

March 14, 2000

Mr. G. Rainey, President
PECO Nuclear
Nuclear Group Headquarters
Correspondence Control Desk
P. O. Box 195
Wayne, PA 19087-0195

SUBJECT: NRC INSPECTION REPORT 05000352/1999010, 05000353/1999010

Dear Mr. Rainey:

On February 7, 2000, the Nuclear Regulatory Commission (NRC) completed an inspection at the Limerick Generating Station, Units 1 and 2. The resident inspectors reviewed routine activities and the regional inspectors reviewed the radwaste transportation program. The enclosed report presents the results of this inspection.

Your staff continued to operate both units safely. Your staff responded well to the December 31, 1999, Unit 2 automatic reactor shutdown and declaration of an Unusual Event. Nonetheless, human performance deficiencies during troubleshooting activities led to the January 8, 2000, automatic reactor shutdown on Unit 2. We understand that your staff is taking action designed to improve human performance at the station. We will continue to closely monitor this area.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. These violations are being treated as Non-Cited Violations (NCV) consistent with Section VII.B.1.a of the Enforcement Policy. The NCVs involved the improper handling of fuel assemblies during the 1993 and 1994 receipts of Shoreham fuel. If you contest the violation or its severity level, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region I, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001, and the NRC resident at the Limerick Generating Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response will be placed in the NRC Public Document Room (PDR).

Mr. G. R. Rainey

2

No reply to this letter is required, but should you have any questions regarding this please contact me at 610-337-5322.

Sincerely,

/RA/

Curtis J. Cowgill, Chief
Project Branch No. 4
Division of Reactor Projects

Docket Nos.: 05000352, 05000353

License Nos: NPF-39, NPF-85

Enclosures: NRC Inspection Report 05000352/1999010, 05000353/1999010

cc w/encl:

J. J. Hagan, Senior Vice President, Nuclear Operations Station Support

G. Edwards, Chairman, Nuclear Review Board

J. A. Hutton, Director - Licensing, PECO Nuclear

J. D. von Suskil, Vice President - Limerick Generating Station

M. P. Gallagher, Plant Manager - Limerick Generating Station

K. P. Bersticker, Experience Assessment Manager - Limerick Generating Station

Secretary, Nuclear Committee of the Board

Commonwealth of Pennsylvania

Mr. G. R. Rainey

3

Distribution w/encl:

Region I Docket Room (with concurrences)

NRC Resident Inspector

Nuclear Safety Information Center (NSIC)

PUBLIC

H. Miller, RA

J. Wiggins, DRA

C. Cowgill, DRP

D. Florek, DRP

D. Cullison, DRP

B. Platchek, DRP

J. Jang, DRS

Distribution w/encl: (Via E-Mail)

J. Shea, OEDO

E. Adensam, NRR

J. Clifford, NRR

B. Buckley, NRR

W. Scott, NRR

R. Correia, NRR

DOCDESK

Inspection Program Branch, NRR (IPAS)

DOCUMENT NAME: C:\Lm991010.wpd

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RI/DRP	RI/DRP					
NAME	Dflorek DJF1	Ccowgill CJC1					
DATE	03/14/00	03/14/00					

OFFICIAL RECORD COPY

EXECUTIVE SUMMARY
Limerick Generating Station, Units 1 and 2
NRC Inspection Report 05000352/1999010, 05000353/1999010

This integrated inspection report includes aspects of PECO Energy (PECO) operations, maintenance, engineering, and plant support. The report covers a six-week period of resident inspection and region-based inspection in the radwaste transportation program area.

Operations

- PECO personnel responded well to a lightning arrester failure, which resulted in an automatic reactor shutdown. The operations staff properly assessed plant conditions and declared an Unusual Event. (Section O2.2)
- Operators failed to use established procedures during electrical ground trouble-shooting activities resulting in a Unit 2 automatic reactor shutdown on January 8, 2000. (Section O2.3)
- Although overall operator response to the January 8, 2000, automatic reactor shutdown was acceptable, the sequence and timing of some operator actions created thermal stratification in the reactor vessel and complicated the recovery from the automatic shutdown. (Section O2.3)
- Deficiencies in procedural guidance for restoring reactor water cleanup bottom head flow, resetting the reactor protection system, minimizing or terminating control rod drive flow, and re-establishing forced reactor vessel circulation following an automatic reactor shutdown contributed to the thermal stratification in the reactor vessel during the January 8, 2000, automatic reactor shutdown. (Section O2.3)
- PECO's Post Trip Review for the January 8, 2000, automatic reactor shutdown did not comprehensively address human performance and documentation discrepancies. (Section O2.3)
- Control room deficiencies do not significantly affect the operation at Limerick. Some deficiencies exist in the management of the system and meeting management goals for timely resolution of control room deficiencies. (Section O2.4)

