UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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September 6, 2000

Florida Power & Light Company
ATTN: T. F. Plunkett
President - Nuclear Division
P.O. Box 14000
Juno Beach, FL 33408-0420

SUBJECT: TASK INTERFACE AGREEMENT 2000-04, "EVALUATION OF ST. LUCIE REPLY TO TIA 99-01 RELATED TO THE DESIGN ADEQUACY OF THE HALON SYSTEM FOR THE UNIT 1 CABLE SPREADING ROOM".

On August 30, 2000, the NRR review of Task Interface Agreement (TIA) 2000-04 was completed. The NRR review included the March 7, 2000, Florida Power & Light (FP&L) submittal regarding the TIA 99-01 response dated November 29, 1999. On August 30, 2000, Region II received a memorandum providing the results of the review of TIA 2000-04. Enclosed, for your information, is the memorandum.

The memorandum describes the NRR review and conclusions regarding the Unit 1 Cable Spreading Room (CSR) Halon system and updates the status of Unresolved Item 50-335,389/ 98-201-09. Our understanding is that presently the Unit 1 CSR Halon system remains functional and that compensatory measures are being implemented as set forth in your Fire Protection Program for an inoperable suppression system in the CSR.

Region II is continuing to evaluate the issue in accordance with the Significance Determination Process and the NRC's Enforcement Policy.

Sincerely,

/RA Charles A. Casto for:/

Kerry Landis, Chief
Engineering Branch
Division of Reactor Safety

Enclosure: As stated

Docket Nos. 50-335, 50-389
Licensee Nos. DPR-67, NPF-16

cc w/encl: (See page 2)

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August 30, 2000

MEMORANDUM TO: Loren R. Plisco, Director
Division of Reactor Projects
Region II

FROM: Suzanne C. Black, Deputy Director ***/RA/***
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: REVISED RESPONSE TO TASK INTERFACE AGREEMENT (TIA) 2000-04, "EVALUATION OF ST. LUCIE REPLY TO TIA 99-01 RELATED TO THE DESIGN ADEQUACY OF THE HALON 1301 SYSTEM FOR THE UNIT 1 CABLE SPREADING ROOM" (TAC NO. MA8565)

INTRODUCTION

On May 8, 2000, you forwarded TIA 2000-04 to the Office of Nuclear Reactor Regulation (NRR). You requested that NRR review the March 7, 2000, licensee's reply to NRR response dated November 29, 1999, to TIA 99-01 dated January 26, 1999. The request was for NRR to determine if the Halon 1301 fire suppression system design for the Unit 1 cable spreading room (CSR) is adequate and consistent with the licensing basis for Florida Power & Light (FP&L) Company's St. Lucie Nuclear Plant, Unit 1.

This memorandum revises and supersedes our memorandum dated August 4, 2000 (Black to Plisco) regarding the same subject. This document was reviewed and agreed to by your staff. It provides the NRR, Plant Systems Branch, review of TIA 2000-04 and the March 7, 2000, FP&L submittal. This issue was identified as Unresolved Item No. 50-335, 389/98-201-09. The March 7, 2000, FP&L response is documented in Fire Protection Evaluation Record PSL-FPER-00-007.

DISCUSSION

Title 10, *Code of Federal Regulations* (10 CFR) Section 50.48 requires licensees to meet General Design Criterion (GDC) 3, "Fire Protection" of Appendix A to 10 CFR Part 50. GDC 3 states, in part: "Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems and components important to safety." In addition, 10 CFR 50.48 requires, in part, that licensees meet the requirements of 10 CFR Part 50, Appendix R, Section III.G, for nuclear power plants licensed to operate prior to January 1, 1979. Section III.G.3 requires that a fixed fire

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suppression system be installed in areas of nuclear power plants which require alternate or dedicated safe shutdown in the event of a fire.

The licensee states in its response that, “National Fire Protection Association” (NAPA) Standard 12A - 1980 edition, “Halon 1301 Fire Extinguishing Systems” was used to design the Halon 1301 system for the CSR to meet the requirements of 10 CFR Part 50 Appendix R, Section III.G.3. The licensee asserts that the Halon 1301 system for the CSR was designed to suppress surface fires, and further claims that a deep-seated fire is not credible in the CSR. The staff’s position is that, based on Sandia National Laboratories (SNL) testing for the NRC, cables of the type used in nuclear power plant applications have the potential to develop deep-seated fires. This was not considered in the design of the St. Lucie Unit 1 CSR Halon 1301 system, as it should have been. NAPA Standard 12A, states that additional Halon 1301 concentrations and soak times, beyond those needed for surface fires, may be required for deep-seated fires and also recommends that appropriate testing be performed to properly address hazards. Therefore, the staff considers the St. Lucie Unit 1 CSR Halon 1301 system design inadequate.

