U.S. NUCLEAR REGULATORY COMMISSION REGION I

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Licensee:	PECO Energy Correspondence Control Desk P.O. Box 195 Wayne, PA 19087-0195
Facilities:	Limerick Generating Station, Units 1 and 2
Location:	Wayne, PA 19087-0195
Dates:	October 18, 1998 through November 30, 1998
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EXECUTIVE SUMMARY Limerick Generating Station, Units 1 & 2 NRC Inspection Report 50-352/98-09, 50-353/98-09

This integrated inspection included aspects of PECO Energy operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection and region-based special inspection of a planned spent fuel shipment from Limerick Station.

Operations

- Conduct of operations at Limerick Units 1 and 2 was professional and focused on safety principles. Operators demonstrated safe and conservative decision making during the two forced load reductions at Unit 1 due to high vibrations on the 1B condensate pump. (Section 01.1)
- A reactor operator mispositioned a control rod during the performance of the control rod exercise test due to distractions within the control room. PECO's corrective actions focused on correcting operator behaviors but did not initially address eliminating other causal factors that distracted the operator. Further, weaknesses were identified related to the documentation of control rod movement abnormalities and resolution of these abnormalities which are potential operator distractions. (Section O2.2)
- Plant management was not appropriately informed by plant staff of a procedural adherence deficiency relevant to the mis-located alignment pin for the shipping cask inner closure lid during a presentation at the Senior Leadership Meeting. However, following NRC intervention, plant management responded well by stopping further cask loading operations. (Section 07.1)

Maintenance

- Overall, PECO and supporting contractors did not effectively plan, prepare for, or implement the irradiated fuel shipment. Technicians were challenged by a procedure that was technically flawed, in part as a result of an inadequate review by the cask vendor. PECO did not provide adequate levels of quality verification and oversight commensurate with the potential safety significance associated with this infrequently performed activity. In two instances procedures were not followed precisely and in one of these cases technicians exercised poor judgement and deviated from a procedure in an attempt to resolve a problem without involving management or implementing the appropriate change process. This represented a violation of Technical Specification 6.8.1.a. In addition, technicians attempted to resolve emergent problems without informing the control room. (Section M1.2)
- LER 2-98-005 described a condition prohibited by Technical Specifications in which an average power range monitor (APRM) surveillance test had been missed. The cause of the missed test was the removal of the surveillance activity from the schedule based on a personnel error involving a faulty assumptions. This licensee identified issue is being treated as a Non-Cited Violation. (Section M8.1)

Executive Summary (cont'd)

 LER 2-98-007 described a condition prohibited by Technical Specifications in which the surveillance test for the residual heat removal (RHR) heat exchanger discharge line high radiation indication light located on the Unit 2 remote shutdown panel (RSP) had been missed. The cause of the missed surveillance was the cancellation of the surveillance test, which tested the light, due to an inadequate review of a plant modification. This licensee identified issue is being treated as a Non-Cited Violation. (Section M8.2)

Plant Support

- During receipt inspection of an empty spent fuel cask, the licensee properly identified that external radiation levels were above regulatory limits and notified the shipper in accordance with regulatory requirements. (Section R1.1)
- Radiological controls during the spent fuel cask loading activities were generally good. However, health physics technicians failed to recognize and correct poor work practices performed by nuclear maintenance division workers until they were prompted by the inspector on several occasions. Although the licensee addressed these practices with the individuals, they did not capture the radiation worker performance and HP oversight deficiencies in their self assessment or in their corrective action system. (Section R1.2)

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Report Details

Summary of Plant Status

Unit 1 began this inspection period operating at 100% power with an asymmetrical rod pattern to suppress a leaking fuel pin in fuel assembly 41-40. The unit remained at full power throughout the inspection period with minor exceptions for testing and the following plant events.

- November 7 Unit operators' reduced power to 69% to facilitate the removal of the 1B condensate pump from service due to an increased frequency of vibration alert alarms. A maintenance team replaced the lower pump motor bearing which rectified the problem. Operators' commenced increasing reactor power, observing power ramping limitations, on November 8 and achieved 100% power on November 10.
- November 13
 Unit operators' reduced power to 75% to facilitate the removal of the 1B condensate pump from service due to reading 12.5 mils vibration on the vibration monitoring system.
 Maintenance found and corrected an insufficient oil supply in the bearing. Operators' returned the unit to 100% on November 16.