Engineering

- Engineering evaluation of the Unit 2 post-shutdown reactor vessel pressure/temperature conditions provided little analysis or technical justifications to support a conclusion that pressure/ temperature limits were not exceeded. Engineering also did not address the operator's concerns associated with the potential for thermal shock during the event. (Section E4)
- License Event Report 1-99-014 identified that during receipt of irradiated fuel assemblies in 1993 and 1994, the fuel shipping cask was lifted from the rail car without the refueling area secondary containment integrity being established. Additionally, redundant rigging was not used for one portion of the cask lift activity, contrary to

Executive Summary

Updated Final Safety Analysis Report requirements. These Severity IV violations are being treated as a Non-Cited Violations, consistent with Section VII.B.1.a. of the Enforcement Policy. These violations are in the PECO corrective action program as Performance Enhancement Program Evaluation I0010301. (Section E8.2)

Plant Support

- Solid radioactive wastes were effectively sampled, packaged, and dewatered with respect to requirements. (Section R1.1)
- Shipping records were properly prepared with no deficiencies identified. (Section R1.2)
- PECO has effectively minimized the amount of contaminated equipment and radioactive wastes stored on-site and has maintained appropriate postings and controls. (Section R1.3)
- Quality Assurance oversight of the radioactive material shipment program was effective through performance of an independent program assessment and surveillance and through radwaste staff self-assessments and shipment verifications. Radwaste transportation problems which were documented during 1999 were not significant and were adequately resolved. (Section R7.1)

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ii
TABLE OF CONTENTS	iv
Report Details	1
Summary of Plant Status	1
I. Operations	1
O1 Conduct of Operations	1
O1.1 <u>General Comments</u>	1
O2 Operational Status of Facilities and Equipment	2
O2.1 <u>Facility Tours</u>	2
O2.2 <u>Unit 2 Automatic Reactor Shutdown and Unusual Event Due to a Lightning Arrester Failure</u>	2
O2.3 <u>Unit 2 Automatic Reactor Shutdown Due to a DC Distribution System Ground</u>	3
O2.4 <u>Control Room Deficiencies</u>	5
O8 Miscellaneous Operations Issues	6
O8.1 <u>(Closed) LER 1-99-013: Declaration of a Unusual Event Based on the Determination of a Credible Bomb Threat</u>	6
O8.2 <u>(Closed) LER 2-99-006: Automatic Reactor Shutdown and Unusual Event Due to a Lightning Arrester Failure - Unit 2</u>	6
O8.3 <u>(Closed) LER 2-00-001: Automatic Reactor Shutdown Due to a DC Distribution System Ground - Unit 2</u>	6
II. Maintenance	7
M1 Conduct of Maintenance	7
M1.1 <u>General Comments on Maintenance Activities (62707)</u>	7
M1.2 <u>General Comments on Surveillance Activities</u>	7
III. Engineering	8
E4 Engineering Staff Knowledge and Performance	8
E4.1 <u>Evaluation of Unit 2 Post-Shutdown Pressure/Temperature Conditions</u>	8
E8 Miscellaneous Engineering Issues	9
E8.1 <u>(Closed) LER 1-99-014:</u>	9
IV. Plant Support	10
R1 Radiological Protection and Chemistry (RP&C) Controls	10
R1.1 <u>Solid Radwaste Processing</u>	10
R1.2 <u>Radioactive Material Shipping</u>	10
R1.3 <u>Solid Radioactive Waste Storage</u>	11
R7 Quality Assurance (QA) in RP&C Activities	11
R7.1 <u>Radioactive Material Shipping QA Oversight</u>	11

Table of Contents

V. Management Meetings	12
X1 <u>Exit Meeting Summary</u>	12
INSPECTION PROCEDURES USED	13
ITEMS OPENED, CLOSED, AND DISCUSSED	13
LIST OF ACRONYMS USED	14

Report Details

Summary of Plant Status

Unit 1 began this inspection period operating at 100%. The unit began end-of-cycle coast-down operation on January 15, 2000, when operators increased reactor recirculation flow to the maximum allowable limit (110%) with all control rods full-out. Unit 1 was operating at 96% power at the end of the inspection period.

