



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

June 14, 2011

LICENSEE: South Carolina Electric and Gas Company, Inc.  
FACILITY: Virgil C. Summer Nuclear Station (VCSNS), Unit No. 1  
SUBJECT: SUMMARY OF MARCH 31, 2011, MEETING WITH SOUTH CAROLINA ELECTRIC AND GAS COMPANY TO DISCUSS NFPA-805 LICENSE AMENDMENT (TAC NO. ME5954)

On March 31, 2011, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff and representatives of South Carolina Electric and Gas Company, Inc. (SCE&G, the licensee), at NRC Headquarters in Rockville, Maryland. SCE&G requested the public meeting to discuss the current status of its plans to submit a license amendment request (LAR) based on the National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants" (NFPA-805). A list of attendees is provided as Enclosure 1.


SCE&G's presentation (see Enclosure 2) included the following topics:

- NFPA-805 Project Goals: Submit an LAR to transition VCSNS Unit 1 to a performance-based fire protection program via NFPA-805. This would include eliminating the self-induced station blackout (SISBO) strategy, minimization of operator manual actions (OMAs) for fire occurring outside the main control room and addressing all current industry issues concerning multiple hot shorts/spurious events, the feasibility of operator actions and "authorized" use of OMAs.
- NFPA-805 Project Status
- Nuclear Safety Compliance Assessment (NSCA)
- NSCA Open Items
- Major Transition Report Attachments
- VC Summer Fire Probabilistic Risk Assessment (PRA)
- VC Summer Fire PRA Results - The Fire PRA (FPRA) core damage frequency takes credit for modifications on protecting circuits, alternate seal injection, incipient detection and reactor coolant pump shutdown seals.
- Fire PRA Results Summary including dominant risk sequences
- Relative improvement value of modifications
- VCSNS FPRA Peer Reviews
- Significant Peer Findings
- Performance-Based Solutions
- Performance-Based Fire Modeling

- General discussion of modifications. SCE&G stated that it will take at least 3 refueling outages (RFOs) after the 2011 RFO to implement the 8 modification groups. RCP seal replacement will take place over 2 to 3 outages. Alternate seal injection will involve provision of an additional high pressure pump/diesel generator.
- Nonpower Operations
- Radioactive Release Analysis
- Implementation Actions
- Condition Monitoring
- NFPA-805 Project Issues – including station management review of the transition report and targeted submittal of the LAR by June 28, 2011.
- NFPA-805 Project Results. SCE&G stated that their goal to eliminate the SISBO strategy had been accomplished. They will go from numerous OMAs with SISBO to no manual actions for fires outside the control room. Most of the operator actions in the current situation are to remove power. They will make modifications to eliminate the need to remove power.

The NRC staff had several questions/comments for consideration by SCE&G in the LAR. The licensee noted that the fire protection audits currently required in the technical specifications will be transferred to the quality assurance program (NQA-1). SCE&G indicated that the following issues would be addressed in the LAR: the self-approval process, performance-based alternatives and the delta-CDF values. SCE&G also noted that the LAR would be on the order of 500 – 1000 pages in length.

Members of the public representing other utilities and industry groups were in attendance. Public Meeting Feedback forms were available at the meeting but no comments were received.

  
Robert Martin, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosures:

1. List of Attendees
2. Licensee's Presentation, "NFPA805 License Amendment Request Pre-application Meeting with NRR [Office of Nuclear Reactor Regulation] Staff, March 31, 2011

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LIST OF ATTENDEES

NRC MEETING WITH SOUTH CAROLINA ELECTRIC AND GAS COMPANY, INC. (SCE&G)

