

DRAFT NRC STAFF EVALUATION OF VCSNS RESPONSES TO THE

REQUESTS FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST

EMERGENCY ACTION LEVEL SCHEME CHANGE

VIRGIL C. SUMMER NUCLEAR STATION, UNITS 2 AND 3

LICENSE NO'S NPF-93 AND NPF-94

By letter dated December 1, 2015, South Carolina Electric & Gas Company (SCE&G, the licensee) requested approval for an emergency action level (EAL) scheme change for the Virgil C. Summer Nuclear Station (VCSNS), Units 2 and 3 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML15335A448). By letter dated August 11, 2016 (ADAMS Accession Number ML16225A160) VCSNS responded to a request for additional information (RAIs). VCSNS proposes to revise their current EAL scheme for Units 2 and 3 from one based on Nuclear Energy Institute (NEI) document NEI 07-01, "Methodology for Development of Emergency Action Levels for Passive Reactors," Revision 0 (ADAMS Accession Number ML092030210), to an alternative scheme proposed by VCSNS for staff review and approval.

The scope of the LAR, and the impetus for VCSNS desiring a change to their already approved EAL scheme, was presented to the staff as being due to a set of technical changes made to the AP1000 VCSNS Design Control Document (DCD) since the combined operating license (COL) was issued. In addition, VCSNS had informed the staff that a few of the enhancements made to NEI 99-01, Revision 6, may be incorporated as well. Contrary to that understanding was a submittal of an LAR that has little to no basis from the DCD changes made between approval of the VCSNS COL and the date of the LAR submittal. In fact, it appears that the impetus for the LAR was to adopt the NEI 99-01, Revision 6 scheme. For example, and as inferred from RAIs VCSNS-08 and VCSNS-09, this attempt to align with NEI 99-01, Revision 6, led VCSNS to request EALs that they have already had approval for, which is already at a more reasonable time frame for the AP1000 design. In addition, the staff cannot determine what EALs from the VCSNS approved EAL scheme cannot be implemented as approved.

The staff undertook a review of this LAR with the understanding that the non-design based enhancements made to EAL scheme development methodology, as documented in NEI 99-01, Revision 6, may be reviewed on a site-specific basis for VCSNS. However, many of the proposed EALs do not apply to the AP1000 design and thus led to the development of RAIs for VCSNS to respond to with changes to their LAR. VCSNS chose to not revise the LAR for several of the RAIs. As a result, the staff has preliminarily concluded that we will not be able to reach a reasonable assurance finding in accordance with 10 CFR 50.47(a), and do not believe that VCSNS meets 10 CFR 50.47(b)(4) either as the proposed EAL scheme would not be considered a "standard" EAL scheme for this design.

In addition, while the response to some of the RAIs may not be entirely correct, particularly when attempting to explain to the staff the basis for some of the EALs, the end result of the proposed change may be acceptable as the staff could independently conclude acceptability from other sources. However, this increases the scope of the eventual Safety Evaluation

Report (SER) as the staff must clearly document that VCSNS' basis for a particular EAL is flawed but the staff determined the EAL to be acceptable based upon an independent staff evaluation.

For clarity, the staff will generally categorize the response to each RAI as: (1) acceptable justification and acceptable EAL; (2) flawed justification yet acceptable EAL; (3) unacceptable EAL.

RAI-VCSNS-01

Unacceptable EAL.

VCSNS chose to not revise the LAR as discussed in the RAI and as discussed during the pre-RAI teleconference. VCSNS states that the propose of using the term "SAFETY SYSTEM" in the context of the proposed EAL scheme is that it is consistent with the 10 CFR 50.2 definition as well as generic EAL scheme development guidance. The purpose of the RAI was not to attempt to redefine this term, but rather to point out that the intent of the EAL scheme for a passive reactor design should incorporate systems that may prevent, or mitigate, radiological risks to the public. As pointed out in NUREG-1793, SECYs 94-084 and 95-132, Regulatory Guide (RG) 1.206 (C.IV.9) and the EPRI-Advanced Light Water Reactor Utility Requirements Document (ALWR-URD), active systems relied upon for defense-in-depth and passive ALWR plant safety and investment protection goals should be defined, which is defined as Regulatory Treatment of Non-Safety Systems (RTNSS). For the purposes of a site Radiological Emergency Response Plan (E-Plan), both safety and RTNSS systems are important to ensure that radiological risk to the public is mitigated. For EALs, this effort is accomplished by ensuring that the EAL scheme bounds events, at the appropriate emergency classification level (ECL), that compromise (or potentially compromise) systems for safe shutdown and safe cooldown. The endorsed guidance, NEI 07-01 Revision 0, and the approved EAL scheme for VCSNS purposely does not provide a distinction for these systems as the term "SAFETY SYSTEM" is not used. While there may be options to consider, as offered to VCSNS, continuing to use this term and not reflect RTNSS systems, in the context of the EALs and EAL scheme, is unacceptable. The staff disagrees with VCSNS as to what should constitute an acceptable EAL scheme.

RAI-VCSNS-02

Acceptable justification and acceptable EAL.

