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BUTLER,W.R. Licensing Branch 2

SUBJECT: Responds to NRC 850418 concerns re fire protection program. Revised fire protection review rept will reflect degree of conformance to App R,per Generic Ltrs 83-33 & 85-01.Control room analyses willconform to Generic Ltr 81-12.

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JUN 11 1985

Director of Nuclear Reactor Regulation
Attention: Mr. W. R. Butler, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
FIRE PROTECTION PROGRAM UNRESOLVED ITEMS
ER 100450 FILE 841-2, 143 Docket Nos. 50-387
PLA-2482 50-388

Dear Mr. Butler:

The purpose of this letter is to address the NRC staff's concerns related to PP&L's Fire Protection Program as expressed in a letter dated April 18, 1985. In order to resolve the NRC staff's concerns, PP&L will provide the following:

The Fire Protection Review Report will be revised to reflect, in a comprehensive manner, the degree to which SSES conforms with the technical requirements of Sections III.G., J. and O. of Appendix R to 10 CFR 50. For each fire area, PP&L will identify and justify that the deviations from these requirements will provide an equivalent level of fire safety. This effort will reflect recent staff guidance as contained in Generic Letters 83-33 and 85-01.

The Control Room analyses will assume complete loss of function of control room systems after manual scram of the reactor and will show that safe shutdown conditions can be maintained outside the control room. This analysis, along with the analyses of associated circuits throughout the plant, will conform to the guidance provided in Generic Letter 81-12 and its supplementary clarification.

The re-assessment of non-rated construction will be in accordance with guidance presented at the site audit. That is, to provide reasonable assurance that fire propagation will not occur beyond non-fire-rated zone boundaries, the boundaries will be upgraded to be continuous barriers with a fire rating sufficient to withstand the effects of a fire involving in-situ and transient combustibles, with conservative margin. If boundary construction is not upgraded, the re-assessment will assume that fire spread will occur into the next most immediate fire zone (horizontally and/or vertically) and will show that such fire spread does not present a decrease in safe shutdown capability.

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The following addresses each of the specific NRC staff's concerns by presenting 1) a description of each of the staff's concerns, 2) a description of the methodology to be used by PP&L to address each concern and 3) a description of the deliverables to the NRC. This letter also supercedes our letter (PLA-2443) dated April 8, 1985.

CONCERN #1: UNRATED FIRE ZONE BOUNDARIES

Description of NRC Concern

Some fire zones in the Susquehanna SES Units 1 and 2 reactor buildings are bounded by floors, ceilings and walls which are not rated as fire barriers. A number of these assemblies do not have rated fire doors, fire proofing on structural steel, penetration seals in pipe and ventilation duct penetrations, or fire dampers in ventilation ducts. In addition, the sealing of seismic gaps between such assemblies varies from open space to a full depth of rodofoam. The licensee has stated that the unrated assemblies would be equivalent to a fire resistance of 45 minutes.

Due to the lack of fire rated assemblies, there can be no assurance that fire damage is confined to the fire zone of origin. It therefore, must be assumed that fire damage would be spread to any adjacent fire zones, (horizontally and/or vertically) and redundant safe shutdown equipment would be damaged.

Description of PP&L's Method for Resolution of the NRC Concern

1.0 Methodology

PP&L will review each fire zone with unrated barriers in all safety-related buildings. This review will include the following:

1.1 Identify the safe shutdown path available in each fire zone.

1.2 Identify the fire severity in each fire zone.

1.3 Identify all adjacent fire zones (horizontal and vertical) separated by non-rated fire barriers indicating for each adjacent zone where the same division and shutdown paths are not available in the event of a fire.

1.4 Resolve concern by:

a) upgrading the fire barrier to a fire rated status (see assumption 3.4); or

b) Reanalyzing fire zones to assure that the same shutdown path is available in each adjacent fire zone; or

c) Identifying on a case by case the specific barrier components which are not rated and providing a justification for their use.

Any additional fire rated protection required as a result of this redefinition will be in accordance with 10CFR50 Appendix R, Section III.G.

2.0 NRC Guidance to be Used in the Reanalysis

2.1 10 CFR 50, Appendix R Section III.G.

2.2 Generic Letters 83-33 and 85-01.

2.3 In addition PP&L will use the guidance given in your April 18, 1985 letter which states:

The re-assessment of non-rated construction should be in accordance with guidance presented at the site audit. That is, to provide reasonable assurance that fire propagation will not occur beyond non-fire-rated zone boundaries, the boundaries should be upgraded to be continuous barriers with a fire rating sufficient to withstand the effects of a fire involving in-situ and transient combustibles, with conservative margin. If boundary construction is not upgraded, your re-assessment should assume that fire spread will occur into the next most immediate fire zone (horizontally and/or vertically).

3.0 Assumptions

3.1 The concrete block or reinforced concrete used in the construction of walls, floors and ceilings are acceptable as being fire rated.

