UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

November 7, 2003

Florida Power and Light Company
ATTN: Mr. J. A. Stall, Senior Vice President
Nuclear and Chief Nuclear Officer
P. O. Box 14000
Juno Beach, FL 33408-0420

SUBJECT: ST. LUCIE NUCLEAR PLANT - NRC FIRE PROTECTION INSPECTION REPORT NOS. 05000335/2003013 AND 05000389/2003013

Dear Mr. Stall:

On November 6, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an in-office review of the significance of the triennial fire protection inspection findings of inspection report 05000335/2003002 and 05000389/2003002 related to your St. Lucie Nuclear Plant, Units 1 and 2. The enclosed inspection report documents the results of our significance determination process, which were discussed on November 6, 2003, with Mr. R. Hughes and other members of your staff.

This report documents one NRC-identified finding of very low safety significance (Green), which was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at St. Lucie Nuclear Plant.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

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

Enclosure: (See page 2)

Enclosure: Inspection Report 05000335/2003013 AND 05000389/2003013
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-335, 50-389
License Nos.:	DPR-67, NPF-16
Report No.:	050335/2003013 and 050389/2003013
Licensee:	Florida Power and Light Company (FPL)
Facility:	St. Lucie Nuclear Plant
Location:	6351 South Ocean Drive Jensen Beach, FL 34957
Dates:	July 14, 2003 - November 6, 2003
Inspectors:	M. Thomas, Senior Reactor Inspector G. Wiseman, Senior Reactor Inspector
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000335/2003-013, 05000389/2003-013; 07/14/2003 - 11/06/2003; St. Lucie Nuclear Plant, Units 1 and 2; Significance Determination of Fire Protection Inspection Findings.

The in-office review was conducted by two regional inspectors and a regional senior reactor analyst. Two Green non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG 1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A Green non-cited violation (NCV) of 10 CFR 50.48 and St. Lucie Unit 2 Operating License Condition 2.C.(20) was identified for the licensee's failure to comply with the approved fire protection program. Specifically, three transformers, each containing approximately 380 gallons of combustible silicone dielectric insulating fluid, were not identified or evaluated in the Unit 2 fire hazards analysis combustible loading. The three transformers were located in the Train B switchgear room (Fire Area C). As a result, the transformers' contribution to combustible loading, fire ignition frequency, and their effects on safe shutdown capability had not been assessed as required by the Fire Protection Program. This finding was entered into the licensee's corrective action program as Condition Report 03-0637.

  The finding is more than minor because it affected the mitigating systems cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The finding is of very low safety significance because postulated fire scenarios indicated that the potential effects of a fire, involving either of the three silicone oil-filled transformers in Fire Area C, would not likely be of sufficient intensity to damage the cables of safe shutdown equipment to the point where it would have an adverse impact on the ability to safely shut down the plant. (Section 1R05.1.b)

B. Licensee-Identified Violations

A violation of very low safety significance (previously identified by the licensee) was reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

1. REACTOR SAFETY
Cornerstones: Initiating Events and Mitigating Systems

1R05 FIRE PROTECTION

.1 Significance Determination for Triennial Fire Protection Inspection Findings

a. Inspection Scope

Inspection Report (IR) 05000335, 05000389/2003002, identified two findings as unresolved items (URIs) pending completion of the NRC significance determination process (SDP). The two URIs were as follows:

- URI 05000389/2003002-01, Failure to Evaluate the Combustible Loading of Oil-Filled Transformers in the FHA and the Effect on SSD Capability in the Event of a Fire in Unit 2.

- URI 05000389/2003002-02, Failure to Provide Adequate Protection for Redundant Safe Shutdown Equipment and Cables in the Event of a Fire in the Unit 2 Train B Switchgear Room.

This IR documents the results of the in-office completion of the NRC SDP with respect to the two URIs. The significance determination was accomplished using the guidance in NRC Inspection Manual Chapter (IMC) 0609, Signification Determination Process; IMC 0609, Appendix A, Significance Determination of Reactor Inspection Findings for At-Power Situations; and IMC 0609, Appendix F, Determining Potential Risk Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Findings. This involved evaluating the significance of a potential fire in the affected fire area using the Phase 2 SDP, considering each finding that could be involved in the fire. Unresolved Item 05000389/2003002-01 is discussed below and URI 05000389/2003002-02 is discussed in Section 4OA7 of this IR.

b. Findings

(Closed) URI 05000389/2003002-01, Failure to Evaluate the Combustible Loading of Oil-Filled Transformers in the FHA and the Effect on SSD Capability in the Event of a Fire in Unit 2

Introduction. A Green non-cited violation (NCV) of 10 CFR 50.48 and St. Lucie Unit 2 Operating License Condition 2.C.(20) was identified for the licensee's failure to comply with the approved fire protection program (FPP). Specifically, three silicone oil-filled transformers were not identified or evaluated in the fire hazards analysis (FHA) for their contribution to the fire loading and fire ignition frequency or their effects on the safe shutdown (SSD) capability of Unit 2. These transformers were located in the Train B switchgear room (Fire Area C).