The technical basis and additional details for these conclusions are attached.

CONCLUSION

1. The licensee is required to meet 10 CFR Part 50 Appendix A, GDC 3; and 10 CFR Part 50 Appendix R, Section III.G.3 based on 10 CFR 50.48 requirements. GDC 3 requires that “Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety.” The licensee committed to comply with the provisions of NFPA 12A in its license. NFPA 12A requires that, based on the results of fire hazard analysis (in this case the principal fire hazard is cable in the cable spreading room), the fire suppression and detection system be capable of suppressing a fire derived from that hazard. Notwithstanding the licensee’s claim to the contrary, cables in the CSR are subject to deep-seated fires as demonstrated in tests conducted in 1986 by SNL and documented in NUREG/CR 3656, “*Evaluation of Suppression Methods for Electrical Cable Fires.”* Neither the requirements of GDC 3 nor the requirements of 10 CFR Part 50 Appendix R, III.G.3 are considered to be met. Both GDC 3 and 10 CFR Part 50 Appendix R, III.G.3 must be met to be in compliance with 10 CFR 50.48.

2. The licensee did not demonstrate that the installed Halon 1301 system was designed to extinguish a deep-seated cable fire. The discussion of the Halon 1301 system evaluation, in the licensee’s response focused only on surface or flaming fire hazards in the CSR. The assessments reported in PSL-FPER-00-007 did not provide any justifications based on fire dynamics principles that smoldering combustion is not a hazard associated with cables, nor that a cable fire can be prevented from becoming deep-seated, nor did it justify why the SNL testing, which addresses deep-seated fire phenomena in electrical cables, does not apply to the CSR. The Halon 1301 fire suppression system installed in its current

configuration in the Unit 1 CSR does not provide reasonable assurance that it will extinguish a potential deep-seated fire involving the cable insulation and jackets. Therefore, the installed system does not provide an adequate level of fire safety as required by Section III.G.3 of Appendix R to 10 CFR Part 50, and 10 CFR Part 50, Appendix A, GDC 3.

Docket No. 50-335

Attachment: Technical Basis

cc w/attachment: M. Oprendek, RI
G. Grant, RII
K. Brockman, RIV

TECHNICAL BASIS REGARDING DESIGN ADEQUACY OF THE HALON SYSTEM

TASK INTERFACE AGREEMENT NO. 2000-04

ST. LUCIE NUCLEAR PLANT, UNIT 1

INTRODUCTION

During a pilot fire protection functional inspection at St. Lucie during March 9-13, 1998, and March 30-April 3, 1998, the U.S. Nuclear Regulatory Commission (NRC) inspection team identified a technical issue concerning the Halon 1301 fire suppression system installed in the Unit 1 cable spreading room (CSR). Based on the inspection results, the inspection team found that neither the CSR Halon 1301 fire suppression system design, nor acceptance tests of the system performed by the licensee, demonstrated that the system would be adequate to suppress a deep-seated cable fire; therefore the system would be unable to perform as required by Title 10, *Code of Federal Regulations* (10 CFR) Part 50, Appendix R. This was identified as Unresolved Item (URI) 50-335, 389/98-201-09 in Inspection Report Nos. 50-335/98-201 and 50-389/98-201.

By memorandum dated January 26, 1999, Region II transmitted Task Interface Agreement (TIA) 99-01, concerning Unresolved Item (URI) 50-335, 389/99-201-09 regarding the design of fire suppression system. NRR responded to the TIA in a memorandum dated November 29, 1999. The TIA 99-01 response was also sent to the licensee. Subsequent to the TIA 99-01 response, the licensee transmitted PSL-FPER-00-007, dated March 7, 2000. By memorandum dated May 8, 2000, Region II requested that NRR review the licensee's reply to TIA 99-01, and determine if the Halon 1301 system design for the Unit 1 CSR is adequate and consistent with the licensing basis. This TIA response focuses on the Florida Power and Light (FP&L) response of March 7, 2000.

