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NND-16-0109
10 CFR 55.46(b)

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

Ms. Jennifer L. Uhle
Director, Office of New Reactors
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station Units 2 and 3
Request for a Commission-Approved Simulation Facility

Ladies and Gentlemen:

Pursuant to 10 CFR 55.46(b), South Carolina Electric & Gas Company (SCE&G) requests a Commission-Approved Simulation Facility for Virgil C. Summer Nuclear Station (VCS) Units 2 and 3. This request corresponds closely with a request for a Commission-Approved Simulation Facility submitted by Southern Nuclear Company (SNC) on September 18, 2015 (ML15265A107) and addresses NRC Requests for Information associated with the SNC submittal.

The enclosures provide information required by 10 CFR 55.46(b) for facility licensees that propose use of a simulation facility other than a plant-referenced simulator in the administration of operating tests under 10 CFR 55.45(b)(1). Enclosure 1 provides summaries of SCE&G evaluations of open simulation facility discrepancies with respect to; AP1000 simulation facility Unresolved Items (UIs) issued by the Nuclear Regulatory Commission (NRC), their cumulative effect on operator performance, simulator conformance with the AP1000 plant design, and variances between AP1000 simulation facilities. Subsequent enclosures provide supporting details.

Pursuant to 10 CFR 2.390, SCE&G requests that the specified information be withheld from public disclosure. In support of this request for withholding, SCE&G has attached to this letter the following documents:

> Enclosure 5P contains an evaluation of AP1000 simulation facility Unresolved Items (UIs) that were issued by the NRC.

Enclosure 8P contains an evaluation of Priority One (1) Potential Human Engineering Discrepancies (PHEDs) from Integrated Systems Validation (ISV) Daily Assessments.

Enclosure 9P contains a list of simulator discrepancies that were open as of September 1, 2015.

Enclosure 12 contains an affidavit for withholding proprietary information from public disclosure, executed by Westinghouse. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Enclosure 13P addresses NRC Requests for Additional Information (RAIs) related to Southern Nuclear Company's request for a Commission-Approved Simulator.

Accordingly, it is respectfully requested that the information which is proprietary to WEC be withheld from public disclosure in accordance with 10 CFR 2.390. Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting WEC Affidavit should reference CAW-16-4363 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

To support the operator licensing schedule, SCE&G respectfully requests NRC approval of this request by June 20, 2016.

This letter makes regulatory commitments as described in Enclosure 13. If you have any questions, please contact April Rice at (803) 941-9858.

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

Executed on this 21st day of April, 2016

Sincerely,

Ronald A. Jones
Vice President
New Nuclear Operations

RJ/gs

Enclosure 1:	Information Provided Pursuant to a 10 CFR 55.46(b) - Request for a Commission-Approved Simulation Facility
Enclosure 2:	Description of the Components of the Simulation Facility Intended to be Used for Each Part of the Operating Test - 10 CFR 55.46(b)(1)(i)
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Enclosure 13P:	NRC Requests for Additional Information (RAIs) related to Southern Nuclear Company's request for a Commission-Approved Simulator (Withhold from Public Disclosure)

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South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

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Enclosure 1

Information Provided Pursuant to a 10 CFR 55.46(b)
Request for a Commission-Approved Simulation Facility

(This Enclosure consists of 6 pages, including this cover page)

TABLE OF CONTENTS

Special Note:
When referring to the "*VCS Units 2&3 Simulator Training System (STS)*", the word "simulator" will be used throughout this and subsequent enclosures.

1.0 Summary

Pursuant to 10 CFR 55.46(b), South Carolina Electric & Gas Company (SCE&G) requests a Commission-Approved Simulation (CAS) Facility for Virgil C. Summer Nuclear Station (VCS) Units 2 and 3 for the administration of operating tests under 10 CFR 55.45(b)(1).

This document and the related enclosures provide the information required by 10 CFR 55.46(b) for facility licensees that propose use of a simulation facility other than a plant-referenced simulator in the administration of operating tests under 10 CFR 55.45(b)(1).

10 CFR 55.46(b)(1) states:

Facility licensees that propose to use a simulation facility, other than a plant-referenced simulator, or the plant in the administration of the operating test under §§ 55.45(b)(1) or 55.45(b)(3), shall request approval from the Commission. This request must include:

(i) A description of the components of the simulation facility intended to be used, or the way the plant would be used for each part of the operating test, unless previously approved; and

(ii) A description of the performance tests for the simulation facility as part of the request, and the results of these tests; and

(iii) A description of the procedures for maintaining examination and test integrity consistent with the requirements of § 55.49.

Enclosure 2 contains a description of the components of the simulation facility per paragraph (i) above.

Enclosure 3 contains a description of the performance tests for the simulation facility and the results of those tests per paragraph (ii).

Enclosure 4 contains a description of the procedures for maintaining examination and test integrity per paragraph (iii).

10 CFR 55.46(b)(2) states:

The Commission will approve a simulation facility or use of the plant for administration of operating tests if it finds that the simulation facility and its proposed use, or the proposed use of the plant, are suitable for the conduct of operating tests for the facility licensee's reference plant under § 55.45(a).

South Carolina Electric & Gas Company commissioned a team to evaluate the known discrepancies in the simulator to determine if the 13 criteria established in 10 CFR 55.45(a), “Operating Tests,” would be challenged. The team was comprised of representatives from SCE&G Operations, Training and Licensing.

The team examined all Simulator Discrepancy Reports (SDRs) that were open as of September 1, 2015, and determined that 97 SDRs were relevant to acceptability of one or more of the first nine (9) criteria of 10 CFR 55.45(a). No SDRs were found to be relevant to the last four criteria; 55.45(a)(10) through 55.45(a)(13). It was determined that no singular SDR posed a challenge to the suitability of the simulation facility for the conduct of operating tests; however, when considered in the aggregate, 77 of the SDRs impacted criterion of 10 CFR 55.45(a) (See section 2.1 below for additional details).

In order to ensure the simulator is suitable for the conduct of operating tests, corrective actions were initiated to address 48 of the subject 77 SDRs. This assessment was communicated to Westinghouse Electric Company (WEC) and WEC committed to implement improvements aimed at resolving these issues in a series of patches deliverable to SCE&G by March 1, 2016. Based on this commitment, it was determined that the proposed changes would be adequate so that the aggregate impact of the remaining discrepancies would not pose a challenge to any of the 10 CFR 55.45(a) criteria.

In February of 2016, WEC delivered the patches to SCE&G which contained corrections for 48 items previously identified along with 37 additional corrections. After performing Verification and Validation (V&V), 7 were determined to require further investigation. After confirming the corrections that successfully passed the V&V process, the CAS Aggregate Study Team reviewed the impact of the 7 outstanding items. The team determined that, in aggregate, the impact of the 7 outstanding items, combined with the improvements in the area of Alarm Response and the other remaining open items, would not impact the suitability of the simulator for the conduct of operating tests.

