

September 14, 2004

United States Nuclear Regulatory Commission
Region III
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

Attention: Mr. Edward Kulzer, CIH, CHP, Decommissioning Inspector, DNMS

SUBJECT: IEMA – BUREAU OF NUCLEAR FACILITY SAFETY
DECOMMISSIONING INSPECTION REPORT
Quarterly Inspection Period: July 1, 2003 through September 30, 2003

Dear: Mr. Kulzer,

On September 8, 2004 the Illinois Emergency Management Agency-Bureau of Nuclear Facility Safety (IEMA-BNFS) Resident Inspector(s) completed the quarterly decommissioning inspection activities at the Zion Nuclear Station, and the associated Spent Fuel Nuclear Island. Per the terms and conditions of the Memorandum of Understanding (MOU) between the NRC and IEMA-BNFS, the enclosed inspection report documents our agency's inspection issues and concerns that were previously discussed with you and members of your staff.

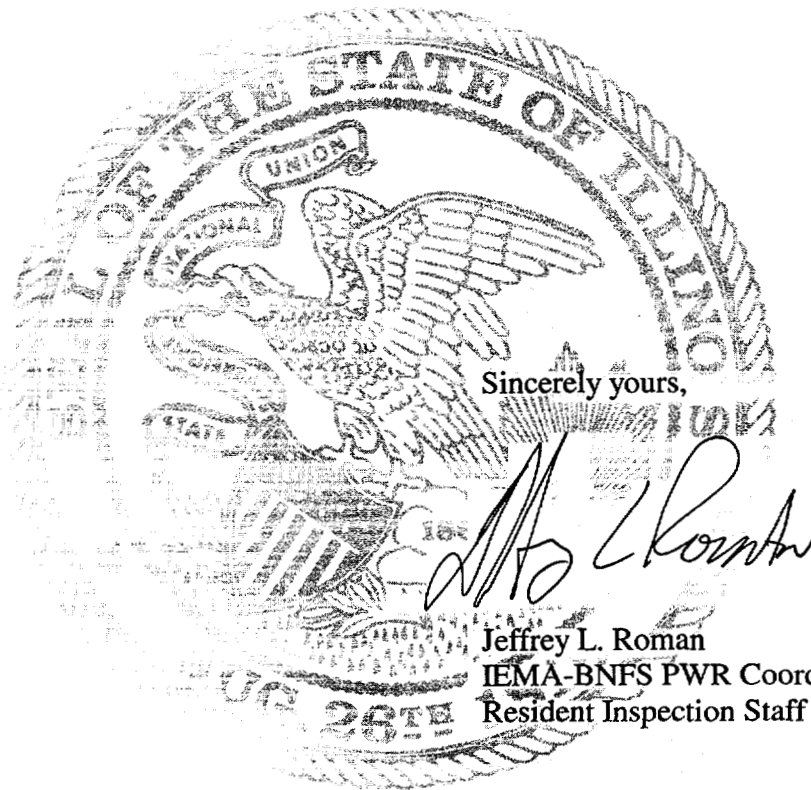
The IEMA-BNFS inspection activities were conducted as they relate to nuclear safety and to compliance with the Commission's rules and regulations and with the conditions of the plant license. The inspector(s) reviewed selected licensee procedures and records, observed licensee activities, and interviewed licensee personnel.

Specifically, the inspection of licensee activities for this period focused on (1) Spent Fuel Pool Safety at Permanently Shutdown Reactors (IP 60801) and (2) Maintenance and Surveillance Activities at Permanently Shutdown Reactors (IP 62801). The details of those specific activities along with their observations, findings and conclusions are disseminated within the text of the IEMA-BNFS Inspection Report.

Based on the results of this inspection, the inspectors did not identify any areas within the inspection scope that contained any apparent degraded conditions.

As a result of the inspection, no issues or concerns have been entered into the IEMA – Bureau of Nuclear Safety Plant Issues Matrix. In full cooperation with, and at the request of the NRC, IEMA-BNFS will continue to follow and assist the NRC Inspection Staff with resolution and closure of any issues and concerns that are observed and documented during decommissioning inspection activities conducted at the Zion station.

If you have any questions, please contact me at your earliest convenience.