REGARDING LICENSE AMENDMENT APPLICATION ON FIRE PROTECTION

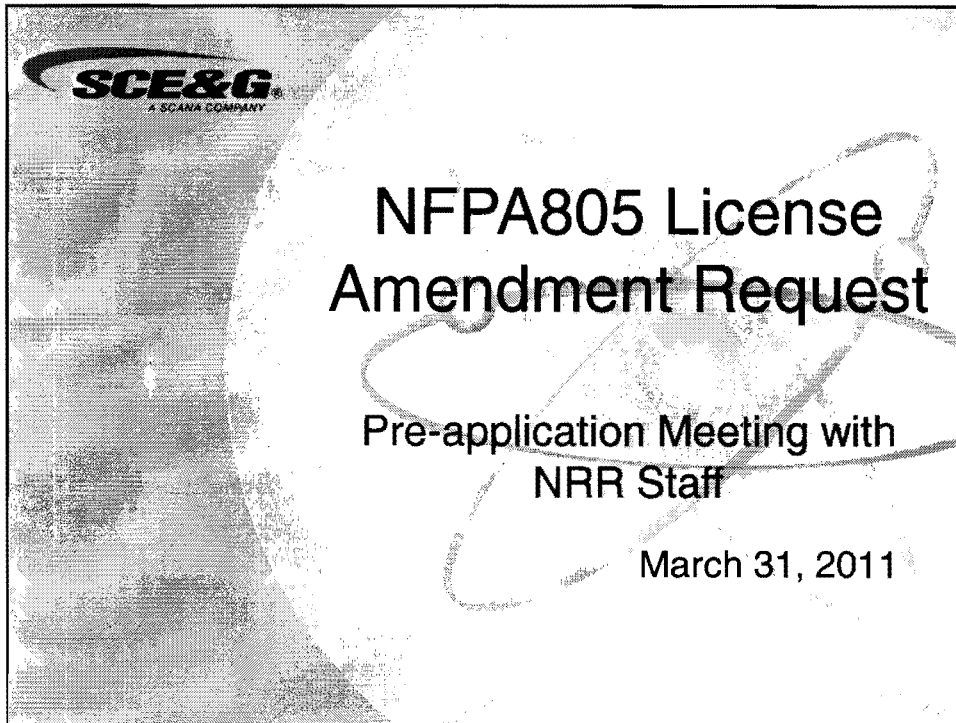
MARCH 31, 2011

<u>NAME</u>	<u>AFFILIATION</u>
Robert Martin	NRC/NRR/DORL
Patrick Boyle	NRC/NRR/DORL
Paul Lain	NRC/NRR/DRA
Alex Klein	NRC/NRR/DRA
Doug Pickett	NRC/NRR/DORL
Donnie Harrison	NRC/NRR/DRA
Stephen Dinsmore	NRC/NRR/DRA
Gary Cooper	NRC/NRR/DRA
Samson Lee	NRC/NRR/DRA
Dan Gatlin	SCE&G
George Williams	SCE&G
Eric Rumfelt	SCE&G
Gerald Loignon, Jr	SCE&G
Wayne Stuart	SCE&G
Gil Williams	SCE&G
Bruce Thompson	SCE&G
Michael Kammer	SCE&G
Tom Basso	NEI

Via Telephone Conference Bridge Line \*

Robert Layton	PNNL
Bijan Najafi	SAIC
Paul Amico	SAIC
Larry Young	Entergy
Vesna Dimitrijevic	AREVA NP
Michael Seaman-Huynh	SC Office of Regulatory Staff
Sal Dolcemascolo	SONGS

\* based on prior notifications



### VC Summer Attendees

Name	Position
Dan Gatlin	Vice President, VC Summer Unit 1
Wayne Stuart	General Manager, Engineering Services
Bruce Thompson	Manager, Nuclear Licensing
<b>Mike Kammer</b>	<b>NFPA 805 Project Manager</b>
Gerald Loignon	Supervisor, PRA Group
<b>Eric Rumfelt</b>	<b>Supervisor, Nuclear Licensing</b>
George Williams	Supervisor, Engineering Programs

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## NFPA805 Project Goals

### NFPA805 Transition:

- Successfully submit an LAR to transition VCSummer Unit 1 to a Performance Based Fire protection Program via NFPA805 (10CFR50.48(c)) [**Letter October 2006**]

### VC Summer Goals (Additional)

- **SISBO:** Eliminate the SISBO Strategy
- **Fires outside Main Control Room:** Minimize, to the extent possible, Operator Manual Actions (OMA)
- **Industry/ CLB Issues:** Address all current industry issues concerning Multiple Spurious Operations/ Events, Feasibility of Operator Actions and use of Operator Manual Actions in Appendix R IIIG.2 areas.