Description. During the pre-triennial fire protection inspection (TFPI) plant walk down on February 26, 2003, the inspectors observed three silicone oil-filled transformers installed in Unit 2 Fire Area C (Train B switchgear room). These three transformers had not been evaluated in the licensee's FHA for contribution to combustible loading and fire ignition frequency nor for their effect on SSD, as required by the FPP. Each of the three transformers was cooled and insulated by about 380 gallons of Dow Corning 561, a dimethyl silicone-type insulating fluid. This finding was entered into the licensee's corrective action program (CAP) as condition report (CR) 03-0637. The Train B switchgear room was one of the fire areas selected for evaluation during the TFPI.

Analysis: The inspectors determined that this finding was associated with the protection against external factors and equipment performance attributes. It affected the objective of the mitigating systems cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events, and is therefore greater than minor.

Appendix F of IMC 0609 was used to assess the significance of this fire protection finding. From Appendix F, Figure 4-1, the inspectors determined that the finding affected the defense-in-depth (DID) element of "Twenty-foot separation" (i.e., the horizontal distance between Train A transformer 2A5 and Train B transformers 2B2 and 2B5 was less than twenty feet). The Appendix F, Phase 1 risk significance screening determined that a Phase 2 SDP analysis was required because this fire area contained both Train A (transformer 2A5) and Train B (transformers 2B2, 2B5) SSD equipment and manual operator actions were required for SSD.

The Appendix F, Phase 2 fire protection risk significance screening methodology requires development of a postulated fire damage scenario with the potential to impact equipment important to safety. The inspectors used the guidance from the NRC Draft NUREG-1805, Fire Dynamics Tools (FDT) Quantitative Fire Hazard Analysis Methods for the U.S. Nuclear Regulatory Commission Fire Protection Inspection Program, dated June 2003. Fire scenarios were developed for the transformers in the Train B switchgear room containing Dow Corning 561 silicone fluid to approximate the potential effects on SSD capability. The inspectors concluded that the potential effects of a fire would not likely have an adverse impact on the ability to safely shut down the plant. This conclusion was based on the fire scenarios which indicated that a fire in either of the Train B oil-filled transformers (2B2, 2B5) would not likely be of sufficient intensity to damage the Train A transformer 2A5 nor the IEEE 383 qualified cables of SSD equipment to the point where SSD capability would be adversely affected. The burning characteristics of a fire involving Dow Corning 561 silicone fluid were such that the cables of concern would likely be exposed to thermal conditions less severe than those assumed to cause cable failure (i.e., the hot gas layer or plume centerline temperatures would be less than 700 degrees Fahrenheit; the radiant heat flux would be less than 10 kilowatts/square meter; and the flame height would not result in direct flame impingement on the IEEE 383 cables above the transformers).

Appendix F requires that fire protection findings be grouped for each fire area in order to assess the impact of the findings on that specific fire area. Accordingly, this finding was reviewed in combination with URI 05000389/2003002-02 (discussed in Section 4OA7 of this inspection report), to determine if the findings, when reviewed together, would be of

greater significance. The inspectors determined that the combined impact of the two findings was of very low safety significance (Green), based on the following:

- Although licensee calculations determined that the combustible loading for Fire Area C would increase when the three silicone oil-filled transformers were included, this increase in combustible loading would not likely be of sufficient intensity to cause damage to the IEEE 383 cables located in Fire Area C.

- The licensee's calculations demonstrated that the fire barrier rating would not be exceeded for Fire Area C due to the increased combustible loading of the area.

- Fire scenarios developed by the inspectors indicated that a fire in either of the three transformers (1) would likely be confined to the Train B switchgear room; (2) the fire would not likely breach the fire area boundary barriers and would not adversely affect SSD actions performed in adjacent plant areas.

- The proceduralized local manual operator actions in Fire Area C were feasible, based on the guidance in NRC Inspection Procedure 71111.05, Enclosure 2; the licensee's SSA, hydraulic time line, off normal operating procedure, and operations staffing.

After reviewing the potential effects of cable damage due to fire, the off normal operating procedures, the hydraulic time line, and staffing, the inspectors concluded that, even with the increased combustible loading due to the three silicone oil-filled transformers in Fire Area C, licensee procedures and training would have enabled operators to maintain the functions needed for SSD. In addition, the licensee stated their intention to revise applicable licensing basis documents to resolve the FHA combustible loading issue through licensing correspondence with the NRC.

