



George A. Lippard  
Vice President, Nuclear Operations  
(803) 345-4810

August 29, 2016  
RC-16-0129

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555-0001

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12  
SEVENTH SIX-MONTH STATUS REPORT IN RESPONSE TO MARCH 12,  
2012, COMMISSION ORDER MODIFYING LICENSES WITH REGARD TO  
REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-  
BASIS EXTERNAL EVENTS (ORDER NUMBER EA-12-049)

- References:
1. Nuclear Regulatory Commission (NRC) Order Number EA-12-049, *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, dated March 12, 2012, Agencywide Documents Access and Management System (ADAMS) Accession Number ML12054A735
  2. NRC Interim Staff Guidance JLD-ISG-2012-01, *Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, Revision 0, dated August 29, 2012, ADAMS Accession Number ML12229A174
  3. NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, Revision 0, dated August 2012, ADAMS Accession Number ML12242A378
  4. SCE&G Letter, *Virgil C. Summer Nuclear Station (VCSNS) Unit 1 Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated October 17, 2012, ADAMS Accession Number ML12296A252
  5. SCE&G Letter, *Virgil C. Summer, Unit 1, Overall Integrated Plan as Required by March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2013, ADAMS Accession Number ML13063A150

On March 12, 2012, the Nuclear Regulatory Commission issued Order EA-12-049 (Reference 1) to South Carolina Electric & Gas Company (SCE&G). Reference 1 was immediately effective and directed SCE&G to develop, implement, and maintain guidance and

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strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an Overall Integrated Plan (OIP) pursuant to Section IV, Condition C.1. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the initial status report regarding mitigation strategies at the Virgil C. Summer Nuclear Station (VCSNS) Unit 1. Reference 5 provided the OIP for VCSNS Unit 1.

In addition, Reference 1 requires submission of status reports at six-month intervals following submittal of the OIP. Reference 3 provides direction regarding the content of the status reports.

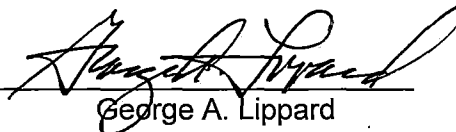
The purpose of this letter is to provide the seventh six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The enclosed report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact Bruce L. Thompson at (803) 931-5042.

I certify under penalty of perjury that the foregoing is true and correct.

8/29/16

Executed on

  
George A. Lippard

TS/GAL/wm

Enclosure      Virgil C. Summer Nuclear Station (VCSNS) Unit 1- Seventh Six-Month Status Report for the Implementation of Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order EA-12-049)

c:    K. B. Marsh  
      S. A. Byrne  
      J. B. Archie  
      N. S. Carns  
      J. H. Hamilton  
      S. M. Shealy  
      W. M. Cherry  
      C. Haney (w/attachments)

      S. A. Williams (w/attachments)  
      M. O. Valentin (w/attachments)  
      NRC Resident Inspector  
      K. M. Sutton  
      NSRC  
      RTS (CR-12-01078)  
      File (815.07)  
      PRSF (RC-16-0129)

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**VIRGIL C. SUMMER NUCLEAR STATION UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12**

**ENCLOSURE**

**SEVENTH SIX-MONTH STATUS REPORT FOR THE IMPLEMENTATION OF ORDER  
MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR MITIGATION  
STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS  
(ORDER EA-12-049)**

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## 1 Introduction

South Carolina Electric & Gas Company (SCE&G) developed an Overall Integrated Plan (OIP) (Reference 1 in Section 8) for Virgil C. Summer Nuclear Station (VCSNS) Unit 1, documenting the diverse and flexible strategies (FLEX) in response to Nuclear Regulatory Commission (NRC) Order EA-12-049 (Reference 2 in Section 8). Subsequently, SCE&G provided the first, second, third, fourth, fifth, and sixth six-month status reports (References 3, 4, 5, 6, 7, and 8 in Section 8, respectively). This report, the seventh six-month status report, provides an update of milestone accomplishments including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any, which occurred during the period between February 15, 2016, and August 18, 2016, hereafter referred to as the "update period."

## 2 Milestone Accomplishments

The following milestone(s) were completed during the update period:

- Submit 6-month update
- Procure on-site equipment

## 3 Milestone Schedule Status

The following provides an update to Attachment 2 of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The table has been modified during this update period to reflect the addition of an alternate Emergency Feedwater (EFW) modification and changes to the full implementation schedule requirement (see Section 5 for more information).

