

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Docket No. 05000171
License No. DPR-12
Inspection No. 05000171/2010007
Licensee: Exelon Generation Company, LLC
Facility: Peach Bottom Atomic Power Station, Unit 1
Location: 1848 Lay Road
Delta, Pennsylvania 17314-9032
Inspection Dates: August 9-12, 2010

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Division of Nuclear Materials Safety

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EXECUTIVE SUMMARY

Exelon Generation Company, LLC
Peach Bottom Atomic Power Station (PBAPS), Unit 1
NRC Inspection Report No. 05000171/2010007

A routine announced safety inspection was conducted on August 9-12, 2010, at Peach Bottom Atomic Power Station Unit 1 by a Region I inspector. The scope of the inspection included an evaluation of the organization and management oversight; implementation of safety reviews, design changes and modifications programs; implementation of the self-assessment and corrective action programs; implementation of long-term safe storage (SAFSTOR) program; implementation of the maintenance and surveillance program; implementation of the occupational radiation exposure program; and implementation of the Effluent, Environmental Monitoring and Radioactive Waste and Transportation programs associated with Unit 1 while in SAFSTOR status. Within the scope of this inspection, no safety concerns or violations were identified. A brief summary of each area inspected is described below.

Organization and Management Oversight

The licensee's organization and management oversight was adequate to support Unit 1 activities. The roles and responsibilities for the Unit 1 activities were consistent with the LS-PB-800, *Unit 1 Process Control Program* and the Technical Specifications (TS).

Safety Reviews, Design Changes, and Modifications

The licensee conducted the safety review and engineering design change screening in accordance with 10 CFR 50.59 requirements.

Self-Assessment and Corrective Action Programs

The licensee maintained an adequate self-assessment program and effectively utilized the established corrective action program to self-identify, evaluate, and correct issues and problems. Issue reports were properly prioritized and corrective actions were tracked in accordance with approved procedures.

SAFSTOR

No dismantlement or decommissioning activities were performed since the previous inspection, conducted in April 2009.

Maintenance and Surveillance

The licensee effectively implemented the preventive maintenance and surveillance program and associated procedures to maintain the Unit 1 facility and monitor ground water leakage into the containment sump in accordance with TS requirements.

Occupational Radiation Exposure

The licensee provided adequate controls to limit exposures of workers to external sources of radiation. Posting and labeling of radioactive materials and radiation areas complied with regulatory requirements. Radiological controls and dose estimates associated with Unit 1 activities were effective to achieve dose goals. Implementation and oversight of the SAFSTOR program was effective for the storage of radioactive material.

Effluent, Environmental Monitoring and Radioactive Waste and Transportation

The licensee effectively implemented and maintained the radioactive effluent controls program, the ground water monitoring program related to Unit 1, the radiological monitoring program, and the radioactive waste management and transportation programs.

REPORT DETAILS

1.0 Background

The Peach Bottom Atomic Power Station, (PBAPS) Unit 1 (Unit 1) is a high temperature gas-cooled demonstration power reactor that operated from February 1966 until October 31, 1974, and has been permanently shut down and in safe storage (SAFSTOR) since that time. All fuel has been removed from the reactor and shipped to an offsite facility. The spent fuel pool has been drained and decontaminated, and all radioactive liquids have been removed.

2.0 Organization and Management Oversight

a. Inspection Scope (Inspection Procedure (IP) 36801)

The inspector evaluated the licensee's organization regarding management oversight of SAFSTOR responsibilities for Unit 1, required by Technical Specifications (TS) 2.1(a). The TS 2.1(a) stipulates that the Peach Bottom Plant Manager maintain the responsibility for administration of all Unit 1 functions. The inspector also reviewed the licensee's procedure LS-PB-800, *Unit 1 Process Control Program* regarding the roles and responsibilities for the operation, maintenance and control of Unit 1. The inspector discussed organization, management and/or staffing responsibilities as outlined in the TS and the LS-PB-800 procedure.

b. Observations and Findings

The licensee made no organization changes since the previous inspection conducted in August 2009. The inspector verified that procedure LS-PB-800 and associated implementing procedures were consistent with the TS. The procedure defines roles and assigns responsibility for the operation, maintenance and control of Unit 1. Implementation of the TS and the LS-PB-800 procedure was adequate.

c. Conclusions

The licensee's organization and management oversight were adequate to support Unit 1 activities. The roles and responsibilities for the Unit 1 activities were consistent with the LS-PB-800, *Unit 1 Process Control Program* and the Technical Specifications (TS). No findings of safety significance were identified.