Enforcement: 10 CFR 50.48 states, in part, that each operating nuclear power plant must have a fire protection program that satisfies Criterion 3 of 10 CFR 50, Appendix A. St. Lucie Unit 2 Operating License NPF-16, Condition 2.C.(20) states, in part, that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the Updated Final Safety Analysis Report (UFSAR), and supplemented by licensee submittals dated July 14, 1982, February 25, 1983, July 22, 1983, December 27, 1983, November 28, 1984, December 31, 1984, and February 21, 1985 for the facility; and as approved in the NRC Safety Evaluation Report Supplement 3 dated April 1983, and supplemented by NRC letter dated December 5, 1986. The approved FPP is maintained and documented in the St. Lucie UFSAR, Appendix 9.5A, Fire Protection Program Report.

The Fire Protection Program Report states, in part, that the St. Lucie fire protection program implemented the philosophy of defense-in-depth protection against fire hazards and effects of fire on SSD equipment. The program further stated that the FHA performed for St. Lucie Unit 2 considered potential fire hazards and their possible effect on SSD capability.

Contrary to the above, NRC inspectors identified on February 26, 2003, that the licensee failed to meet 10 CFR 50.48 and their FPP, in that, they did not adequately evaluate the combustible fire loading in the FHA for the Unit 2 Train B switchgear room (Fire Area C). Specifically, 380 gallons of transformer silicone dielectric insulating fluid in each of three transformers (2A5, 2B2, 2B5) located in Fire Area C were not identified nor evaluated in the FHA for their combustible loading contribution and the possible effects on SSD capability. This FPP noncompliance had been in existence for years. Because this failure to evaluate the silicone oil-filled transformers in the FHA is of very low safety significance and has been entered into the licensee's CAP as CR 03-0637, this violation of NRC requirements is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. This finding is identified as NCV 05000389/2003013-01, Failure to Evaluate Combustible Loading of Silicone Oil-Filled Transformers in the FHA and the Effect on SSD Capability for Fire Area C.

Three additional transformers, each containing approximately 380 gallons of Dow Corning 561 silicone insulating fluid, were identified in other Unit 2 fire areas. One transformer was located in Fire Area A (Train A switchgear room) and two transformers were located in Fire Area QQ (turbine building switchgear room). These transformers were entered into the licensee's CAP to be tracked for resolution under CR 03-0637. The CR stated that the silicone filled transformers located in Fire Areas A and QQ would result in approximately a two percent increase in the combustible loading for each fire area. The three transformers located in Fire Area C would result in approximately a 53 percent increase in the combustible loading for Fire Area C. The licensee's preliminary review of the change in combustible loading for the affected fire areas indicated that the silicone filled transformers in Fire Areas A and QQ would likely have less of an effect on SSD capability than the three silicone oil-filled transformers located in Fire Area C. Fire Areas A and QQ, and the applicable silicone oil-filled transformers, were not inspected by the inspectors during the TFPI or during the in-office review. Unresolved item 05000389/2003002-01 is closed.

4. OTHER ACTIVITIES

4OA6 Meetings

On November 6, 2003, the inspectors presented the inspection results to Mr. R. Hughes and other members of the licensee's staff, who acknowledged the findings. The inspectors confirmed that proprietary information is not included in this report.

4OA7 Licensee-Identified Violations

(Closed) URI 05000389/2003002-02, Failure to Provide Adequate Protection for Redundant Safe Shutdown Equipment and Cables in the Event of a Fire in the Unit 2 Train B Switchgear Room

The following finding of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- The approved Fire Protection Program for St. Lucie Unit 2 commits to 10 CFR 50, Appendix R, Section III.G. Section III.G.2 requires in part, that, where cables or equipment,.... that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided: (1) physical protection by a three-hour rated fire barrier; (2) physical protection by a separation of more than 20 feet with no intervening combustibles or fire hazards, plus fire detection and automatic suppression; (3) physical protection by a one-hour rated fire barrier plus fire detection and automatic suppression.

  Manual operator actions to respond to maloperations are not listed as an acceptable method for satisfying this requirement.

  Contrary to the above, on January 22, 2003, the licensee identified that they had failed to protect cables to ensure that redundant trains of systems and equipment necessary to achieve and maintain SSD were maintained free of fire damage in the event of a fire in Fire Area C. In lieu of providing adequate physical protection, the licensee used manual operator actions outside the main control room without obtaining prior NRC approval. This finding was entered into the licensee's corrective action program as CR 03-0153.