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

I. Operations

O1 Conduct of Operations¹

01.1 General Comments (71707)

In general, PECO Energy's (PECO) conduct of operations at Limerick Units 1 and 2 was professional and focused on safety principles. Operators demonstrated safe and conservative decision making during the two forced load reductions at Unit 1 due to high vibrations on the 1B condensate pump.

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 Operational Status of Facilities and Equipment

02.1 Engineered Safety Feature (ESF) System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following ESF systems:

- Standby Liquid Control System (Unit 1)
- Residual Heat Removal Service Water System (Common)
- Emergency Service Water System (Common)

Equipment operability, material condition, and housekeeping were acceptable in all cases. The inspectors identified no substantive concerns as a result of these walkdowns.

02.2 Mispositioned Control Rod During Exercise Test

a. Inspection Scope (71707)

On November 8, the Unit 2 reactor operator (RO) inadvertently mis-positioned control rod 46-07 while performing surveillance test ST-6-107-760-2, "Control Rod Exercise." The inspector performed an independent review of the event and reviewed the performance enhancement program (PEP) evaluation.

b. Observations and Findings

The RO was experiencing difficulty moving several control rods from position 48 to position 46 during the performance of the surveillance test (ST). The RO notified the control room supervisor (CRS) for each control rod for which he experienced the problem. In particular, control rod 46-07 required several attempts to move the control rod to position 46. The RO then became distracted by an incoming telephone call. Subsequently, believing that he had complete the test of control rod 46-07, the RO selected the next control rod to be tested. After completing the exercise test for the second control rod, the RO noted that control rod 46-07 still remained at position 46, the RO informed the CRS who then entered offnormal procedure ON-123, "Mispositioned Control Rod," and verified that all control rods were at the proper positions.

Several factors hindered the performance of the ST. The RO was experiencing difficulty with control rods failing to move and remain in the correct position on the first attempt when inserted one notch. This was due to misadjusted flow settings at the hydraulic control unit. Periodic rod block monitor (RBM) alarms distracted the RO requiring the CRS to direct bypassing the RBM. Further, the RO allowed himself to become distracted by another task (answering a telephone call) prior to completing the first. Lastly, the RO did not review the data sheet to verify where he was in the procedure prior to continuing in the surveillance test.

Although adequate corrective actions were eventually implemented, following discussions with the inspector, the initial resolution of this issue focused on the operator behaviors only and did not address the impact of the equipment problems and other distractions on operator performance for this ST or other control room tasks. The inspector also noted that the procedure required the operator to document any observed abnormality in the comments section of the procedure. This was not performed for any of the control rods that failed to move and remain in the correct position on the first attempt. An action request to investigate the cause of the CRD moving problem was initiated on November 8; however, as of the date of the exit meeting, the CRD problem had not been resolved apparently as a result of an administrative error with the action request. The failure to document the abnormalities is a minor violation not subject to formal enforcement.

c. Conclusions

A reactor operator mispositioned a control rod during the performance of the control rod exercise test due to distractions within the control room. PECO's corrective actions focused on correcting operator behaviors but did not initially address eliminating other causal factors that distracted the operator. Further, weaknesses were identified related to documentation of control rod movement abnormalities and resolution of these abnormalities which are potential operator distractions.

07 Quality Assurance in Operations

07.1 Licensee Self-Assessment Activities (71707)

a. Inspection Scope

The inspectors routinely attended the Senior Leadership Meeting.

b. Observations and Findings

The inspector determined that the Senior Leadership Meetings were an effective means for plant management to communicate their expectations to the plant staff. Plant management discussed plant status, reviewed recent plant events, and tracked the status of plant processes. Representatives from various organizations frequently made presentations to explain the details of recent events to management.