- December 29, 1999 Operators reduced reactor power to 60% for Year 2000 roll-over activities and for condenser waterbox cleaning. Operators returned the unit to 100% on January 1, 2000.

Unit 2 began this inspection period operating at 100%. The unit remained at full power throughout the period with exceptions for testing, rod pattern adjustments, and the following plant events:

- December 31, 1999 Unit 2 shutdown automatically following a main transformer B-phase insulator failure. The failure caused a ground fault resulting in a generator lockout and main turbine trip, which initiated the reactor shutdown.
- January 1, 2000 Operators restarted the reactor and synchronized the main generator to the grid on January 2. The operators raised reactor power and reached 100% on January 4.
- January 8, 2000 Unit 2 shutdown automatically while operators were investigating a balance of plant battery ground. Operators restarted Unit 2 on January 10 and synchronized the generator to the grid on January 12.

I. Operations

O1 Conduct of Operations¹

O1.1 General Comments (71707)

PECO conducted activities at Limerick Units 1 and 2 safely. Routine operations, surveillance, and other plant-related activities were generally performed as per station procedures in a deliberate manner with clear communications and effective oversight by shift supervision. The control room logs generally reflected plant activities and shift turnovers were comprehensive. Operators implemented effective controls for work activities using conservative decision making.

O2 Operational Status of Facilities and Equipment

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.

O2.1 Facility Tours (71707)

The inspectors routinely conducted independent plant tours and walk-downs of selected portions of safety-related systems during the inspection period. These activities consisted of the verification that system configuration, power supplies, process parameters, support system availability, and current system operational status was consistent with Technical Specification (TS) requirements and Updated Final Safety Analysis Report (UFSAR) descriptions. System operability and material conditions were noted to be acceptable in all cases. The inspectors did not identify any substantive concerns or deficiencies as a result of these walk-downs.

O2.2 Unit 2 Automatic Reactor Shutdown and Unusual Event Due to a Lightning Arrester Failure

a. Inspection Scope (93702, 71707)

The inspector responded to a Unit 2 automatic reactor shutdown and a Unusual Event declared on December 31, 1999. The inspector observed the activities performed by the plant staff and assessed the status of the facility.

b. Observations and Findings

On December 31, 1999, at 1:11 a.m., Unit 2 automatically shutdown following a failure of the lightning arrester insulator on the B-phase of the main transformer. The failure resulted in a main generator lockout, a main turbine trip, and a reactor shutdown. Plant systems responded to the automatic shutdown as expected. Operators stabilized the unit in a hot shutdown condition in accordance with approved procedures.

About 2:55 a.m., the shift manager declared a Unusual Event after PECO found some visible damage to the "B" and "C" main transformer power output insulators and other plant structures as a result of the catastrophic failure of the lightning arrester. PECO terminated the Unusual Event at about 4:00 a.m., after determining that the visible damage did not impact the capability to maintain the unit in a safe shutdown condition and that no security threat existed.

PECO determined that the lightning arrester failure occurred after the system dispatcher removed a capacitor bank from service in the 500Kv switchyard to adjust electrical distribution system parameters. The B-phase of the circuit breaker, used to remove the capacitor bank from service, failed during breaker operation. This allowed a high voltage and frequency surge to pass back to the lightning arrester. Although the lightning arrester was designed to withstand this type of surge, the lightning arrester failed. PECO replaced the lightning arresters insulators on all three Unit 2 transformers and repaired other insulators that were damaged during the event.

c. Conclusions

PECO personnel responded well to a lightning arrester failure, which resulted in an automatic reactor shutdown. The operations staff properly assessed plant conditions and declared an Unusual Event.