Docket No. 05000295
License Nos. DPR-39, DRP 48
Enclosure(s): Inspection Report

cc w/o encl: A.C. Settles, Chief Division of RICC
J. C. Yesinowski, BNFS-RI, LaSalle Station

IEMA-DNS INSPECTION REPORT SUMMARY

Docket No(s): 50-295, 50-304

License No(s): DRP-39, DRP-48

Licensee: Exelon Company

Facility: Zion Nuclear Plant, Units 1 and 2, including Spent Fuel Nuclear Island

Location 101 Shiloh Boulevard
Zion, IL 60099

Dates: September 8, 2004

IEMA Inspector Jane Yesinowski

Inspection Hours: 12

Inspection Modules 60801 Spent Fuel Pool Safety at Permanently Shutdown Reactors

62801 Maintenance and Surveillance at Permanently Shutdown Reactors

EXECUTIVE SUMMARY

Spent Fuel Pool Safety at Permanently Shutdown Reactors

The licensee identified Spent Fuel Nuclear Island (SFNI) issues as they occurred, trended the issues, and worked towards their resolution. In particular, the licensee recognized a SFNI electrical power supply reliability issue, initiated the Zion Station System Health Monitoring Program, and worked toward the goal of improving SFNI electrical power reliability.

The safety significance due to loss of power events to SFNI busses was minimal because power was promptly restored with negligible effect on SFP temperature and all 2004 loss of power events with one exception affected only one redundant power feed. The offsite power losses were more an inconvenience to operations personnel who were required to restart SFNI equipment rather than of any safety significance.

Maintenance and Surveillance at Permanently Shutdown Reactors

The general material condition of structures, systems, and components for the safe storage of spent fuel was good. The licensee adequately prioritized maintenance work commensurate with its safety significance concerning the safe storage of spent nuclear fuel. Maintenance work instructions and documentation were appropriate to circumstances.

REPORT DETAILS

1.0 Spent Fuel Pool Safety at Permanently Shutdown Reactors (IP 60801)

a. Inspection Scope

The inspectors evaluated the Spent Fuel Nuclear Island (SFNI) operation including the SFNI electrical power supply reliability. The inspectors reviewed the System Health Indicator Worksheet for the Spent Fuel (SF) system and the System Health Review meeting notes dated September 7, 2004. The inspectors also reviewed the Loss of SFNI Power Events log and Work Request (WR) No. 154471, Loss of Power to SFNI Bus 1. The inspectors also discussed SFNI operation and electrical power reliability with the Decommissioning Engineer.

b. Observations and Findings

The inspectors observed SFNI equipment operation and found the SFNI equipment to be operating as designed. The September 8, 2004 Plant Status sheet indicated that all system operating parameters were normal. Spent Fuel Pool (SFP) temperature was maintained at approximately 90 degrees Fahrenheit. SFP level was at 615' 1", within its normal range.

On September 7, 2004, just prior to the inspection, the licensee experienced a loss of power event to a single SFNI bus. There are two offsite electrical lines to Zion Nuclear Station, each feeding a separate and redundant SFNI bus. Work Request (WR) No. 154471, Loss of Power to SFNI Bus 1, documented the September 7, 2004, loss of power event. At approximately 7:10 PM on September 7, 2004, a pole top switch failure on 34 KV line 1662 caused a loss of power to line A-151, which fed SFNI bus 1. The failure was isolated and at 7:31 PM on September 7, 2004, line A-151 was re-energized followed by SFNI bus 1 re-energization at 7:32 PM. The SFNI equipment had been aligned to Bus 2 so SFP cooling was not affected. The WR was written for event trending.

From discussions with the Decommissioning Engineer and a review of the Loss of SFNI Power Events log, the inspectors discovered that:

- The licensee logged Loss of SFNI Power Events for trending purposes.
- In 2004, as of September 9, 2004, there were a total of 9 Loss of SFNI Power Events.
- Seven of the single line losses were electrical feeds to SFNI bus 1; one was to SFNI bus 2.
- Four of the single line disruptions to SFNI bus 1 were due to momentary loss of power.