Enclosure 6 contains the Aggregate Study mentioned above. Enclosure 7 contains a list of the items WEC corrected. Enclosure 9 contains a list of the open SDRs as of September 1, 2015.

2.0 Description of Simulator Discrepancies

Simulator discrepancies identified by SCE&G, other domestic AP1000 simulator owners, and those discrepancies that were issued as Unresolved Issues (UIs) by the NRC were evaluated. SDRs that could not be corrected were evaluated by performing a Training Needs Assessment to determine the impact on training. If the Training Needs Assessment determined that there was an impact on training, a Training Needs Analysis was performed to determine the extent of effect and to develop mitigation under the Systematic Approach to Training (SAT) process. If the Training Needs Assessment determined that there was no impact on training, then the discrepancy was entered into the Simulator Discrepancy Report as a historical record.

2.1 Cumulative Effect of Simulator Discrepancies on Operator Performance

As stated in Section 1.0 above, SCE&G commissioned a team to determine if, in aggregate, open discrepancies would present a challenge to the simulation facility's suitability for the conduct of operating tests. The results of this study are documented in the report "Commission Approved Simulator Aggregate Study - Simulator Training System Deficiency Impact on 10 CFR 55.45" (Enclosure 6).

It was ultimately determined that the suitability of the simulator for the conduct of operating tests would not be challenged with 85 of the discrepancies corrected. SCE&G requested Westinghouse Electric Company (WEC) to correct these discrepancies.

Based on WEC's commitment to correct these items, the CAS Aggregate Study Team reviewed the remaining SDRs to determine if they would still present a challenge to SCE&G's ability to conduct an operating examination in accordance with 10 CFR 55.45. The team concluded that the aggregate impact of the remaining items would not pose a challenge to any of the 10 CFR 55.45(a) criteria.

2.2 Evaluation of AP1000 Simulation Facility UIs Issued By the NRC

SCE&G performed a review of AP1000 simulation facility UIs issued by the NRC (References 1 and 2).

Enclosure 5 contains the results of SCE&G's evaluation of AP1000 Simulation Facility UIs issued by the NRC.

2.3 Simulator Conformance with the AP1000 Plant Design

Westinghouse retains design authority of the plant configuration until turnover. Simulator discrepancies that are determined to be plant design issues prior to turnover will be tracked until the AP1000 plant design changes have been approved. Approved design changes will be incorporated into the simulation facility in accordance with SCE&G simulator fidelity and configuration management programs per 10 CFR 55.46(d).

3.0 Variances between AP1000 Simulator Facilities

It has been noted that variances exist between the various AP1000 simulators.

As described in this letter and Enclosures, SCE&G reviews simulator discrepancy reports from other licensees and the vendor. The item is entered into the Simulator Discrepancy Report database and tracked to resolution.

For example, if SCE&G identifies an issue or is able to duplicate an issue identified on one of the other AP1000 simulators, SCE&G will generate an SDR. SCE&G shares these with WEC. WEC, at its discretion, may immediately distribute the solution with other AP1000 simulator owners or wait to incorporate the correction as part of a future software update.

4.0 Conclusion

SCE&G evaluated all open simulator discrepancies that existed through September 1, 2015 and corrected discrepancies that, in aggregate, could impact the suitability of the simulators for the conduct of operating tests. SCE&G has determined that there is no open simulator discrepancy, individually or in aggregate, that would challenge the ability of licensed operators to respond to simulator scenarios in normal, off-normal, or emergency conditions.

The material SCE&G is presenting is required for a Commission-Approved Simulation Facility as defined in 10 CFR 55.46(b). SCE&G is requesting the Commission's approval of the VCS Units 2 and 3 simulation facility for use in the administration and conduct of operating tests in accordance with 10 CFR 55.46(b)(2).

5.0 References

1. NRC Email dated 2015-05-13, Meeting Materials for May 14, 2015- VCSNS 2 and 3 Commission-Approved Simulator - CAS-Summer-RAI 5-7-15_b Redacted, ML#15133A497

2. NRC Letter dated 2015-07-02, Virgil C. Summer Nuclear Station Units 2 and 3 - Request For A Commission Approved Simulation Facility - ML15182A097

3. SNC Letter dated 2014-12-30, Vogtle Electric Generating Plant, Units 3 & 4 - Response to SVP_SVO_002964 and Simulator Training System (STS) Acceptance

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

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Enclosure 2

Description of the Components of the Simulation Facility Intended to be Used for Each Part of the Operating Test - 10 CFR 55.46(b)(1)(i)

(This Enclosure consists of 5 pages, including this cover page)

1.0 Summary Description

The VCS simulation facility is comprised of two AP1000 full scope simulators, designated "2A" and "2B." Both simulators are referenced to VCS Unit 2 and are intended to be maintained functionally identical. The simulators are licensed to conform to the requirements of ANSI/ANS-3.5-1998, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examination," as endorsed by Revision 3 of NRC Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations."

2.0 Functional Description

Instructor-controlled normal plant evolutions, system malfunctions, Component Level Failures (CLFs) and Local Operator Actions (LOAs) are used to provide simulated plant performance and failure or degradation of simulated plant systems or equipment. To achieve this level of functionality, plant systems listed in Table E2-1 are simulated.

3.0 Detailed Description of the VCS Simulators

The simulation facility design, models, and software are based upon the Westinghouse "Baseline 7" milestone for Instrumentation and Controls (I&C) design. The Baseline 7 milestone document established a set of requirements to ensure the integrated I&C system design is consistently implemented within various core I&C platforms and systems. The VCS simulation facility has also been updated with various modifications, in coordination with Westinghouse as new I&C issues or design changes have been identified.

The VCS Unit 2A and 2B simulators are referenced to Unit 2. Unit 2 is approximately one year ahead of construction for Unit 3.

The VCS Unit 2 Simulator Training System is tested to the AP1000 design. Simulator fidelity is maintained in accordance with 10 CFR 55.46(d) as documented by the NRC. Any significant outstanding discrepancies will be resolved during the finalization of the AP1000 design and/or initial test program. SCE&G continues to identify SDRs and information associated with these SDRs is forwarded to Westinghouse for inclusion in the next baseline update or patch as appropriate.

4.0 Detailed Description of Simulated Systems

The systems listed in Table E2-1 are simulated. A detailed description of each of these systems can be found in the VCS 2 and 3 Updated Final Safety Analysis (UFSAR), Rev. 3a. The systems listed in Table E2-2 are systems that are listed in the UFSAR, but are not modeled for the reasons stated in the table.