O2.3 Unit 2 Automatic Reactor Shutdown Due to a DC Distribution System Ground (71707)

a. Scope

The inspector responded to a Unit 2 automatic reactor shutdown on January 8, 2000. The inspector observed the activities performed by the plant staff, assessed operator response and procedure adequacy and assessed the effectiveness of PECO's post trip review.

b. Observations and Findings

Cause of the Automatic Reactor Shutdown

On January 8, 2000, the Unit 2 reactor automatically shutdown due to a main generator lockout and turbine trip. All required plant systems responded appropriately during the event.

Just prior to the automatic shutdown, operators were trying to locate and isolate a ground on a DC electrical bus. The operators attempted to correct the problem by isolating transformer alarm circuits, believing that they were the source of the ground. When the equipment operator (with direction from the control room supervisor) opened an isolation switch for a low liquid level transformer alarm circuit on the 222 plant services electrical distribution bus transformer, the ground on the DC distribution system cleared. To confirm that this alarm circuit was the source of the ground, the control room supervisor directed the equipment operator to re-close the isolation switch. When the operator re-closed the alarm circuit isolation switch, a DC voltage transient occurred. This voltage transient caused sensitive main generator protective relays to activate which generated the automatic reactor shutdown.

Subsequent review by PECO staff determined that operators did not use established procedures for detecting and isolating a ground on the DC distribution system.

PECO's corrective actions for the equipment problems were appropriate. PECO repaired an exposed spare wire on the 222 bus transformer low liquid level switch and PECO planned to investigate similar equipment for potential wiring problems. They replaced two damaged generator protective relays. Operations Management discussed procedural compliance expectations with all supervisors and operators. Some of PECO's longer term corrections were to improve operational guidelines to clarify management expectations on procedure use and provide additional teamwork training to all control room teams.

Operator Performance During the Unit 2 January 8, 2000 Automatic Reactor Shutdown

The inspector determined that overall operator response to the automatic reactor scram was acceptable. Nevertheless, the inspector identified that the sequencing and timing of operator actions related to resetting the scram, reestablishing reactor water cleanup bottom head drain flows, minimizing or stopping control rod drive flow, and restarting reactor recirculation pumps allowed thermal stratification conditions to develop in the reactor vessel. Because of the thermal stratification, the temperature in the bottom head lowered significantly. One temperature instrument showed that the vessel was being operated in a region not allowed by the temperature pressure curves in the Technical Specification. The operators determined that this indicator was not representative of the vessel temperature and that they were always operating in an acceptable region.

Procedure Adequacy

During the January 8 automatic reactor shutdown, the inspector noted that shift management was implementing GP-3, "Normal Plant Shutdown," while continuing to follow T-101, "RPV Control" to address overall plant operation. The inspector identified that neither T-101 nor GP-3 provided appropriate guidance for restoring reactor water cleanup bottom head flow, resetting the reactor protection system, minimizing or stopping control rod drive flow, and re-establishing forced reactor vessel circulation. The inspector concluded that the procedure deficiencies noted contributed to the thermal stratification in the reactor vessel during the event. PECO initiated trend PEP I0010759 to evaluate and address these problems.

The inspector noted that PECO previously identified some procedure deficiencies following the December 31, 1999, Unit 2 automatic reactor shutdown. Although PECO's long term actions to address the procedure deficiencies were in their corrective action process via PEP I0010620, no interim action was taken prior to the January 8 event. These same procedure deficiencies also challenged operators during the January 8 automatic reactor scram.

Post-Trip Review

The inspector determined that PECO's post trip review thoroughly reviewed and appropriately dispositioned equipment anomalies but did not address the operator performance issues regarding thermal stratification in the vessel. In addition, PECO's post trip review missed some documentation discrepancies in the Unified Operator Log and GP-18 Review Checklist. The inspector also noted that a similar problem with the post trip review following an automatic reactor shutdown is discussed in NRC Inspection Report 05000352/05000353 1999004.

