2 Observations and Findings

The inspectors reviewed the licensee's programs for changes; attended a sampling of licensee weekly onsite safety review committee meetings throughout the inspection period to verify that requirements were met; and performed a review of procedure and modification changes on a sample of licensee-approved changes. The inspectors

determined that when issues were identified, the issues were documented by the licensee in the CAP at an appropriate threshold.

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.

## 2.0 **Self-Assessments, Audits, and Corrective Actions (IP 40801)**

### 2.1 Inspection Scope

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

- Administrative procedures prescribed actions for the identification, evaluation, and resolution of problems;
- License procedures prescribed thresholds for the performance of self-assessments, audits, and surveillances;
- Licensee management reviewed self-assessments, audits, and corrective actions to remain knowledgeable of plant performance;
- Issues or problems were identified and corrected in accordance with the licensee's CAP;
- Quality assurance personnel audited changes in the status of decommissioning and licensee organization; and
- Licensee management observed maintenance and surveillance activities, operations evolutions and training.

The inspectors reviewed CAP documents to determine: if a sufficiently low threshold for problem identification existed; the quality of follow-up evaluations, including extent-of-condition; and if the licensee assigned timely and appropriate prioritization for issue resolution commensurate with the significance of the issue. Issues that were repetitive and those with the potential for safety or regulatory consequence were evaluated further by the inspectors to assess apparent and/or common cause and significance. The inspectors also observed a sample of licensee corrective action review team and corrective action review board meetings to ascertain if the CAP documents were implemented appropriately.



## 2.2 Observations and Findings

The inspectors identified a SL IV NCV of 10 CFR 50.72(b)(2)(xi) for the licensee's failure to notify the NRC within four hours of an event for which the licensee notified another government agency.

Specifically on August 12, 2016, at 1:56 pm central time, a security officer noticed that two male children were walking on the railroad tracks, approximately 50 yards inside the plant property fence. The children, presumably upon noticing the officer, turned and ran off toward the fence. They were not found during a subsequent search of the area by plant personnel.

On August 15, at 3:20 pm, the licensee (a radioactive waste group supervisor) contacted the U.S. Transportation Security Administration to discuss the trespassing incident, in accordance with 49 CFR 1580.105 - Reporting Significant Security Concerns, pertaining to rail transportation security. At 3:40 pm, after that discussion, the supervisor contacted the U.S. Department of Homeland Security Freedom Center and provided details of the incident. The licensee, however, did not notify the NRC until 8:14 am on August 16, in excess of the requirement in 10 CFR 50.72(b)(2)(xi) to notify the NRC within four hours of an event for which notification of other government agencies has been or will be made.

Upon identification by the NRC inspectors of the failure, the licensee entered the issue into its CAP and provided training to all licensee personnel regarding the 10 CFR 50.72(b)(2)(xi) requirement.

This violation was determined to be a Severity Level IV violation using the Violation Examples in the Enforcement Policy, dated November 1, 2016. The most informative example for this violation is Example 6.9.d.9 in the Enforcement Policy, as both this violation and the example violation are related to the failure to meet the 10 CFR 50.72 reporting requirements.

Title 10 CFR 50.72(b)(2)(xi) states, in part, that the licensee shall notify the NRC as soon as practical and in all cases, within four hours of the occurrence of any event for which notification to other government agencies has been or will be made.

Contrary to the above, as of 7:20 pm central time on August 15, 2016, the licensee failed to notify the NRC within four hours of notifying another government agency of an event. Specifically, at 3:20 pm on August 15, the licensee notified the U.S. Transportation Security Administration of an event but did not notify the NRC of the event until 8:14 pm on August 16.

Upon identification by the inspectors of the failure, the licensee entered the issue into its CAP and provided training to all licensee personnel regarding the 10 CFR 50.72(b)(2)(xi) requirement of notifying the NRC within four hours when notification to other government agencies has been or will be made. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000295/2016003-01; 05000304/2016003-01, Failure to Notify the NRC Within Four Hours of an Event for Which Other Government Agencies Were Notified)**

### 2.3 Conclusions

The inspectors identified a SL IV NCV of 10 CFR 50.72(b)(2)(xi) for the licensee's failure to notify the NRC within four hours of an event for which notification to other government agencies was made.