Table E2-1
List of Plant Systems Simulated

System Code	System Title
ASS	Auxiliary Steam Supply System
BDS	Steam Generator Blowdown System
CAS	Compressed and Instrument Air Systems
CCS	Component Cooling Water System
CDS	Condensate System
CES	Condenser Tube Cleaning System
CFS	Turbine Island Chemical Feed System
CMS	Condenser Air Removal System
CNS	Containment System
CPS	Condensate Polishing System
CVS	Chemical and Volume Control System
CWS	Circulating Water System
DAS	Diverse Actuation System
DDS	Data Display and Processing System
DOS	Standby Diesel Fuel Oil System
DTS	Demineralized Water Treatment System
DWS	Demineralized Water Transfer and Storage System
ECS	Main AC Power System
EDS	Non Class 1E DC and UPS System
EHS	Special Process Heat Tracing System
ELS	Plant Lighting System
FPS	Fire Protection System
FWS	Main and Startup Feedwater System
GSS	Gland Seal System
HCS	Generator Hydrogen and CO2 Systems
HDS	Heater Drain System
HSS	Hydrogen Seal Oil System
IDS	Class 1E DC and UPS System
IIS	Incore Instrumentation System
LOS	Main Turbine and Generator Lube Oil System
MES	Meteorological and Environmental Monitoring System
MHS	Mechanical Handling System
MSS	Main Steam System
MTS	Main Turbine System
OCS	Operation and Control Centers System
PCS	Passive Containment Cooling System
PGS	Plant Gas Systems
PLS	Plant Control System
PMS	Protection and Safety Monitoring System
PSS	Primary Sampling System

Table E2-1 (continued)

System Code	System Title
PWS	Potable Water System
PXS	Passive Core Cooling System
RCS	Reactor Coolant System
RMS	Radiation Monitoring System
RNS	Normal Residual Heat Removal System
RWS	Raw Water System
RXS	Reactor System
SDS	Sanitary Drainage System
SFS	Spent Fuel Pool Cooling System
SGS	Steam Generator System
SJS	Seismic Monitoring System
SMS	Special Monitoring System
SSS	Secondary Sampling System
SWS	Service Water System
TCS	Turbine Building Closed Cooling Water System
TDS	Turbine Island Vents, Drains and Relief System
TOS	Main Turbine Control and Diagnostics System
VAS	Radiologically Controlled Area Ventilation System
VBS	Nuclear Island Nonradioactive Ventilation System
VCS	Containment Recirculation Cooling System
VES	Main Control Room Emergency Habitability System
VFS	Containment Air Filtration System
VHS	Health Physics and Hot Machine Shop HVAC System
VLS	Containment Hydrogen Control System
VRS	Radwaste Building HVAC System
VTS	Turbine Building Ventilation System
VUS	Containment Leak Rate Test System
VWS	Central Chilled Water System
VXS	Annex/Aux Building Nonradioactive Ventilation System
VYS	Hot Water Heating System
VZS	Diesel Generator Building Heating and Ventilation System
WGS	Gaseous Radwaste System
WLS	Liquid Radwaste System
WRS	Radioactive Waste Drain System
WSS	Solid Radwaste System
WWS	Waste Water System
ZAS	Main Generation System
ZBS	Transmission Switchyard and Offsite Power System
ZOS	Onsite Standby Power System
ZRS	Offsite Retail Power System
ZVS	Excitation and Voltage Regulation System

Table E2-2
List of Plant Systems NOT Simulated

System Code	System Title	Not Simulated Because . . .
DFS	Diesel Fuel Offloading System	No control room interface
DRS	Storm Drain System	No control room interface
EFS	Communication Systems	The simulator does not model the EFS networking scheme but does provide similar functions for communication systems. The simulator mimics the plant communication systems with a Private Branch Exchange (PBX) phone system for the Training Center.
EGS	Grounding and Lightning Protection System	No control room interface
EQS	Cathodic Protection System	No control room interface
FHS	Fuel Handling and Refueling System	No control room interface
NCS	Network Connection System	No control room interface
OWS	Offsite Water Treatment System	No control room interface
RDS	Gravity and Roof Drain Collection System	No control room interface
RLS	Radiochemistry Laboratory System	No control room interface
SES	Plant Security System	No control room interface
TVS	Closed Circuit TV System	No control room interface
VDS	Demineralized Water Treatment Building HVAC System	No control room interface
VGS	Auxiliary Boiler Building Ventilation System	No control room interface
VIS	Transmission Switchyard Ventilation System	No control room interface
VNS	Switchyard Control Building HVAC System	No control room interface
VPS	Pump House Building Ventilation System	No control room interface
VQS	Chlorination Workshop HVAC System	No control room interface
VVS	Waste Water Treatment Plant Ventilation System	No control room interface
YFS	Yard Fire Water System	No control room interface
ZFS	Offsite Communications System	The simulator does not model the ZFS but does provide similar functions for communication systems. The simulator mimics the plant and offsite communication systems with a PBX for the Training Center.

5.0 References

1. None

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

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Enclosure 3

Description of the Performance Tests for the Simulation Facility and Results of the Tests - 10 CFR 55.46(b)(1)(ii)

(This Enclosure consists of 7 pages, including this cover page)

1.0 Summary Description of the Performance Tests for the Simulation Facility and Results of the Tests

Performance tests were conducted on site, in addition to the earlier factory acceptance tests performed by the vendor at the vendor's facility, in order to demonstrate simulator fidelity. The performance testing concluded that simulator performance met the requirements of ANS/ANSI-3.5 testing for the current simulator design. On May 21, 2015, the NRC completed an inspection of the VCS Units 2 and 3 simulation facilities to "ensure that the VCS 2A and 2B simulation facilities were being tested in accordance with ANSI/ANS-3.5-1998, 'Nuclear Power Plant Simulators for Use in Operator Training Examination,'" (Reference 1) with no findings of significance. The following is a summary of the simulator performance test licensing basis, a description of the performance tests conducted and the test results.

2.0 Detailed Description of the Performance Tests for the Simulation Facility and Results of the Tests

2.1 Vendor and Other Testing

The VCS Units 2 and 3 Simulator Training System (STS) was developed by WEC and installed at SCE&G on August 11, 2014. In parallel, WEC continued design finalization activities which included Human Factors Engineering Validation tasks such as Integrated System Validation (ISV). The ISV used and exercised the simulator extensively. The ISV shakedown, pilot and final ISV testing identified a number of integration issues. The NRC had requested licensees to report and assess these issues for NRC consideration. Some of the issues reported by other licensees were not able to be duplicated in the performance tests on the VCS Units 2 and 3 STS. Refer to Enclosure 1 Section 3.0 for a discussion on simulator variations.

A preliminary review of ISV testing identified twenty one *potential* Priority-1 Human Engineering Discrepancies (HEDs). The NRC had requested licensees to report and assess those *potential* HEDs. The assessment results, including resolutions, were provided to the NRC. The NRC did not fully accept some of the resolutions and indicated that they would need additional information (Reference 2). SCE&G reviewed the information requested by the NRC and developed resolutions which are provided in Enclosure 8.

2.2 Simulator Performance Testing Licensing Bases

Simulator licensing bases are described in VCS Units 2 and 3 UFSAR Chapter 1, Appendix 1A. Per the UFSAR, VCS conforms to section C.1 of Regulatory Guide 1.149, Revision 3 "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations." Operator Licensing examinations are conducted on a simulator meeting the applicable requirements of ANSI/ANS-3.5-

1998." This Regulatory Guide endorses ANSI/ANS 3.5-1998 "Nuclear Power Plant Simulation Facilities for Use in Operator License and Examinations." Section 4.4.3 of the ANSI/ANS 3.5 describes the simulator performance testing.