BACKGROUND

St. Lucie Unit 1 was granted an operating license by the NRC on March 3, 1976. Later, certain provisions of 10 CFR 50.48(a) and (b) required that plants licensed to operate prior to January 1, 1979, have a fire protection plan that satisfies General Design Criterion (GDC) 3 of 10 CFR Part 50 Appendix A, and implement portions of Appendix R to 10 CFR Part 50.

10 CFR 50.48(a) requires licensees to satisfy GDC 3 of Appendix A to 10 CFR Part 50, which is the general design criterion for fire protection for nuclear power plants. This design criterion requires fire protection systems to be installed which have the capacity and capability to minimize the adverse effects of fires.

10 CFR 50.48 (b) specifies that plants that satisfied the fire protection provisions of Appendix A to Branch Technical Position (BTP) APCSB 9.5-1 were required to implement only the additional requirements of Appendix R, Sections III.G, III.J, and III.O. St. Lucie, Unit 1, did not receive an acceptance of the Halon 1301 system using the BTP APCSB 9.5-1 guidelines. Therefore, the licensee was required to implement the applicable requirements of 10 CFR Part 50 Appendix R.

Attachment

Section III.G.1 of Appendix R requires that one train of systems needed to achieve and maintain hot shutdown conditions will remain free of fire damage. Section III.G.2 specifies fire protection methods to demonstrate that one train will remain free of fire damage. Section III.G.3 requires that, in areas where it is not possible to meet one of the III.G.2 methods of ensuring that one train of equipment will remain free of fire damage, alternative or dedicated shutdown capability must be provided. Section III.G.3 of Appendix R also requires that a fixed fire suppression system be provided for the area. Implicit in this requirement is the understanding that the system will be adequate to perform fire suppression activities for the fire hazards in the area.

On February 4, 1980, the Plant Systems Branch of NRR issued a review of fire protection open items at St. Lucie Unit 1 and concluded that a Halon 1301 or a carbon dioxide gaseous system was needed for the CSR. This letter also describes requirements for an installed Halon 1301 system, which are as follows:

"If Halon 1301 is used, the system should be designed to the applicable requirements of National Fire Protection Association (NFPA) 12A with provisions for two discharges. Initial discharge shall produce a 7% concentration with a soak time of 20 minutes. The reserve supply shall be capable of a 6% Halon concentration for 10 minutes."

St. Lucie, Unit 1, operating license condition C.3 requires that the licensee implement and maintain in effect all provisions of the approved fire protection program, as described in the Updated Final Safety Analysis Report (UFSAR). The license condition also lists the licensee submittals provided as a part of the approved program. Licensee letter L-83-514, dated October 7, 1983, is listed as part of the approved program. In this letter the licensee stated that the separation requirements defined in Appendix R, Section III.G.2, could not be provided for essential components and circuits in the CSR. Therefore, alternative shutdown, in accordance with Appendix R, Section III.G.3, is provided.

In Section 9.5 of the UFSAR, which provides a comparison of plant conformance to Appendix A to BTP 9.5-1 Guidelines, Paragraph E.4, the licensee states that, “The Halon 1301 automatic fire suppression system in the cable spreading room is installed utilizing the guidelines of NFPA 12A.”

DISCUSSION

The following is a summary of the Fire Protection Evaluation Record (FPER) PSL-FPER-00-007, Rev 0 - Evaluation of Unit 1 Cable Spreading Room Halon 1301 Design for Conformance with 10 CFR Part 50, Appendix R, Section III.G.3, which was transmitted to the NRC on March 7, 2000. Also, the staff’s conclusions and additional comments with respect to the licensee’s report are included in this section.

The licensee stated in the cover letter of its reply (PSL-FPER-00-007) that, “Industry data supports that cable fires result in a surface fire hazard, and that cable fires do not represent a deep-seated fire hazard. The CSR fire suppression system Halon 1301 concentration and hold times were designed to suppress the fire hazards associated with the CSR by utilizing industry fire test reports and NFPA guidelines. Therefore, the design of the St. Lucie Unit 1 CSR suppression system did not require extinguishment of deep-seated fires.”

The licensee considers that the Halon 1301 system installed in the CSR is not required to extinguish a deep-seated electrical cable fire because the quantity of combustibles and the ignition sources present in the CSR do not represent probable fires of magnitude or duration that would result in a deep-seated fire. The licensee claims that they only considered surface or flaming fire hazards in the Unit 1 CSR during design/installation of the Halon 1301 system.