3.2 Evaluation of the fire rating of existing doors by Factory Mutual Research is acceptable to the NRC staff.

3.3 The unprotected structural steel will be shown to be acceptable using the methodology acceptable to the NRC.

3.4 The upgraded fire barrier ratings will be based on the highest fire severity (based on the average combustible loadings) in the adjacent fire zones plus a conservative addition (minimum of 15 minutes) to account for transient combustibles.

3.5 If the existing fire zone barriers are not upgraded, the fire spread will occur only into the adjacent (horizontally and vertically) fire zone. Fire spread beyond the adjacent zone need not be considered.

Description of Deliverable to the NRC

When this analysis is completed, PP&L will provide a summary report which will contain the following:

1.0 The methodology utilized.

2.0 The assumptions utilized.

3.0 Listing of deviations from 10CFR50 Appendix R criteria and NRC guidance used in the fire zone reanalysis and justification for the deviations.

4.0 The results of the analysis.

5.0 Identification of modifications, if any

a) Additional conduit and raceways requiring protection and the methods to be used.

b) Fire barriers which are to be upgraded with details on methods to be used.

6.0 A schedule to implement the modifications.

7.0 Identification of compensatory measures as needed.

This analysis and summary report will be completed and submitted to the NRC by August 30, 1985.

CONCERN #2: CRITERIA FOR FIRE PROTECTION OF SAFE SHUTDOWN SYSTEMS WITHIN A FIRE ZONE WHICH DO NOT COMPLY WITH THE REQUIREMENTS OF SECTION III.G

Description of the NRC Concern

The Licensee has not adequately analyzed or documented the separation/protection of redundant shutdown systems where they deviate from the requirements of Section III.G. These criteria may be justifiable criteria for certain configurations, but these criteria are not acceptable for all configurations in the plant. The minority division essential cable protection criteria presented in Section 2.11 of the FPRR Rev. 2 must be justified (except items a and e) on a case by case basis:

Description of PP&L Method for Resolution of the NRC Concern

PP&L will identify the specific Section 2.11 criteria or combinations thereof which apply for each fire zone. Where the criteria for a fire zone deviates from the requirements of 10CFR50, Appendix R or NRC guidance, PP&L will provide justification for each deviation.

[illegible]

Description of Deliverables to the NRC

The listing of all fire zones showing compliance or deviations, and the specific justification for each deviation will be provided by November 15, 1985.

CONCERN #3: THE INDEPENDENCE OF THE ALTERNATE SHUTDOWN CAPABILITY FROM THE CONTROL ROOM

Description of the NRC Concern

The NRC staff has no concern with the isolation of the Alternate Shutdown capability from the control room since the control circuits from the control room were satisfactorily fused with separated fused circuits or coordinated fused circuits.

Description of PP&L's Method for Resolution of the NRC Concern

None required.

Description of Deliverables to the NRC

None required.

CONCERN #4a: THE ANALYSIS OF ASSOCIATED CIRCUITS WITHIN FIRE ZONES OUTSIDE THE CONTROL ROOM

Description of the NRC Concern

With respect to areas outside the control room, the NRC staff finds that the FPRR methodology analyzed associated circuits for the "minority" division but not for the "majority" division. The licensee's separation criteria is adequate to assure that the "minority" division is not associated electrically with the "majority" divisions. However, the methodology is not adequate to analyze cases where a majority component (i.e. valve) could prevent successful operation of a minority system.

Description of PP&L's Method for Resolution of the NRC Concern

PP&L will review the safe shutdown component list to determine the potential for such interactions, and take appropriate action if any are found.

In order to demonstrate the above, PP&L will:

1. Verify that successful operation of a "minority" division safe shutdown system or support system can not be defeated by a spurious signal from a "majority" division component and that the minority division system operation does not rely on a majority division component.

2. Verify that vessel inventory is not compromised by a spurious operation of a "majority" division component.

Description of Deliverables to the NRC

PP&L will submit a summary report which documents the approach, assumptions and results by November 15, 1985.

CONCERN #4b: THE ANALYSIS OF ASSOCIATED CIRCUITS WITHIN THE CONTROL ROOM

Description of NRC Concern

The NRC staff's concern for the control room fire is that the "minority" division analysis was not conducted. For the control room fire it was postulated that a fire would occur in a single tray or in a single panel (only one division would be lost).

Description of PP&L's Method for Resolution of the NRC Concern

1.0 Methodology

PP&L will reanalyze the effects of a fire in the control room on the ability to safely shutdown the plant. PP&L will demonstrate that in the event of a fire in the control room the alternate shutdown systems and their support systems will remain operable from outside the control room and that any single spurious signal from a fire in the control room will not affect the ability of the alternate shutdown systems to shut down the plant nor will a spurious signal cause a loss of inventory from the reactor pressure vessel.

In order to demonstrate the above, PP&L will

1. Identify all required components for those systems on the Remote Shutdown Panel (alternate shutdown systems).

2. Verify that all required alternate shutdown systems components are isolated from the control room and are operable either from Remote Shutdown Panel or locally.

3. Verify that a control room fire cannot defeat any of the alternate shutdown systems by spurious operation of components in interconnecting systems.

