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 RECIP. NAME RECIPIENT AFFILIATION  
 RUSSELL, W. T. Region 1, Office of Director

SUBJECT: Responds to violations noted in Insp Repts 50-387/85-06 & 50-388/85-06. Corrective actions: Deviation Request 3 dtd Sept 1986 submitted to justify acceptability of nonrated doors & plant drawings re resealing requirements being revised.

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Pennsylvania Power & Light Company

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Harold W. Keiser  
Vice President-Nuclear Operations  
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Reply to a Notice  
of Violation

JUL 15 1987

Mr. William T. Russell  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION  
RESPONSE TO ENFORCEMENT ACTION 85-112  
PLA-2887 FILE R41-2/R41-1C/A17-15

Docket Nos. 50-387/NPF-14  
and 50-388/NPF-22

Dear Mr. Russell:

Pursuant to 10CFR2.201, Pennsylvania Power & Light Company hereby provides the attached response to Enforcement Action 85-112 (Attachment 2).

In addition to the responses requested in the specific violations, we have taken this opportunity to provide you with an update of our ongoing review of our fire protection program (Attachment 1).

We trust the Commission will find our response acceptable.

Very truly yours,

H. W. Keiser  
Vice President - Nuclear Operations

Attachments

cc: ~~NRC~~ Document Control Desk (original)  
NRC Region I  
Mr. L. R. Plisco, Resident Inspector  
Mr. M. C. Thadani, Project Manager

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## ATTACHMENT 1

### REVIEW OF FIRE PROTECTION PROGRAM

As a result of the Appendix R inspection conducted by the NRC during February 1985, PP&L was requested to respond to a series of NRC concerns. These concerns and the actions to resolve them were itemized and submitted to the NRC on June 11, 1985 (PLA-2482).

Follow-up responses to the NRC transmitted reports, revisions and clarifications to the reports and responses to additional NRC questions related to the deviation requests accompanying these reports (Ref. PLA-2529 dated 9/4/85, 2541 dated 10/3/85, 2566 dated 12/18/85, 2574 dated 12/18/85, 2592 dated 2/10/86 and 2762 dated 12/11/86). Modifications described in these letters are on schedule for completion during the Unit 1 third refueling and inspection outage (4th quarter 1987) and the Unit 2 second refueling and inspection outage (2nd quarter 1988). Compensatory actions as provided in PLA-2417 dated 2/22/85 are in effect and will remain so until the committed modifications are installed.

In addition, PP&L decided that it was necessary not only to assure that NRC was satisfied with our Fire Protection Program, but also that we were totally satisfied with the program in light of our improved understanding of Appendix R resulting from the inspection and our own internal reviews. As a result, we included information in PLA-2566 dated 12/18/85 stating that we were embarking on an upgraded Appendix R Safe Shutdown analysis. In addition, PP&L has undertaken a comprehensive fire protection program review intended to establish a well documented, readily auditable and easily understood set of fire protection documentation. This will assure that our commitments with respect to fire protection are incorporated into our standard engineering and operational practices and will simplify the job of ensuring continuing compliance.

#### Summary of Fire Protection Program Review

PP&L believes that the basic fire protection design of Susquehanna SES is adequate and safe. The fire protection program review is a comprehensive effort focusing on compliance with the requirements of Sections III G, J, and O of Appendix R to 10CFR50. The effort is intended to create easily auditable documentation, confirm compliance and provide a means of more effectively maintaining compliance in the future.

A multi-disciplined team approach is being utilized in the conduct of the review. This approach takes advantage of the individual specialized skills and knowledge of each technical discipline while broadening the base of fire protection knowledge and experience.

The review effort currently consists of:

#### SAFE SHUTDOWN ANALYSIS

The Safe Shutdown Analysis for Susquehanna Steam Electric Station is being redone using current industry and regulatory interpretations of the requirements of Appendix R. The following activities are being performed:

- 1) A set of systems sufficient to achieve cold shutdown in accordance with the current interpretation of Appendix R was selected. These systems ensure the ability to accomplish a dual unit shutdown under the Appendix R scenario where the non-fire unit could be subjected to a Loss of Offsite Power (LOOP) simultaneous with a fire and a LOOP in the affected unit.
- 2) Components and cabling which support the operation or which could cause the misoperation of the systems selected in number 1 above are being identified along with their location by fire zone in the plant.
- 3) For each cable and component a review is being conducted to assure that redundant trains are adequately separated by the necessary spatial separation and/or rated barriers and that fire protection consistent with the requirements of Section III G of 10CFR50 Appendix R is provided.