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	Oct 2012	Complete	
Submit Overall Integrated Plan	Feb 2013	Complete	
<b>Submit 6 Month Updates:</b>			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete	
Update 3	Aug 2014	Complete	
Update 4	Feb 2015	Complete	
Update 5	Aug 2015	Complete	
Update 6	Feb 2016	Complete	
Update 7	Aug 2016	Complete	

<b>Milestone</b>	<b>Target Completion Date</b>	<b>Activity Status</b>	<b>Revised Target Completion Date</b>
<b>FLEX Strategy Evaluation</b>	Aug 2013	Complete	
<b>Walk-Throughs or Demonstrations</b>	Aug 2015	Complete	
<b>Perform Staffing Analysis</b>	Jul 2014	Complete	
<b>Modifications:</b>			
Modifications Evaluation	Dec 2013	Complete	
Unit 1 Design Engineering Evaluation	Jan 2015	Complete	
Unit 1 Implementation Outage	Nov 2015	Complete	
Alternate EFW Modification	Jul 2016	In Progress	Sep 2016
<b>Storage:</b>			
Design Storage Building	Jul 2014	Complete	
Storage Implementation	Jul 2015	Complete	
<b>FLEX Equipment:</b>			
Procure On-Site Equipment	Oct 2014	Complete	Aug 2016
Develop Strategies with RRC	Nov 2014	Complete	
Install Off-Site Delivery Station (if Necessary)	Aug 2013	Complete	
<b>Procedures:</b>			
PWROG issues NSSS-specific guidelines	May 2013	Complete	
Create Site-Specific FSPs	Feb 2014	Complete with exception of the Alternate EFW Strategy	Sep 2016
Create Maintenance Procedures	Oct 2014	Complete with exception of the Alternate EFW Strategy	Sep 2016
<b>Training:</b>			
Develop Training Plan	Jan 2015	Complete	
Training Complete	Jul 2015	Complete with exception of the Alternate EFW	Sep 2016

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
		Strategy	
Unit 1 FLEX Implementation	Nov 2015	Complete with exception of the Alternate EFW Modification	Sep 2016
Submit Completion Report	Jan 2016	In Review	Nov 2016

#### 4 Changes to Compliance Method

No changes to the compliance method as documented in the Overall Integrated Plan (Reference 1) or to the changes that were submitted in References 3, 4, 5, 6, 7, or 8 of this status report were made during this update period.

#### 5 Need for Relief/Relaxation and Basis for the Relief/Relaxation

In a letter to the NRC, VCSNS Unit 1 requested a schedule relaxation of the requirement for full implementation of Order EA-12-049 (Reference 9 in Section 8). The NRC responded to the request, relaxing the requirement of the order for full implementation for VCSNS Unit 1 until July 31, 2016 (Reference 10 in Section 8).

On June 30, 2016, VCSNS Unit 1 submitted a request for an additional 60 days to accommodate the expanded project scope required to implement the Alternate Emergency Feedwater FLEX Strategy to fully comply with NRC Order EA-12-049 (Reference 11 in Section 8). The NRC responded to the June 30, 2016 request, allowing an additional 60 days from July 31, 2016 to meet EA-12-049 requirement for full implementation (Reference 12 in Section 8). The requirement of EA-12-049 for full order implementation was relaxed until September 30, 2016.

#### 6 Open Items

VCSNS Unit 1 response to the NRC's concern regarding the seismic design of the Emergency Response Building (ERB), FLEX Storage Building (FSB), and the Containment Access Ramp (CAR) Storage Area is provided below.

The Emergency Response Building (ERB), Flex Storage Building (FSB), and Containment Access Ramp (CAR) Storage Area are the site structures which house FLEX Equipment required/credited during response to a beyond design basis seismic event. A discussion regarding the acceptability of each of the structures to withstand the Safe Shutdown Earthquake (SSE) event and provide adequate protection to enclosed equipment is provided below.