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## NFPA805 Project Status

### Major Tasks

- NSCA Model/ Open Issues
- FirePRA
- Performance Based Resolution (VFDR)
  - Fire Risk Evaluation
  - **Performance Based Fire Modeling**
- Non Power Operations
- NFPA805: NFPA Code Compliance
- Radioactive Release Analysis
- Fire Protection Program
  - Administrative/ Condition Monitoring

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## Nuclear Safety Compliance Assessment (NSCA)

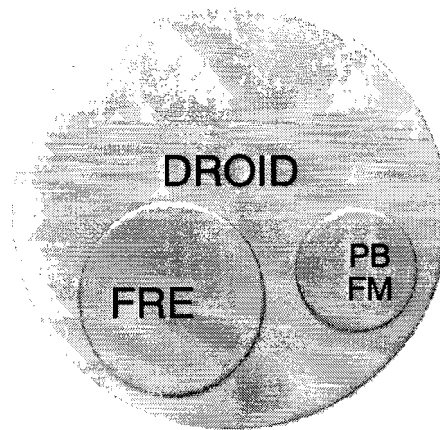
### Status/ Updates

- PCCKS Updates Complete
- Model Development: Open Issue Complete
- NSCA Model Review (SCE&G) Complete
- ECR Package Reviews (SCE&G) Complete
- NSCA Model Updates Complete
- Finalize Open Issues (DROID) Complete
- Finalize Detailed Mod (Detail) Finalizing
- Documentation/ SCE&G Reviews Finalizing

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## NSCA Open Items

- DROIDS: NSCA Open Items
- VFDR (Green): Performance Based Solutions
- Other Solutions
  - Modifications
  - Additional Circuit analysis
  - Model Updates



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## Major TR Attachments

### **Attachment B1:** Chapter 3 Compliance

- No issues
- Substantially Complete

### **Attachment B2:** Transition Shutdown Strategy

- Issued for Review
- Adding NFPA Compliance References
- Note: Not transitioning existing SD strategy

### **Attachment B3:** Area by Area Assessment

- Incorporating Fire Risk Evaluations

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## VC Summer Fire PRA

FPRA Peer Reviews    **Complete**

Peer Review Comment Resolution  
**May 2011**

Documentation/ Final SCE&G review  
**May 2011**

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## VC Summer Fire PRA Results

### Fire PRA\*

- CDF 3.83 E-05/yr
- LERF 1.47 E-07/yr

### Internal Events PRA

- CDF 1.67 E-05/yr
- LERF 1.56 E-07/yr

\* Includes credits for modifications

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## Fire PRA Results Summary

**CDF**  
3.83E-5 / yr

**LERF**  
1.47E-7 / yr

### Dominant Risk Sequences

- Loss of RCP Seal Cooling With Seals Susceptible To Failure
- Fire-induced Safety Injection in conjunction with PORV challenge
- Consequential Steamline Break with EFW Pump Runout
- Consequential Primary PORV LOCA

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## Relative Improvement: Modifications

Baseline CDF  
3.83E-5 / year

- Protecting Circuits
- Alternate Seal Injection
- Incipient Detection
- RCP Shutdown Seals

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## VCSNS FPRA Peer Reviews

### August 2010

- 30 findings
- Fire Scenario Selection: Not Reviewed
- 3 SRs related to "new" procedures: Not Reviewed
- 3 SRs related to FQ and UNC NR due to FSS NR

### February 2011: Focused Scope

- 16 findings
- Most findings involved providing more specific justification/documentation [Do not affect results]

### Licensing Amendment Request

- Contain all Findings, and
- How each has been resolved

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## Significant Peer Findings