#### COMBUSTIBLE LOADING ANALYSIS

A new combustible loading analysis is being performed to confirm the combustible loading for each fire zone. The results of the new analysis will be compared with the current level of fire protection provided in the areas of the plant where safe shutdown equipment is located to assure the level of protection provided bounds that required by the fire hazard.

#### LONG TERM COMPLIANCE ITEMS

The following program improvements are being undertaken to provide a well documented and broadly distributed understanding of our commitments:

- 1) Preparation of Fire Protection Features Drawings

These drawings are being prepared to show the locations of fire area and fire zone boundaries, to document the required safe shutdown division in each fire zone, and to specify the location of fire doors, fire dampers and fire barriers which must be maintained in order to assure safe shutdown.

- 2) Preparation of Electric Wrapped Raceway Drawings

These drawings are being prepared to document the physical location and level of protection required for raceway necessary to support safe shutdown.

- 3) Preparation of Design Standards

Design standards are being prepared to assure that plant and design personnel have an understanding of the actions that must be performed to preserve our compliance with Appendix R. Design standards to cover the following are being prepared:



- 3.1 A design standard is being prepared to outline the requirements for maintaining compliance with Appendix R Section III G, J & O when adding new or modifying existing components and cables in the plant. This design standard references the fire protection features drawings outlined in number 1 above for a determination as to the safe shutdown division required to be protected in a given fire zone.
- 3.2 A design standard is being prepared to document how to perform a combustibile loading analysis and how to maintain our commitments with respect to the combustibile loading analysis.

4) Preparation of Specifications

Specifications are being prepared to explain to plant personnel those aspects of the Appendix R analysis which require actions on their part to maintain our commitments. The following specifications are being prepared.

- 4.1 Specifications referencing the fire protection features drawings and the electrical wrapped raceway drawings are being prepared to identify the specific surveillance items required by our new Appendix R analysis in the following areas: fire doors, fire dampers, fire rated barriers and wrapped raceway.
- 4.2 A specification providing an acceptable calculational method for the control of transient combustibles is being prepared.
- 4.3 Existing cable routing specifications are being revised to reference the electrical wrapped raceway drawings for a determination of the required level of protection for raceway which are required to be protected.

The work described above is scheduled for completion by December 31, 1987.

Potential conflicts with existing plant design identified by the review will be thoroughly evaluated. If the evaluation identifies any safety significant deviations from the requirements of Appendix R, Sections III. G, J or O, appropriate compensatory actions as required by our NCR process and technical specifications will be implemented until permanent modifications are completed.

At the completion of the review, the Fire Protection Review Report will be revised. The revision will summarize the analytical work and will reflect any changes which result. The revised report is scheduled to be issued during the second quarter of 1988.

ATTACHMENT 2

RESPONSE TO NOTICE OF VIOLATION

I. Violation

The Susquehanna Unit 1 Operating License NPF-14, Paragraph 2.C(6), requires the licensee to maintain the fire protection program set forth in Appendix R to 10 CFR Part 50. The Susquehanna Unit 2 Operating License NPF-22, Paragraph 2.C(3), requires the licensee to maintain in effect and fully implement all provisions of the approved fire protection program. In a letter dated March 26, 1981 to NRC, the licensee stated that the Susquehanna Fire Protection Program would be implemented in accordance with Appendix R, particularly Sections III.G, J, and O. The fire protection program was approved by the staff in the Safety Evaluation Report and associated Supplements 1 - 3.

10 CFR Part 50, Appendix R, Section III.G.1 requires that fire protection features shall be provided for structures, systems, and components important to safe shutdown. These features shall be capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage.

Sections III.G.2 and III.G.3 specify four alternatives that may be implemented outside of primary containment to assure that one redundant train of equipment cabling and associated circuits necessary to achieve and maintain hot shutdown remain free of fire damage. The alternatives are:

Separation of redundant trains of equipment, cabling and associated circuits by a three-hour rated fire barrier.

Separation of redundant trains of equipment, cabling and associated circuits by a horizontal distance of 20 feet with no intervening combustibles and fire detection and automatic fire suppression systems installed in the area.

Enclosure of redundant trains of equipment, cabling and associated circuits by a one-hour rated fire barrier with fire detection and automatic fire suppression systems installed in the area.