The inspector identified Unified Operator Log discrepancies in the time the reactor protection system was reset, entry and exit of T-101, suspected loss of reactor bottom head drain flow, and locking of the mode switch in Shutdown. The GP-18 Review Checklist discrepancies related to a reactor feed pump high level trip on one instrument channel and a redundant reactivity control/alternate rod insertion actuation on one instrument channel.

c. Conclusions

Operators failed to use established procedures during electrical ground trouble-shooting activities resulting in a Unit 2 automatic reactor shutdown on January 8, 2000.

Although overall operator response to the January 8, 2000, automatic reactor shutdown was acceptable, the sequence and timing of some operator actions created thermal stratification in the reactor vessel and complicated the recovery from the automatic shutdown.

Deficiencies in procedural guidance for restoring reactor water cleanup bottom head flow, resetting the reactor protection system, minimizing or terminating control rod drive flow, and re-establishing forced reactor vessel circulation following an automatic reactor shutdown contributed to the thermal stratification in the reactor vessel during the January 8, 2000, automatic reactor shutdown.

PECO's Post Trip Review for the January 8, 2000, automatic reactor shutdown did not comprehensively address human performance and documentation discrepancies.

O2.4 Control Room Deficiencies (71707, 37551)

a. Scope

The inspector reviewed the impact of main control room equipment deficiencies (MCRD) on an operator's ability to respond to normal and transient plant conditions.

b. Observations and Findings

As of January 5, 2000, the inspector noted that there were 55 control room deficiencies on Unit 1 and Unit 2 with 25 of the non-outage deficiencies greater than 60 days old. This did not meet management's goal to have non-outage control room deficiencies resolved in 30 days. None of the control room deficiencies reviewed were safety or risk significant.

During the review, the inspector identified that PECO had missed a technical specification operability issue during surveillance testing because of the existing control room deficiency on the 1B intermediate range monitor (IRM). Due to reliability problems, IRM B had been "bypassed," which disabled its companion average power range monitor's (APRM) downscale trip function. During surveillance testing of the "1F" APRM the number of operable APRM downscale trip channels for the reactor protection system was less than the technical specification requirements. This was not recognized by the operating shift supervisor. Since the testing was completed and the required

APRM downscale functions were returned to operable status within the required technical specification allowed outage time, no technical specification violation occurred.

The inspector also identified that one control room deficiency was confusing to the operators. One control room deficiency was the closure of the main steam pressure equalizing valve (HV-C-041-1F020) because this valve was used to isolate a packing leak on a downstream valve. An administrative clearance applied to control the operation of this valve was confusing to the operators and could have prevented or delayed proper operation of this valve during a loss of coolant accident to establish the required main steam isolation valve leakage alternate drain pathway.

The inspector identified some control room deficiencies that were not properly classified as control room deficiencies in PECO's corrective action program. Use of the designator control room deficiency raises the priority to correct the problem. PECO has since included these, as well as other licensee identified items in their control room deficiency list.

c. Conclusion

Control room deficiencies do not significantly affect the operation at Limerick. Some deficiencies exist in the management of the system and meeting management goals for timely resolution of control room deficiencies.

O8 Miscellaneous Operations Issues (90712)

O8.1 (Closed) LER 1-99-013: Declaration of a Unusual Event Based on the Determination of a Credible Bomb Threat

This event was discussed in Inspection Report 05000352/050000353 1999008. No violations or new issues were revealed by the Licensee Event Report (LER).

O8.2 (Closed) LER 2-99-006: Automatic Reactor Shutdown and Unusual Event Due to a Lightning Arrester Failure - Unit 2

This event was discussed in Section O2.2. No violations or new issues were revealed by the LER.

O8.3 (Closed) LER 2-00-001: Automatic Reactor Shutdown Due to a DC Distribution System Ground - Unit 2

This event was discussed in Section O2.3. No new issues were identified in the LER.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments on Maintenance Activities (62707)

The inspectors observed selected maintenance activities to determine whether approved procedures were in use, TS's were satisfied, maintenance was performed by knowledgeable personnel, and post-maintenance testing was appropriately completed.