The staff has researched the issue of deep-seated fires in cable trays. This research has identified two studies which show that deep-seated fires are credible for cable trays (Chavez, 1986 and Dube, 1983). The staff's review of the licensee's reply (PSL-FPER-00-007) with respect to the possibility of deep-seated fires indicates that the licensee did not demonstrate that the total flooding Halon 1301 system, as designed for the Unit 1 CSR, could extinguish a potential deep-seated cable fire.

EVALUATION

This section presents the staff's evaluation in response to specific points from licensee report PSL-FPER-00-007, Rev. 0.

(1) The licensee states that "fire tests demonstrate that the combustible materials present in the CSR exhibit fire characteristics representative of surface fires, not the deep-seated fires that are postulated by the staff's response to the TIA. Therefore, FP&L concludes that there is no technical basis for a Halon 1301 suppression systems design that is required to extinguish a deep-seated cable fire [in Unit 1 CSR]."

Staff Response to Above Item

Based on the research performed by Sandia National Laboratories (SNL) for the NRC, the staff disagrees with the licensee's statement (Chavez, 1986 and Dube, 1983). This research shows that, for the cables typically installed in nuclear power plants (i.e., Institute of Electrical and Electronics Engineers (IEEE) 383 rated and nonrated), characteristics of deep-seated fires are exhibited. Although the licensee has identified generic industry data (for computer rooms and polyvinyl chloride cable) which shows that cable fires exhibit surface burning characteristics, the cable fires expected in cable trays of nuclear power plants have been shown to exhibit characteristics of deep-seated fires.

The fire loading in the CSR consists of large quantities of electrical cables. Regardless of the ignition sources present, cable insulation may develop deep-seated fires when externally ignited and allowed to burn, or the fire may originate as deep-seated if conductors inside the cable overheat (Grant, 1995). Initially, the cables installed in the CSR will undergo flaming (surface) combustion. Over time, they may develop a char layer and may become deep-seated. Pyrolysis of cable insulation can result from smoldering combustion. Smoldering combustion involves surface oxidation of a char layer which provides sufficient heat necessary to cause further thermal degradation of the neighboring layer of combustible materials. Successful propagation requires that volatiles be progressively driven out ahead of the zone of active combustion to expose fresh char, which then begins to burn.

The licensee has not acknowledged the concept of deep-seated fires which may develop in the CSR and failed to provide an equivalent level of fire protection to that required by section III.G.3 of Appendix R to 10 CFR Part 50 and the St. Lucie fire protection program. Additionally, since it

has not been shown that the Halon 1301 system in the Unit 1 CSR is adequate to suppress a deep-seated fire, the requirements of GDC 3 have not been met.

(2) The licensee states that the St. Lucie Unit 1 CSR Halon 1301 suppression system was designed to deliver a minimum Halon 1301 concentration of 5% for 10 minutes for flaming or surface fires, as supported by NFPA Standard 12A and field testing.

Staff Response to Above Item

The licensee's description of the Halon 1301 system states that the design concentration of the system is 5 percent for 10 minutes, which is adequate for surface or flaming fires involving Class A (ordinary combustibles) or Class B (flammable or combustible liquids) fires. However, the staff disagrees with the licensee's assessment that only a surface fire needs to be addressed. The staff notes, as stated above, that a deep-seated fire must be addressed.

NFPA 12A - 1980, the licensee's code of record (COR), recognizes the risk of deep-seated fires and suggests that additional protection (additional Halon 1301 concentration and/or soak time) may be required. The licensee did not address the NFPA 12A - 1980, criteria discussed in Sections 1-5.4, 2-2.1.4, 2-4.3. A-2-2 and A-2-4 regarding the minimum concentrations and soak times necessary for extinguishment of deep-seated electrical cable fires. Further, Section A-2-1 specifically recommends that appropriate testing be performed to properly address the hazard.

Cables installed in cable trays have the capability of igniting due to Class C (energized electrical) fires. These cable fires have the potential to develop deep-seated fires in addition to surface or flaming combustion. A cable overheating event would cause an ignition at the surface of the conductor (i.e., the inside of the insulator) which would be considered a deep-seated fire. For the deep-seated fires, higher Halon 1301 concentrations are required to achieve complete extinguishment. NFPA standard 12A "Halon 1301 Fire Extinguishing Systems," 1980 edition (the COR for the St. Lucie installation), Section A-2-4, states that deep-seated fires usually require higher concentrations than 10 percent and longer soaking times than 10 minutes.