Installation of alternative or dedicated shutdown capability independent of the equipment, cabling and associated circuits under consideration, and installation of fire detection and fixed fire suppression systems in the area under consideration.

Contrary to the above, as of February 15, 1986, fire protection features were not provided for certain redundant trains of equipment and/or cabling located outside the primary containment and necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control stations such that one train would remain free of fire damage and none of the alternatives provided by Section III.G.2 and III.G.3 were implemented. Specifically:



**I.A. Violation (387/85-06-02 and 388/85-06-02)**

Redundant trains of residual heat removal (RHR) pumps located in the RHR pump rooms of Units 1 and 2 (Fire Zones 1-1E, 1-1F, 2-1E, 2-1F) were separated by more than 20 feet with no intervening combustibles and provided with fire detection capability. However, the suppression system provided was not automatic. No alternative or dedicated shutdown capability was provided.

**Response to Violation I.A.****(1) Reason for the Violation:**

The barriers separating fire zones 1-1E and 1-1F in Unit 1 and fire zones 2-1E and 2-1F in Unit 2 were not three-hour rated fire barriers. The plant configuration existing at the time of the inspection and the justification thereof were clearly provided in the Susquehanna SES Fire Protection Review Report revision 2 dated November 1982 (Unit 1, pages 4.3-8 through 4.3-12; Unit 2, pages 4.4-8 through 4.4-12). Until the inspection it was PP&L's position that although this fire zone barrier could not be termed a three-hour rated fire barrier, the construction was adequate to mitigate the spread of fire from one redundant train to the other considering the actual fire hazard. Therefore, an automatic suppression system or alternative shutdown capability were not thought to be necessary.

**(2) Corrective steps that have been taken and the results achieved:**

Upon identification of the concern, interim compensatory measures as stated in PP&L letter PLA-2417 dated February 22, 1985 were implemented. These measures are being maintained.

The construction of these fire zone boundaries was reviewed to determine the changes which were necessary in order to upgrade these fire barriers to three-hour rated status. The following actions were taken:

- o Deviation Request Number 3 dated September, 1986, has been submitted to justify the acceptability of non-rated doors.
- o A design change package for upgrading all penetrations and the seismic gap between the subject barriers and the primary containment to a three-hour rating has been prepared. Installation is scheduled for the next refueling and inspection outage on each unit.

## (3) Corrective steps taken to avoid further violations:

Plant design drawings detailing the sealing requirements for penetrations through plant fire barriers are being revised to require a three-hour rating in all cases.

## (4) Date of full compliance

PP&L will complete the modifications identified in (2) above by the end of the third refueling and inspection outage for Unit 1 (4th Quarter 1987) and the second refueling and inspection outages for Unit 2 (2nd Quarter 1988). PP&L is revising Deviation Request Number 3 to clearly extrapolate the Factory Mutual results to cover water tight doors in these barriers. The revised Deviation Request will be submitted prior to the end of the third refueling and inspection outage for Unit 1 (4th Quarter 1987). Additional actions related to Deviation Request Number 3 are contingent upon NRC review.

**I.B. Violation (388/85-06-03)**

Electrical power and control raceways (Nos. E1K715, E2PJ19, E2KJ19, F2K123) located in the Containment Access Area of Unit 2 (Fire Zone 2-4A) were provided with fire detection and automatic suppression capabilities, but were not enclosed by a one-hour fire barrier, or separated by a horizontal distance of 20 feet. No alternative or dedicated shutdown capability was provided.

**Response to Violation I.B.**

## (1) Reason for the Violation:

PP&L's new safe shutdown analysis has made the following determinations.

- o Raceway F2K123 is not contained in fire zone 2-4A and, therefore, is not in violation. There is a raceway F2K132 in fire zone 2-4A, but this raceway contains no safe shutdown cables and, therefore, is not in violation.
- o Raceway E2PJ19 is an end section of cable tray which contains no cables and, therefore, is not in violation.
- o Raceway E1K715 is located in fire zone 2-4A-W. As outlined in Deviation Request Number 4, revised September, 1986, fire zone 2-4A-W is a wraparound fire zone. The intent of the wraparound area is to provide a minimum 50 feet spatial separation between redundant shutdown paths. This 50 foot distance is comprised of 25 feet North and 25 feet South of Column 33 in fire zone 2-4A-W. Raceway E1K715 is 29 feet South of Column 33, which is outside of the portion of the wraparound zone where protection is required and, therefore, is not a violation.