## 3.0 **Maintenance and Surveillance (IP 62801)**

### 3.1 Inspection Scope

The inspectors conducted plant tours, interviews, and direct observations to verify that maintenance and surveillance for structures, systems, and components were being conducted in a manner that resulted in the proper operation of radiation monitoring and effluent control equipment.

During walkdowns, the inspectors evaluated material condition and housekeeping, assessed area radiological conditions, radiological access control and associated posting/labeling, and reviewed the overall condition of systems, structures, and components that support decommissioning. Independent radiation measurements were periodically made by the inspectors in areas toured to determine if those areas were controlled properly and posted as prescribed in 10 CFR Part 20.

### 3.2 Observations and Findings

The inspectors noted that throughout the inspection period housekeeping remained satisfactory and changing radiological conditions were addressed in a prompt and timely manner by licensee staff.

The inspectors also verified that equipment, which remained available following the shutdown, had the appropriate preventive maintenance schedules established with input from equipment vendors. Finally, the inspectors verified that when equipment issues occurred, the licensee staff implemented the appropriate troubleshooting procedures to identify and correct the equipment deficiency identified.

No findings were identified.

### 3.3 Conclusions

Plant material condition and housekeeping were adequate and had not adversely impacted safe decommissioning. Workers followed work plans, surveillance procedures, and industrial safety protocols and were aware of job controls specified in work instructions.

## 4.0 Occupational Radiation Exposure (IP 83750)

### 4.1 Inspection Scope

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

- Planning and preparation for radiation work were adequate and if licensee management supported radiation protection planning;
- Personal dosimetry for external exposure met requirements;
- Management and administrative controls of external radiation exposure met requirements and were designed to make exposures ALARA;
- Processes or engineering controls were used to the extent practicable to limit concentrations of airborne radioactive materials;
- Survey and monitoring activities were performed as required;
- Control of radioactive materials and contamination met requirements; and
- Issues, events, or problems were identified, resolved, and prevent future problems in the area of radiological controls.

### 4.2 Observations and Findings

The inspectors reviewed the RWP and ALARA plans associated with removal of a Unit 1 SG, the RWP for the demolition of the north cavity liner, and the RWP for the removal of a high activity instrument calibration source. The inspectors observed that during the performance of these activities, the RP technicians had performed the necessary radiation and contamination surveys in accordance with the reviewed procedures. The inspectors reviewed the air sampling and survey results. The air sampling and survey results did not indicate any unexpected radiological hazards. The inspectors also interviewed various licensee RP staff and supervisors. All licensee personnel were knowledgeable about the hazards of the evolutions being performed and the proper RP protocols for any radiological incidents. The inspectors also observed the licensee don the appropriate personal protection equipment, such as alarming dosimetry, and followed appropriate ALARA practices.

No findings were identified.

### 4.3 Conclusions

RWP and ALARA reviews provided contamination controls and dose reduction measures appropriate for the work activities. Workers adhered to the radiological controls provided in the RWPs and ALARA plans and followed RP staff instructions.

Decommissioning activities were executed in general alignment with planning documents and as provided in RWPs and ALARA reviews. Radiation surveys were performed adequately to identify the hazards present. Command and control of radiologically significant activities was executed in a manner that was safe and achieved the desired result.

## **5.0 Inspection of Final Status Surveys at Permanently Shutdown Reactors (IP 83801)**

### **5.1 Inspection Scope**

The inspectors interviewed the hydrolancing operator to evaluate the effectiveness of the cleaning process of the embedded floor drain pipe in the auxiliary building. The inspectors reviewed the hydrolancing job hazard assessment.

The inspectors reviewed the final radiation survey (FRS) field log and interviewed the RP personnel who conducted the FRS after hydrolancing was conducted. The inspectors also reviewed the FRS data.

