



**Pennsylvania Power & Light Company**

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DEC 17 1996

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop P1-137  
Washington, D. C. 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
REPLY TO A NOTICE OF VIOLATION  
(50-387/96-10-02 AND  
50-387/96-10-03; 50-388/96-10-03)  
PLA-4538**

**FILE R41-2**

**Docket Nos. 50-387  
and 50-388**

This letter provides Pennsylvania Power and Light Company's response to the Notice of Violation (50-387/96-10-02 and 50-387/96-10-03 and 50-388/96-10-03) contained in NRC Inspection Report 50-387/96-10 and 50-388/96-10 dated November 12, 1996.

Violation B concerning high radiation postings was an issue addressed at the August 29, 1996, Health Physics management meeting with NRC Region I. PP&L stated at the meeting that the need for enhancements to Susquehanna health physics program was recognized. The radiation posting program was one area identified as requiring enhancements. PP&L's health physics plan which was developed to implement the necessary enhancements will also strengthen the radiation posting program.

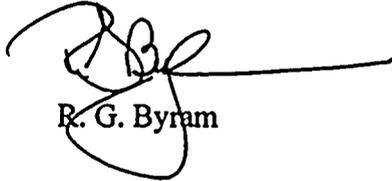
Three of the four radiological events described in the NOV occurred prior to the August 29, 1996 management meeting. The corrective actions resulting from the evaluations of those events were discussed at that time. The remaining event, on September 6, 1996, was promptly identified, and mitigated, as the result of an independent verification required by the health physics program.

The notice required submittal of a written reply within thirty (30) days of the date of the letter. However, as discussed with Dr. Walter J. Pasciak of NRC Region I on December 12, 1996, PP&L has been authorized to delay the response until December 16, 1996. We trust that the Commission will find the attached response acceptable.

~~961226-646~~

If you have additional questions, please contact Mr. R. D. Kichline at (610) 774-7705.

Very truly yours,

A handwritten signature in black ink, appearing to be 'R. G. Byram', with a horizontal line extending to the right from the end of the signature.

R. G. Byram

Attachment

copy: NRC Region I  
Mr. K. Jenison, NRC Sr. Resident Inspector  
Mr. C. Poslusny, NRC Sr. Project Manager

**REPLY TO A NOTICE OF VIOLATION**

**Violation A (387/96-10-02)**

Unit 1 Technical Specification (TS) 6.8.1, "Procedures," states that the licensee shall establish and implement procedures recommended in Regulatory Guide 1.33, including item 9.c(2) procedures for repair and replacement of control rod drives (CRDs). Susquehanna Steam Electric Station (SSES) Nuclear Department Administrative Procedure (NDAP)-QA-0500 established approved practices for maintenance procedures and work plans. NDAP-QA-0500 refers to Maintenance Procedure MT-AD-501, Maintenance Procedure Program, which establishes the procedural adherence requirements for different types of SSES maintenance procedures.

Section 6.2 of MT-AD-501, states that a step-by-step conditional procedure provides specific detailed direction. It further states that strict adherence to the procedure, exactly as written and in its entirety, is required. Finally, it states that the procedure must be in the field and on the job.

Maintenance Procedure MT-055-001, CRD Removal, is a step-by-step conditional procedure that controls the removal and replacement of the CRD mechanisms, including the identification of the correct mechanism, and controls to second party verify the correct mechanism.