- o Raceway E2KJ19 is located in fire zones 2-4A-W and does contain safe shutdown cables related to train A of the Emergency Switchgear Room HVAC System and three inboard containment isolation valves required to prevent loss of vessel inventory. Since the FPRR Revision 2 indicates a loss of these functions was acceptable, PP&L believed we were in compliance.

(2) Corrective steps that have been taken and the results achieved:

PP&L's current safe shutdown analysis identified raceway E2KJ19 as requiring wrapping.

(3) Corrective steps to be taken to avoid further violation:

A long-term compliance program as described in Attachment 1 is under development.

(4) Date of full compliance:

Raceway E2KJ19 will be wrapped by the end of the Unit 2 second refueling and inspection outage (2nd Quarter 1988).

**I.C. Violation (388/85-06-04)**

Redundant trains of safe shutdown equipment located in the Equipment Removal Room of Unit 2 (Fire Zone 2-3B) were not separated by three-hour fire barriers and were provided with automatic suppression capability in only a portion of the area. No alternative or dedicated shutdown capability was provided.

**Response To Violation I.C.**

(1) Reason for Violation:

The approved revision of the Susquehanna SES Fire Protection Review Report (FPRR), revision 2 indicated in figures 5.10 and 5.12 and Table 6-1 that the equipment removal area of fire zone 2-3B and the equipment shaft area of fire zone 2-5A were provided with automatic suppression. These drawings incorrectly indicated automatic suppression capabilities for all elevations in the shaft. As described in PLA-2592 dated 2/10/86, only the lower elevation of the equipment shaft is required to contain automatic suppression capabilities. Additionally, it was never PP&L's intent to provide full automatic suppression in the equipment removal area (2-3B).

Also, the first sheet in Section 5.0 of Revision 2 to the FPRR indicates that the figures in that section are representative of the plant fire protection features and are not as-built or controlled drawings.

(2) Corrective steps that have been taken and results achieved:

During 1983, and subsequent to the issuance of Revision 2 to the FRR, plant fire protection design drawings were generated to document and control the plant fire protection features. On these plant drawings the partial fire suppression in fire zones 2-3B and 2-5A has been properly depicted. (Ref. Drawings E-184302 Sh. 3 Revision 4 & Sh 5 Revision 3). Additionally, a review of raceway requiring protection in these areas has shown that no raceways have been improperly protected (i.e. one-hour rated wrapping vs. three-hour rated wrapping) in the portions of Fire Zone 2-3B that were improperly indicated as having automatic suppression or in the shaft area of 2-5A.

(3) Corrective steps to be taken to avoid further violations:

The revised Fire Protection Review Report will properly depict the plant configuration for the area in question.

(4) Date of full compliance:

A revised Fire Protection Review Report is scheduled to be issued during the second quarter of 1988.

II. Violation (388/85-06-07)

The Susquehanna Unit 1 Operating License NPF-14, Paragraph 2.C(6), requires the licensee to maintain the fire protection program set forth in Appendix R to 10 CFR Part 50. The Susquehanna Unit 2 Operating License NPF-22 Paragraph 2.C(3), requires the licensee to maintain in effect and fully implement all provisions of the approved fire protection program. In a letter dated March 26, 1981 to the NRC, the licensee stated that the Susquehanna Fire Protection Program would be implemented in accordance with Appendix R, particularly Sections III.G, J, and O. The fire protection program was approved by the staff in the Safety Evaluation Report and associated Supplements 1 - 3.

10 CFR Part 50, Appendix R, Section III.J, requires that emergency lighting units with at least an 8-hour battery power supply be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

Contrary to the above, as of February 15, 1985, the battery power supply for the emergency lighting unit provided in the stairwell to the Remote Shutdown Panel at elevation 670 feet of the Unit 2 Reactor Building was only rated for 3.75 hours.



Response:

(1) Reason for Violation:

The improperly rated battery power supply was incorrectly installed during the construction phase of the plant. The 3.75 hour rated battery power supply are those used throughout the plant where a higher rated power supply is not required.

(2) Corrective steps that have been taken and the results achieved:

The incorrect power supply unit was replaced with a power supply of the proper rating.

(3) Corrective steps to be taken to avoid further violations:

No additional actions are required.

(4) Date of full compliance:

Base on the actions taken above, PP&L is in full compliance. Additionally, the Resident Inspectors closed this violation in Detail 1.2 of Inspection Report 50-388/86-04.

