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 EISENHUT, D.G. Division of Licensing

SUBJECT: Forwards Rev 1 to 820714 deviation requests for exemption
 from Section III-G of 10CFR50 App R & three new deviation
 requests, per results of completed detailed engineering
 design.

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 TITLE: Licensing Submittal: Fire Protection

NOTES: Revised 1/14/85 *CAW*

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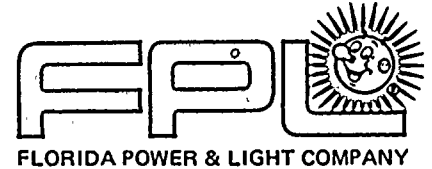
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forwarded Nov 1 to 82014 deviation requests for exception
from Section III of 10CFR50 App B & three new deviation
requests per results of completed detailed engineering
design.

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[illegible]



February 25, 1983
L-83-89


Office of Nuclear Reactor Regulations
Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Eisenhut:

RE: ST. LUCIE UNIT NO. 2
DOCKET NO. 50-389
APPENDIX R - FIRE HAZARD
ANALYSIS REVISION 1

By letter L-82-282 dated 7/14/82, FP&L provided an evaluation supporting requests for exemption from Section III-G of Appendix R to 10CFR50. Based on subsequent meetings and discussions with the staff, several modifications to the document were required and insertion of the attached pages establishes Revision 1 to our deviation requests. In addition, three new deviation requests are enclosed which are required as a result of completed detailed engineering design. If you have any questions regarding this submittal, please contact us.

Very truly yours,


Robert E. Uhrig
Vice President
Advanced Systems and Technology

REU/RJS/PPC/mp

Attachment

cc: J.P. O'Reilly, Region II
Harold F. Reiss, Esquire

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ATTACHMENT

As an explanation of the attached it is noted that additions and modifications to the original exemption requests are designated "RI." Modifications are further identified by underscoring. The following summarizes the revisions by Fire Area:

Fire Area A, deviation A3
Newly identified deviation

Fire Area C, deviation C4
Thermal wrap for ducts

Fire Area C, deviation C5
Two hour conduit wrap in B Switchgear Room

Fire Area H., deviation H3
Two hour conduit wrap

Fire Area K, deviation K1
Added evaluation items 9 thru 13

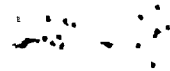
Fire Area N, deviation N1
Newly identified deviation
Changed charging pump separation
Changed height of 3-hour partition
Deleted Eval. N1 6

Fire Area Q, deviation Q2
Corrected penetration number
Corrected reference to Fire Area F

Fire Area O, deviations 05 and 06
Newly identified deviations

Fire Area M-M, deviation M-M 1
Changed type of detection

Fire Area M-M, deviation M-M 2
Deleted



- 3) Combustible loading in zone 48 is low.

Conclusion C3

Based on our evaluation, the existing fire barrier provides adequate separation. The installation of fire dampers in the duct/louvers at penetration Nos. 5, 18, 19, and 17 would not augment or materially enhance the safety of the plant. Therefore we conclude, this is an acceptable deviation to Appendix R to 10CFR50, Section III-G.2.a.

Deviation C4

A deviation is requested from Section III-G.2.a of Appendix R for wall penetration Nos. 4, 6 (west 3 hour fire barrier) and 3 (north 3 hour fire barrier) at fire zone 48 because no fire damper is provided in the ventilation duct.

Evaluation C4

- 1) Ionization smoke detection is provided in Fire Area "F" (Control Room).
- 2) Fire Area "F" is constantly attended and access by plant personnel is controlled.
- 3) Fire Area "C" is lightly trafficked, thus reducing the probability of transient combustibles being introduced.
- 4) The combustible loading in fire zone 48 of Fire Area "C" and Fire Area "F" is low.
- 5) Fire Zone 34 has a significant cable load and ionization smoke detection is provided. The major communication from fire zone 34 to fire zone 48 is through the vertical 14 gage duct at penetration 62-1. A fire, smoke, or heat generated in fire zone 34 would have to traverse the penetration countercurrent to the ventilation air flow, breach the vertical 14 gage duct, and initiate a conflagration in fire zone 48 prior to impacting the 14 gage continuous ducts in fire zone 48. Due to early notification of a fire in fire zone 34 and low combustible load in fire zone 48, such a scenario is not postulated.
- 6) Each duct penetration is provided with a fire stop of approved 3 hour rating.
- 7) The ducts are continuous in Fire Area "C" with no registers.
- 8) Fire damage to the ducts located in Fire Area "C" is precluded because the heavy gage duct, (which is 14 gage as compared to the 22 gage of a 3 hour rated fire damper), and heavy duty support, metal heat transmission and dissipation characteristics, and metal closure angles applied to the ducts on both sides of the barrier

would serve to render the ductwork impervious to expansion deformation or heat failure for periods of expected fire duration. While localized high off-gas temperatures can be expected in the immediate vicinity of a fire, air mixture dilution temperature at the ducts, which are 13 feet above the floor, is not expected to reach high temperatures. As the ventilation ducts remain intact they are considered extensions of the Fire Barrier and thus the overall fire resistance integrity continues undiminished.