3.0 Safety Reviews, Design Changes, and Modifications

a. Inspection Scope (IP 37801)

The inspector reviewed the Unit 1 Updated Final Safety Analysis Report, Revision 5 (UFSAR), procedure LS-AA-104, *Exelon 50.59 Review Process*, and conducted interviews with engineering and licensing personnel to evaluate any plant modifications since the previous inspection conducted in August 2009.

b. Observations and Findings

There were no plant modifications since the previous inspection conducted in August 2009. There are no structures, systems, or components in Unit 1 that perform a safety function because of the non-operating and defueled status of the plant.

c. Conclusions

The licensee conducted the safety review and engineering design change screening in accordance with 10 CFR 50.59 requirements. No findings of safety significance were identified.

4.0 Self-Assessment and Corrective Action Programs

a. Inspection Scope (IP 40801)

The inspector reviewed the self-assessment regarding the SAFSTOR activities at Unit 1. The inspector also reviewed elements of the corrective action program (CAP) for the identification, evaluation, and resolution of problems. The inspector reviewed the procedure, LS-AA-125, *Corrective Action Program (CAP)*, reviewed selected issue reports (IRs) from August 2009 through August 12, 2010, relative to Unit 1 issues, including monitoring for potential water intrusion into the containment vessel.

b. Observations and Findings

The self-assessment of the Unit 1 SAFSTOR program was conducted May 10-21, 2010 using the procedure, LS-AA-126-1005, *Check-In Self-Assessments*, Revision 4. The self-assessment was conducted to assess whether Unit 1 facility maintenance, monitoring, and safety programs were effective at maintaining public health and safety, and environmental safety, while the plant remains in a SAFSTOR condition. The self-assessment included an evaluation of the previous NRC-identified non-cited violations, the water intrusion evaluation, the FSAR, the TS, and associated procedures. The licensee's self-assessment was thorough and sufficiently detailed to identify strengths and weaknesses related to the Unit 1 facility.

Regarding the CAP, the priority for addressing issue reports and implementation of corrective actions was adequate and based upon safety significance. Corrective actions were implemented to address identified issues, and were being tracked to closure using the licensee's corrective action program.

c. Conclusions

The licensee maintained an adequate self-assessment program and effectively utilized the established corrective action program to self-identify, evaluate, and correct issues and problems. The IRs were properly prioritized and the corrective actions were tracked in accordance with approved procedures. No findings of safety significance were identified.

5.0 SAFSTOR

a. Inspection Scope (IP 71801)

The inspector reviewed the licensee's current decommissioning status with respect to the LS-PB-800, *Unit 1 Process Control Program* procedure and the TS.

b. Observations and Findings

Unit 1 is currently in the SAFSTOR condition. The licensee informed the inspector that they plan to actively decommission Unit 1 in conjunction with the decommissioning of Unit 2 and Unit 3 after those Units have been permanently shutdown.

c. Conclusions

No dismantlement or decommissioning activities were performed since the previous inspection, conducted in April 2009. No findings of safety significance were identified.

6.0 Maintenance and Surveillance

a. Inspection Scope (IP 62801)

The inspector evaluated the maintenance and surveillance program related to the implementation of the semi-annual surveillance test (ST), ST-H-099-960-2, *Unit 1 Exclusion Area Semi-Annual Inspection*, Revision 17. The inspector selected portions of the ST to ensure that the licensee verifies that the Unit 1 exclusion area barriers and personnel access doors to the containment vessel, the radioactive waste building, and the spent fuel pool building are locked and intact (TS 2.1.b.1); verifies that water accumulation in the containment sump is less than 500 gallons (TS 2.1.b.9.), and assesses the material condition of the Unit 1 facility (TS 2.3.b.1), including the containment vessel, the radioactive waste building, and the spent fuel pool building.

b. Observations and Findings

The inspector observed the licensee conduct visual inspections to assess the material condition of the containment vessel, the radioactive waste building, and the spent fuel building. The inspector observed that the Unit 1 exclusion area barriers and personnel access doors to the containment vessel, the radioactive waste building, and the spent fuel pool building are locked and intact. The inspector observed the licensee check for water intrusion and verify that the accumulation of water in the containment sump was less than 500 gallons. During the plant tour on August 10, 2010, there was approximately five gallons of ground water in the containment sump. Also during the plant tour, the inspector discussed with the chemistry manager the licensee's procedure for quarterly monitoring of ground water intrusion into the containment sump. The licensee indicated that if any water is observed in the sump, it is manually pumped into a 55-gallon drum. The licensee pumps, processes, and discharges the water through the Unit 2 radioactive waste processing system using the radioactive discharge procedure,

ST-C-095-805-2, *Liquid Radwaste Discharge*, Revision 13. The inspector reviewed and assessed the completed ST records from January 2010 to August 12, 2010 and determined that the licensee implemented its maintenance and surveillance program according to the ST and the applicable TS requirements.

c. Conclusions

The licensee effectively implemented the preventive maintenance and surveillance program and associated procedures to maintain the Unit 1 facility and monitor ground water leakage into the containment sump in accordance with TS requirements. No findings of safety significance were identified.