- In 2004, there was one event where, within several minutes, power was lost to both redundant lines to SFNI busses. The line to SFNI bus 1 was a momentary loss. The line to SFNI bus 2 was lost due to a felled tree.
- Due to redundancy by design, SFNI equipment was capable of restoration from either an unaffected bus or the affected bus when power was restored.
- Restoration of power to SFNI equipment ranged from 21 minutes to 130 minutes. During these times, there was no safety significance because the SFP temperature increases were negligible.

In early 2004, the licensee implemented a draft Zion Administrative Procedure (ZAP), Zion Station System Health Monitoring Program (SHMP), ZAP-0500-16. The procedure was approved on July 23, 2004. The procedure's purpose was stated as follows: "This program will be used for early detection of equipment problems, system performance trending, evaluating effectiveness of preventative and corrective maintenance, and prioritizing work." The System Health Monitoring Committee (SHMC) met periodically to review performance of "REQUIRED" systems. From the System Health Review meeting notes dated September 7, 2004, the SFNI system was moved from a "yellow" status to "green" status on July 7, 2004, and a three-month monitoring period was planned to end on October 7, 2004. ZAP -0500-16 stated that "Yellow" status means that maintenance activities should be prioritized to return the system to "green". From discussion with the Decommissioning Engineer, the SFNI system was placed on a "yellow" health status because of various issues including SFNI electrical power reliability, though procedurally, the SFNI status screened "green". Placing it at "yellow" status elevated the SFNI concerns to focus attention on fixing the problems. The licensee plans to add a time delay relay to delay opening of the SFNI busses feed breakers in the event of a momentary loss of an offsite power line. This would improve SFNI electrical power supply reliability. Another more long-term licensee consideration was to provide SFNI bus feeds from the licensee's switchyard.

c. Conclusions

The licensee identified SFNI issues, trended these issues, and worked toward their resolution. In particular, the licensee recognized a SFNI electrical power supply reliability issue, initiated the Zion Station System Health Monitoring Program, and worked toward the goal of improving SFNI electrical power reliability.

The safety significance of loss of power events to SFNI busses was minimal because power was always restored with negligible effect on SFP temperature and all 2004 loss of power events with one exception affected only one redundant feed.

Since operations personnel were required to restore the SFNI equipment following each power loss event, such events were more an inconvenience to operations personnel than an issue of safety significance.

There were no apparent degraded conditions associated with this activity.

2. Maintenance and Surveillances at Permanently Shutdown Reactors (IP 62801)

a. Inspection Scope

The inspectors performed a plant walkdown of the Fuel Building and Spent Fuel Nuclear Island (SFNI) cooling towers outside the building to observe and assess the general material condition of the structures, systems, and components (SSCs) associated with the safe storage of spent fuel. The inspectors also reviewed the results of Operating Special Procedure, OSP-01-002, Spent Fuel Pool Heat Up Data Collection Procedure, Revision 0, performed by licensee personnel on August 17-18, 2004.

The inspectors reviewed Work Order No. 668650-02 instructions for the "B" Spent Fuel System Cooling Tower Pump. The inspectors also reviewed the Exelon PowerLabs Mid-West Division report titled "Evaluation of Internal Deposits from the B Spent Fuel System Cooling Tower Pump at Zion Station", dated March 16, 2004.

The inspectors reviewed the Target Master B list, which licensee personnel considered its backlog work. The inspectors discussed the use of this list with licensee personnel.

The inspectors reviewed Work Order No. 99220993-03, Close the Training Trailers, and Work Order No. 613811 01, SFNI Cooling Loop B Lubricate Pump Motor Bearings, to assess that the maintenance was conducted in accordance with instructions appropriate to the circumstances. The inspectors also verified that the licensee adequately assessed availability and operability of redundant systems for safe fuel storage and other possible impacts on the site-wide activities.

b. Observations and Findings

The inspectors and the licensee Decommissioning Engineer toured the Fuel Building. The inspectors found that the general material condition of the SFNI SCCs was good as evidenced by the following:

- There were no pump or piping leaks.
- Pump oil levels were satisfactory.

- Fuel Building housekeeping was good.
- Fuel Building lighting was good.
- The area radiation monitors reflected current low radiation levels in the Fuel Building.
- The Data Acquisition System (DAS) computer monitor in the Fuel Building reflected actual plant conditions. All data was available with no alarm conditions present.