On November 6, the inspector observed a presentation to management related to difficulties encountered on November 5, during the loading of a fuel bundle into a shipping cask (Section M1.2). Specifically, technicians discovered that the alignment pin for the inner cask closure lid was mis-located. The presenter characterized the event as an 'attention to detail' issue in spite of several probing questions by the plant manager. The inspector, aware that the issue resulted from a failure to adhere to the procedure, challenged the presenter after the meeting. The presenter disclosed to the inspector that the misplaced guide pin was the result of a procedure adherence problem. The inspector then informed the plant manager

that his staff did not fully disclose information relevant to the mis-located pins during the presentation at the Senior Leadership Meeting. The Plant Manager directed that no further work be performed until the issue was resolved.

c. Conclusions

Plant management was not appropriately informed by plant staff of a procedural adherence deficiency relevant to the mis-located alignment pin for the shipping cask inner closure lid during a presentation at the Senior Leadership Meeting. However, following NRC intervention, plant management responded well by stopping further cask loading operations.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments on Surveillance Activities (61726)

The inspectors observed selected surveillance tests to determine whether approved procedures were in use, details were adequate, test instrumentation was properly calibrated and used, technical specifications were satisfied, testing was performed by knowledgeable personnel, and test results satisfied acceptance criteria or were properly dispositioned.

The inspectors observed portions of the following surveillance activities:

- ST-2-052-801-2, Loop A Core Spray System Response Time Testing Unit 2 (Nov. 14)
- ST-6-048-230-1, SLC Pump Valve and Flow Unit 1 (Nov. 24)

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.

M1.2 Spent Fuel Shipment Preparations

a. Inspection Scope (62700)

The inspectors reviewed a planned spent fuel shipment from Limerick Station to verify conformance with the requirements of the NRC Certificate of Compliance for the shipping container, the associated safety analysis report, and PECO's procedures for radiological controls, and fuel cask loading and shipping activities. Fuel cask loading activities were observed during the period between November 2 and 12, 1998.

b. Observations and Findings

On November 5, PECO initiated activities to load one spent fuel assembly (with the fuel channel removed) into a fuel shipment cask for transport to General Electric Nuclear Energy (GE) for the purpose of research and examination at Vallecitos, California. This was PECO's first attempt to prepare, process, and ship spent fuel from the Limerick Generation Station.

PECO established a special team to conduct this activity. The team consisted of GE representatives, who were responsible for shipping the material and facilitating the required security for the transportation of the special nuclear material; Nuclear Assurance Corporation International (NAC), the shipping cask supplier; and members of PECO's nuclear maintenance department, who were responsible for the conduct of on-site licensed activities associated with loading the assembly into the shipping cask and preparing it for transport.

In accordance with the established procedures, all fuel loading activities were conducted underwater in the spent fuel and cask loading pools. The personnel assigned to conduct the activity were verified to be trained and qualified. As part of the process, all affected personnel were briefed on the conduct of the task. Appropriate radiological controls were established, including personnel monitoring, radiological surveys, and contamination controls. PECO's Plant Operating Review Committee approved the procedures for use, and the applicable procedures were available in the work area. Supervisory personnel were assigned to effect management oversight and control.

Summary of Activities

PECO installed the bundle into the cask on November 5, 1998. When attempting to install the cask inner lid, an alignment pin inserted in the wrong position, prevented the lid from being installed. On November 6, 1998, PECO transferred the bundle back into spent fuel pool to facilitate moving the alignment pin to the correct position and identified that the fuel bundle spring fingers had been damaged, which would prevent subsequent insertion of the bundle into the cask. On November 11, 1998 the spring fingers were removed. On November 12, 1998 the bundle was again placed into the cask and a procedure discrepancy was noted regarding the seating of the bundle in the cask. On November 13, 1998 PECO terminated further efforts to ship the bundle.

Seating of Bundle in Cask

During the first attempt to load the fuel assembly into the cask, the bail handle appeared to be approximately 0.5 inches below the inner closure lid flange (based on observations from an underwater camera), and not 3.0 inches below the inner closure lid flange surface as described in Procedure M-053-006, Rev. 1, "NLI-1/2 Spent Fuel Shipping Cask Preparation and Loading". While the PECO staff opined that parallax distortion may be affecting the observation and that 2 inches below the cask flange would be acceptable, PECO took no action to make an actual

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measurement to verify that the assembly was fully seated or verify the adequacy of the procedural description.

