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July 22, 2015
NND-15-0366

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Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3
Combined License Nos. NPF-93 and NPF-94
Docket Nos. 52-027 & 52-028

Subject: VCSNS Units 2 & 3 Response to Request for Additional Information Letter No. 4 (eRAI 7741) Regarding Mitigation Strategies for Beyond Design Basis External Events Pertaining to License Condition 2.D(13) of Combined Operating License (COL) Numbers NPF-93 and NPF-94

References:

1. Virgil C. Summer Nuclear Station Units 2 & 3 Overall Integrated Plan with Regard to Mitigation Strategies for Beyond Design Basis External Events pursuant to License Condition 2.D(13) "Mitigation Strategies for Beyond Design Basis External Events" of Combined License (COL) Numbers NPF-93 and NPF-94 Dated August 21, 2013 (Accession Number ML13234A519)

2. Request for Additional Information Letter No. 04 Related to Fukushima Near-Term Task Force Recommendation 4.2, "Mitigation Strategies for Beyond Design-Basis External Events" for the Vogtle Electric Generating Plant Units 3 and 4 Combined Licenses Dated November 7, 2014 (Accession Number ML14311A993)

3. Vogtle Electric Generating Plant Units 3 and 4 Overall Integrated Plan 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 22, 2013 (Accession Number ML13235A228).

On March 30, 2012, The Nuclear Regulatory Commission (NRC) issued to South Carolina Electric & Gas Company (SCE&G) Combined Operating License numbers NPF-93 and NPF-94 for Virgil C. Summer Nuclear Station, Units 2 & 3, respectively. These COLs include license condition 2.D(13), which requires SCE&G to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event.

On August 21, 2013, pursuant to license condition 2.D(13)(f)3, VCSNS Units 2&3 submitted the Overall Integrated Plan (OIP), Reference 1, to the NRC under

correspondence letter number NND-13-0447.

On November 7, 2014 The NRC issued a Request for Additional Information (RAI) letter, Reference 2, to Southern Nuclear Operating Company regarding the Vogtle Electric Generating Plant Units 3 and 4 Overall Integrated Plan, Reference 3.

Since Reference 3 is based upon the proprietary Westinghouse report APP-GW-GLR-170 Revision 0, a document submitted by both SCE&G, in Reference 1, and Southern Nuclear Operating Company (SNC), in Reference 3, SCE&G elects to respond to Reference 2 with the answers provided in Enclosure 1 of this letter.

Should you have any questions about this letter, please contact Justin Bouknight, Supervisor, Nuclear Licensing, by phone at 803-941-9828 or via email at justin.bouknight@scana.com.

This letter contains no regulatory commitments.

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

Executed on this 22nd day of July, 2015.

Sincerely,

April R. Rice
Manager, Nuclear Licensing
New Nuclear Deployment

DK/ARR/dk

Enclosure 1: Virgil C. Summer Nuclear Station Units 2&3 – Response to Request for Additional Information Letter No. 4 (eRAI 7741) Regarding Mitigation Strategies for Beyond Design Basis External Events

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Virgil C. Summer Nuclear Station Units 2 & 3

NND-15-0366

Response to

NRC Request for Additional Information

Letter No. 4 (eRAI 7741)

Regarding Mitigation Strategies

for Beyond Design Basis External Events

(This enclosure contains 3 pages, including this cover page)

NRC RAI 04-1

Commission Order EA-12-049 requires the licensee to address the requirement of maintaining or restoring core cooling in the final phase for mitigating beyond-design-basis external events. The response, provided in a letter dated August 22, 2013, appears to assume the automatic depressurization system (ADS) has actuated before entering the final phase. Section 6.3.7.7 of the FSAR states if the plant does not need actuation of ADS the operators are directed to de-energize all loads on the 24-hour batteries, blocking actuation of ADS and allowing for its actuation later should plant conditions degrade. This later time is undefined, which has caused staff to question whether the passive residual heat removal heat exchanger is credited for core decay heat removal entering the final phase, or if ADS has been actuated prior to entering the final phase. Additionally, Table 3.11-1 of the FSAR provides environmentally qualified electrical and mechanical equipment required operating times of 24 hours for ADS stages 1-3 and 72 hours for ADS stage 4, which has caused staff to question the availability of the ADS system to actuate beyond their specified operating times. NRC staff is requesting the following information:

a) What method of core cooling is credited entering the final phase?

b) Do the applicable Equipment Qualifications cover de-energizing, re-energizing, and firing of the ADS system? If not, how is the availability of ADS assured beyond the operating times specified in Table 3.11-1 of the FSAR?