### **5.2 Observations and Findings**

The licensee had previously cleaned the embedded pipe by a mechanical rotary tool to loosen debris and a high capacity vacuum system to collect the loosened material. To improve the cleaning efficiency, the licensee used hydrolancing to clean all the embedded pipe (2,721 feet) including those previously cleaned by the mechanical rotary tool and an obstructed section of the pipe (85 feet). RP personnel conducted the FRS of the inner surface of the pipe, except the obstructed section of the pipe, which was about three percent of the total length of the pipe. To be conservative, the licensee assigned the highest pre-remediation activities of the accessible portion of the pipe to the obstructed section of the pipe.

Based on the review of the FRS data, radionuclide mixtures, and the efficiencies of the detector, the inspectors determined that the activities of the radionuclides were properly determined. Based on the summation of 2636 measurements and 85 estimated activities, the total activities of radionuclide of concern in the embedded pipe were 100.87 milliCurie(s) (mCi) of Co-60, 0.03 mCi of Cs-134, 91.79 mCi of Cs-137, 50.50 mCi of Ni-63, and 0.06 mCi of Sr-90.

Using the licensee's proposed auxiliary basement fill model dose factors (millirem/year/mCi): 1.14E-02 (Co-60), 1.64E-02 (Cs-134), 3.12E-02 (Cs-137), 3.01E-04 (Ni-63), 3.47E-01 (Sr-90), the inspectors calculated that the embedded pipe could contribute about 4.05 millirem/year to the public from the groundwater pathway, a value well within the 25 millirem/year regulatory limit.

No findings were identified.

### **5.3 Conclusions**

The NRC inspectors reviewed the FRS results for the embedded piping and determined that the activities of the radionuclides were properly determined and that the embedded pipe would contribute about 4.05 millirem/year to the public from groundwater pathway.

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

### **6.1 Inspection Scope**

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

- Radioactive waste treatment systems were maintained and operated to keep offsite doses ALARA;
- The licensee effectively controlled, monitored, and quantified releases of radioactive materials in liquid, gaseous, and particulate forms to the environment; and
- The radiological environmental monitoring programs were effectively implemented to ensure effluent releases were being adequately performed as required to minimize public dose.

As part of the inspection, the inspectors verified that licensee programs and procedures were appropriately implemented by licensee staff. In addition, the inspectors verified that when issues were identified licensee personnel appropriately documented the issues in the corrective action program and adequate corrective actions were taken.

### **6.2 Observations and Findings**

The inspectors noted during walkdowns of the radioactive effluent equipment and pathways that they were configured as described in the Offsite Dose Calculation Manual (ODCM) and were in good material condition. The inspectors also discussed with licensee personnel the changes to the ODCM in preparation for the upcoming open air demolition of the Unit 1 and Unit 2 containments, fuel building, and the auxiliary building. The inspectors also walked-down the area where the licensee had newly installed several air samplers. The air samplers were functioning properly and RP personnel were knowledgeable about filter change out frequency and actions to take if it were discovered that one of the air samplers did not function properly.

No findings were identified.

### **6.3 Conclusions**

The licensee maintained effluent monitoring and control systems as provided in the General Design Criteria of 10 CFR 50, Appendix A. The effluent flow paths and monitoring systems reviewed aligned with descriptions in the ODCM and were functional. The effluent monitors reviewed were functional, calibrated, and alarm set points conservatively set to meet regulatory requirements.

## 7.0 Solid Radioactive Waste Management and Transportation of Radioactive Materials (IP 86750)

### 7.1 Inspection Scope

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

- Whether the licensee provided detailed instructions and operating procedures for transfer, packaging, and transport of low-level radioactive waste;
- Whether the material was properly classified, described, packaged, marked, and labeled for transportation;
- Whether the licensee used up dated and audited procedures when scaling factors or correlation factors are used to quantify the concentration of hard-to-detect radionuclides; and
- Whether shipments made by the licensee were in compliance with NRC and Department of Transportation regulations.

