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

Subject: Virgil C. Summer Nuclear Station Units 2 and 3
Docket Numbers 52-027 and 52-028
Additional Information Related to a Request for a Commission-Approved
Simulation Facility

References: (1) Letter NND-15-0026, "Request for a Commission-Approved
Simulation Facility," dated January 16, 2015
(2) Letter NND-15-0199, "Request for a Commission-Approved
Simulation Facility – Revision 1," dated March 30, 2015

Pursuant to 10 CFR 55.46(b), South Carolina Electric & Gas Company (SCE&G) hereby submits additional information related to a request for a Commission-Approved Simulation Facility for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 (References 1 and 2). The enclosed information provides a summary of SCE&G's assessment of the cumulative effects of open Simulator Discrepancy Reports (SDRs) compared to the NRC operating test attributes described in 10 CFR 55.45(a)(1-13).

This letter contains no regulatory commitments.

If there are any questions regarding this request, please contact me by telephone at (803) 941-9858, or by email at arice@scana.com.

Sincerely,

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AR/gs

Enclosure

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South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station Units 2 and 3

NND-15-0273

Enclosure

**Additional Information Provided Pursuant to a 10 CFR 55.46(b)
Request for a Commission-Approved Simulation Facility
for Virgil C. Summer Nuclear Station Units 2 and 3**

**Additional Information Provided Pursuant to a 10 CFR 55.46(b)
Request for a Commission-Approved Simulation Facility
for Virgil C. Summer Nuclear Station Units 2 and 3**

Executive Summary:

A cumulative effect evaluation was performed to assess the aggregate impact of Simulator Discrepancies currently documented against the AP1000 Simulation Facility in use at V.C. Summer Units 2 and 3.

Simulator discrepancies are electronically documented in the Simulator Discrepancy Report (SDR) database. SDRs identify discrepancies, enhancements, and necessary maintenance to simulator hardware and/or software. A total of 194 discrete simulator discrepancies are currently documented in the Simulator Discrepancy Report (SDR) database.

Thirty-two SDR items designated as enhancements and another 12 SDR items addressing changes that have been resolved with site specific procedure changes, were eliminated from the cumulative effect assessment. The remaining 150 discrete SDRs were evaluated for aggregate impact.

The 150 simulator discrepancies range across 36 separate systems. Simulator discrepancies were grouped by system and also by the 13 items referenced in 10 CFR 55.45(a) for conducting an operating test. Evaluators assessed the cumulative effect of multiple discrepancies which could challenge the ability to train and evaluate licensed operator candidates.

The result of this cumulative effect evaluation concluded that the performance of the V.C. Summer Units 2 and 3 AP1000 Baseline 7 design simulators supports effective training and evaluation of licensed operator candidates. Additionally, the capabilities of the V.C. Summer Units 2 and 3 simulators provide an adequate sampling of the 13 items specified in 10 CFR 55.45(a).

The following table presents South Carolina Electric & Gas Company's (SCE&G) assessment of cumulative effects of simulator discrepancy report items as compared to the NRC operating test attributes described in 10 CFR 55.45(a)(1-13).

An evaluation is available for inspection that includes summaries of SDRs by plant system as well as the thirteen items described in 10 CFR 55.45(a)(1-13).

**Assessment of Cumulative Effects of Simulator Discrepancy Report Items
as Compared to the
NRC Operating Test Attributes Described In 10CFR 55.45(a)(1-13)**

#	10 CFR 55.45(a) Attribute	Simulator Discrepancy Report (SDR) Items binned to this attribute	Potential Effect	Conclusion
1	Perform pre-startup procedures for the facility, including operating of those controls associated with plant equipment that could affect reactivity.	VC-TO-103 VC-1411-09 VC-1501-08 VC-TO-55 VC-TO-53 VC-1411-15 VC-1503-30 VC-1503-26 VC-1503-27 VC-TO-74 VC-TO-56 VC-1504-6 VC-1503-26 VC-1503-27 VC-TO-74 VC-TO-56 VC-1504-6	The aggregate impact of these SDRs results in a challenge to the operator's ability to anticipate and validate control rod response to various plant situations. The currently designed AP1000 automatic low power rod control as well as automatic axial power offset rod control utilizes a complex scheme of rod control to startup plant operations. Future design improvements are anticipated. Currently, the students are being trained and examined using the simulator as it is currently configured, with the expectation that all conditions presented in the simulator will be responded to as	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. Compensatory actions include: using manual 1/M plots, use of hard copy references such as the COLR vs. relying on ovation displays, providing alternate indication locations, and cueing of students during exercises. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives, however the instructor guide