The inspectors discussed the licensee plans concerning the Spent Fuel Canal weir gate leakage. The weir gate now leaks on both the SFP side and the transfer canal side. The licensee drafted a Project Plan considering various options. The draft Project Plan was scheduled for presentation at the station on September 30, 2004.

The licensee performed OSP-01-002, Spent Fuel Pool Heat Up Data Collection Procedure, Revision 0, on August 17-18, 2004. The test was done with SFP cooling secured. Fuel Building ventilation was also secured. The Spent Fuel Pool Heat-Up Test Results were as follows:

- SFP heat-up rate was approximately 0.6 degrees Fahrenheit per hour.
- Assuming an initial SFP temperature of 90 degrees Fahrenheit, it would take approximately 200 hours for the SFP to reach saturation temperature, i.e., boiling of the cooling volume.

Previously, during the August 27, 2003 test, the estimated SFP heat-up rate was approximately 0.7 degrees Fahrenheit per hour. The lower heat-up rate was attributed to a reduction in spent fuel assembly decay heat emission.

During the inspectors' review of Work Order No. 668650-02 instructions for the "B" Spent Fuel System Cooling Tower Pump, the inspectors found that the issue review by the licensee adequately documented the pump failure. The licensee disassembled the pump and sent samples of internal deposits to Exelon PowerLabs Mid-West Division for testing. The report prepared by Exelon PowerLabs Mid-West Division Senior Metallurgical Engineer, "Evaluation of Internal Deposits from the B Spent Fuel System Cooling Tower Pump at Zion Station", dated March 16, 2004, concluded that deposits, which resulted in the wear ring to impellor binding causing pump seizure, were primarily of two characteristics. The hard, adherent deposit on the wear ring surface consisted primarily of calcium carbonate. The casing deposits were primarily iron oxide/hydroxide corrosion products from the cast iron casing. The pump's four-month stagnant water exposure contributed to the casing corrosion. To resolve this issue, the licensee revised its SFNI operational procedures such that the standby SFNI Cooling Tower Pump would now be bumped weekly as a compensatory measure to demonstrate availability of the standby pump. This activity was assigned as a Preventative Maintenance activity.

From the inspectors' review of the Target Master B list and discussion with a Maintenance Coordinator, the backlog list was used as an effective tool to assist in tracking and scheduling station work. When the inspectors questioned the Maintenance Coordinator concerning the status of the five Spent Fuel (SF) System items on the list, he was knowledgeable on the status of each item. Work Request No. 729718-02, SFNI Blowdown Valve stuck open, was a B3 item and was addressed in the System Health Review meeting notes dated September 7, 2004. The licensee Code Value described a B3 item as "emergent work scheduled and started within five weeks". The other SF items were a status "C" and defined as "routine work that follows the normal scheduling process."

During the inspectors' review of Work Order No. 99220993-03, Close the Training Trailers, and Work Order No. 613811-01, SFNI Cooling Loop B Lubricate Pump Motor Bearings, the inspector verified that the licensee adequately assessed availability and operability of redundant systems for safe fuel storage and other possible impacts on the site-wide activities. The inspectors found that documentation indicated that the maintenance was conducted in accordance with instructions that were appropriate to the tasks.

c. Conclusions

The inspectors found that the general material condition of structures, systems, and components (SCCs) for the safe storage of spent fuel was good.

The inspectors found that the licensee evaluation of the B Cooling Tower Pump seizure failure was good.

The licensee adequately prioritized maintenance work commensurate with its safety significance concerning the safe storage of spent fuel.

Maintenance work instructions and documentation were appropriate to circumstances. Impact of the maintenance work on the plant was adequately assessed. Causes of SCCs failures were adequately assessed.

There were no apparent degraded conditions associated with this activity.

LIST OF ACRONYMS USED

DAC	Data Acquisition System
IEMA	Illinois Emergency Management Agency
IL	Illinois
IP	Inspection Procedure
SF	Spent Fuel System
NRC	Nuclear Regulatory Commission
OSP	Operating Special Procedure
SFNI	Spent Fuel Nuclear Island
SFP	Spent Fuel Pool
SHMC	System Health Monitoring Committee
SHMP	System Health Monitoring Program
SSC	Structures, Systems, and Components
WR	Work Request
ZAP	Zion Administrative Procedures

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