7.0 Occupational Radiation Exposure

a. Inspection Scope (IP 83750)

The inspector evaluated implementation of the occupational exposure program to determine the licensee's capability to monitor and control radiation exposure to employees, and to determine the adequacy of the radiation protection program. The inspector also evaluated the radiation protection program related to the implementation of the semi-annual ST, ST-H-099-960-2, *Unit 1 Exclusion Area Semi-Annual Inspection*, Revision 17 and associated records from January 2010 to August 12, 2010.

b. Observations and Findings

The radiologically controlled areas were appropriately posted and labeled for radioactive material. Radiological postings were readily visible, well-maintained, and reflected radiological conditions. The radiological survey maps and related information maintained at the Unit 1 access point were current. The radiation work permits (RWP) were commensurate with the radiological significance of the tasks and included the appropriate exposure control measures for the safe implementation of the activities. The RWP dose totals were below the dose goal totals for 2009 and January 2010 through June 2010. The inspector observed the licensee implement the exclusion area ST, which included the performance of radiation survey measurements, surface contamination surveys, and air particulate samples in the containment vessel. The inspector assessed radiation worker practices, radiological postings and barriers, and access controls to the containment vessel, the radioactive waste building, and the spent fuel pool building. The inspector determined that the licensee had verified that the radiation levels in the containment vessel, the spent fuel pool building and the radioactive waste building were less than 0.2 millirem per hour (mrem/hr), and that smearable contamination levels were less than 1000 disintegrations per minute per 100 square centimeters (1000 dpm/100 cm²) for beta and gamma radiation.

c. Conclusions

The licensee provided adequate controls to limit exposures of workers to external sources of radiation. Posting and labeling of radioactive materials and radiation areas complied with regulatory requirements. Radiological controls and dose estimates

associated with Unit 1 activities were effective to achieve dose goals. Implementation and oversight of the SAFSTOR program was effective for the storage of radioactive material. No findings of safety significance were identified.

8.0 Effluent and Environmental Monitoring Programs

a. Inspection Scope (IP 84750)

The inspector evaluated the radioactive effluent control and the site radiological environmental monitoring programs. The evaluation included a review of the annual *PBAPS Unit 1 Decommissioning Status Report* for 2009, dated May 7, 2010, required by TS 2.4.a. The inspector reviewed the radioactive liquid release permits, the analytical sample results, and the projected doses to the public associated with the ground water in-leakage into the containment sump. The inspector also evaluated the ground water monitoring program and the radiological environmental monitoring program, including the analytical results associated with samples of shoreline sediment, fish, and water from January 2010 through June 2010. The inspector verified that the licensee complied with the requirements of 10 CFR Part 20, Appendix B, and 10 CFR Part 50, Appendix I.

b. Observations and Findings

The annual report contained a summary of the status of the Unit 1 facility, including radiation survey results, quantities of radioactive effluents released, results of water analyses from the containment vessel, and performance of security and surveillance measures. The inspector determined that the annual report met the reporting requirements of TS 2.4.a.

The radioactive liquid effluent release permits were completed according to TS 2.1.b.7 and the radioactive discharge procedure, ST-C-095-805-2, *Liquid Radwaste Discharge*, Revision 13. From a review of the analytical data, the inspector verified that the projected doses to the public were well below TS limits and were performed in accordance with the Offsite Dose Calculation Manual and the Code of Federal Regulations (10 CFR 50.36a) for maintaining doses to the public from radioactive effluents as low as is reasonably achievable.

