U.S. NUCLEAR REGULATORY COMMISSION
REGION I

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Report No.	50-387/99-07, 50-388/99-07
Licensee:	Pennsylvania Power and Light Company 2 North Ninth Street Allentown, Pennsylvania 19101
Facility:	Susquehanna Steam Electric Station
Location:	P.O. Box 35 Berwick, PA 18603-0035
Dates:	July 20, 1999 through August 28, 1999
Inspectors:	S. Hansell, Senior Resident Inspector J. Richmond, Resident Inspector A. Blamey, Resident Inspector J. McFadden, Radiation Specialist
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EXECUTIVE SUMMARY

Susquehanna Steam Electric Station (SSES), Units 1 & 2
NRC Inspection Report 50-387/99-07, 50-388/99-07

This integrated inspection included aspects of Pennsylvania Power and Light Company's (PP&L's) operations, maintenance, engineering, and plant support at SSES. The report covers a six week period of routine resident inspection activities and the input from a regional health physics inspector.

Operations

- Reactor water chemistry on both units has improved since the plant modifications on the condensate water filtration and hydrogen water chemistry systems have been completed. (Section O1.1)

- On August 5, 1999, PP&L did not perform a Technical Specification required safety function determination for out of service primary containment isolation instruments because the requirement to perform a safety function determination for out of service primary containment isolation instruments was not contained in the procedure that controlled the Safety Function Determination Program. PP&L's failure to maintain adequate procedures for the control of the Safety Function Determination Program is a violation of Technical Specification Section 5.4, "Procedures." This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is documented in PP&L's corrective action program as condition report 194180. (Section O3.1)

Maintenance

- PP&L did not effectively plan scheduled-maintenance and scheduled-testing activities on the reactor core isolation cooling and high pressure coolant injection systems. Specifically, the reactor core isolation cooling system was unavailable longer than PP&L initially planned during repair of a vacuum pump seal and the high pressure coolant injection surveillance test was performed at a time when suppression pool cooling was less efficient. (Section M1.1)

Plant Support

- PP&L improperly packaged radioactive waste that was shipped to a low-level waste disposal facility. Upon identification, PP&L reviewed the circumstances of these shipments, entered the occurrences into their corrective action program as condition report 188042, and initiated corrective measures to prevent recurrence. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. (Section R8.1)

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Report Details

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 operated at 100% power throughout the inspection period, except for the following power reduction. On August 14, power was reduced to 85% for a control rod pattern sequence exchange, then returned to 100%.

SSES Unit 2 operated at 100% power throughout the inspection period, except for the following power reduction. On August 28, power was reduced to 92% for a control rod pattern sequence exchange and scram time testing, then returned to 100%.

I. Operations

O1 Conduct of Operations [1]

O1.1 Unit Operations and Operator Activities (71707)

The inspectors determined routine operator activities were satisfactorily established, communicated, and conservatively performed in accordance with SSES procedures. Control room activities were well performed. Control room logs accurately reflected plant activities.

Problems related to Reactor Building ventilation damper slow stroke times resulted in the entry into a Technical Specification (TS) required plant shutdown limiting condition for operation (LCO). The problem was corrected satisfactorily prior to the expiration of the TS LCO.

Reactor water chemistry on both units has improved since the plant modifications on the condensate water filtration and hydrogen water chemistry systems have been completed.

O2 Operational Status of Facilities and Equipment

O2.1 Operational Safety System Alignment (71707)

During routine plant tours, the proper alignment and operability of various safety systems, engineered safety features, and on-site power sources were verified. Partial walkdowns were performed for the reactor core isolation cooling (RCIC) system, the high pressure coolant injection (HPCI) system, residual heat removal (RHR) system, and the emergency service water (ESW) system. Minor equipment problems were corrected promptly.

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[1]Topical headings such as O1, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics.