Conclusion C4

Based on our evaluation, the existing fire barrier provides adequate separation. The installation of fire dampers in the ventilation ducts at penetration Nos. 4, 6 and 3 would not augment or materially enhance the safety of the plant since they would not aid in preventing fire migration between Fire Areas "C" and "F". Therefore, we conclude, this is an acceptable deviation to Appendix R to 10CFR50, Section III-G.2.a.

Deviation C5

A deviation is requested from Section III-G.2.c of Appendix R for fire zone 34 (B Switchgear Room) because an automatic suppression system is not provided in the fire area to protect conduit containing four cables essential for safe shutdown which are enclosed in a fire barrier having a minimum of one hour fire resistance rating.

Evaluation C5

- 1) Ionization smoke detection is provided throughout fire zone 34.
- 2) Fire Area "C" is lightly trafficked, thus reducing the probability of transient combustibles being introduced.
- 3) The four A train cables essential for safe shutdown identified in fire zone 34 are being enclosed in a fire barrier having a minimum of one hour fire resistance rating.
- 4) Early response to a smoke detection alarm is assured from the control room utilizing the exterior stairway and southwest entry to fire zone 34, one level below the control room.
- 5) A standpipe system hose station equipped with 100 feet of hose is located in fire zone 34 at the southwest entry.
- 6) Portable fire extinguishers are provided in fire zone 34 and access to the fire zone from the northeast entry with additional hose lines is available.
- 7) Inadvertent operation of a water type suppression system could cause undo damage to electrical equipment in the plant switchgear rooms.

Conclusion C5

Based on our evaluation, the existing smoke detection, and early response with manual fire suppression equipment, and enclosure of the four cables identified in a barrier having a minimum of one hour fire resistance rating provides adequate protection. The installation of an automatic suppression system in fire zone 34 would not augment or materially enhance the safety of the plant since it would not reduce the time required for fire extinguishment. Therefore, we conclude, this is an acceptable deviation to Appendix R to 10CFR50, Section III-G.2.c.

- 4) The B train cable traverses the section of fire zone 39 northeast of Column RAD/2-RA3 alone (the redundant counterpart no longer routed in parallel), enclosed in a fire barrier of one hour fire resistance rating.
- 5) The section of fire zone 39 northeast of Column RAD/2-RA3 is separated from the adjacent portion of fire zone 39 by a full height concrete wall. While the wall is not considered a 3 hour rated fire barrier it provides a considerable deterrent to fire conflagration from the adjacent portion of fire zone 39.

Conclusion H3

Based on our evaluation, the enclosure of the single cable essential for safe shutdown in the section of fire zone 39 northeast of Column RAD/2-RA3 within a barrier of one hour fire resistance rating provides adequate separation of redundant trains essential for safe shutdown. The installation of fire detection and an automatic fire suppression system northeast of Column RAD/2-RA3 would not augment or materially enhance the safety of the plant. Therefore, we conclude, this is an acceptable deviation to Appendix R to 10CFR50, Section III-G.2.c.

FIRE AREA "N"

This fire area is fire zone 18 (charging Pump Area) as shown on the attached drawings. Parameters descriptive of the area, including physical description, safe shutdown capability, fire hazard analysis and fire protection, are outlined in the attached matrix. Essential equipment in this area is shown in the attached essential equipment list.

The following deviations from Appendix R to 10CFR50 are requested:

Deviation N1

Deviation is requested from Section III-G.2.a of Appendix R since the redundant charging pumps are not entirely separated by a 3 hour rated fire barrier.

Evaluation N1

- 1) Fire Area "N" is provided with ionization type smoke detection.
- 2) The charging pump cubicle access corridor is provided with an automatic preaction sprinkler system.
- 3) The charging pumps are approximately 10 ft apart separated by a 10 ft high 3 hour fire rated partition.
- 4) This fire area contains a very low combustible loading and as a radiation area has limited personnel access, thus reducing the probability of introducing transient combustibles.
- 5) A fire on either side of the fire partitions involving in-situ and/or transient combustibles would not directly impinge upon or radiate heat to the essential equipment on the opposite side. While localized high off-gas temperatures can be expected in the vicinity of a fire, air mixture dilution temperatures which would stratify in the upper level of this area would not reach a point capable of jeopardizing the operation of the redundant charging pumps.
- 6) The extension of the cubicle walls an additional 3 ft in height to approximately 10 ft high, as requested by the NRC during a previous site visit (Reference 4) is considered an accepted deviation.