The inspectors observed portions of the following work activity:

- Unit 1 - C0191519, HCU SCRAM Solenoid Pilot Valve Fuse Replacement - January 22;
- Unit 1 - Steam Leak Repair on Seventh Stage Extraction Streamline to Main Condenser - January 22;
- Unit 1 - Hydrogen Valve Leak at Hydrogen Flask Farm - January 28;
- Unit 1 - HPCI Vacuum Tank Cond. Pump Check Valve - January 31 and February 3;
- 2B Core Spray Pump Motor Inspection - February 1;
- 2B Core Spray Pump Suction PCIV Breaker - February 1;
- Core Spray Pump B&D Min. Flow Byp. PCIV Breaker - February 1;
- Rework Unit 1 HPCI 2" Check Valve; February 3;
- Replace Unit 1 HPCI valve 1F035; February 3.

The observed maintenance activities were conducted well using approved procedures, and were completed with satisfactory results. Communications between the various work and support groups were good and supervisor oversight was good.

M1.2 General Comments on Surveillance Activities (61726)

The inspectors observed selected surveillance tests to determine whether approved procedures were in use, test instrumentation was properly calibrated and used, TS's were satisfied, testing was performed by knowledgeable personnel, and test results either satisfied the acceptance criteria or was properly dispositioned.

The inspectors observed portions of the following surveillance activity:

- Unit 2 - ST-06-092-316-2, D22 Diesel Generator Fast Start - January 5;
- Unit 1 - ST-05-030-700-1, Post Accident Sampling System Liquid Sample Loops Contaminated Piping Inspection - January 20;
- Unit 1 - ST-2-052-801-1, Loop A Core Spray System Response Time Testing - January 22;
- Unit 1 - ST-2-052-802-1, Loop B Core Spray System Response Time Testing - January 22;
- ST-6-092-114-1, D14 Diesel Generator 24 Hour Endurance Run - February 1;
- ST-2-042-935-1, RPS and NSSSS - Reactor Water Level Low Response Time Test - February 1;

- ST-6-052-232-2, 2B Core Spray Pump, Valve, and Flow Test - February 2;
- ST-6-092-318-1, D14 Diesel Generator Fast Start Surveillance Test - February 3.

The observed surveillance tests were conducted well using approved procedures and were completed with satisfactory results. Communications between the various work and support groups were good and supervisor oversight was good.

III. Engineering

E4 Engineering Staff Knowledge and Performance

E4.1 Evaluation of Unit 2 Post-Shutdown Pressure/Temperature Conditions

a. Inspection Scope (37551)

The inspectors reviewed the Engineering evaluation of the January 8, 2000, post-shutdown reactor vessel pressure and temperature conditions. The inspectors reviewed PEP I0010648 and other PECO documents, and discussed the evaluation with Engineering, Operations, and Experience Assessment personnel.

b. Observations and Findings

On January 9, engineering personnel documented that there had been no violation of reactor vessel minimum temperature limits, based on the review of the event data. The evaluation stated that alternate temperature readings could be used when the bottom head drain temperature becomes questionable or unavailable.

Overall, the inspector concluded that the PECO evaluation was adequate. Nevertheless, the inspector identified a number of discrepancies in the evaluation. The documentation of PECO's evaluation did not have a comprehensive analysis or discussion of the bases for the engineering conclusion and did not review the procedure used by operators for pressure/temperature monitoring. For example, the inspectors noted that:

- The evaluation did not indicate whether the temperature reading at the bottom head drain line for the time of the potential curve violation was valid.
- The evaluation did not document whether the bottom head drain flow rate was sufficient to consider the bottom head drain line temperature reliable.
- The basis for using alternate temperature points for bottom head drain line temperature was not consistent with guidance in the temperature monitoring surveillance procedure, ST-6-107-640-2.
- The evaluation did not address or discuss rapid changes in the bottom head drain line temperature near the time of the potential curve violation.

The inspectors' discussions with Engineering and Operations personnel revealed that Engineering personnel had not fully evaluated Operations' questions about potential

thermal shock concerns during the event. Operations had requested Engineering review the restoration of flow through the bottom head drain per procedure S44.1.J, "RWCU Hot Shutdown Operation." That procedure contained cautions about restoring flow with a high differential temperature between the steam dome and the bottom head (which existed during the event). This Engineering review had not been performed, due to mis-communications between Operations and Engineering and within the Engineering department.

