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Exelon Nuclear

March 15, 2007
CZE-07-002

10 CFR 50.73
10 CFR 20.2201

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Zion Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-39 and DPR-48
NRC Docket Nos. 50-295 and 50-304

Subject: Submittal of Licensee Event Report Number 2007-001-00 – Units 1 and 2, "Inadequate Special Nuclear Material (SNM) Record Keeping Practices for Exempt Quantities"

The enclosed Licensee Event Report (LER) is being submitted in accordance with 10 CFR 50.73, "License event report system," and 10 CFR 20.2201, "Reports of theft or loss of licensed material," paragraph (b), "Written reports." 10 CFR 20.2201 requires a written report be submitted within 30 days following the telephone notification in accordance with 10 CFR 20.2201 paragraph (a) after the occurrence of any lost, stolen, or missing licensed material in a quantity greater than 10 times the quantity specified in Appendix C to Part 20.

There are no regulatory commitments contained in the attached report. Should you have any questions concerning this submittal, please contact Mr. James Ashley, Licensing Engineer, at (847) 379-2978.

Respectfully,

Ron Schuster
Decommissioning Plant Manager
Zion Nuclear Power Station

Enclosure: LER Number 2007-001-00

cc: Regional Administrator- NRC Region III
Office of Nuclear Facility Safety-IEMA Division of Nuclear Safety

IE22

bcc: Vice President – Licensing and Regulatory Affairs
Director – Licensing and Regulatory Affairs
Licensing Engineer – Zion Nuclear Power Station
Zion Nuclear Licensing Administrator
Manager, Licensing – Braidwood, Byron and LaSalle County Stations
Exelon Document Control Desk Licensing
Commitment Tracking Coordinator – Cantera
Zion Station Master File

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Zion Station, Unit 1	05000295	1 of 4

4. TITLE
Inadequate Special Nuclear Material (SNM) Record Keeping Practices for Exempt Quantities

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									Zion Station, Unit 2	05000304
02	28	2007	2007	- 001 -	00	03	15	2007	FACILITY NAME: N/A	DOCKET NUMBER: N/A

9. OPERATING MODE
Permanently Defueled

10. POWER LEVEL
N/A

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☒ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
James Ashley, Licensing Engineer	(847) 379-2978

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

In the process of reviewing Special Nuclear Material (SNM) records, it was identified that all disposition records for reactor incore detectors could not be found. The reactor incore detectors contain very small quantities of U-235 and were used to monitor reactor power during plant operation. The unaccounted for material was classified as missing on February 28, 2007 due to lack of records documenting the current location of forty-three detectors that were received onsite between 1972 and 1987. Based on interviews with former Zion Nuclear Material Custodians and other relevant personnel, it is believed that these detectors were shipped as radioactive waste to the Barnwell Low-Level Radioactive Waste Disposal Facility located in South Carolina. Additionally, select historical records indicate that it was common practice for Zion Station to dispose of detectors as radioactive waste. A search of storage locations at Zion was performed, but the detectors were not located. There is no evidence of theft or diversion of these detectors.

LICENSEE EVENT REPORT (LER)

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

A. Plant Operating Conditions Before The Event:

Event Date: February 28, 2007 Event Time: 1305 (Central Daylight Time)

Unit: 1 Permanently Defueled
Unit: 2 Permanently Defueled

B. Description of Event:

In February 2007, a Zion Station audit of historical records for items containing exempt quantities of Special Nuclear Material (SNM) was conducted. In the process of reviewing SNM records, it was identified that all disposition records for reactor incore detectors could not be found. The reactor incore detectors contain very small quantities of U-235 and were used to monitor reactor power during plant operation. Efforts to locate the missing records included an extensive search of site and corporate archived records and a database search of regulatory correspondence. Documents sought included SNM receipt, inventory, acquisition, transfer and disposal records. In addition, several former Nuclear Material Custodians (NMCs) were interviewed regarding record keeping and disposal practices for exempt quantities of SNM. The Barnwell Low-Level Radioactive Waste Disposal Facility, which received previous Zion radioactive waste shipments, was also requested to review their records to identify any documented SNM shipments received.

The SNM audit was completed on February 28, 2007. At that time, it was concluded that all disposition records for reactor incore detectors could not be found. A search of storage locations at Zion was performed, however the detectors were not located. Select records retrieved and information obtained from former Zion NMC interviews identified that it was common practice to dispose of detectors as radioactive waste via shipment to the Barnwell Low-Level Radioactive Disposal facility located in South Carolina; however, this disposal facility was unable to locate records that would indicate receipt of the detectors from Zion.

It is believed that the detectors were disposed of as radioactive waste and therefore no inadvertent radiation exposures are believed to have occurred as a result of this situation. There is no evidence of theft or diversion of these detectors and no additional actions are planned to locate the detectors. Due to incomplete detector disposal documentation, it was conservatively decided to classify the SNM as missing.