On the second attempt to install the spent fuel assembly into the shipping cask, the licensee measured the actual position of the fuel assembly in the cask and noted that the fuel assembly bail handle extended approximately 0.5 inches above the inner closure lid flange, which was contrary to the expectation expressed in the procedure that the bail handle would be 3.0 inches below the inner lid closure flange when the fuel assembly was properly seated in the cask. PECO stopped activities in order to determine if the cask and closure lid were properly configured to accommodate the fuel assembly.

Subsequent PECG and contractor review revealed that the cask was properly configured and was designed to accommodate the fuel assembly. However, PECO had to perform actual measurements of the inner closure lid to verify that it was the correct component. The licensee determined that the inner closure lid was recessed to fit the extended bail handle and that the procedure incorrectly described the expected position of the bail handle. PECO also determined that the loading procedure had not been adequately reviewed by the cask vendor. PECO terminated further efforts to effect shipment of the selected fuel assembly due to constraints on resources and time.

Inner Closure Lid Mis-alignment

Following the initial attempt to load the cask, PECO attempted to install the inner cask closure lid onto the cask. However, PECO encountered difficulty in properly aligning the closure lid to the cask. Subsequent licensee review of the fuel loading procedure determined that cask disassembly specifications of the procedure were not followed precisely. Procedure M-053-006 (a Category Level 1, continuous use procedure), specified that the cask lid alignment guide pins were to be installed prior to removing the bolted inner cask closure lid. However, the PECO work crew experienced difficulty in accessing the guide pins and, upon consultation with the cask vendor and GE representatives that were present, elected to remove the lid before installing the guide pins. The PECO work crew deviated from a procedure in an attempt to resolve a problem without involving management or implementing the appropriate change process. Subsequently, one of the guide pins was installed in the wrong alignment socket, resulting in the licensee's inability to properly align the inner lid for closure.

The inspector independently determined that procedure M-053-006 had not been adequately reviewed by the licensee and contractors, and that technicians failed to adhere to the sequence of procedure, with respect to installation of the inner cask closure lid alignment guide pins. Technical Specification (TS) 6.8.1 and applicable references requires that maintenance be properly pre-planned and performed in accordance with written procedures. Licensee procedure A-C-079, "Procedure Adherence and Use," requires that the user perform each step in the sequence specified in a Category Level 1 procedure. Procedure, M-053-006, "NLI-1/2 Spent Fuel Shipping Cask Preparation and Loading," a Category Level 1 procedure, steps 5.7.17 through 5.7.28, specifies the sequence for installation of the inner cask lid alignment pins. The inspector considered the failure to install the inner cask lid alignment pins in the sequence specified in procedure steps 5.7.17 through 5.7.28 to be a violation. (VIO 50-352, 353/98-09-01)

Bent Spring Fingers

During the first attempt to load the fuel assembly into the cask, refueling bridge alignment difficulties were encountered in loading the fuel assembly into the cask. A GE representative opined that the difficulty was due to the extremely close tolerance between the fuel assembly and the internal cask fuel basket since the fuel assembly was not enclosed in a fuel channel, which allowed the spring fingers to be extended.

Upon removal of the fuel assembly from the cask, PECO observed that four spring fingers located at the bottom of the fuel assembly had been bent during the loading process. The procedure cautioned that extreme care be taken to eliminate damage to the fuel bundle spacers but did not address the spring fingers. PECO determined that the bent spring fingers would likely provide interference upon reloading of the fuel assembly into the cask. Subsequently, the licensee resolved the condition by removing the damaged spring fingers from the fuel assembly. Special tooling and processes were acquired and used to accomplish this unanticipated operation.

Communication

Though ultimately responsible for the conduct of all licensed activities on site, shift management and operations personnel were unaware of the emerging inner cask closure lid alignment problems until informed by the inspector. The refueling floor supervision and vendor representatives attempted to determine a resolution to the inner cask closure lid alignment problem given a fuel loaded and cask submerged configuration without involving the operations shift supervision in the control room. Upon understanding the nature of the problems, operations shift supervision required refueling floor activities to be suspended pending the development of an approved plan for resolving the inner cask closure lid alignment problem. Subsequent y, a recovery plan (involving removal of the fuel assembly from the cask in order to re-install the alignment guides in the proper position) was approved and initiated to resolve the problem.