### 7.2 Observations and Findings

The inspectors identified one violation of 10 CFR 71.5(a) for the licensee's failure to meet 49 CFR 173.427(a)(6)(ii) requirement in which there may not be any leakage of radioactive material from the conveyance during exclusive use transport. The licensee failed to meet this requirement during the transportation of a Unit 1 SG from Zion to a burial site.

On May 12, 2016, the Zion *Solutions* rail car (number QTTX13618, package number SG1C, manifest number 0958-02-0062) arrived at a burial site in Clive, Utah, with gaps in the caulking, between the large component and manway/handhold cover, from which radioactive contamination had leaked. The steam generator had been shipped exclusive use as a sealed, surface contaminated object (SCO). Apparently, the caulking had shrunk after the rail car left Zion on April 28, allowing the contamination to leak out. The State of Utah personnel at the burial site identified the gaps in the caulking when the rail car arrived and quantified the contamination as 22,000 disintegrations per minute/100 square centimeters on the rail car.

The NRC was notified of the contamination event by the licensee on July 20, 2016, and subsequently discussed with the licensee the contamination event and the corrective actions the licensee took. The licensee entered the contamination event into the CAP, standardized the caulking used to seal gaps for other SGs that would be prepared for transportation, and required inspection by management once all the caulking was completed and the item was ready for transport.

This violation was determined to be a SL IV violation using the Violation Examples in the Enforcement Policy, dated November 1, 2016. The most informative example for this

violation is Example 6.8.d.2 as both this violation and the example violation are related to unexpected contamination outside the conveyance during transportation.

Title 10 CFR 71.5(a) requires, in part, that a licensee who transports licensed material outside of the site of usage, or who delivers licensed material to a carrier for transport, comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR Parts, 107, 171-180, and 390-397.

Title 49 CFR 173.427(a)(6)(ii) states, in part, that for SCO consigned as exclusive use there may not be any leakage of radioactive material from the conveyance.

Contrary to the above, from April 28 to May 12, 2016, the licensee transported or delivered for transport an SCO consigned as exclusive use and leakage of radioactive material from the conveyance occurred.

Upon identification of the leakage, the licensee entered the issue into its CAP, standardized the caulking used to seal gaps for other SGs that would be prepared for transportation, and required inspection by management once all the caulking was completed and the item was ready for transport. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

**(NCV 05000295/2016003-02; 05000304/2016003-02, Leakage of Contamination from a Steam Generator Sent to a Burial Site)**

### 7.3 Conclusions

The inspectors identified one violation of 10 CFR 71.5(a) for the leakage of radioactive material from a sealed steam generator shipped via rail car from Zion to a burial site.

### 8.0 **Exit Meeting**

The inspectors presented the results of the inspection to Mr. Jerry Houff and other members of the licensee's staff at a telephone exit meeting on January 12, 2017. 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

G. Van Noordennen, Vice President of Regulatory Affairs  
J. Ashley, Zion Licensing Engineer  
J. Houff, Licensing Manager  
J. Smith, Radiological Engineer  
T. Orawiec, Plant Manager  
B. Yetter, Characterization/License Termination Manager  
C. Keene, RP Director

### INSPECTION PROCEDURES (IPs) USED

IP 37801 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors  
IP 40801 Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors  
IP 62801 Maintenance and Surveillance at Permanently Shutdown Reactors  
IP 83750 Occupational Radiation Exposure  
IP 83801 Inspection of Final Surveys at Permanently Shutdown Reactors  
IP 84750 Radioactive Waste Treatment, and Effluent and Environmental Monitoring  
IP 86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened and Closed</u>	<u>Type</u>	<u>Summary</u>
05000295/2016003-01; 05000304/2016003-01	NCV	Failure to Notify the NRC Within Four Hours of an Event for Which Other Government Agencies Were Notified
05000295/2016003-02; 05000304/2016003-02	NCV	Leakage of Contamination from a Steam Generator Sent to a Burial Site

#### Discussed

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.