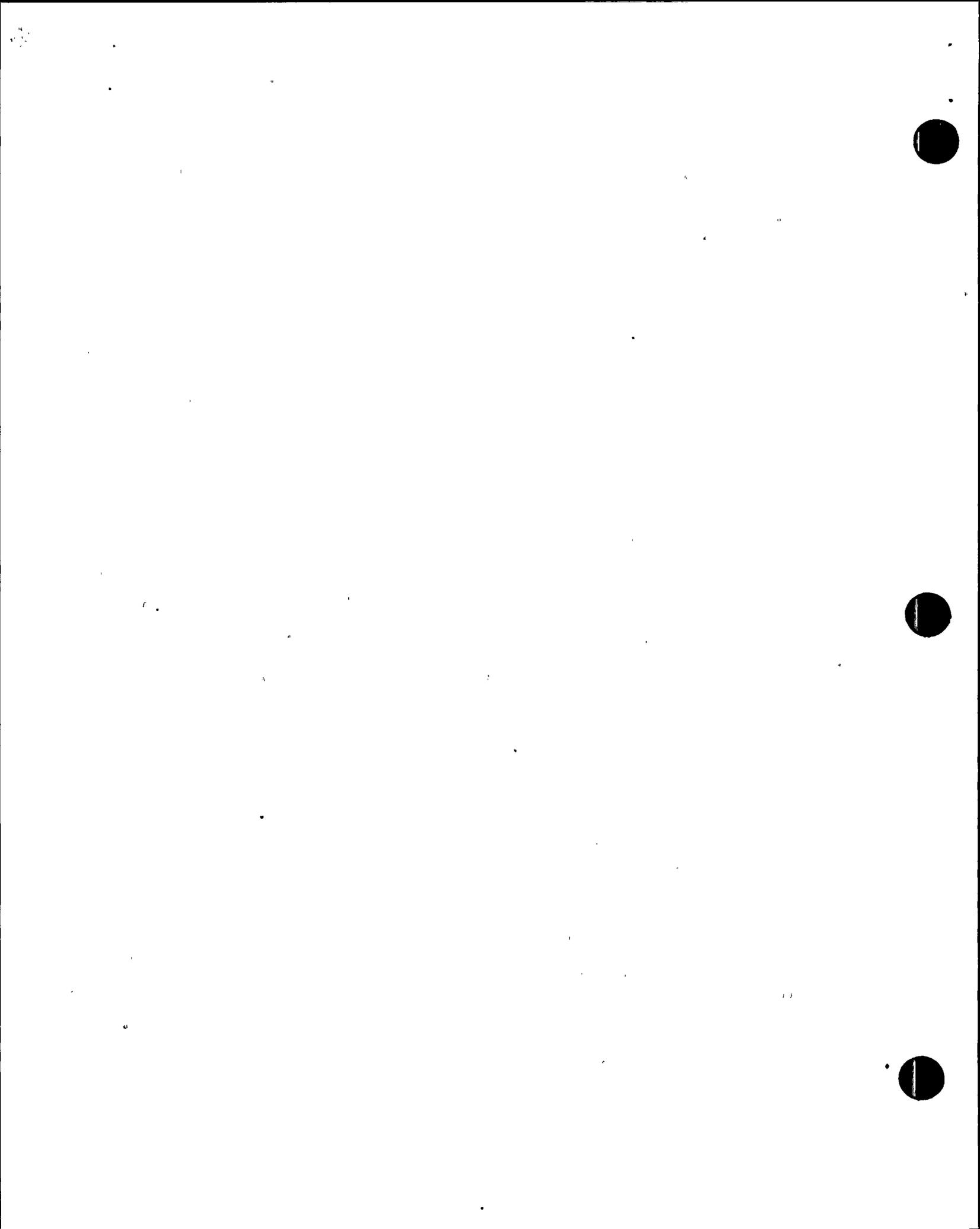
Contrary to the above, on September 26, 1996, MT-055-001 was not used in a step-by-step fashion in the field by the foreman directing the CRD removal activities on Unit 1. The correct CRD was not identified nor second party verified. This failure resulted in the wrong CRD being partially disassembled, with the potential to negatively affect the cooling of fuel assemblies in the core and spent fuel pool; and/or affect local reactivity conditions.