Quality Verification

The inspector determined that quality verification was not adequate to assure key steps were performed correctly for the infrequently performed fuel shipment tasks. Although some redundant verifications were performed using double verification (DV) steps, a number of the key steps only specified worker verifications (WV). WVs involve only one level of verification, one person instead of two confirming the step was completed correctly. For example, the procedure step to confirm the fuel bundle was correctly seated only specified a WV which ultimately was not adequate to identify that the fuel bundle was not seated consistently with the procedural

requirements. The inspector also noted that no Quality Assurance personnel observed the key refuel floor activities.

Cessation of Fuel Shipment

Several emergent problems and an inadequate procedure led to personnel uncertainty, confusion and procedural adherence errors during the loading of a dry cask shipping container. Based on the sum of these unexpected events, PECO ceased further cask loading activities, unloaded the cask, and shipped the empty cask off-site. PECO stated that increased planning, enhanced procedure review, and coordination with the contractors would be worked out prior to any future attempts to ship the irradiated fuel bundle. The inspector reviewed and determined that the licensee's corrective actions were adequate.

c. Conclusions

Overall, PECO and supporting contractors did not effectively plan, prepare for, or implement the irradiated fuel shipment. Technicians were challenged by a procedure that was technically flawed, in part as a result of an inadequate review by the cask vendor. PECO did not provide adequate levels of quality verification and oversight commensurate with the potential safety significance associated with this infrequently performed activity. In two instances procedures were not followed precisely and in one of these cases technicians exercised poor judgement and deviated from a procedure in an attempt to resolve a problem without involving management or implementing the appropriate change process. This represented a violation of Technical Specification 6.8.1a. In addition, technicians attempted to resolve emergent problems without informing the control room.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) LER 2-98-005, Average Power Range Monitor (APRM) Gain Measurement and Adjustment Missed Surveillance

This LER documents the discovery that the APRM gain determination and adjustment was not performed within the Technical Specification required weekly periodicity. On June 29, 1998, the surveillance test coordinator discovered that the APRM surveillance had not been performed and promptly notified the control room. The surveillance test (ST) was subsequently performed within in a day of the required interval and no adjustments were required. The licensee determined that the missed ST was a result of the scheduled activity to perform this test being incorrectly updated as complete. Apparently this action was taken based on the faulty assumption that the same ST performed during a recent startup would meet the weekly requirement. However, since the testing performed during the startup was prior to the normally scheduled test. Although the licensee found the primary cause to be personnel error, the investigation was unable to determine who or what group was responsible. The licensee also determined that weaknesses existed in the use of software program for scheduling weekly STs. The inspector performed an in-field review including interviews to confirm the cause of the event and to verify implementation of the corrective actions. The licensee's corrective actions included issuing a read and sign bulletin, adding a requirement to obtain ST coordinator approval prior to rescheduling weekly STs, and the incorporation of an "out of sequence report" to identify and track STs out of there normal scheduled frequency. The licensee also plans to enhance the weekly ST software program. The inspector determined that the corrective actions implemented to prevent recurrence were adequate the cause for this missed surveillance was different than other recently missed STs. Therefore this event could not have reasonably been prevented by previous corrective actions. This licensee-identified, non-repetitive and corrected violation is being treated as a No Cited Violation consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-352, 353/98-09-02)

M8.2 (Closed) LER 2-98-007, Remote Shutdown Panel High Radiation Light Missed Surveillance

This LER documents the discovery of a missed surveillance test for the RHR heat exchanger discharge line high radiation indication light located on the Unit 2 remote shutdown panel (RSP). On August 4, 1998, station personnel performing a routine review of surveillance test revisions determined that surveillance requirement SR 4.3.7.4.2 had not been performed for this indicating light since December 10, 1997. The missed surveillance occurred due to an inadequate engineering review of a plant modification that removed the unit specific RHR service water radiation monitor from each unit, and subsequent cancellation of the 24-month Channel Calibration Surveillance Test, in which the light was tested.