2.3 VCS Units 2 and 3 Simulator Performance Testing Description

Simulator performance testing is made up of operability testing and scenario-based testing. Simulator performance testing is performed in a fully integrated mode of operation. The test procedures are documented in VCS procedures VCS-TQP-1103, "Simulator Conduct of Operations and Configuration Management" and the following Integration Systems Tests (IST): VC2-IST-0001, and VC2-IST-0002).. These tests are based on the ANS-3.5-1998 standard. The test cases included:

1. Simulator Operability Testing - Simulator Operability Testing is conducted to confirm overall simulator model completeness and integration. Operability testing is intended to demonstrate:
    - overall simulator model completeness and integration
    - Simulator steady-state performance
    - simulator transient performance for a benchmark set of transients as shown below

Item	Title	Test Type
1	Manual Reactor Trip	Transient
2	Simultaneous Trip of all Feedwater Pumps	Transient
3	Simultaneous Closure of All Main Steam Isolation Valves	Transient
4	Simultaneous Trip of All Reactor Coolant Pumps	Transient
5	Single Reactor Coolant Pump Trip	Transient
6	Main Turbine Trip Without a Reactor Trip	Transient
7	Maximum Rate Power Ramp	Transient
8	Maximum Size Reactor Coolant System Rupture with Loss of Offsite Power	Transient
9	Maximum Size Unisolable Main Steam Line Rupture	Transient
10	Slow Primary System Depressurization to Saturated Condition (Pzr Safety)	Transient
11	Maximum Design Load Rejection	Transient

    - Includes real time and repeatability tests

Item	Title	Test Type
12	Real Time and Repeatability Test	Real Time
13	Simulated Limits Exceeded Test	Real Time
14	Steady State Similarity Test	Repeatability
15	Transient Similarity Test	Repeatability

    - Includes simulator steady-state performance tests

Item	Title	Test Type
16	Steady State Performance at 50% Power	Steady State
17	Steady State Performance at 75% Power	Steady State
18	Steady State Performance at 100% Power	Steady State

- Includes the following normal evolutions

Item	Title	Test Type
19	Plant Heatup from Mode 5 to Mode 4	Normal Evolution
20	Plant Heatup from Mode 4 to Mode 3	Normal Evolution
21	Plant Startup from Mode 3 to 2% Power	Normal Evolution
22	Plant Startup from Mode 2 to 100% Power	Normal Evolution
23	Reactor Trip Recovery to 100% After Reactor Trip	Normal Evolution
24	Plant Shutdown from Mode 1 to Mode 3	Normal Evolution
25	Plant Cooldown from Mode 3 to Cold Shutdown	Normal Evolution
26	Surveillance Testing on Safety Equipment	Normal Evolution
27	Gray Rod Exchange	Normal Evolution

- Includes the following core tests

Item	Title	Test Type
28	Shutdown Margin Determination	Core
29	Critical Boron Concentration	Core
30	Isothermal Temperature Coefficient	Core
31	Fission Product Poison	Core
32	Control Rod Worth Test	Core

2. Malfunction testing is conducted on an as needed basis. Malfunction testing was conducted to gather base line data.

Item	Title	Test Type
33	Steam Generator Tube Rupture	Malfunction
34	Loss of Coolant Outside Containment	Malfunction
35	Large Break Loss of Coolant Accident	Malfunction
36	Small Break Loss of Coolant Accident	Malfunction
37	PZR Safety Valve Fails Open	Malfunction
38	CVS Safety Relief Fails Open	Malfunction
39	Loss of Instrument Air	Malfunction
40	Loss of IDS Division A Instrument Busses	Malfunction
41	Loss of IDS Division B Instrument Busses	Malfunction
42	Loss of IDS Division C Instrument Busses	Malfunction
43	Loss of IDS Division D Instrument Busses	Malfunction
44	Loss of Offsite Power with Loss of Diesel Generators	Malfunction
45	Loss of Electrical Distribution Bus ES-1	Malfunction
46	Loss of Electrical Distribution Bus ES-2	Malfunction
47	Loss of Electrical Distribution Bus ES-3	Malfunction
48	Loss of Electrical Distribution Bus ES-4	Malfunction
49	Loss of Electrical Distribution Bus ES-5	Malfunction
50	Loss of Electrical Distribution Bus ES-6	Malfunction
51	Loss of Electrical Distribution Bus EK-11	Malfunction
52	Loss of Electrical Distribution Bus EK-12	Malfunction
53	Loss of Electrical Distribution Bus EK-13	Malfunction
54	Loss of Electrical Distribution Bus EK-14	Malfunction
55	Loss of Electrical Distribution Bus EK-21	Malfunction
56	Loss of Electrical Distribution Bus EK-22	Malfunction

Item	Title	Test Type
57	Loss of Electrical Distribution Bus EK-23	Malfunction
58	Loss of Electrical Distribution Bus EK-24	Malfunction
59	Loss of Electrical Distribution Bus EK-31	Malfunction
60	Loss of Electrical Distribution Bus EK-41	Malfunction
61	Loss of EDS1 Instrument Buses	Malfunction
62	Loss of EDS2 Instrument Busses	Malfunction
63	Loss of EDS3 Instrument Busses	Malfunction
64	Loss of EDS4 Instrument Busses	Malfunction
65	Aux Transformer ZAS-ET-2B Fault	Malfunction
66	*Loss of CWS Medium Voltage Switchgear ES-55	Malfunction
67	*Loss of CWS Medium Voltage Switchgear ES-66	Malfunction
68	*Loss of CWS Low Voltage Switchgear EK-551	Malfunction
69	*Loss of CWS Low Voltage Switchgear EK-552	Malfunction
70	*Loss of CWS Low Voltage Switchgear EK-661	Malfunction
71	*Loss of CWS Low Voltage Switchgear EK-662	Malfunction
72	*Loss of RWS Low Voltage Switchgear EK-151	Malfunction
73	*Loss of RWS Low Voltage Switchgear EK-251	Malfunction
74	*Loss of RWS Low Voltage Switchgear EK-651	Malfunction
75	Reactor Coolant Pump Shaft Break	Malfunction
76	Reactor Coolant Pump Locked Rotor	Malfunction
77	MAX RAMP to <75% with Loss of ALL RCPs - Natural Circ Test	Malfunction
78	Loss of Condenser Vacuum	Malfunction
79	Loss of Condenser Level Control (single failure)	Malfunction
80	Loss of Condenser Level Control (Multiple Failures)	Malfunction
81	Loss of Service Water	Malfunction
82	Loss of Shutdown Cooling	Malfunction
83	Loss of Component Cooling Water	Malfunction
84	Loss of Normal Feedwater	Malfunction
85	Loss of All Heat Sinks	Malfunction
86	Multiple PMS Faults of PZR Level Signal to PZR Heaters Control	Malfunction
87	Loss of HSL to ILP Logic Cab A01	Malfunction
88	Loss of Division C PMS	Malfunction
89	Rod F06 Stuck	Malfunction
90	Rod B06 Uncouples	Malfunction
91	Rod F06 Drops	Malfunction
92	Misaligned Rod	Malfunction
93	Inability to Drive Rods	Malfunction
94	Fuel Clad Failure	Malfunction
95	Main Turbine Trip	Malfunction
96	Main Generator Trip	Malfunction
97	Inadvertent Operation of Core Makeup Tanks at Power	Malfunction
98	Inadvertent Actuation of Passive Residual Heat Exchanger at Power	Malfunction
99	Feedwater Sys Malf that Results in a Increase in FW Flow	Malfunction
100	Steam Generator PORV Fails Open	Malfunction
101	Increase in RCS Inventory	Malfunction
102	Failure of Pressurizer Pressure Control	Malfunction
103	Inadvertant Operation of ADS	Malfunction
104	Reactor Trip	Malfunction