#	10 CFR 55.45(a) Attribute	Simulator Discrepancy Report (SDR) Items binned to this attribute	Potential Effect	Conclusion
			real. When more information becomes available, then gap training will be provided to the operators.	must state that the SUR response lags. For impact to examination: the current items concerning SUR response complicates the ability to perform a reactor startup certification for each student. This will be done when a PRS is obtained. When more information becomes available, then gap training will be provided to the operators to provide that information. The cumulative effect on operator work load is expected to become easier as the items are resolved
2	Manipulate the console controls as required to operate the facility between shutdown and designated power levels.	VC-1503-22 VC-TO-45 VC-TO-47 VC-1501-08 VC-1502-10	The aggregate impact of these SDRs result in a challenge to the operator's ability to anticipate and validate control rod response to various plant situations. This is currently being compensated for in both training and examination settings by providing instructor prompts to the candidate.	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. Compensatory actions include: use of backtrack to repeat training exercise segments in the event rods reject to manual, and cueing of students during exercises for Fire Panel indications and response. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For

#	10 CFR 55.45(a) Attribute	Simulator Discrepancy Report (SDR) Items binned to this attribute	Potential Effect	Conclusion
				impact to examination: operators are expected to respond to plant conditions as they present themselves. Currently, there is a possibility rods may reject to manual during transients such as a turbine runback, or Rapid Power Reductions System activation. Critical task(s) must be appropriately tied to the conservative actions, if plant conditions warrant. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information. The cumulative effect on operator work load is expected to become easier as the items are resolved.
3	Identify annunciators and condition-indicating signals and perform appropriate remedial actions where appropriate.	VC-1503-31 VC-15-04-1 VC-1411-03 VC-1411-03A VC-1504-3 VC-1503-16	The aggregate impact of these SDRs increases the challenge to operator workload and prioritization, which is expected to become easier as the items are resolved. For the challenges presented by alarm workload, operators are trained and examined to utilize the prioritization hierarchy already fully functional in Alarm Presentation System (APS): Red, Orange, Yellow, and Green color coded alarms are addressed in	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. The potential exists for students to misdiagnose or incorrectly prioritize changing plant conditions based on the current work load. Compensatory actions focus on the use of

#	10 CFR 55.45(a) Attribute	Simulator Discrepancy Report (SDR) Items binned to this attribute	Potential Effect	Conclusion
			<p>descending order of priority. Operations rules of usage are established that set expectations for addressing alarms in order of priority: Red (Priority 1), Orange (Priority 2), etc. The Emergency Operating Procedures (EOP) / Abnormal Operating Procedures (AOP) Users Guide further sets priorities such that EOP procedure are addressed prior to AOPs, and that AOP procedures are addressed prior to Alarm Response Procedures (ARPs). Operators are trained to apply conduct of operations prioritization techniques and practices.</p> <p>One SDR has been written to document that the Alarm Response Procedures (ARPs) are not aligned to the current approved plant Technical Specifications (TS). All ARPs have since been updated to the current Amendment 20 TS, and this item will now be closed.</p> <p>The LCO monitoring NAP display screen is incorrectly labeled with Westinghouse original TS numbering. The alarms and ARPs driven from these points are updated</p>	<p>current Conduct of Operations alarm prioritization and use of hard copy TSs for all TS declarations. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: operators are expected to respond to plant conditions as they present themselves. Currently, the alarm workload is greater than anticipated for the final plant state, so operator performance is anticipated to improve. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information. The cumulative effect on operator work load is expected to become easier as the items are resolved. Operators are continuing to apply Conduct of Operations prioritization techniques and practices to facilitate continued operator training and examination.</p>

#	10 CFR 55.45(a) Attribute	Simulator Discrepancy Report (SDR) Items binned to this attribute	Potential Effect	Conclusion
			as noted above.	
4	Identify the instrumentation systems and the significance of facility instrument readings.	VC-1504-8 VC-1410-11 VC-1411-07 VC-1411-03A VC-TO-102 VC-1411-06	These SDRs document missing, or incorrectly indicating instrumentation in the control room. The aggregate impact of these SDRs increases the challenge to operator workload and prioritization by requiring assessment of conditions by other alternate indications. Operators are trained to apply conduct of operations prioritization techniques and practices.	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. Compensatory actions focus on the use of alternate indications where they exist. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: there are no conditions in the current state which prevent the use of this equipment in exam settings. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information.
5	Observe and safely control the operating behavior characteristics of the facility.	VC-TO-116 VC-TO-126 VC-TO-136 VC-TO-63 VC-1503-03 VC-TO-131 VC-1503-33 VC-1502-13	The aggregate impact of these SDR results increases the challenge to operator workload and prioritization. Alternate indications and operator manual calculations are available to compensate for some of these items. There are some isolated instances of equipment which is modeled	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. There is a potential negative cumulative effect caused by the number of

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		VC-1501-03 VC-TO-25 VC-1411-10 VC-TO-66 VC-TO-84 VC-TO-09	incorrectly that limits its use for operating exams. Operators are trained to apply Conduct of Operations prioritization techniques and practices to facilitate continued operator training and examination.	items in this attribute which present questionable data to the candidate. Compensatory actions focus on the use of alternate indications for plant status, and the use of instructor cueing where necessary. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: operators are expected to respond to plant conditions as they present themselves. There are some isolated instances of equipment which is modeled incorrectly that limits its use for operating exams. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information. The cumulative effect on operator work load is expected to become easier as the items are resolved.
6	Perform control manipulations required to obtain desired operating results during normal abnormal, and emergency	VC-TO-128 VC-TO-06 VC-1412-01	The impact of the first SDR, VC-TO-128 results in a post trip plant reactivity challenge which is not realistically expected to occur by plant design. Operators are trained	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be