The inspector performed an in-field review of ST-2-012-404-0, Radiation Monitoring - RHR Service Water Radiation Monitor; Division I, Channel A Calibration/Functional Test. PECO revised the test procedure so that the light was adequately tested at the RSP. The light in question was for indication only and did not have any required safety function associated with it. The inspector determined that the corrective actions implemented to prevent recurrence of this event were adequate. This licensee-identified, non-repetitive and corrected violation is being treated as a Non-Cited Violation consistent with Section VII.B.1 of the NRC Enforcement Policy. (NCV 50-352, 353/98-09-03)

III. Engineering

E8 Miscellaneous Engineering Issues (92902)

E8.1 (Closed) VIO 50-352, 353/98-04-03: Weak and Untimely Corrective Actions for Inadeguate Primary Containment Isolation Valve Testing

In December 1997, the licensee identified that 89 automatic closing and 26 remote manually operated primary containment isolation valves (PCIVs) had not been adequitely tested. The inspector determined that PECO's corrective actions

implemented for these testing deficiencies were weak. Further, interim corrective actions to address discrepancies that led to the missed testing had not been implemented and the long term corrective action plan and implementation time-table were not established in a timely manner.

The root cause of the surveillance testing error was due to personnel error during initial surveillance test development caused by an error in the original design documents. A review of data provided on the logic diagrams failed to determine the appropriate logic path required to be tested for closing the PCIVs. Long term corrective actions to prevent recurrence included revising the logic drawings by December 1999. In the interim but subsequent to the initial inspection, an engineering design change request was posted against each of the applicable drawings to alert potential users of the drawing inaccuracy. Further, engineering performed a detailed review of the control room emergency fresh air supply system drawings to ensure the logic system testing satisfied applicable requirements. No deficiencies were identified. Applicable surveillance tests are being revised to include the proper closing logic contacts. The revision will be completed prior to the next scheduled performance. This item is closed.

E8.2 (Closed) EA 98-141: Ineffective Corrective Actions for the High Pressure Coolant Injection and Residual Heat Removal Systems

The inspector identified three violations that involved failures to identify and correct conditions adverse to quality, including instances where inoperability of safety-related equipment was not recognized. These failures involve internal binding of the high pressure coolant injection exhaust valve, the residual heat removal minimum flow valve being found closed on four occasions, and the reversed installation of a D22 emergency diesel generator bearing. The inspector determined that the licensee's response to these issues was adequate. The impector noted that the operability determination process and review by plant staff has improved. This item is closed.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

- R1.1 Spent Fuel Cask Receipt Inspection
 - a. Inspection Scope (86740)

On November 4, 1998, Limerick Generating Station accepted receipt of an empty spent fuel shipping cask. Receipt inspection of the fuel cask was verified with respect to 10 CFR 70 and 49 CFR Parts 171-177. Radiation surveys were conducted in accordance with procedure, HP-C-715, Rev. 4, "Surveys in Support of Exclusive-Use Radioactive Shipments and Receipt/Shipment of Non-Exempt Radioactive Packages." The inspector reviewed the radiation survey and discussed the results with radwaste shipment personnel.

b. Observations and Findings

According to licensee records, during receipt inspection of the empty cask contact radiation readings of 1 mrem/hr gamma and 12 mrem/hr beta radiation were detected by the licensee. The cask was shipped from Memphis, Tennessee, as an excepted package, limited quantity - empty shipment. Department of Transportation (DOT) radiation limits for this type of shipment specify that the radiation exposure rate may not exceed 0.5 mrem/hr. Accordingly, this shipment, as received, was not in conformance with the requirements specified in 49 CFR 173.421(a)(2). The shipper, Hake Inc., a licensee of the Agreement State of Tennessee, was informed of the apparent violation by the licensee, as required. NRC Region I staff similarly informed the appropriate Agreement State personnel.

Otherwise, cask components and configuration were verified to be in accordance with the Certificate of Compliance for NAC cask Model No. NLI-1/2. The cask was then opened and prepared for loading in accordance with the applicable procedure.

c. Conclusions

During receipt inspection of an empty spent fuel cask, the licensee properly identified that external radiation levels were above regulatory limits and took appropriate actions to notify the shipper, in accordance with regulatory requirements.