- ZNPS 50.59 Screenings and Evaluations for 2015
- ZNPS 50.59 Screenings and Evaluations for 2016



- **PARTIAL LIST OF DOCUMENTS REVIEWED**

- ZS-WC-100; Decommissioning and Work Control Process, Initiating and Screening Work Requests; Revision 13
- AD-11; Regulatory Reviews; Revision 1
- CR-2016-0139; Purchase Orders for Final Status Survey Not Accurate and Missing Quality Requirements; December 7, 2016
- CR-2016-0140; All Decommissioning Work Was Not Completed in an Area Turned Over for Final Status Survey (FSS); December 7, 2016
- CR-2016-0141; Discrepancies Identified with Final Status Survey (FSS) Packages and Release Records; December 7, 2016
- CR-2016-0142; An Evaluation and Resolution of the "At Risk" FSS and Documentation is Needed; December 7, 2016
- CR-2016-0143; Additional Controls Are Required for Some License Termination Plan Procedures; December 7, 2016
- CR-2016-0126; FSS of Unit 1 Steam Tunnel Determined To Be Invalid; November 9, 2016
- CR-2016-0132; Liquid Rad Waste System Leak; November 17, 2016
- CR-2016-0108; Zion License Termination Change Plan; October 13, 2016
- CR-2016-0109; Excessive Water Entering the Aux Building; October 14, 2016
- CR-2016-0095; Railcar Contain Water; September 19, 2016
- Uniform Low-Level Radioactive Waste Manifest; May 12, 2016
- Department of Transportation Special Permit 14455
- Auxiliary Building Floor Drain Spreadsheets
- Radiation Survey 2016-2507
- Dose Estimate for CR-2016-0066
- D&D Operations Job Aids SD-1; Revision 0; August 17, 2016
- Zion Station Final Radiation Survey Release Records; Auxiliary Building 542 Embedded Floor and Equipment Drain Pipe; September 1, 2016
- Quality Assurance Memo 2016-06; August 29, 2016
- ALARA Review 2016-2-0002; June 21, 2016
- ALARA Review 2015-0-0017; March 1, 2016
- Radiological Work Permit 2016-0-0002; June 21, 2016
- Radiological Work Permit 2016-0-0021; October 19, 2016
- Radiological Work Permit 2016-0-0017; September 19, 2016
- ZS-LT-300-001-004 Final Status Survey Data Assessment; Revision 5; October 8, 2016
- ZS-LT-300-001-006 Radiation of Pipe Interior Using Sodium Iodine Detectors; Revision 2; October 18, 2016
- ZS-LT-400-001-001 Unconditional Release of Material, Equipment, and Secondary Structures; Revision 3; April 20, 2015
- ZS-LT-400-001-002 Contamination Verification Surveys Prior to Demolition; Revision 2; October 27, 2016
- Manafort Brothers Job Hazard Assessment Hydro Lancing
- Zion Effluent Release Record R-16-016; August 3, 2016
- State of Utah Department of Environmental Quality Inspection Report; July 29, 2016
- ODCM Air Sample Analysis Sheets
- Personnel Lapel Air Sample Analysis Sheet
- Zion Station Job Aid No. LRW-1 Liquid Rad Waste Treatment System Operations; Revision No. 2.1; October 18, 2016
- Zion Station Procedure ZCP-421-1 Liquid Release Documentation; Revision 42; July 28, 2016

## LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Is Reasonably Achievable
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DHS	Department of Homeland Security
DNMS	Division of Nuclear Materials Safety
FRS	Final Radiation Survey
IP	Inspection Procedure
IR	Inspection Report
LSA	Low Specific Activity
mCi	milliCurie(s)
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records System
RP	Radiation Protection
RWP	Radiation Work Permit
SAFSTOR	Safe Storage
SCO	Surface Contaminated Object
SG	Steam Generator
SL	Severity Level
ZNPS	Zion Nuclear Power Station