In addition, when reviewed in combination with URI 05000389/2003002-01 (discussed in Section 1R05.1.b of this inspection report), the inspectors determined that this finding was of very low safety significance (Green). The basis for this determination was the additional FHA combustible loading for the Train B switchgear room would not likely result in damage to other SSD equipment nor breach the fire area boundary barrier; the fire would likely be confined to the Train B switchgear room; the local manual operator actions were reviewed and determined to be feasible per the guidance of NRC Inspection Procedure 71111.05, Enclosure 2; and it did not result in additional local manual operator actions beyond those previously identified in the SSA. Unresolved Item 05000389/2003002-02 is closed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

P. Barnes, Fire Protection Engineering Supervisor
K. Frehafer, Licensing Engineer
R. Hughes, Site Engineering Manager
R. McDaniel, Fire Protection Supervisor
T. Patterson, Licensing Manager

NRC Personnel

R. Bernhard, Senior Reactor Analyst, Division of Reactor Safety
J. Moorman, Team Leader, Engineering Branch 1, Division of Reactor Safety
J. Munday, Chief, Projects Branch 3, Division of Reactor Projects
C. Ogle, Chief, Engineering Branch 1, Division of Reactor Safety
T. Ross, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000389/2003013-01	NCV	Failure to Evaluate Combustible Loading of Silicone Oil-Filled Transformers in the FHA and the Effect on SSD Capability (Section 1R05.1.b)

Closed

05000389/2003002-01	URI	Failure to Evaluate the Combustible Loading of Oil-Filled Transformers in the FHA and the Effect on SSD Capability in the Event of a Fire in Unit 2 (Section 1R05.1.b)
05000389/2003002-02,	URI	Failure to Provide Adequate Protection for Redundant Safe Shutdown Equipment and Cables in the Event of a Fire in the Unit 2 Train B Switchgear Room (Section 4OA7)

Discussed

None

ATTACHMENT

APPENDIX

LIST OF DOCUMENTS REVIEWED

Section 1R05: Fire Protection

Procedures:

2-ADM-03.01, Unit 2 Power Distribution Breaker List, Rev. 6C
2-ONP-100.01, Response to Fire, Rev. 9

Drawings:

2998-G-078, Sheets 107, 108, 109, 110, Unit 2 Reactor Coolant System, Rev. 1
2998-G-078, Sheets 121A, 121B & 122, Unit 2 Chemical and Volume Control System, Rev. 16
2998-G-078, Sheets 130A, 130B, 131, 132, Unit 2 Safety Injection System, Rev. 12
2998-G-079, Sheets 1, 2 & 7, Unit 2 Main Steam System, Rev. 20
2998-G-080, Sheets 2A & 2B, Unit 2 Feedwater and Condensate System, Rev. 25
2998-G-083, Sheets 1 & 2, Unit 2 Component Cooling Water System, Rev. 28

Calculations and Evaluations

2998-B-048, St. Lucie Unit 2, Appendix R Safe Shutdown Analysis, Rev. 8
2998-B-049, St. Lucie Unit 2 Essential Equipment List, Rev. 6
PSL-ENG-97-070, UFSAR Combustible Loading Update for Unit 2, Rev. 0
Calculation to determine the capacity of diked areas surrounding Unit 2 transformers 2A5, 2B5 and 2B2, dated March 12, 2003
Evaluation to determine compliance with DC 561 Technical Manual "Use Restrictions" for Unit 2 transformers 2A5, 2B5 and 2B2, dated March 10, 2003

Condition Reports

CR 03-0153, Use of manual actions in Appendix R, III.G.2 areas without prior NRC approval
CR 03-0637, Silicone oil-filled transformers installed in Unit 2 interior rooms

Technical Manuals/Vendor Information

Dow Corning 561 Silicone Transformer Liquid, Material Safety Data Sheet 01496247, 1/27/97
Dow Corning 561 Silicone Transformer Fluid Technical Manual,10-453-97, 1997
Dow Corning 561 Silicone Transformer Fluid Product Information Sheet
Dow Corning Fire Safety Properties of Some Transformer Dielectric Liquids, 1979

Miscellaneous

IPEEE Submittal for St. Lucie Units 1 and 2, Rev. 0, dated December 15, 1994
Fire Brigade Drill Training Reports for operating shifts, August 2001- February 2003
NRC Supplemental Safety Evaluation Report SSER 3, for St. Unit 2

Pre-fire Strategy No. 7, B Switchgear Room, Fire Area C, Rev. 23
Pre-fire Strategy No. 8, Electrical Equipment Supply Fan Room, Fire Area C, Rev. 23
UFSAR Appendix 9.5A, Fire Protection Program Report
NRC Draft NUREG-1805, Fire Dynamics Tools (FDT) Quantitative Fire Hazard Analysis Methods for the U.S. Nuclear Regulatory Commission Fire Protection Inspection Program, dated June 2003

LIST OF ACRONYMS

CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DID	Defense-in-Depth
FDT	Fire Dynamics Tools
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IR	Inspection Report
NCV	Non-Cited Violation
SDP	Significance Determination Process
SSA	Safe Shutdown Analysis
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item