Item	Title	Test Type
105	Main Steam Line Break Inside Containment	Malfunction
106	Main Steam Line Break Outside Containment	Malfunction
107	Main Feed Line Break Inside Containment	Malfunction
108	Main Feed Line Break Outside Containment	Malfunction
109	Failure of Power Range Nuclear Instrument	Malfunction
110	Failure of Intermediate Range Nuclear Instrument	Malfunction
111	Failure of Source Range Nuclear Instrument	Malfunction
112	Serial Communication Link Failure to DAS Processor Cabinet	Malfunction
113	Pressurizer Spray Valve Spurious Open	Malfunction
114	Passive Containment Cooling Water Storage Tank Screen Blockage	Malfunction
115	Loss of Normal Feedwater Flow with Failure of PXS-V108A/B	Malfunction
116	Large Break LOCA with Failure of PXS-V014B	Malfunction
117	Anticipated Transient without SCRAM without DAS	Malfunction
118	Anticipated Transient without SCRAM with DAS	Malfunction
119	ATWS with Turbine Trip	Malfunction

3. Simulator Scenario-Based Testing (SBT) – The VCS Units 2 and 3 simulator facility is committed to the SBT methodology described in the 1998 ANS-3.5 standard as endorsed by Reg. Guide 1.149 Rev. 3 and in NEI 09-09. SBT is the parallel testing and evaluation of simulator performance while instructors validate NRC Initial license examination scenarios, licensed operator requalification annual examination scenarios, and scenarios used to satisfy the reactivity control manipulation requirements for license candidates in 10 CFR 55.31 (a)(5). As instructors validate satisfactory completion of training or evaluation objectives, procedure steps and scenario content, they are also ensuring satisfactory simulator performance in parallel, not series, making the process an “online” method of evaluating simulator performance. SBT is conducted to ensure the simulator was capable of producing the expected “reference unit” response to satisfy predetermined learning or examination objectives by utilizing the existing training and examination scenario validation process. The term, “reference unit,” as used above, refers to the AP1000 plant design since both of the VCS units are still under construction.

2.4 Simulator Operability Test Results

The most recent Operability tests were completed satisfactorily in October of 2015 with no failures.

Previously on May 21, 2015, the NRC documented an inspection that included a selection of simulator test procedures and test records. Based on the results of that inspection, no findings of significance were identified (Reference 1).

3.0 Maintenance of Simulator Fidelity

As mentioned in Enclosure 2, the simulators are maintained in conformance with the requirements of ANSI/ANS-3.5-1998, "Nuclear power Plant Simulation Facilities for Use in Operator Training and License Examination," as endorsed by Revision 3 of NRC Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations."

The NRC documented an inspection of the VCS Units 2 and 3 simulation facility on May 21, 2015. The inspection included a review of SCE&G's programs and processes related to continued assurance of simulator fidelity in accordance with 10 CFR 55.46(d). The inspection yielded no findings of significance and determined that SCE&G's programs to assure continued simulator fidelity were adequate (Reference 1).

4.0 Summary Conclusion

Simulator operability tests and simulator scenario-based tests were conducted and completed with no major differences identified between the AP1000 plant design and the simulator. As a result, SCE&G believes NRC examiners should be able to make pass-fail judgments with confidence as required by Reg. Guide 1.149.

5.0 References

1. Virgil C. Summer Nuclear Station Units 2 and 3 – NRC Simulation Facility Inspection Report 05200027/2015301, 05200028/2015301, dated May 21, 2015

2. Virgil C. Summer Nuclear Station Units 2 and 3 - Request for a Commission-Approved Simulation Facility, Dated July 2, 2015 - ML15182A097

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 4

Description of the Procedures for Maintaining Examination and Test Integrity Consistent with the Requirements of 10 CFR 55.49 - 10 CFR 55.46(b)(1)(iii)

(This Enclosure consists of 2 pages, including this cover page)

1.0 Summary Description of the Procedures for Maintaining Examination and Test Integrity Consistent with the Requirements of 10 CFR 55.49

Security for examination development and implementation is accomplished with VCS-TQP-0405, “Regulatory Exam Security ” This procedure conforms to the requirements of NUREG-1021, “Operator Licensing Examination Standards for Power Reactors,” which is founded in the requirements of 10 CFR 55.49. The procedure includes:

- Door Security Access Control;
- Encryption of Initial Condition (IC) sets and Application (APP) and Trigger files;
- Disabling of Video Recording Equipment; and,
- Physical Security of Examination Material.

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 5

Evaluation of AP1000 Simulation Facility Summary of Unresolved Items (UIs) Issued By the NRC

Redacted
(Non-Proprietary)

(This Enclosure consists of 19 pages, including this cover page)

1.0 Summary Evaluation of AP1000 Simulation Facility Unresolved Items (UIs) Issued by the NRC

SCE&G performed a review of AP1000 simulation facility UIs (References 1 and 2).

2.0 Detailed Description of SCE&G's Process

Simulator discrepancies are captured by the SCE&G Simulator Discrepancy Report process. The main method SDRs are identified is through direct simulator response during training, validation, or performance testing. Noticeable differences and discrepancies in expected simulator response are entered into the SDR database. This database is used for issue reporting, tracking/querying issues, and other simulator related administrative issues. Alterations to the simulator models, simulated I&C, and Design Change Package (DCP) implementation are all documented via VCS-TQP-1103, "Simulator Conduct of Operations and Configuration Management". SCE&G also receives simulator discrepancies from Vogtle Units 3 and 4 and Westinghouse. These issues are examined for applicability to VCS and processed through the SCE&G simulator configuration management process where applicable.

During analysis of reported simulator discrepancies, design documents are reviewed in order to determine the response that should be expected from SCE&G's simulator. Design documentation is the main method of analyzing appropriate response due to the lack of an operating reference unit.

Westinghouse is informed of any I&C or design issue via the SCE&G corrective action process. Vendor issued fixes are processed through the WEC corrective action process. All simulator changes are tested in accordance to the ANSI/ANS-3.5.1998 standard. Verification and Validation are performed to examine the effectiveness of the simulator repair.