Following a independent review of the post-scrum pressure/temperature data, the inspectors determined that technical specification pressure/temperature limits were not exceeded. PECO initiated PEP I0010847 to address the adequacy of the post-shutdown pressure/temperature evaluation and the related communication issues. The planned corrective actions include an evaluation of potential thermal shock concerns during the event.

c. Conclusions

Engineering evaluation of the Unit 2 post-shutdown reactor vessel pressure/temperature conditions provided little analysis or technical justifications to support a conclusion that pressure/ temperature limits were not exceeded. Engineering also did not address the Operator's concerns associated with the potential for thermal shock during the event.

E8 Miscellaneous Engineering Issues (92700, 37551)

E8.1 (Closed) LER 1-99-014:

In LER 1-99-014 PECO identified that they had violated technical specifications in 1993 and 1994. During receipt of Shoreham irradiated fuel assemblies in 1993 and 1994, the fuel shipping cask was lifted from the rail car without refueling area secondary containment integrity established. Additionally, redundant rigging was not used for one portion of the cask lift activity, contrary to UFSAR requirements. The inspector performed an in-office review and determined that this old issue was identified as a result of corrective actions from previous violation and does not represent current performance. The failure to maintain secondary containment integrity while handling the cask was a violation of TS 3.6.5.1.2. This Severity IV violation is being treated as a Non-Cited Violation (**NCV 05000352/1999010-01**), consistent with Section VII.B.1.a. of the Enforcement Policy. The failure to use redundant rigging while handling the cask contrary to the UFSAR was a violation of 10 CFR 50.59. This Severity IV violation is being treated as a Non-Cited Violation (**NCV 05000352/1999010-02**), consistent with Section VII.B.1.a. of the Enforcement Policy. These violations are in the PECO corrective action program as PEP I0010301.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Solid Radwaste Processing

a. Scope (86750)

Plant tours were conducted to review solid radwaste processing activities with respect to UFSAR descriptions and radwaste sampling, characterization, and waste classification requirements.

b. Observations and Findings

LGS radwaste liquids were processed through powdered and bead resins. Condensate liquids were filtered using a pre coatless filter and the backwash filtrate represented a second waste stream. A reactor water cleanup powdered resin represented a third waste stream. Contaminated trash represented the final waste stream. All processed waste streams were as described in the UFSAR. Representative samples of each waste stream were taken and analyzed on an annual basis. Quantification of resin, contaminated trash (dry active waste), and condensate filtrate waste streams utilized accepted methodologies.

Resin/condensate filtrates were dewatered to less than 1% free standing water utilizing an NRC approved process control program as required.

c. Conclusions

Solid radioactive wastes were effectively sampled, packaged, and dewatered with respect to requirements.

R1.2 Radioactive Material Shipping

a. Scope (86750)

There were no shipments of radioactive waste or radioactive material between January 3 and January 5, 2000. Selected 1999 shipping records were reviewed with respect to 10 CFR 20, 61, 71, and 49 CFR 171-179 requirements.

b. Observations and Findings

The inspectors reviewed three radwastes, eleven radioactive material, and one spent fuel shipping records. All shipping records were in accordance with regulatory requirements. Current copies of valid Agreement State and/or NRC licenses were available for all of the shipment destinations. Shipping record documentation associated with shipping cask certificates of compliance demonstrated that all requirements had been met.

c. Conclusions

Shipping records were properly prepared with no deficiencies identified.

R1.3 Solid Radioactive Waste Storage

a. Scope (86750)

LGS areas were toured to observe the condition of radioactive material storage areas. The LGS high level radioactive waste storage facility inventory was also reviewed.

b. Observations and Findings

Within the LGS process buildings, limited amounts of stored contaminated equipment were observed and were properly maintained and controlled. Located in shielded vaults within the high level radioactive waste storage facility, there was an inventory of six portable demineralizers, one polyethylene liner of filters, and one polyethylene liner containing spent powdered resin. This was considered a very low backlog and well within the design of the radwaste high-level storage area.

Four sea vans were staged outside the radwaste building for the receipt of bulk contaminated trash bags and contaminated laundry bags. Each consisted of partial shipments, was properly posted and controlled.

c. Conclusions

PECO has effectively minimized the amount of contaminated equipment and radioactive wastes stored onsite and has maintained appropriate postings and controls.