O3 Operations Procedures and Documentation

O3.1 Safety Function Determination of RCIC Primary Containment Isolation Valve

a. Inspection Scope (71707,40500)

The inspectors reviewed PP&L's reactor core isolation cooling (RCIC) system configuration during preplanned maintenance to verify compliance with Technical Specification (TS) requirements.

b. Observations and Findings

On August 5, 1999, the Division 2 RCIC room high temperature isolation instruments and the Division 2 RCIC steam supply line low pressure isolation instruments were disabled for planned maintenance. With these instruments disabled, the outboard (Division 2) primary containment isolation valve (PCIV) for the RCIC steam supply line would not have automatically closed on a high room temperature or a low steam line pressure condition. After the instruments had been disabled for approximately three hours, PP&L manually closed both the inboard and outboard RCIC steam line PCIVs.

When a system (e.g., a PCIV) cannot perform its function solely due to a support system being inoperable, TS 3.0.6 allows the system to remain operable provided, in part, that an evaluation is performed to determine if a loss of safety function (e.g., primary containment penetration automatic isolation capability) has occurred. The required evaluation is performed by the Safety Function Determination Program, which is controlled by TS 5.5.11. The isolation instruments, disabled during maintenance, were a support system for the outboard RCIC steam line PCIV, which is required to automatically close, per TS 3.6.1.3, to isolate the primary containment penetration for the RCIC steam line. PP&L did not perform a Safety Function Determination (SFD), as required by TS, for this planned maintenance. Although a SFD was not performed, the safety significance of this issue was low because the RCIC steam line PCIVs were manually closed within 4 hours.

The inspectors reviewed NDAP-QA-0312, "Control of Limiting Conditions for Operation, Technical Requirements for Operation, and Safety Function Determination Program," revision 2 dated April 6, 1999, and concluded that the station procedure did not require a safety function determination to be performed for instruments which provide isolation trip signals to primary containment isolation valves. The failure to maintain adequate procedural control of the Safety Function Determination Program is a Severity Level IV violation of Technical Specification Section 5.4, "Procedures," and is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is documented in PP&L's corrective action program as condition report 194180. **(NCV 50-387, 388/99-07-01)**

c. Conclusion

On August 5, 1999, PP&L did not perform a Technical Specification required safety function determination for out of service primary containment isolation instruments because the requirement to perform a safety function determination for out of service primary containment isolation instruments was not contained in the procedure that controlled the Safety Function Determination Program. PP&L's failure to maintain adequate procedures for the control of the Safety Function Determination Program is a violation of Technical Specification Section 5.4, "Procedures." This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is documented in PP&L's corrective action program as condition report 194180.

O8 Miscellaneous Operations Issues

O8.1 Inspector Follow-up Item (IFI) Review (71707,92700)

(Closed) IFI 50-387,388/98-04-05 - Control of Emergency Operating Procedure Support Procedures

This item related to the inconsistent control of emergency operating procedure (EOP) support procedures. The inspectors reviewed PP&L corrective actions which included the revision of administrative procedures NDAP-QA-0330, "Symptom-Oriented EOP and EP-DS Program and Writer's Guide," NDAP-QA-0331, "Verification Program For SSES EPG and Symptom Based EOPs and EP-DSs," and NDAP-QA-0332, "Validation Program for Symptom Oriented EOPs." The procedures were revised to include the emergency support (ES) procedures in the EOP program and to require controls similar to the EOP flowcharts. The inspectors concluded that the corrective actions were appropriate. No violations were identified. The IFI is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Surveillance and Pre-Planned Maintenance Activity Review

a. Inspection Scope (61726,62707,40500)

The inspectors observed and reviewed selected portions of pre-planned maintenance and surveillance activities, to determine whether the activities were conducted in accordance with NRC requirements and SSES procedures.

b. Observations and Findings

The inspectors observed portions of the following work activities and surveillances:

Work Authorizations

PCWO190855	SV-25780B Position Indication Microswitch Replacement
RIE-96-0158	Target Rock Microswitch Replacement
TP-024-147	"C" EDG Restoration from 2-year Inspection
P91987	"C" EDG Protective Relay Calibrations
TP-142-003	"C" Circulating Water Pump Motor Initial Start & Run-in
TCWO107653	Unit 2 RCIC Turbine Barometric Condenser Vacuum Pump Repair
S84186	"B" Emergency Service Water Pump Replacement
WO-188765	Replace Unit 2 "A" RHR Conductivity Cell
WR 2-99-023	Wescosville 500 KV line 5043 Switching
WA 195331	HD 27524B Secondary Containment Damper Failed to Close Within the Required TS Time.

Surveillances

SO-273-003	PCIV Quarterly Operability Verification
SE-070-013	SGTS Outside Air Damper Operability Verification
SO-070-001	"B" SGTS Monthly Air Flow Verification Check
SO-234-001	RB Zone 2 Quarterly Isolation Damper Timing
SO-149-B02	Quarterly RHR System Flow Verification Div. II
SO-249-B02	Quarterly RHR System Flow Verification Div. II
SO-252-002	Quarterly HPCI Flow Verification
SO-250-002	Quarterly RCIC Flow Verification

In addition, selected portions of procedures, drawings, and vendor technical manuals, associated with the maintenance and surveillance activities, were also reviewed and determined to be acceptable. In general, maintenance personnel were knowledgeable of their assigned activities.

Reactor Core Isolation Cooling Scheduled Outage

The inspectors observed the repair activities on the leaking barometric condenser vacuum pump seal for the Unit 2 reactor core isolation cooling (RCIC) system on August 6, 1999. RCIC remained out of service for approximately 12 hours.

Planning for this maintenance task was ineffective in that the leaking barometric condenser vacuum pump seal was not fully repaired and RCIC was unavailable for longer than expected.

PP&L originally planned to repack the vacuum pump seal and restore the system to service within seven hours. Due to the vacuum pump and motor configuration, the maintenance mechanic estimated that it would take approximately 24 hours to complete

the planned pump work. PP&L then changed the plan to add one ring of packing to the vacuum pump seal and return the system to service. When the RCIC system was returned to service, a small water leak from the barometric condenser vacuum pump seal remained, although the leak did not affect the satisfactory operation of the RCIC system.

In addition, problems with the new plant nuclear information management system computer software and availability of health physics coverage for the post maintenance system test run delayed restoring RCIC to service.

High Pressure Coolant Injection Surveillance Test

The inspector observed the Unit 2 high pressure coolant injection (HPCI) quarterly surveillance test on July 30, 1999. The test was performed on day shift during hot weather conditions. PP&L effectively coordinated and performed the surveillance test to minimize heat input to the suppression pool. Although PP&L minimized heat input into the suppression pool, the time selected to perform the surveillance test occurred when the suppression pool cooling system was less efficient at removing the added heat.

c. Conclusions

PP&L did not effectively plan scheduled-maintenance and scheduled-testing activities on the reactor core isolation cooling and high pressure coolant injection systems. Specifically, the reactor core isolation cooling system was unavailable longer than PP&L initially planned during repair of a vacuum pump seal and the high pressure coolant injection surveillance test was performed at a time when suppression pool cooling was less efficient.

III. Engineering

E8 Miscellaneous Engineering Issues

E8.1 Licensee Event Report (LER) Review

(Closed) LER 50-388/99-003-00
Scram Due to Unit 2 Main Transformer Failure

A failed main transformer bushing resulted in the automatic reactor shutdown on June 8, 1999. The plant was shutdown safely and all major equipment operated per design. Based on an in-field review of the issues reported in this LER, including the control room operators' response to the transient, plant operation review committee assessment and associated condition report corrective actions, the inspectors found PP&L's corrective actions to be appropriate. No violations of NRC requirements were identified. This LER is closed.