Conclusion N1

Based on our evaluation, the 10 ft 3 hour fire rated partitions provide adequate separation of the redundant charging pumps. The extension of the walls to full height would not augment or materially enhance the safety of the plant since it would not provide additional protection for redundant charging pumps. Therefore, we conclude that this is an acceptable deviation from Appendix R to 10 CFR50, Section III-G.2.a.

Radiant energy shields are being provided between safety-related A and B cables trays in the cable penetration area to provide separation.

- 6) Vertical cable tray runs are being provided with fire stops installed every 20 feet along the vertical rise.
- 7) Fire Area "K" is a high radiation area and personnel access is limited, thus minimizing the probability of introducing transient combustibles.
- 8) The large free volume (2.5 million cubic feet) of Fire Area "K" allows for dissipation of hot off-gas temperatures and reduces the effect of stratified hot gases at essential components.

Conclusion K1

Based on our evaluation, the existing features in Fire Area "K" provide adequate separation for a fire in transient or in-situ combustibles. Additional modification would not augment or materially enhance the safety of the plant since it would not aid in the prevention of fire damage to redundant components essential for safe shutdown. Therefore, we conclude, this is an acceptable deviation to Appendix R to 10CFR50, Section III-G.2.d.

FIRE AREA "Q"

This fire area is fire zone 44 (Component Cooling Water Surge Tank Room) as shown in the attached drawings. Parameters descriptive of the fire area, including physical description, safe shutdown capability, fire hazard analysis and fire protection are outlined in the attached matrix. Essential equipment within this fire area is shown in the attached essential equipment list.

The following deviations to Appendix R to 10CFR50 are requested:

Deviation Q1

A deviation is requested from Section III-G.2.a of Appendix R for penetration No. 1 in the North fire barrier of Fire Area "Q" because no fire damper is provided.

Evaluation Q1

- 1) The fire area has negligible combustible loading.
- 2) The fire area is very lightly trafficked, thus minimizing the probability of introducing combustibles.
- 3) Outdoor exposure fires are not postulated in the plant yard based on the lack of combustible storage adjacent to buildings and on the height of penetration above grade which allows for heat dissipation. Where concentrations of combustible material, such as oil in plant transformers or diesel generator fuel oil storage tanks, are in the plant yard adequate spacial separation from important plant facilities is provided and the flow of combustible liquids is directed to or confined a safe distance from important plant facilities as outlined in the Fire Hazard Analysis Report. (Reference 5)
- 4) A postulated fire involving in-situ and/or transient combustibles within Fire Area "Q" does not require a fire damper at penetration No. 1 due to the non-essential nature of the yard exterior to the penetration.

Conclusion Q1

Based on our evaluation, the existing fire barrier provides adequate separation. The installation of a fire damper in the duct at penetration No. 1 would not augment or materially enhance the safety of the plant. Therefore, we conclude, this is an acceptable deviation to Appendix R to 10CFR50, Section III-G.2.a.

Deviation Q2

A deviation is requested from Section III-G.2.a of Appendix R for wall penetrations 3, 4 and 6 because no fire dampers are provided in the ventilation ducts.

Evaluation Q2

See Evaluation F1

Conclusion Q2

See Conclusion F1

FIRE AREA "M-M"

This fire area is the intake cooling water pump area previously designated as Fire Area 13. Parameters descriptive of the fire area including physical description, safe shutdown capability, fire hazard analysis analysis and fire protection, are outlined in the attached matrix.

Essential equipment within this fire area is shown in the attached Essential Equipment List.

The following deviations from Appendix R to 10CFR50 are requested:

Deviation M-M 1

A deviation from Section III-G.2.b of Appendix R is requested because no automatic suppression system is provided.

Evaluation M-M 1

- 1) Fire Area "M-M" is provided with ionization type smoke detection.
- 2) This fire area is lightly trafficked, thus minimizing the probability of introducing transient combustibles.
- 3) The fire area has low combustible load and no continuity of combustibles.
- 4) The pumps are over 10 ft apart edge-to-edge. Cable and conduit is embedded in concrete but exposed for a short length at each pump.
- 5) A postulated fire involving in-situ and/or (transient combustibles will be prevented from spreading at the pump level by the floor openings and curbs separating each pump.
- 6) This fire area was reviewed by the NRC during a site visit (Reference 4) and determined to be an acceptable deviation.
- 7) The pump room is designed for natural ventilation which precludes the buildup of heat.

Conclusion M-M 1

Based on our evaluation, the existing arrangement provides adequate protection for the redundant Intake Cooling Water Pumps. The installation of an automatic suppression system would not augment or materially enhance the safety of the plant since the area design prevents the migration of a fire. Therefore, we conclude that this is an acceptable deviation from Appendix R to 10CFR50, Section III-G.2.b.