In 1986, the NRC commissioned SNL to research the question of effectiveness of fire suppressants on electrical cable fires. The results were published in NUREG/CR-3656, *"Evaluation of Suppression Methods for Electrical Cable Fires*." On the basis of its full-scale fire experiments, SNL concluded that a Halon 1301 concentration of 6 percent with a soak time of 10 minutes for IEEE 383 non-rated cables, or 15 minutes for IEEE-383 rated cables is the minimum concentration required to suppress fully-developed cable tray fires. SNL defined fully-developed fires as "fires that involved four of five cable trays. This represented a fire that had been burning for some time. Four burning cable trays represent a significant fuel load." The St. Lucie CSR has similar cable tray arrangements as the SNL tests.

Thus, consideration of deep-seated fires should have involved designing higher agent concentrations and/or hold times for the installed Halon 1301 system, as described in NFPA 12A, 1980 edition (the licensee COR for Halon 1301 system). The licensee provided no qualification tests of the Halon 1301 system to demonstrate that the required Halon 1301 concentrations to suppress a deep-seated cable fire are maintained for the entire soak time.

(3) The licensee states that the thermal detection system provides reasonable assurance that the application of the Halon 1301 agent would occur before any major fire damage occurred. This is based on a CSR automatic Halon 1301 system equipped with cross-zoned thermal detection for actuation of the Halon 1301 system and ionization detectors for early warning fire detection.

Staff Response to Above Item

The licensee has provided thermal detectors to actuate the Halon 1301 system in the CSR at a fixed temperature of 200°F. To optimize the speed of the fire detection system that actuates the Halon 1301 fire suppression system, the detector must be sensitive enough to the products of combustion (heat, smoke, etc.) to rapidly respond to the fire during its incipient stage. Photoelectric (preferred) or ionization smoke detectors are typically used to actuate a Halon 1301 system since they have different response characteristics (photoelectric detectors respond to larger particles as produced in smoldering or deep-seated fires, while ionization detectors can provide very fast response to flaming fires), whereas thermal detectors react more slowly to the anticipated fire conditions. Therefore, the use of photoelectric or ionization detectors in the CSR, for suppression system actuation, would result in early detection of the fire and, thus, quicker actuation. The ionization detectors installed in the CSR are only used for early warning fire detection and not for suppression system actuation. The use of thermal detectors for actuation could result in excessive delay in agent discharge which would allow time for the fire to grow and become further deep-seated. There are strong recommendations in NFPA 12A for the use of automatic actuation of the Halon 1301 system coupled with sensitive detectors. The primary reason behind these recommendations is to limit the size and severity of fire as well as to prevent a surface fire from becoming deep-seated. This point is of secondary concern at present since the installed Halon 1301 system itself is not adequate to meet the guidelines of NFPA 12A for a deep-seated fire as required by the operating license.

CONCLUSIONS

Our review of the results of the licensee's report (PSL–FPER-00-007) indicates that:

1. The licensee is required to meet 10 CFR Part 50 Appendix A, GDC 3; and 10 CFR Part 50 Appendix R, Section III.G.3 based on 10 CFR 50.48 requirements. GDC 3 requires "Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety." As a result, the licensee committed to comply with the provisions of NFPA 12A in its license (see UFSAR section 9.5, where the licensee states that "The Halon 1301 automatic fire suppression system in the cable spreading room is installed utilizing the guidelines of NFPA 12A"). NFPA 12A requires that, based on the results of fire hazard analysis (in this case the principal fire hazard is cable in the cable spreading room), the fire suppression and detection system be capable of suppressing a fire derived from that hazard. Notwithstanding the licensee's claim to the contrary, cables in the CSR are subject to deep-seated fires as demonstrated in tests conducted in 1986 by SNL and documented in NUREG/CR 3656. Neither the requirements of GDC 3 nor the requirements of III.G.3 are considered to be met. Both GDC 3 and 10 CFR Part 50 Appendix R, III.G.3 must be met to be in compliance with 10 CFR 50.48.