1. Emergency Response Building: The seismic design criteria and loadings for the ERB were developed in accordance with ASCE 7-10 as an Essential Facility (Category IV), which is the most conservative and robust of the potential options. To ensure conformance with the NRC expectation that the ERB supports fulfillment of FLEX mitigating strategies, Design Calculation DC02490-004 Revision 1, has been developed,

in part, to analyze the ERB with respect to the SSE. The calculation evaluates the seismic lateral force resisting system (LFRS) components of the structure, in high bay location of the ERB where the equipment is to be stored. The conclusion of the calculation is that the seismic LFRS of the ERB is expected to withstand the SSE seismic forces and the ERB will remain accessible and will experience no catastrophic damage.

2. FLEX Storage Building: The seismic design criteria and loadings for the FSB were developed in accordance with ASCE 7-10 as an Essential Facility (Category IV), which is the most conservative of the potential options. To ensure conformance with the NRC expectation that the FSB supports fulfillment of FLEX mitigating strategies, Design Calculation DC02490-005 Revision 0, has been developed, in part, to analyze the FSB with respect to the SSE. The FSB was designed to a wind speed in excess of the ASCE 7-10 wind speed requirements, in an attempt to demonstrate functionality during low intensity tornado events. Due to the increased wind speed used, the forces due to the design high wind of 188 mph bound the lateral SSE forces and therefore control the design of the lateral force resisting system design for the FLEX Storage Building (FSB). The conclusion of the calculation is that the seismic LFRS of the FSB is expected to withstand the SSE seismic forces and the FSB will remain accessible and will experience no catastrophic damage.
3. Containment Access Ramp Storage Area: The CAR storage area is a part of the Intermediate Building East Penetration Area, and is a Safety Related/Seismic Category 1 concrete structure which is integral with the Intermediate Building structure. Therefore, the CAR concrete structure was designed to withstand the SSE event. As part of the FLEX response, a metal panel curtain wall and roll-up door were added to the CAR area to enclose the access opening for the storage area and provide a suitable FLEX equipment storage area. Design Calculation DC03440-004 Revision 0, was developed as part of the FLEX implementation to provide structural design of the enclosure wall and associated supports. The steel enclosure was designed for both the ASCE 7-10 wind and seismic loadings, and also the SSE loadings. Due to the light weight of the enclosure wall, the wind loadings controlled the design. In conclusion, the concrete and steel enclosures of the CAR Storage Area were both designed to withstand the SSE event.

## **7 Potential Draft Safety Evaluation Impacts**

No potential impacts to the Draft Safety Evaluation have been identified.

## **8 References**

The following references support the information contained within this enclosure.

1. SCE&G Letter, *Virgil C. Summer, Unit 1, Overall Integrated Plan as Required by March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2013, Agencywide Documents Access and Management System (ADAMS) Accession Number ML13063A150

2. NRC Nuclear Regulatory Commission (NRC) Order Number EA-12-049, *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, dated March 12, 2012, ADAMS Accession Number ML12054A735
3. SCE&G Letter, *Virgil C. Summer, Unit 1, First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 28, 2013, ADAMS Accession Number ML13242A273
4. SCE&G Letter, *Virgil C. Summer, Unit 1, Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 27, 2014, ADAMS Accession Number ML14063A203
5. SCE&G Letter, *Virgil C. Summer, Unit 1, Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 28, 2014, ADAMS Accession Number ML14245A405
6. SCE&G Letter, *Virgil C. Summer, Unit 1, Fourth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 27, 2015, ADAMS Accession Number ML15062A007
7. SCE&G Letter, *Virgil C. Summer, Unit 1, Fifth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 24, 2015, ADAMS Accession Number ML15239A750
8. SCE&G Letter, *Virgil C. Summer, Unit 1, Sixth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 26, 2016, ADAMS Accession Number ML16061A005
9. SCE&G Letter, *Request for Schedule Relaxation from NRC Order EA-12-049, "Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events,"* dated August 13, 2015, ADAMS Accession Number ML15231A025
10. NRC Letter, *Virgil C. Summer Nuclear Station, Unit 1 - Relaxation of the Schedule Requirements of Order EA-12-049 "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,"* dated October 4, 2015, ADAMS Accession Number ML15243A450
11. SCE&G letter, *Request for an Additional Sixty Days to Comply with NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,"* dated June 30, 2016, ADAMS Accession Number ML16188A197



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12. NRC letter, *Virgil C. Summer Nuclear Station, Unit 1 – Relaxation of Schedule Requirement for Order EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,”* (CAC NO. MF2338), dated July 25, 2016, ADAMS Accession Number ML16187A160