R1.2 Radiological Controls During Shipping Cask Loading

a. Inspection Scope (86740)

The inspector observed radiological controls during the activities involving loading a shipping cask with a spent fuel bundle.

b. Observations and Findings

Overall, health physics (HP) technicians effectively maintained radiological controls of activities associated with the loading of a shipping cask with spent fuel. However, some poor work practices by NMD technicians were observed by the inspector. During the cask pit and spent fuel pool gate handling activities, poor contamination control behaviors were observed on two separate occasions with no coaching or interface by HP technicians with the workers. These behaviors included improper protective clothing and handling of the gate without first being surveyed. Another poor performance included an inadequate survey for alpha contamination on the under-surface of the inner cask lid prior to workers handling it. The inspector pointed out these practices to the HP supervisor. Subsequent dose rate surveys of these and other components removed from the cask or fuel pools were performed and demonstrated to be at a proper dose sensitivity by the HP technicians. During the self-assessment critique, the inspector observed that radiation worker practices were characterized as "overall...good." These above stated poor work practices were not mentioned. Although HP supervision counseled the individuals and believed they had resolved the issue, the poor practices and lack of HP oversight were not captured in the self assessment critique for future work performance improvements nor in a corrective action process for trending purposes.

c. Conclusions

Radiological controls during the spent fuel cask loading activities were generally good. However, health physics technicians failed to recognize and correct poor work practices performed by nuclear maintenance division workers until they were prompted by the inspector on several occasions. Although the licensee addressed these practices with the individuals, they did not capture the radiation worker performance and HP oversight deficiencies in their self assessment or in their corrective action system.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of plant management at the conclusion of the inspection on December 4, 1998. 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.

INSPECTION PROCEDURES USED

- IP 37551: Onsite Engineering
- IP 61726: Surveillance Observation
- IP 62707: Maintenance Observation
- IP 71707: Plant Operations
- IP 71750: Plant Support Activities
- IP 86740: Inspection of Transportation Activities
- IP 90712: In-office Review of Written Reports
- IP 90713: Review of Periodic and Special Reports
- IP 92904: Followup Plant Support
- IP 93702: Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

VIO 50-352,353/98-09-01:	Procedure Adherence Error During Dry Cask Shipping Activities. (Section M1.2)
Opened/Closed	
NCV 50-352,353/98-09-02:	Average Power Range Monitor (APRM) Gain Measurement and Adjustment Missed Surveillance (Section M8.1)
NCV 50-352,353/98-09-03:	Remote Shutdown Panel High Radiation Light Missed Surveillance (Section M8.2)
Closed	
LER 50-353/2-98-005:	Average Power Range Monitor (APRM) Gain Measurement and Adjustment Missed Surveillance (Section M8.1)(NCV 98-09-02)
LER 50-353/2-98-007:	Remote Shutdown Panel High Radiation Light Missed Surveillance (Section M8.2)(NCV 98-09-03)
VIO 50-352,353/98-04-03:	Weak and Untimely Corrective Actions for Inadequate Primary Containment Isolation Valve Testing (Section E8.1)
EA 98-141:	Ineffective Corrective Actions for the High Pressure Coolant Injection and Residual Heat Removal Systems (Section E8.2)
Discussed	

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
ESF	Engineered Safety Feature
GE	General Electric Nuclear Energy Company
GL	Generic Letter
IR	Inspection Report
LER	Licensee Event Report
LGS	Limerick Generating Station
LICENSEE	Philadelphia Electric Company Energy Company
NAC	Nuclear Assuran Corporation, International, Incorporated
NCV	Non-Cited Violation
NMD	Nuclear Maintenance Division
NRC	Nuclear Regulatory Commission
PECO	PECO Energy
PEP	Performance Enhancement Process
RBM	Rod Block Monitor
RHR	Residual Heat Removal
RP&C	Radiological Protection and Chemistry
RSP	Remote Shutdown Panel
SLC	Standby Liquid Control
ST	Surveillance Test
TS	Technical Specification
VIO	Violation

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