2. The licensee did not demonstrate that the installed Halon 1301 system was designed to extinguish a deep-seated cable fire. The discussion on the Halon 1301 system evaluation, in the licensee's response, focused only on surface or flaming fire hazard in the CSR. The assessments reported in PSL-FPER-00-007 did not provide any justifications based on fire dynamics principles that smoldering combustion is not a hazard associated with cables, nor that a cable fire can be prevented from becoming deep-seated, nor did it justify why the SNL testing, which addresses deep-seated fire phenomena, does not apply to the CSR. The Halon 1301 fire suppression system installed in its current configuration in the Unit 1 CSR does not provide reasonable assurance that it will extinguish a potential deep-seated fire involving the cable insulation and jackets. Therefore, the installed system does not provide an adequate level of fire safety as required by Section III.G.3 of Appendix R to 10 CFR Part 50, and GDC 3 of Appendix A to10 CFR Part 50,

Additional Staff Comments:

1) St. Lucie Unit 1 CSR has two types of detectors, fixed temperature thermal detectors (200°F) (for suppression system actuation) and ionization smoke detectors (for early warning fire detection). Fixed temperature thermal detectors are not typically considered the optimum actuation means for actuating Halon 1301 suppression systems for protecting against cable fire hazards. For this type of hazard, the preferred type of detection system for actuating Halon 1301 suppression systems is an ionization or photoelectric smoke detection system. The use of thermal detection will result in a delay in the actuation of the Halon 1301 system, which increases the likelihood for the development of a deep-seated fire. The slow response time of the installed Halon 1301 fire suppression system would allow time for the fire to continue to grow and become further deep-seated, potentially challenging the installed fire barriers. This issue should be the subject of further consideration.

2) The St. Lucie CSR has a high combustible loading (greater than 3 hours) and the potential for a deep-seated fire. The CSR shares fire barriers with both the main control room and the room containing the remote shutdown panel. Therefore, the Halon 1301 system is considered to be important to safety, since a severe fire in this area could challenge main control room and remote shutdown room fire barriers. If the Halon 1301 fire suppression system fails to completely extinguish a deep-seated fire in its first attempt, a severe fire can develop. Under the conditions of a severe fire in the CSR, smoke may spread into the main control room and the area adjacent to the CSR where the remote shutdown panel is located. This involves more than a minimal increase in risk due to fire since a single CSR fire can potentially damage both the main control room and remote shutdown panels. Further evaluation of this issue by both the staff and the licensee is warranted.

REFERENCES

Chavez, J. M., and Lambert, L. D., “Evaluation of Suppression Methods for Electrical Cables Fires,” NUREG/CR-3656, SAND83-2664, NRC, Washington, DC, October 1986.

Dube, D. A, “Fire Protection Research Program for the US Nuclear Regulatory Commission 1975-1981,” NUREG/CR-2607, SAND82-0431, NRC, Washington, DC, April 1983.

Grant, C. C., “Halon 1301 Design Calculations,” Section 4/Chapter 6, The SFPE Handbook of Fire Protection Engineering, Second Edition, DiNenno, P. J., Editor-in-Chief, National Fire Protection Association, Quincy, Massachusetts, 1995, p. 4-133.

Hebdon, F. J., “Fire Protection Functional Inspection of St. Lucie Plant,” NRC Inspection Report Nos. 50-335/98-201 and 50-389/98-201, NRC, Washington, DC, July 9, 1998.

Kundalkar, R. S., “Fire Protection Evaluation Record - Evaluation of Unit 1 Cable Spreading Room Halon 1301 Design for Conformance with 10 CFR Part 50 Appendix R Section III.G.3,” Document No. PSL-FPER-00-007, Revision 0, FP&L, March 7, 2000.

Memorandum to Berkow, H. N, from West, K. S., “Response to Region II TIA 99-01 on Cable Spreading Room Halon 1301 Fire Suppression System,” NRC, Washington, DC, October 1, 1999.

NFPA 10, “Standard for Portable Fire Extinguishers,” 1998 Edition, National Fire Protection Association, Quincy, Massachusetts.

NFPA 12A, “Standard on Halon 1301 Fire Extinguishing Systems,” 1980 Edition, National Fire Protection Association, Quincy, Massachusetts.

URI 50-335, 389/98-201-09, “Fire Mitigation System Does not Meet Plant Licensing Basis Requirements/Commitments or Minimum Industry Codes and Standards for Systems Design and Testing,” NRC Inspection Report Nos. 50-335/98-201 and 50-389/98-201, NRC, Washington, DC, July 9, 1998.

configuration in the Unit 1 CSR does not provide reasonable assurance that it will extinguish a potential deep-seated fire involving the cable insulation and jackets. Therefore, the installed system does not provide an adequate level of fire safety as required by Section III.G.3 of Appendix R to 10 CFR Part 50, and 10 CFR Part 50, Appendix A, GDC 3.

Docket No. 50-335

Attachment: Technical Basis

cc w/attachment: M. Oprendek, RI
G. Grant, RII
K. Brockman, RIV