**FQ:** Inability to create “one top” model results in inability to calculate importance measures

**Status:** May 2011 Completion (Cutset reviews)

**FSS:** Some Main Control Room Abandonment Scenarios not quantified

**Status:** Complete

**FSS:** Dependency between automatic and manual suppression not considered

**Status:** May 2011 Completion

**UNC:** Sensitivity analysis was not completed (for LERF) report was still “draft”

**Status:** May 2011 Completion

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## Performance Based Solutions

### General Information

Total Fire Areas	71
Total DROIDS	597
Total VFDR	334

### Fire Modeling (NFPA805, 4.2.4.1)

Total Fire Areas	5 Fire Areas
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### Fire Risk Evaluations (NFPA805, 4.2.4.2)

Total Fire Area FRE	32
Status	> 80%

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## Performance Based Fire Modeling

### NFPA805, Section 4.2.4.1

- Maximum Expected Fire Scenario (MEFS)
- Limiting Fire Scenario (LFS)

### Manage “Fire” within Space

- Address Fire Scenario (s)
- Fuel Package
- Fire Location
- Fire Type

### Focus: Impact on “Area” Targets

- Hot Gas Layer
- Direct Heat Transfer (Radiation, Convective)

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Modification Title	General Discussion
NFPA805 Circuit/ Tubing Protection	Provide protection of tubing/ circuits from the effects of fire(Train Separation/ Spurious Operation)
NFPA805 RCP Seal Replacement	Provide lower leakage RCP Seals [Risk Reduction/ Outage]
NFPA805 1DA 115kV Supply Reroute	Eliminate affects of common TB West fire (TB01) affecting 115kV and 230kV offsite power to 1DA/ 1DB (Risk Reduction/ Outage]
NFPA805 Hazard Protection	Provide mitigation strategies to address fire initiators or means to propagate fires
NFPA805 Instrument Air Recovery	Provide autostart capability for the Diesel Driven Air Compressor (XAC0014)
NFPA805 Communication	Provide alternate backup, protected communication system to support fire event
NFPA805 Incipient Detection	Provide Incipient Detection System at the top of selected electrical panels in the Relay and Upper Cable Spreading Rooms (Risk Reduction)
Alternate Seal Injection (MSPI)	Provide addition high pressure pump/ Diesel Generator to mitigate loss of RCP seal cooling (Risk Reduction)

## **Non Power Operations**

Preliminary Document Issued      **Complete**

SCE&G Internal Review:          **Complete**

**Current Status**                              **May 2011**

- Restraint: Final NSCA Model Updates
- Addressing Comments/ Reissue
- Finalizing DROIDS/ Final SCE&G Review

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## **Radioactive Release Analysis**

- Completed (2009)
- Readdressing due to FAQ09-0056 (4<sup>th</sup> Qtr 2011)
- Outside Radioactive Release study
- Radioactive Release Report **In Process**
  - Impact: Fire Preplans and coordination with HP/ Chemistry
  - Address Gaseous / Liquid Release

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## **Implementation Actions**

- Modification Scoping
- Engineering Procedures
- Condition Monitoring Program  
FAQ10-0059
- Fire Preplans
- Fire Brigade Training Updates
- Fire Protection Admin Procedures
- Resolution of Code Requirements / Self Assessments
- Fire Safety Analysis
- Operations Procedure/ Training

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## **Condition Monitoring**

Reliability/ Availability being measured

Data back fit for FP Features

Procedure/ Model Developed (Samples)

- FS Detectors
- FS Alarm System
- FS Main
- Fire Pumps

Monitoring FAQ10-0059 Resolution

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## NFPA 805 Project Issues

### Project Challenges

- **VC Summer RF19** (April/ May 2011)  
Station Management Reviews of NFPA805  
LAR/ Transition Report

### LAR Significant Issues/ Gaps

- None identified or expected

### LAR/ Transition Report

- June 28, 2011

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## NFPA805 Project Results

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### VC Summer Goals (Additional)

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# Questions

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Docket No. 50-395

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DATE	06/08/2011	06/06/2011	06/14/2011	06/14/2011

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