R7 Quality Assurance (QA) in RP&C Activities

R7.1 Radioactive Material Shipping QA Oversight

a. Scope

A QA assessment of radioactive material shipping activities, conducted February 2, 1999, through March 3, 1999, was reviewed which included eighteen QA surveillance of this program area. Radioactive waste processing and transport vendor audits were reviewed in accordance with IE Bulletin 79-19 requirements. Also, LGS radwaste transportation self-assessments for 1999 were reviewed. In addition, applicable 1999 radwaste transportation problem reports (PEP reports) were reviewed to determine the significance of the problems and the ability of the licensee to effectively resolve these issues.

b. Observations and Findings

The March 3, 1999, QA assessment was an adequate broad review of the solid radwaste and radioactive material transport program area and indicated that the program was effectively implemented. In addition, during the past eighteen months, there has been at least eighteen QA surveillance that covered principal radwaste shipping activities. No significant findings or recommendations resulted. There were generally no independent QA reviews of radioactive material shipments. Instead, the radwaste authorized shippers provided peer review verifications of each outgoing shipment. Results have been good, without any noncompliance identified. Several off-site vendors supply transfer, packaging and transport of licensees' radioactive waste and fall within the audit requirements of IE Bulletin 79-19. These include: Molten Metal Technology (Allied Technology Group), GTS Duratek, and Chem Nuclear Systems, Inc. Vendors' audits were available for Molten Metal Technology and Chem Nuclear Systems, Inc., and the other radwaste processing vendors were verified to have been recently audited by the Nuclear Utilities Procurement Issues Council. No significant issues were identified as a result of these audits.

Eight PEP reports associated with radwaste/transportation were reviewed. No safety significant issues were identified.

c. Conclusions

QA's oversight of the radioactive material shipment program was effective through performance of an independent program assessment and surveillance and through radwaste staff self-assessments and shipment verifications. Radwaste transportation problem reports documented during 1999 were not significant and were adequately resolved.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the results to members of Plant Management at the conclusion of the inspection on March 3, 2000. The Plant Manager acknowledged the inspectors' findings. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

The inspector presented the radwaste inspection results to members of PECO management at the conclusion of the inspection on February 7, 2000. PECO management acknowledged the findings presented.

INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering
IP 61726:	Surveillance Observation
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 86750	Solid Radwaste Management and Transportation of Radioactive Materials
IP 90712	In-Office LER Review
IP 92700	On-site LER Review
IP 93702	Prompt On-Site Response to Events

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

NCV 05000352/200010-01 A fuel shipping cask was lifted from a rail car without refueling floor secondary containment integrity established. (Section E8.1)

NCV 05000352/200010-02 A fuel shipping cask was lifted without redundant rigging for one portion of the cask lift. (Section E8.1)

Closed

LER 05000352/1-99-013 PECO's declaration of an Unusual Event based upon the determination of a credible bomb threat. (Section O8.1)

LER 05000352/1-99-014 A fuel shipping cask lifted from a rail car without refueling floor secondary containment integrity established and without redundant rigging for one portion of the cask lift. (Section E8.1)

LER 05000353/2-99-006 Automatic reactor shutdown and Unusual Event due to a lightning arrester failure. (Section O8.2)

LER 05000353/2-00-001 Automatic reactor shutdown due to a DC distribution system ground. (Section O8.3)

LIST OF ACRONYMS USED

ADS	Automatic Depressurization System
APRM	Average Power Range Monitor
CFR	Code of Federal Regulations
DC	Direct Current
EOP	Emergency Operating Procedures
LA	Lightning Arrester
LCO	Limiting Condition for Operation
LGS	Limerick Generating Station
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
MCRD	Main Control Room Deficiencies
MSIV	Main Steam Isolation Valve
MSPEV	Main Steam Pressure Equalizing Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OT	Operational Transient
PDR	Public Document Room
PECO	PECO Energy
PEP	Performance Enhancement Program Evaluation
QA	Quality Assurance
RPS	Reactor Protection System
TRIP	Transient Response Implementing Procedures
TS	Technical Specification
UE	Unusual Event
UFSAR	Updated Final Safety Analysis Report