The Simulator Review Group (SRG) reviews SDR dispositions. SCE&G also determines if uncorrected simulator discrepancies introduce negative training to the licensed operator curriculum. Issues which do not introduce negative training and remain uncorrected for any given length of time are presented to the students at the beginning of each segment/class. Issues having the potential to introduce negative training undergo a Training Needs Analysis to exercise the SAT process to prevent negative training.

3.0 Simulator Review Group (SRG)

The Simulator Review Group (SRG) is composed of the Manager, Nuclear Operations, the Manager, Nuclear Training, the Supervisor, Operations Training, a Simulator Operations Specialist, a Simulator Software Engineer, a Simulator Senior Process Control Analyst, the Supervisor, Initial Training Programs/ designee; the Supervisor, Requalification Training Programs/ designee and the Supervisor, Simulator Engineering.

The SRG is supplemented by additional personnel, as necessary, to serve as subject matter experts to conduct a Training Needs Assessment (an appraisal by a subject matter expert of a simulator deviation, deficiency, or modification, and its relative importance to the operator as required tasks are performed). Additional members of the SRG are Operations individuals who have completed AP1000 certification training or individuals with previous SRO License experience at another utility. Representatives from Engineering attend the SRG when required to discuss plant design changes and their impact on the simulator.

Table E5-1
SCE&G Evaluation of UIs and Cross-Reference List

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
1	Subcriticality Critical Safety Function (CSF) alarm block is turning magenta (bad input) intermittently	TO-40	5627	Closed. Fixed with CAS 123 patch. Retested successfully 2/19/16. V&V testing was performed successfully. [ ]a,c.
2	Rods are rejecting to MANUAL ~25% of the time when there is a power loss to Incore instrumentation PROCESSING CABINET 1 or 2.	TO-45	5808	Closed. Original problem fixed with CAS 123 patch and Retested 2/19/16. [ ]a,c. For Validation and Verification (V&V), a loss of ES-1 was conducted nine times. A loss of ES-2 was also conducted nine times. During each test, rod control remained in automatic. SCE&G has not seen rods reject to manual for this condition this since the patch was installed.
3	DDS-PLM20-Y1 is cycling between Modes 2 and 3 when RX trip breakers are closed during startup	TO-52	6144	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. Originally closed, based on being fixed with CAS 123 patch. Re-Opened during scenario development work on 3/17/16 when it was identified that the problem had not been corrected. The declaration of mode change between mode 2 and 3 is procedurally driven, and based on criteria clearly defined in Technical Specifications. The condition described is limited to indication only and does not impede the ability to make that determination.
4	Feedflow oscillations	TO-54 and 58	6151	Closed. Fixed with CAS 123 patch provided to SCE&G on Oct 15, 2015. Secondary plant performance was observed to be significantly more stable during regression testing. Since the system is performing its design function of maintaining SGWL, SCE&G has determined that this issue does not impact the suitability of the simulator for the conduct of operating tests. SCE&G does consider cycling of the SFCVs and the resulting feedflow oscillations as an undesirable condition for an operating plant. WEC is aware of this issue and plans are in place to obtain more precise tuning data during hot functional testing. Hot functional testing will provide as-built flow characteristics and more accurate controller tuning values. Once hot functional testing has been completed, the expectation is that SGWL will continue to be maintained in the required operating band with the SFCVs in AUTO and with no observable feedflow oscillations.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
5	Unexpected hotwell low level during trip recovery	TO-89	5987	Closed. Fixed with CAS 123 patch Retested successfully 2/19/16 V&V testing was performed successfully. For V&V, hotwell makeup valves were fully opened at 100% power. Simulator conditions under which the issue was first identified were replicated as nearly as possible. Makeup flow was verified to be greater than the required value per AP1000 design documents. Also did not have any hotwell makeup issues during normal OPS under similar simulator conditions as where the issue was first identified.
6	Modeling of baseline vs design certification configuration	TO-96	None	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This issue relates to how a secondary trip function is administered during training scenarios. During the evaluation of operators, any scenario affecting the operation of the turbine control valves, the instructor will either have all automatic trips fail, requiring operators to take manual action to trip the turbine, OR insert a spurious trip of the turbine, requiring operators to take action based on the sudden loss of turbine load. In either case, the issue is transparent to the operators. The Cause and Effect document for TOS02 on the Instructor Station references future design information. This is an administrative issue on the Instructor Station. The functionality can be updated by WEC when the appropriate design resolution is available. The current modeling for TOS02 does prevent an automatic turbine trip. When evaluating operators, SCE&G will have all automatic turbine trips fail so as to require operators to take manual actions in accordance with plant procedures.
7	Control rods reject to manual when running simulator unattended over the weekend	TO-101 and 104	5659	Closed. Fixed With CAS 123 patch, and with changes to the process used to reset the simulator between scenarios. Retested successfully 2/19/16. V&V testing was performed successfully. SCE&G has not seen this since the patch was installed. For Validation and Verification (V&V), the simulator was placed in run for 14 hours during a steady state test created for ANSI testing and in that 14 hour period, the rods did not reject to manual. A manual turbine trip was inserted [ ]a,c.
8	Moisture Separator Reheater (MSR) valve response during MSR shutdown is incorrect and causes a reactor coolant system (RCS) temperature transient	TO-128	5618	Fixed with CAS 123 patch and retested successfully 2/19/16. V&V testing was performed successfully. For V&V, Normal Operations Testing was conducted paying particular attention of Main Steam to MSR response during startup and shutdown. No problems or transients were noted in either case.
9		TO-131	5609	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
	{GSS Header pressure will not maintain pressure as required}			V&V testing was performed successfully. For V&V, testing was performed at 100% power from 100% power to turbine shutdown and then subsequent startup.. Initial simulator conditions under which the issue was first identified were replicated as nearly as possible during V&V testing. Gland Sealing Steam header pressure maintained [ ]a,c psig under all operation conditions while on Main Steam or Aux Steam. This issue has not been noted on the simulator since the correction was implemented.
10	Unexpected Main Turbine System alarm at power	1411-03	5722	Closed. Fixed with CAS 123 patch and successfully retested 2/19/16. V&V testing was performed successfully. For V&V, turbine load was lowered [ ]a,c. Simulator conditions under which the issue was first identified were replicated as nearly as possible. A second test was then conducted where turbine load was lowered [ ]a,c. During both turbine load reductions, APS was monitored. The unexpected MTS alarm was not received during either test. This issue has not been noted on the simulator since the correction was implemented.
11	Rod control urgent failure on loss of EK-12 appears inconsistently without loss of power	1501-08	6726	Closed. Fixed with CAS 123 patch set, and retested satisfactorily. V&V testing was performed successfully. For V&V, For V&V, ran five “Loss of EK-12” malfunctions. No Rod Control Urgent Failure alarm occurred during any test.
12	Axial Offset (AO) rods move inconsistently between tests	1502-10	5585 5659	Closed. Fixed with CAS 123 patch set, and retested satisfactorily. V&V testing was performed successfully. Ran 3 Maximum Ramp Transient test (AP-OPS-T-007) with no issues. AO rods randomly rejecting to manual has not been observed since the implementation of this patch.
13	RCS wide range pressure dropped from 1400 to 700 psig	1503-03	6741	Closed. This item was addressed by two different approaches: An investigation determined that this pressure drop is the expected plant response to proper operation of the plant passive cooling capabilities. Additionally CMT check valve response was fixed with CAS 123 patch, and retested successfully 2/19/16. This improvement makes the pressure drop occur more gradually. Further details of the vendor discussion of plant response are summarized below : This observation was made during a simulator scenario which was evaluating operator response to a Loss of Coolant Accident (LOCA). The dynamic conditions of the plant at the time were that plant pressure was lowering and the Pressurizer (PZR) had completely emptied. This resulted in the reactor vessel coolant conditions [