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	situations.		<p>to anticipate and validate all steam paths isolate correctly in this condition. Although it increases the burden to operators in the short term, it does increase their overall awareness of the importance of checking these important items.</p> <p>The other SDRs identified, VC-TO-6 and VC-1412-01, do not impact operator training or examination.</p>	<p>responded to as real. A compensatory action in the form of an instructor cue is used in training settings. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: there are no conditions in the current state which prevent the use of this equipment in exam settings. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information.</p>
7	Safely operate the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and identify the relations of the proper operation of these systems to the operation of the facility.	VC-1503-13 VC-1502-07	<p>These SDRs are unrelated, and do not represent an increased aggregate impact to operator training. The first, VC-1503-13, is driving a question to review and consider changing plant design. The second, VC-1502-07, is driving a review of expected plant performance under extreme conditions. The current path for operator training and examination regarding procedures FR-C.1 and C.2 is to enter the procedure as soon as Core Exit Thermocouple</p>	<p>Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. Compensatory actions utilize a procedure change based on the best information available. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: there are</p>

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			(CET) indications begin oscillating above the criteria. This allows the operator to practice the implementation of the procedures independent of the future engineering determination.	no conditions in the current state which prevent the use of this equipment in exam settings. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information.
8	Safely operate the facility's auxiliary and emergency systems, including operation of those controls associated with plant equipment that could affect reactivity or the release of radioactive materials to the environment.	VC-TO-04 VC-1501-06 VC-TO-139 VC-1410-9 VC-TO-72 VC-1501-02	<p>Two of these SDRs, VC-TO-72 and VC-1501-02 are tracking questions concerning future plant design updates – if required.</p> <p>The remaining SDRs are linked to simulator modeling questions, which can be compensated for by the instructors, so are transparent to the student. In all cases, Operators are trained to respond to the plant indications as presented during operator training and examination.</p>	<p>Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real.</p> <p>Compensatory actions focus on the use of alternate indications where they exist, and instructor cueing for training settings. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: There are some isolated instances of equipment that are modeled incorrectly or response is under investigation, therefore limiting use for Operating exams. When future plant design changes or more information becomes available, then gap training will</p>

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				be provided to the operators to provide that information.
9	Demonstrate or describe the use and function of the facility's radiation monitoring systems, including fixed radiation monitors and alarms, portable survey instruments, and personnel monitoring equipment.	VC-TO-10 VC-TO-117 VC-TO-76 VC-TO-75 VC-TO-70	These SDRs involve ventilation radiation monitor alarms and meteorological indication alarms. The aggregate impact of these SDRs increases the challenge to operator workload and prioritization. Operators are trained to apply Conduct of Operations prioritization techniques and practices to facilitate continued operator training and examination.	Students are being trained and examined using the simulator as it is currently configured with the expectation that all conditions presented in the simulator will be responded to as real. Compensatory actions focus on the use of alternate indications where they exist, and instructor cueing for training settings. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: There are some isolated instances of equipment which is modeled incorrectly or response is under investigation, which limits use for Operating exams. When future plant design changes or more information becomes available, then gap training will be provided to the operators to provide that information.
10	Demonstrate knowledge of significant radiation hazards, including permissible levels in excess of those	No specific SDR items, other than already discussed in attribute 9, have been written which	No effect.	N/A

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	authorized, and ability to perform other procedures to reduce excessive levels of radiation and to guard against personnel exposure.	directly bin to this attribute.		
11	Demonstrate knowledge of the emergency plan for the facility, including, as appropriate, the operator's or senior operator's responsibility to decide whether the plan should be executed and the duties under the plan assigned.	VC-TO-93 VC-TO-40 VC-1504-3	The aggregate impact of these SDRs increases the challenge to operator workload and prioritization by limiting the automated display of shutdown critical safety function status trees. The status tree indications are used as decision point for implementing the emergency plan—these will have be determined manually or via instructor cueing.	These SDRs result in increased challenges to operator workload and prioritization, which is expected to become easier as the items are resolved. Compensatory actions focus on the use of alternate indications where they exist, and use of manual calculations and/or monitoring by the candidates. For impact to training; there are no conditions in the current state which prevent achieving the program learning objectives. For impact to examination: There are some isolated instances of automated calculations which do not function correctly, so would need to be tested using manual methods for Operating exams.
12	Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated	No specific SDR items have been written which directly bin to this attribute.	No effect.	N/A

#	10 CFR 55.45(a) Attribute	Simulator Discrepancy Report (SDR) Items binned to this attribute	Potential Effect	Conclusion
	with the safe operation of the facility.			
13	Demonstrate the applicant's ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.	No specific SDR items have been written which directly bin to this attribute.	No effect.	N/A