IV. Plant Support

R8 Miscellaneous RP&C Issues

R8.1 Packaging and Shipment of Radioactive Waste

a. Inspection Scope (86750-02)

The inspector reviewed the shipping manifests for shipments numbered 99-85 and 99-86 and related correspondence.

b. Observations and Findings

On June 29, 1999 and on July 1, 1999, PP&L shipped dewatered condensate demineralizer bead resin waste, as low specific activity (DOT LSA II) material and with the NRC waste classification of A (unstable), to a low-level waste disposal site. The shipment manifest numbers were 99-85 and 99-86. In both cases, during the unloading process, the low-level waste disposal facility operators discovered small amounts of loose contaminated resin (100 cubic centimeters or less) on top of the liner/waste disposal container which was inside the shipping cask. The low-level waste disposal facility notified the shipper that the General Packaging Condition 61 of South Carolina Radioactive Material License 097, Amendment 47, prohibits loose radioactive waste within shipping casks. The Agreement State (South Carolina Department of Health and Environmental Control) notified PP&L that this discrepancy constituted an infraction of the Agreement State regulations. PP&L generated a condition report (No. 188042) for this issue and took appropriate immediate corrective action.

10 CFR 61.56, "Waste Characteristics," states requirements which are intended to facilitate handling at the disposal site and provide protection of health and safety of personnel at the disposal site and requires that waste must be packaged for disposal. 10 CFR 30.41, "Transfer of Byproduct Material," states that no licensee shall transfer byproduct material except as authorized pursuant to 10 CFR 30.41 which includes authorization to transfer byproduct material to any person authorized to receive such byproduct material under terms of a specific license or a general license or their equivalents issued by the Atomic Energy Commission, the Commission, or an Agreement State. PP&L failed to properly package byproduct material for disposal on June 29, 1999 and on July 1, 1999. The byproduct material was not packaged in accordance with General Packaging Condition 61 of South Carolina Radioactive Material License 097, Amendment 47 and is a violation. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as condition report 188042. **(NCV 50-387,388/99-07-02)**

c. Conclusions

PP&L improperly packaged radioactive waste that was shipped to a low-level waste disposal facility. Upon identification, PP&L reviewed the circumstances of these

shipments, entered the occurrences into their corrective action program as condition report 188042, and initiated corrective measures to prevent recurrence. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of PP&L management at the conclusion of the inspection period, on September 2, 1999. PP&L acknowledged the findings presented.

The inspectors asked PP&L whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering Observations
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726	Surveillance Observations
IP 62707	Maintenance Observations
IP 71707	Plant Operations
IP 71750	Plant Support Activities
IP 92700	On Site Followup of Reports

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened/Closed

50-387,388/99-07-01	NCV	Safety Function Determination of RCIC Primary Containment Isolation Valve (section O3.1)
50-387,388/99-07-02	NCV	Packaging and Shipment of Radioactive Waste (section R8.1)

Discussed

None.

Closed

50-387,388/98-04-05	IFI	Control of Emergency Operating Procedure Support Procedures (section O8.1)
50-388/99-003-00	LER	Scram Due to Unit 2 Main Transformer Failure (section E8.1)

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CR	Condition Report
DOT	Department of Transportation
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
ESW	Emergency Service Water
FSAR	Final Safety Analysis Report
HPCI	High Pressure Coolant Injection
IFI	Inspector Follow-up Item
ISEG	Independent Safety Engineering Group
IR	[NRC] Inspection Report
LCO	Limiting Condition for Operation
LER	Licensee Event Report
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NRC	Nuclear Regulatory Commission
PCIV	Primary Containment Isolation Valve
PCO	Plant Control Operator
PORC	Plant Operations Review Committee
PP&L	Pennsylvania Power and Light Company
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SFD	Safety Function Determination
SFDP	Safety Function Determination Program
SSES	Susquehanna Steam Electric Station
TRO	Technical Requirement for Operation
TS	Technical Specification