**Response**

1. **Reason for the Violation**

Maintenance procedure MT-055-001, titled "CRD Pump Disassembly, Inspection and Reassembly" as referenced in the Notice of Violation does not perform the evolution for removing a CRD from the reactor vessel; however, MT-055-015 titled "Control Rod Drive Removal" does perform this function. Therefore, this NOV response discusses the actions associated with procedure MT-055-015 and not MT-055-001.

The cause of the event was a human error on the part of workers doing the CRD exchange. During the conduct of the work, the CRD removal crew removed the identification streamer (identifies the CRD to be removed) from CRD mechanism 38-55 because of a concern that the streamer length would allow it to tangle in the CRD bolting removal tool. The equipment platform was then moved to enhance worker safety. The repositioning of the equipment platform placed the CRD bolting removal tool at the



incorrect CRD. The step in MT-055-015 prior to the actual removal of the bolts requires a recheck of the correct CRD location; however, it does not state the precise method to be used. Following the repositioning of the equipment platform confirmation that the correct CRD was being removed was performed by relying on the position of the CRD handling system (equipment platform). This resulted in the partial unbolting of the incorrect CRD. Additionally, the under vessel location of CRD's 38-55 and 34-51 is such that remote verification to confirm that the correct CRD is being removed could not be performed. Based upon the lessons learned from this event it was determined that MT-055-015, although utilized correctly, could be enhanced to minimize the likelihood of a repeat occurrence under similar circumstances.

2. **Corrective Steps Which Have Been Taken and the Results Achieved**

The corrective steps taken to restore CRD 34-51 (bolts from this CRD incorrectly removed) to an operable status included: retorquing the six flange bolts for CRD 34-51, and performing stroke time and scram time testing on the CRD. The result of the Operational Hydro, stroke and scram time testing for CRD 34-51 were acceptable.

MT-055-015 has been revised to: (1) provide clear direction to assure that the identification streamers, attached to the CRD and used to identify the correct CRD to be removed, remains on the CRD until the CRD removal tool is positioned under the CRD and the initial six bolts are removed; (2) requires reconfirmation of the proper CRD to be worked, if the equipment platform is rotated, and (3) provides specific methods, including independent verification, on rechecking correct CRD location prior to unbolting. No additional CRD handling events occurred during the Unit 1 ninth refueling an inspection outage.

MT-055-015 as well as the other CRD exchange procedures provide substantial defense in depth to prevent inadvertent reactivity changes. MT-055-015 was also sufficiently detailed to immediately detect the CRD unbolting error prior to a more serious event occurring. The identified procedural enhancements were implemented prior to resuming CRD removal activities strengthened the performance of the evolution.

3. **Corrective Steps Which Will Be Taken to Avoid Further Violations**

A method for supervision to remotely confirm that the correct CRD is being worked is being developed. This process will be developed for implementation by March 15, 1997.

4. **Date of Full Compliance**

Based upon the action taken in 2 above, PP&L is in full compliance.

**Violation B (387/96-10-03; 388/96-10-03)**

Units 1 & 2 TS 6.12, "High Radiation Area," requires each high radiation area to be barricaded and conspicuously posted as a high radiation area.

Contrary to the above, the following high radiation areas were not barricaded and conspicuously posted as high radiation areas.

- On May 5, 1996, the entrance to the Unit 1 Turbine Building 676' elevation "D" Demin Room from the "E" Demin Room was not posted as a high radiation area, and had dose rates of 200 mrem/h.
- On May 11, 1996, the entrance to the Unit 1 Turbine Building 676' elevation, Steam Jet Air Ejector (SJAЕ) Room from the spare SJAЕ room was not barricaded and posted as a high radiation area, and had dose rates of 1200 mrem/h.
- On July 31, 1996, an un-posted high radiation area of 400 mrem/h was found originating from the Unit 2 Reactor Building 779' elevation at resin inlet valve HV-24511B.
- On September 6, 1996, the west entrance to the Unit 2 Turbine Building 729' elevation moisture separator room was not barricaded or posted as a high radiation area, and had dose rates as high as 800 mrem/h.