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				]a,c during their re-creation of this event. The continued cooling, [ ]a,c. V&V testing was performed successfully for the CMT check valve response. For V&V, For V&V, we developed an APP file that would duplicate the conditions where the initial problem was discovered. This was performed on the simulator before patches to gather a reference data set. In this "before patches" [ ]a,c. After the CAS 123 patches were installed the [ ]a,c.
14	Alarm avalanche	1503-16 HED #14	5612 5813	Closed. Fixed with CAS 123 patch. V&V testing was performed successfully. SCE&G has determined that this issue no longer impacts the simulator's suitability for the conduct of operating tests. The large volume of alarms, often referred to as the "Alarm Avalanche", was significantly lowered due to the combination of WEC's alarm prioritization project and SCE&G's use of the APS "Consequence" feature. The alarm prioritization project by WEC led to a reevaluation of the alarm points and the priority assigned to each. [ ]a,c and response but do not require immediate attention as they did previously. [ ]a,c. To date; SCE&G has developed 8 specific consequence files based on identified transients where the use of the consequence logic has been proven beneficial. An example of this is that [ ]a,c. Those alarms can be set to populate the Consequence tab on APS vice appearing on the current tab. The consequence alarms can be reviewed at any time by selecting the correct tab or by turning off individual consequence functions. Through the combination of these two efforts the overall number of audible alarms received during transients is reduced to those [ ]a,c. This removes a major distraction from operators and allows efforts and attention to be focused upon monitoring and controlling the plant. Examples of alarm reduction: Reactor Trip:

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				[ ]a,c [ ]a,c Loss of offsite power concurrent with main generator trip: [ ]a,c [ ]a,c This item was also identified during the ISV. See Enclosure 8, HED #14.
15	Inconsistent VRS and VHS radiation monitor indications on a loss of process flow	TO-75 and 76	5828 5914	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16. V&V tests were performed successfully. Ran Test Loss of EK-14 to verify response of VRS and VHS. The test was conducted at 100% power. This was the test where both issues were discovered. ECS-ES-1 was de-energized. ECS-EK-14 was de-energized and both VRS and VHS lost power. It was verified that [ ]a,c. It was verified that [ ]a,c.
16	BEACON operability	TO-102	5583	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This issue has been determined to be a simulator I&C implementation issue. The issue is not an AP1000 I&C design issue, nor is it a modeling issue. The ability of BEACON to perform its intended function is directly related to the functionality of [ ]a,c. In the event that BEACON is not functional, operators are required to carry out actions in specific Technical Specifications. For training scenarios where it is desired to fail BEACON (or one of the inputs to BEACON), OPDMS, as it is currently implemented on AP1000 simulators, fails to alert operators that it is no longer operable. Currently, the status of BEACON is passed to students by instructors when OPDMS displays an incorrect operational status. Therefore, the lack of the ability of BEACON to determine its operability status when the BDP NAP provides a BAD quality signal to BEACON does not impact the suitability of the simulator for the conduct of operating tests.
17	Inconsistent navigation to Protection and Safety Monitoring System (PMS) mimics in	1504-02	6670	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16. V&V testing was performed successfully. Ran two independent navigation tests of PMS mimics. At no point was a link found that changed divisions or navigated to the wrong page.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
	Ovation			
18	Stage 3 ADS box unused on PMS Divisions C and D Display	TO-122	5619	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. An investigation determined that this is in accordance with the AP1000 design and that this is the expected plant indication. The ADS Summary graphic provides the following possible indications in regards to ADS Actuation: [ ]a,c, just before the sheet navigation flag for the respective valve control sheet. For this reason SCE&G has determined that this SCR is not valid. These indications are the designed indications and therefore will be the same indications available to and require the same actions from an operator.
19	Unexplained Steam Generator (SG) level rise following trip of all Reactor Cooling Pumps	1502-03	6471	SCE&G evaluated this item and determined that the simulator is modeling the AP1000 plant design. SCE&G has closed this issue. The rise in level is due to the downcomer dropping the last bit of water it has as it goes to near dryout