SCE&G Response to RAI 04-1a)

As stated in NEI 12-06, Rev. 0, Table F.3.2-1, the long term core cooling safety function is provided by the passive residual heat removal heat exchanger (PRHR HX). The automatic depressurization system (ADS) actuation and in-containment refueling water storage tank (IRWST) injection provide a backup means of long term core cooling.

The conditions for actuating ADS are driven by plant conditions and are not linked to a predetermined timeline (once the 24 hour battery power has been preserved via load stripping and the ADS timer has been stopped).

For a beyond design basis event, the PRHR HX is the credited means of core cooling, unless there is a need to switch to open loop cooling and actuate ADS, IRWST injection and containment recirculation. This switch could be required by occurrences such as excessive reactor coolant system (RCS) leakage or excessive loss of IRWST inventory.

Additionally, as described throughout APP-GW-GLR-170 Rev. 0, actions associated with FLEX strategy deployment are independent of the core cooling mechanism. Operators will monitor the self-contained passive core cooling system (PXS), while deploying FLEX strategies to support the passive containment cooling system (PCS), spent fuel pool (SFP) makeup, and the post-accident monitoring system (PAMS).

SCE&G Response to RAI 04-1b)

The Class 1E dc and uninterruptible power supply system (IDS) battery equipment qualification (EQ) program does not include de-energizing, re-energizing and continuation of the load discharge profile (including firing of the ADS valves). However, the twelve motor operated valve (MOV) ADS valves in ADS stages 1, 2, and 3, and also the twelve squib valves in ADS stage 4, IRWST injection, and containment recirculation lines are required to be qualified for both abnormal and post-accident conditions. The abnormal conditions are described in WEC DCD and VCSNS Units 2 & 3 UFSAR Section 3D.5.2. The Group 2 abnormal conditions include substantial operation at conditions consistent with operation of the PRHR HX. The environment conditions associated with this scenario are shown in WEC DCD and VCSNS Units 2 & 3 UFSAR Table 3D.5-3. The EQ program for these valves includes testing for abnormal conditions followed by design basis post-accident conditions.

While the IDS batteries are not qualified for de-energizing, re-energizing, and firing of the ADS system at a later time, the availability of ADS is assured by the following:

- The batteries are safety related, and thus conservatively designed. It is expected that they will be available once reconnected to perform their duty.
- As time progresses, fewer of the twelve ADS stage 1, 2, and 3 MOVs are required to actuate to provide adequate RCS vent area because RCS pressure and temperature will decrease over time. This significantly reduces the power demand of the batteries after they are reconnected.
- The ADS stage 4 squib valve 14” MOV isolation valves are not expected to be required to open since they are normally open. Because the power to open these valves is conservatively modeled in the battery load profile, the absence of the need to open them provides additional margin in the battery design for this beyond design basis event.
- Should battery supply be insufficient to actuate the ADS stage 1, 2, and 3 MOVs, the ADS stage 4 squib valves should still be available to be actuated via the protection and safety monitoring system (PMS) and the IDS batteries because they require very little power.
- Should the battery supplies become completely exhausted, the ADS stage 4 squib valves, IRWST injection squib valves, and containment recirculation squib valves can be actuated via a diverse actuation system (DAS) power independent actuation device located at the secondary DAS station. Note that these devices can not generate enough power to open one of the ADS MOVs and can only actuate the mentioned squib valves.

The above list of margins and options for depressurization provide assurance that the RCS can be depressurized and open loop cooling can be achieved in beyond design basis scenarios.