**Response**

At the August 29, 1996, Health Physics management meeting with NRC Region I, PP&L stated that the need for enhancements to Susquehanna health physics program was recognized. The radiation posting program was one area identified as requiring enhancements. PP&L's health physics plan which was developed to implement the necessary enhancements will also strengthen the radiation posting program.

Three of the four radiological events described in the NOV occurred prior to the August 29, 1996 management meeting. The corrective actions resulting from the evaluations of those events were discussed at that time. The remaining event, on September 6, 1996, was promptly identified, and mitigated, as the result of an independent verification required by the health physics program.

1. Reason for the Violation

- a. On May 5, 1996, one entrance to the Unit #1 Turbine Building 676' elevation "D" Demin Room from the "E" Demin Room was not posted as a high radiation area, and had dose rates of 200 mrem/hr. The event occurred as a result of human error on the part of the HP technician covering the job and was discovered by the First Line Supervisor during a procedurally required verification walkdown.
- b. On May 11, 1996, the entrance to the Unit #1 Turbine Building 676' elevation, Steam Jet Air Ejector (SJAE) Room from the spare SJAE room was not barricaded and posted as a high radiation area, and had dose rates of 1200 mrem/hr. The evaluation of this event identified the following three causes: (1) Human Performance - person(s) unknown entered the common hallway to gain access to the spare SJAE room; (2) Design - the hallway between the Condenser Bay and the spare SJAE does not have a door to prevent access to the SJAE room; and (3) Inadequate Change Management - HP supervision underestimated the staffing required for adequate constant coverage when the power level at which waterbox work is performed, was increased.
- c. On July 31, 1996, an unposted high radiation area of 400 mrem/hr was found originating from the Unit #2 Reactor Building 779' elevation at resin inlet valve HV-24511B. Two reasons for this event were identified and include: (1) The system has valve HV-24511B located in a general (radiological) access area. During unplanned RWCU Demineralizer System transients and system draining during unpressurized conditions, resin collects in piping adjacent to this valve and results in a significant source of radiation; and (2) Plant procedures for RWCU operation did not identify actions to be taken when unplanned operating conditions resulted in resin build-up at inlet valve HV-24511B.
- d. On September 6, 1996, the west entrance to the Unit #2 Turbine Building 729' elevation moisture separator room was not barricaded or posted as a high radiation area and had dose rates as high as 800 mrem/hr. The primary reason for this event was human performance. A HP technician who escorted workers into the moisture separator room failed to adequately verify that the door was closed and locked before leaving the area. The condition of this door was found by another HP technician performing the daily high radiation door verifications required by the Health Physics program. A causal factor for this event was the type of door closure mechanism that was installed on the door. This mechanism allowed the door to be inadvertently propped open.

2. Corrective Steps Which Have Been Taken and the Results Achieved

a. Entrance to the Unit 1 Turbine Building 676' elevation "D" Demin Room from the "E" Demin Room was not posted as a high radiation area.

1. Upon detection of this violation the unposted entrance was immediately posted and barricaded.
2. Coaching and counseling using human performance causal factor techniques was conducted for the involved individual.
3. A topic concerning station posting problems was added to the 1996 Cycle #3 HP Technician Continuing Training. This incident is used as an example in the training.
4. Health Physics procedures were revised to include a specific requirement to complete the verification walkdown for regulatory posting changes within 24 hours of notification.

b. The entrance to the Unit 1 Turbine Building 676' elevation, Steam Jet Air Ejector (SJAE) Room from the spare SJAE Room was not barricaded and posted as a high radiation area.

1. Upon detection of this violation the unposted entrance was immediately posted and barricaded.
2. A temporary barricade to the Steam Jet Air Ejector Room and the Condenser Bay stairs leading to elevation 699' is constructed when working at power on 676' and below. This temporary barricade has been constructed several times since the May 11, 1996, incident. These temporary barricades prevent unauthorized access to these areas with radiation levels greater than 1 Rem/hr.
3. The Human Performance concern was addressed by the issuance of a Rad Safety Note to all plant work groups reinforcing the station and regulatory requirements regarding radiation boundary doors and the requirements to keep them closed.