RAI-VCSNS-03

Acceptable justification and acceptable EAL.

RAI-VCSNS-04

Unacceptable EAL.

The approved EAL scheme for VCSNS uses a combination of alarms and elevated readings to bound this event. In addition, contrary to the VCSNS response, alarm set points are specifically evaluated in the EAL. For those set points that do not change often (top of active fuel, etc.) the expectation is to incorporate the actual value into the EAL. For those set points that may change over a specific fuel cycle, particularly for radiation values, it may be acceptable to point

to an external document (i.e., Offsite Dose Calculation Manual ODCM)) which would document how these set points are derived. In either case, the staff evaluates the values for all EALs. In addition, and as discussed in the basis, an elevated radiological reading, coupled with in-plant reports or evidence of a potential fuel damaging event, should be considered for this EAL. Limiting the EAL to only be when a high radiation alarm occurs is not as currently approved, nor as endorsed.

RAI-VCSNS-05

Flawed justification yet acceptable EAL.

VCSNS demonstrated inadequate attention to detail by pointing to NEI 07-01 IC AA1 when in fact it is NEI 07-01 IC AA3. In addition, while using surveys to bound the event for CAS may be acceptable, the fact that VCSNS already has an approved EAL scheme that uses the availability of radiation monitoring in the area to support a more timely classification makes it difficult for the staff to understand why it could be implemented. VCSNS did not elaborate on why this could not be implemented as approved. However, the staff has already established a position that the use of surveys for the CAS is acceptable for the current fleet of power reactors, thus denying the EAL based upon this issue would be inappropriate. The staff will address the inattention to detail and our independent review of the issue in the (tentative) SER as the VCSNS response to the RAI is flawed.

RAI-VCSNS-06

VCSNS did not answer the question.

The RAI asked for more information related to NOTE-09, particularly for the impact on timing and the overall EAL scheme. VCSNS did not provide this information.

RAI-VCSNS-07

RAI (1) acceptable. RAI (2) Flawed justification yet acceptable. (3) may be unacceptable pending a more detailed DCD review as VCSNS did not provide any justification for their position.

For RAI (1), VCSNS acknowledged they made an error and are correcting the error. This is acceptable.

For RAI (2), VCSNS states that the approved EAL scheme references Low-4 as 9.6% of span, which it does not. However, the staff can independently evaluate this issue and may find it acceptable, but the SER will need to reflect this detail as the VCSNS response is ambiguous and does not completely answer the question.

For RAI (3), VCSNS made a statement of significance without providing any information related to how this statement was developed. The staff must evaluate if the approved EAL scheme, which uses this 12% Pressurizer level set point, cannot be implemented as approved.

RAI-VCSNS-08

Acceptable justification and acceptable EAL.

VCSNS acknowledged they made an error and are correcting the error. This is acceptable.

RAI-VCSNS-09

RAI (1), Acceptable justification and acceptable EAL. RAI (2) may be unacceptable pending a more detailed DCD review as VCSNS did not provide justification for their position.

For RAI (1), VCSNS acknowledged they made an error and are correcting the error. This is acceptable.

For RAI (2), VCSNS stated that instrumentation limitations preclude implementation of the EAL as approved. However, insufficient information was provided to allow for an independent review of this issue, which was requested in the RAI.

RAI-VCSNS-10

Acceptable justification.

VCSNS acknowledged they made an error and are correcting the error. This is acceptable.

RAI-VCSNS-11

Did not answer the question.

The use of a logic “and” or “or” was not the scope of the RAI. The issue is that the approved EAL scheme incorporates guidance related to digital instrumentation and control (IC) and that the staff needs to fully understand why this cannot be implemented as approved. The use of NEI 99-01 guidance is inappropriate as it does not reflect digital IC. For EAL HG1, using an EPFAQ as the sole basis for a change is not acceptable as the EPFAQ is generic and not entirely applicable to any specific licensee. However, the staff can independently review this and possibly find it acceptable, but this will need to be highlighted in the SER.

RAI-VCSNS-12

Unacceptable EAL.

The staff finds the VCSNS response (pre-decisional) to be unacceptable. The EALs as currently approved (CU8, CA2, and CA7) should be implemented as expected. VCSNS determined that these EALs are unnecessary based upon their interpretation of EAL scheme development methodology rather than why it cannot be implemented as approved. In addition, the staff does not agree with the interpretation of the intent of these EALs as stated by VCSNS.

RAI-VCSNS-13

Acceptable justification and acceptable EAL.

RAI-VCSNS-14

Flawed justification, yet acceptable EAL.

The removal of the annex, turbine, and radwaste building is potentially acceptable, however, the response to the RAI related to Appendix R information being in the EAL basis section was inadequate. The intent of this information is to bound the rationale for allowing an additional

15-minutes for single-point fire alarms where there is no other evidence to support the determination that a real fire exists. However, this could be addressed in the SER.

RAI-VCSNS-15

Acceptable justification and acceptable EAL.

VCSNS acknowledged they made an error and are correcting the error. This is acceptable.