During the period August 2009 through August 2010, the licensee removed water from the containment sump using procedure, RW-PB-900, Revision 0, *Movement of Water Containing Tritium from Unit 1 Exclusion Area to PBAPS Radwaste System*. The licensee pumped the water from the sump into drums and transferred the drums to the Unit 2 radioactive waste building. The licensee processed this water through the Unit 2 radioactive waste processing system and discharged it in batch releases using procedure, ST-C-095-805-2, *Liquid Radwaste Discharge*, Revision 13. The inspector reviewed the licensee's liquid radwaste discharge permits and determined that the licensee followed the required procedure. The licensee used the appropriate dilution volumes and flows and ensured that the water would be discharged according to the applicable 10 CFR Part 20 and Part 50 requirements. The inspector verified that the total effective dose equivalent to the public as a result of this effluent release was a small fraction of the applicable limit in 10 CFR Part 20.

The inspector reviewed the radiological analytical results of water sampled from the monitoring wells near Unit 1 during August 12, 2009 through August 12, 2010. The inspector determined that the samples were collected according to procedure, CY-PB-170-4160, *Station RGPP Controlled Sample Point Parameters* and were analyzed by a contract laboratory. The well water sample results were less than the lower limit of detection (200 pCi/L) for tritium. The analytical results of the monitoring well water samples indicate that the regulatory liquid release limit for tritium, as specified in 10 CFR Part 20, Appendix B, Table 2, Column 2, was not exceeded. Also based on the analytical results, the inspector verified that the total effective dose equivalent to the public was below the regulatory limit of 0.1 rem in one year.

The analytical results for shoreline sediment, fish, and water from January 2010 through June 2010 for the radiological environmental monitoring program indicated that no significant radioactivity was identified in fish and the environment.

c. Conclusions

The licensee effectively implemented and maintained the radioactive effluent controls program, the ground water monitoring program, and the radiological monitoring program. No findings of safety significance were identified.

9.0 Solid Radioactive Waste Management and Transportation of Radioactive Materials

a. Inspection Scope (IP 86750)

The inspector evaluated the radioactive waste management and transportation programs to determine if there had been any radioactive waste shipments from the Unit 1 facility for offsite disposal.

b. Observations and Findings

The inspector reviewed the shipping logs and contamination survey results from August 2009 through August 12, 2010 and interviewed the radioactive waste supervisor. The results indicated that the smearable contamination levels were less than 1,000 dpm/100cm² for beta and gamma radiation. Based on these results, the licensee did not generate radioactive waste and therefore, did not ship radioactive waste from the Unit 1 facility for offsite disposal.

c. Conclusions

The licensee effectively implemented the radioactive waste management and transportation programs. No findings of safety significance were identified.

Exit Meeting Summary

On August 12, 2010, the inspector presented the inspection results to Garey Stathes, Plant Manager, and other members of the licensee's staff. Mr. Stathes acknowledged the inspection findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Armstrong, Regulatory Affairs Manager
A. Czyzewics, Chemistry Engineer
D. Foss, Senior Regulatory Affairs Engineer
D. Hines, Radiation Protection Supervisor
R. Holmes, Radiation Protection Manager
C. Howell, Mechanical Design Engineer
L. Lucas, Chemistry Manager
H. McCrory, Radiation Protection Technical Support Manager
T. McDonald, Radiation Protection Technician
S. Minnick, Nuclear Oversight Manager
M. Moonitz, Radiation Protection Technician
R. Poteet, Radiation Protection Technician
M. Ross, Radwaste and Environmental Supervisor
F. Saponaro, FIN Team
K. Shelly, Maintenance
R. Smith, Regulatory Affairs Engineer
G. Stathes, Plant Manager
G. Swayne, Enercon, Chemistry contractor
F. Young, Maintenance
J. Zellers, FIN Team

INSPECTION PROCEDURES USED

36801 Organization, Management, and Cost Controls at Permanently Shutdown Reactors
37801 Safety Reviews and Design Changes
40801 Self Assessment and Corrective Action
62801 Maintenance and Surveillance at Permanently Shutdown Reactors
71801 Decommissioning Performance and Status Reviews
83750 Occupational Radiation Exposure
84750 Radioactive Waste Treatment and Effluent and Environmental Monitoring
86750 Solid Radioactive Waste Management and Transportation

ITEMS OPEN, CLOSED, AND DISCUSSED

Opened, Closed and Discussed – None

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents and Management Access System
A/R	Action Request
CAP	Corrective Action Program
CFR	Code of Federal Regulations
FIN Team	Fix-it-Now Team
IP	Inspection Procedure
IR	Issue Report
NRC	Nuclear Regulatory Commission
PBAPS	Peach Bottom Atomic Power Station
pCi/L	picoCuries per liter
RWP	radiological work permit
SAFSTOR	safe storage
ST	Surveillance Test
TS	Technical Specifications
U1	Unit 1
U2	Unit 2
UFSAR	Updated Final Safety Analysis Report