- c. An unposted high radiation area was found originating from the Unit 2 Reactor Building 779' elevation at resin inlet valve HV-24511B.
1. The high radiation area was immediately posted and barricaded until a system flush could be performed to remove the source of high radiation. The system flush has subsequently been performed and the high radiation area no longer exists.
  2. A remote area radiation monitor (ARM) has been installed on both units on the mezzanine above the RWCU Hold Pump Room entry alcove. This ARM is utilized to alert personnel of elevated radiation levels in the area.
  3. Health Physics instructions have been revised to specify actions to be taken ( i.e. survey, post as required, etc.) when an alarm is received.
- d. West entrance to the Unit 2 Turbine Building 729' elevation moisture separator room was not barricaded or posted as a high radiation area.
1. Upon discovery, the door was immediately closed and verified locked.
  2. The incident and locking requirements were reviewed with the involved HP technician using Human Performance Causal Factors techniques.
  3. Since the technician involved was a contractor who was on-site in support of the Unit #1 outage, a memorandum was issued to all Health Physics personnel and contractors describing this event and reviewing the High Radiation Posting and Barricading requirements.
  4. The door closing mechanism on both Unit #1 and Unit #2 Moisture Separator rooms were modified so that the door cannot inadvertently be propped open.

3. Corrective Steps Which Will Be Taken to Avoid Further Violations

- a. Entrance to the Unit 1 Turbine Building 676' elevation "D" Demin Room from the "E" Demin Room was not posted as a high radiation area.

The 1996 Cycle #3 HP Technician training program which contains training concerning this event will be completed by the end of the first quarter of 1997.

- b. The entrance to the Unit 1 Turbine Building 676' elevation, Steam Jet Air Ejector (SJAЕ) Room from the spare SJAЕ Room was not barricaded and posted as a high radiation area.

No additional actions are required to preclude recurrence of this event.

- c. An unposted high radiation area was found originating from the Unit 2 Reactor Building 779' elevation at resin inlet valve HV-24511B.

1. The system design and operating procedures will be reviewed to determine if the probability of resin backing up into the precoat line to inlet valves HV-24511A(B) can be reduced by operational changes. This action is scheduled to be completed by the end of the first quarter of 1997.
2. Operating procedures will be reviewed to: (1) determine if guidance on evolutions that have the potential to result in High Radiation levels at this location are required, and (2) instruct that Operations personnel alert HP to monitor the area for changes in radiation levels when performing evolutions that may increase the radiation levels in the area. This action is scheduled to be completed by the end of the first quarter of 1997.

- d. West entrance to the Unit 2 Turbine Building 729' elevation moisture separator room was not barricaded or posted as a high radiation area.

No additional actions are required to preclude recurrence of this event.

4. Date of Full Compliance

- a. Entrance to the Unit 1 Turbine Building 676' elevation "D" Demin Room from the "E" Demin Room was not posted as a high radiation area.

Based on the action taken in 2.a.1 above, PP&L is in full compliance.

- b. The entrance to the Unit 1 Turbine Building 676' elevation. Steam Jet Air Ejector (SJAЕ) Room from the spare SJAЕ Room was not barricaded and posted as a high radiation area.

Based on the action taken in 2.b.1 above, PP&L is in full compliance.

- c. An unposted high radiation area was found originating from the Unit 2 Reactor Building 779' elevation at resin inlet valve HV-24511B.

Based on the action taken in 2.c.1 above, PP&L is in full compliance.

- d. West entrance to the Unit 2 Turbine Building 729' elevation moisture separator room was not barricaded or posted as a high radiation area.

Based on the action taken in 2.d.1 above, PP&L is in full compliance.