4. Identify all required components for the safe shutdown support systems.

5. Verify that all required support systems components are isolated from the control room and are operable from outside the control room.

6. Evaluate the effects of a control room fire on all potential loss of inventory paths from the reactor pressure vessel.

2.0 NRC Guidance to be Used in the Reanalysis

The reanalysis of the effects of a control room fire is being done in accordance with the guidance presented in Generic Letter 85-01.

3.0 Assumptions

The following assumptions are being made in order to perform the analysis of the control room fire:

1) A fire in the control room will cause an evacuation of the control room.

2) The reactor is manually scrammed from the control room prior to evacuation and all control rods are inserted which renders the reactor subcritical. All other shutdown functions are implemented and monitored from outside the control room.

3) Two cases will be analyzed relative to the availability of off-site power:

   a. Off-site power is available throughout the entire event.

   b. Off-site power is lost concurrent with the control room fire and is not available for a period of 72 hours.

4) No credit is taken for the automatic function of valves and pumps if their control circuits are in the control room.

5) Manual actions outside the control room to restore power, assure valve line ups, and assure pump operability are acceptable.

6) Manual actions outside the control room are acceptable to correct spurious actuation of equipment.

7) Only one spurious signal (as a result of an open circuit, short circuit or hot short) is assumed to be caused by the control room fire.

8) Any number and combinations of spurious signals is assumed if these spurious signals lead to the opening of a high/low pressure interface.

Description of Deliverables to the NRC

PP&L will submit a summary report which will contain:

1. the methodology utilized.

2. the assumptions utilized.

3. the results of the analysis.

4. for any item identified which is affected by a control room fire the following will also be identified:

   a) corrective action.

      i) Interim corrective action including a reference to an existing procedure if applicable.

      ii) Identification of long term corrective action including a schedule to implement a modification; or

   b) exemption request and justification.

This summary report will be submitted by August 30, 1985.

CONCERN #5: THE SAFETY SIGNIFICANCE OF DEVIATIONS

Description of the NRC Concern

The Post Fire Shutdown Capability may not be adequate in some cases because of:

1) The lack of a systematic analysis of the "majority" division system interaction with the "minority" division shutdown system.

2) The lack of an associated circuits analysis for the control room.

3) The loss of certain support systems during control room fire.

Description of PP&L Method for Resolution of the NRC Concern

PP&L is convinced that the issues presented by the NRC do not have a safety impact associated with them. However, PP&L has implemented compensatory measures. In addition, if the reassessment identifies a safety significant item, PP&L will notify the NRC and will implement compensatory measures.

Description of Deliverables to the NRC

None required.

CONCERN #6: THE CONFORMANCE OF THE RE-ANALYSIS TO THE WORKSHOP GUIDANCE

Description of the NRC Concern

The NRC staff has a concern that the re-analysis was not performed to Section III.G of Appendix R and the Appendix R workshops.

Description of PP&L's Method for Resolution of the NRC Concern

The reanalysis performed by PP&L will be in accordance with 10CFR50, Appendix R, Sections III.G, III.J, and III.O. In addition PP&L will use the guidance contained in this letter and in NRC's generic letters (eg GL 85-01, 81-12 and 83-33) as an acceptable interpretation from the NRC of the specific requirements of 10CFR50, Appendix R, Sections III.G, III.J, and III.O.

Description of Deliverables to the NRC

None required.

Additionally, PP&L will revise the Fire Protection Review Report to incorporate all the above information after the analyses described is completed and reviewed by the NRC. The schedule for this revision will be agreed to by both PP&L and NRC Staff.

If you have any questions, please contact us.

Very truly yours,

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

cc: M. J. Campagnone USNRC
R. H. Jacobs USNRC

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Mr. Norman W. Curtis, Vice President
Engineering and Construction
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

The following documents concerning our review of the subject facility are transmitted for your information.

- ☐ Notice of Receipt of Application, dated _____.
- ☐ Draft/Final Environmental Statment, dated _____.
- ☐ Notice of Availability of Draft/Final Environmental Statement, dated _____.
- ☐ Safety Evaluation Report, or Supplement No. _____, dated _____.
- ☐ Notice of Hearing on Application for Construction Permit, dated _____.
- ☐ Notice of Consideration of Issuance of Facility Operating License, dated _____.
- ☒ Monthly Notice; Applications and Amendments to Operating Licenses Involving no Significant Hazards Considerations, dated June 4, 1985.
- ☐ Application and Safety Analysis Report, Volume _____.
- ☐ Amendment No. _____ to Application/SAR dated _____.
- ☐ Construction Permit No. CPPR- _____, Amendment No. _____ dated _____.
- ☐ Facility Operating License No. _____, Amendment No. _____, dated _____.
- ☐ Order Extending Construction Completion Date, dated _____.
- ☐ Other *(Specify)* _____

Office of Nuclear Reactor Regulation

Enclosures:
As stated

See next page

cc:

OFFICE➤	LB#2/DL						
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DATE➤	6/13/85						

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