The incomplete records are associated with detector transactions that occurred between 1972 and 1988. Following the issuance of NRC Information Notice (IN) No. 88-34, "Nuclear Material Control and Accountability of Non-Fuel Special Nuclear at Power Reactors," Exelon Generation Company (formerly Commonwealth Edison Company) enhanced exempt quantity SNM accounting practices. No incore detector record discrepancies were identified for detector transactions occurring from 1989 to date.

The audit identified that a lack of disposition documentation exists for forty-three detectors received onsite prior to 1988. The detectors contain an extremely small amount of SNM and pose no significant safety concern. Depending on design, each incore detector contained between approximately 0.0004 grams and 0.0027 grams of Uranium 235, resulting in an aggregate quantity of approximately 0.102 grams of Uranium 235. The activity of this quantity is approximately 0.22 micro-curies. This activity exceeds the reportability threshold of 10 times the quantity specified in Appendix C to 10 CFR 20 which is 0.01 micro-curies. Therefore, this classification of missing SNM is reportable in accordance with 10 CFR 20.2201(a)(1)(ii). The 30 day telephone report required by 10 CFR 20.2201(a)(1)(ii) was completed via Emergency Notification System Number 43202 at 1316 (Central Daylight Time) on February 28, 2007. This 30 day written report is being submitted in accordance with 10 CFR 20.2201(b).

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

C. Cause of Event

This event resulted from inadequate accounting practices related to exempt quantities of SNM. The inadequate accounting practices occurred from 1972 through 1988. This event is attributed to lack of attention to detail regarding Federal Regulations and lack of procedural guidance for SNM control.

D. Safety Consequences:

The detectors contained an extremely small amount of SNM and pose no significant safety concern. Depending on design, each incore detector contained between approximately 0.0004 grams and 0.0027 grams of Uranium 235, resulting in an aggregate quantity of approximately 0.102 grams of Uranium 235. It is believed that the detectors were disposed of as radioactive waste at the Barnwell Low-Level Radioactive Waste Disposal Facility and therefore, no inadvertent radiation exposures are believed to have occurred as a result of this situation.

E. Corrective Actions:

A review of historical documentation was completed, including site and corporate regulatory correspondence, SNM records, and Barnwell Low-Level Radioactive Waste Disposal Facility records. A search of storage locations was also completed.

Former NMCs were interviewed regarding record keeping and disposal practices, which identified that it was a common practice to dispose of detectors as radioactive waste via shipment to the Barnwell Low-Level Radioactive Waste Disposal Facility.

All other SNM material was accounted for. In addition, a review of current Exelon proceduralized requirements for exempt quantity SNM controls has concluded that existing requirements are adequate to prevent recurrence of this event.

F. Previous Occurrences:

There have been no previous similar events at Zion Station.

G. Component Failure Data:

Manufacturer	Nomenclature	Model	Mfg. Part Number
N/A	N/A	N/A	N/A

The following information is required by 10 CFR 20.2201(b):

DESCRIPTION OF LICENSED MATERIAL INVOLVED, INCLUDING KIND, QUANTITY, AND CHEMICAL AND PHYSICAL FORM

Forty-three incore detectors manufactured by Reuter-Stokes with a stainless steel outer shell. Detector dimensions are approximately 2.2 inches long and 0.2 inches in diameter. The aggregate quantity of Uranium 235 contained in the detectors is approximately 0.102 grams.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

DESCRIPTION OF CIRCUMSTANCES UNDER WHICH THE LOSS OR THEFT OCCURRED

The detectors are believed to have been disposed of as radioactive waste. Detailed disposal records for the detectors have not been found. They are classified as missing due to the lack of disposal documentation.

A STATEMENT OF DISPOSITION, OR PROBABLE DISPOSITION, OF THE LICENSED MATERIAL INVOLVED

The detectors were probably disposed of as radioactive waste at the Barnwell Low-Level Radioactive Waste Disposal Facility located in South Carolina.

EXPOSURES OF INDIVIDUALS TO RADIATION, CIRCUMSTANCES UNDER WHICH THE EXPOSURES OCCURRED, AND THE POSSIBLE TOTAL EFFECTIVE DOSE EQUIVALENT TO PERSONS IN UNRESTRICTED AREAS

There is no known exposure to individuals. It is believed that the detectors were disposed of as radioactive waste and therefore, no inadvertent radiation exposures are believed to have occurred as a result of this situation.

ACTIONS THAT HAVE BEEN TAKEN, OR WILL BE TAKEN, TO RECOVER THE MATERIAL

All actions related to this event are complete.

PROCEDURES OR MEASURES THAT HAVE BEEN, OR WILL BE, ADOPTED TO ENSURE AGAINST A RECURRENCE OF THE LOSS OR THEFT OF LICENSED MATERIAL

A review of current Exelon proceduralized requirements for exempt quantity SNM controls has concluded that existing requirements are adequate to prevent recurrence of this event.