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
	(RCPs)			conditions. During AP-OPS-T-004, "Trip of ALL RCPS," a level rise of [ ]a,c (with a slight delta between SGs). At this time all inputs and outputs from the SGs have been isolated for over [ ]a,c A detailed evaluation of the conditions internal to the SGs determined the level rise is due to the last bit of water dropping out of the downcomer as it enters near dryout conditions. WEC agreed with this. Therefore, the simulator modeling is correct and this is a correct plant response for the transient.
20	Pressurizer (PZR) Level went down in 2 of 3 training scenarios with the leak through the PZR safety	1502-08	6484	Closed. The focus of the issue was that the level went down, as expected, for 2 crews, but up for the 3rd crew. That 3rd crew was observed to have an [ ]a,c. Three attempts were made to recreate the event which were unsuccessful. No other occurrences of this have been observed over the next 8 months of training.
21	Over power control permissives did not respond to steam leak as designed	1502-09	6122	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16 V&V testing was performed successfully. V&V testing was conducted from 100% power under initial simulator conditions similar to those that existed at the time the issue was identified. Turbine control was placed in MWe IN with rods in automatic. Both Power Operated Relief Valves (PORVs) were failed fully open.. [ ]a,c. V&V testing was completed satisfactory.
22	PZR Water Level response during Safety valve malfunctions has variations in tests	1502-12	6484	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This SDR was written during [ ]a,c. In all tests conducted, the station has only ever observed the repeatable, minor differences/oscillations as described in the SDR. The minor differences in the timing of the inventory recovery and the highest observed Pzr level do not affect operator decision points during this accident sequence.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				ANSI 3.5 does not require a tolerance on plant parameters during malfunctions, just that parameters move in the same direction as those expected from the reference unit. The stated responses move in the direction expected and the variances do not introduce challenges to operational analysis, decision making and action.
23	During Load Rejection events, Load Unbalance response is inconsistent causing noticeable deltas in several key parameters	1502-13	6483	Closed. Fixed with CAS 123 patch and retested successfully 2/16/16. V&V testing was performed successfully. V&V testing was conducted with three identical tests under initial simulator conditions similar to those that existed at the time the issue was identified. Each test initiated a 100% load rejection and was frozen at 15 seconds run time. Printouts of the TCPS Load/Speed Control Mode graphic for turbine speed and intercept valve position were made. Turbine speed and intercept position responded identically throughout all three tests. The problems that were initially reported under this issue were not observed during these tests. V&V testing was completed satisfactory.
24	TCS heat transfer characteristics through the H2 coolers are unrealistic	1503-33	6181	SCE&G has determined that this issue is acceptable and that it does not impact the simulator's suitability for the conduct of operating tests. The simulator is correctly modeling the present plant design. This issue is based on the inability of the TCS temperature control valve, controlling H2 cooler temperature, to establish a steady state position. Corrective Action Program And Learning (CAPAL) 100221278 was sent to CB&I for a design or I&C change. CB&I responded by informing SCE&G that the heat exchanger is too large. This corresponds to the Simulator response. Because the heat exchanger is too large, the temperature control valve is forced closed to prevent over-cooling. Because the valve is fully closed, when the temperature reaches a point where the valve needs to open, the response time is too slow and temperature doesn't begin to lower before a high temperature alarm is received. As the valve continues to open, temperature turns and begins to lower, but the temperature drop occurs faster than the valve can respond and the valve is once again forced closed. However, even in steady-state conditions a small modulation of the temperature control valve will result in temperature lowering. CB&I will need a better control scheme or an actual heat exchanger design change. This cycling of temperature from a low to a high value occurs over approximately 2 hours (from points where the over-cooling has occurred and high temperature alarm is received). A mitigating strategy has been put in place to establish the initial conditions and then save those initial conditions immediately after the temperature has been lowered. This provides the maximum amount of time before a high temperature alarm is received. Most training scenarios are either less than 2 hours OR result in placing the plant in a condition where H2 cooling is no longer required prior to this 2 hour window expiring. [ ]$_{a,c}$. For an Operator Licensing exam scenario, that response is reviewed as part of the SBT process.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
25	"Instrument Air" alarm tile has no points assigned to it	1504-01	6669	Closed. Fixed with CAS 123 patch and retested successfully 2/22/16. V&V testing was performed successfully. The Instrument Air tile has been replaced by a “Compressed Air” tile, which is tied to alarming points in the Service Air and Instrument Air System. For V&V, ran “Loss of Instrument Air” test to verify proper operation of the alarms on lowering air pressure. The Instrument Air tile has been replaced by a “Compressed Air” tile, which is tied to alarming points in the Service Air and Instrument Air System.
26	Control logic functions associated with solid plant operations do not function as described in the design documentation	1504-09	5968	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16. V&V testing was performed successfully. For V&V testing a test of the changes to [ ]a,c. logic was implemented. [ ]a,c. Both tests resulted in satisfactory V&V.
27	Control rods rejecting to manual during Anticipated Transient Without Scram (ATWS) based on Hi Auct Tavg MERE Signal.	TO-47	None	SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. The fix installed by CAS 123 patch was retested on 2/4/16 and did not fully meet the acceptance criteria. For V&V six runs at [ ]a,c. were performed. In four tests rods rejected to Manual before all M Bank rods were on the bottom. After further review it has been determined that the control rod system is responding IAW the current plant design during this extreme event. In all cases [ ]a,c. IAW with plant design. If operators encounter Rods rejecting to Manual, they will follow their procedures, which will direct control rods to be inserted in manual, which continuing to monitor core conditions.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				The procedure provides the steps necessary for operators to respond to the condition.
28	Steam dump capacity appears to be larger than expected	1410-07	6830	Closed. Fixed with CAS 123 patch and retested successfully 2/16/16. V&V testing was performed successfully. V&V testing was conducted under initial simulator conditions similar to those that existed at the time the issue was identified. Main Steam Header pressure and Turbine Bypass valve response was monitored during the spurious trip of the main generator circuit breaker from 100% power. Steam flow through turbine bypass valve, MSS-V003, was verified correct when the valve was full open. [ ]a,c. V&V testing was successful.
29	Determine if ventilation system response is correct (VAS, VRS, (VFS) systems)	1501-02	6410	Closed. Fixed with CAS 123 patch (changes made in logic timing to align flowpath earlier) and retested successfully 2/16/16. V&V testing was performed successfully. V&V testing was performed by running [ ]a,c. This was the same test which discovered this issue. Proper realignment of VAS to VFS occurred and VFS Exhaust was aligned properly and in operation.
30	Following SG dryout, SG Wide Range level does not stay at zero. The Level will oscillate	1502-14	6434	SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. The oscillation is repeatable. During a Faulted SG condition, it was noted that [ ]a,c. Unlike existing fleet control room designs where the crew would be looking at an analog meter face with a bouncing needle or at a chart recorder, [ ]a,c.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
31	SG parameters have unexplained damped oscillation following "Main Steamline Break Outside Containment"	1502-15	6482	SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. The effect is observed during prolonged reverse heat transfer from [ ]a,c.
32	Difficulty determining CMT actuation	1503-08 and 09 HED #2	5998	SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. This issue has been mitigated in two ways. An improvement to CMT discharge check valves was implemented with CAS 123 patch which corrected the valve to have an open bias as designed, which was retested successfully 2/16/16. An additional procedure change has been implemented to address the ISV comments. HED #2 was driven by inconsistencies in determining whether CMTs were in service by crews during ISV. To correct this, WEC issued procedural changes to the Emergency Operating Procedure network. SCE&G has implemented them in accordance with the normal procedural change process. V&V testing was performed successfully for the CMT check valve response. For V&V, Tests [ ]a,c. Related to Enclosure 8, HED #2.
33	Problems during transfer to remote shutdown room	1503-21	6075	Closed. This issue was a Westinghouse simulator issue observed prior to ISV, and has not been observed to occur at the VCS simulator.
34	(RNS) system over-pressurization	1503-13 HED #11	None	SCE&G evaluated this issue and determined it that it does not impact the suitability of the simulator for the conduct of operating tests.. SCE&G evaluated this issue against its procedures and determined that its procedures were adequate, providing sufficient detail and guidance to prevent an operator or crew from performing this action. Specifically: In accordance with 3-RNS-SOP-001 version D 0.3, [ ]a,c (Attachment 4 section 3.0). [

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				]a,c which is inside containment. By following regulatory requirements, management expectations to follow procedures and SCE&G's "Conduct of Operations" procedure, an event where the need for an interlock on RNS-V061 should not occur. For this event to occur, an SCE&G operator or an operating crew would have to intentionally violate one or more procedures. Therefore, SCE&G has determined that this issue does not affect operator training or the development of exams. Related to Enclosure 8, HED #11.
35	CCS low surge tank level alarm priority is incorrect	1503-15 HED #13	None	Closed. . Fixed with CAS 123 patch. V&V testing was performed successfully. The priority of the CCS surge tank low level alarm was raised to [ ]a,c which is commensurate with the effects of a low tank level upon the plant. Related to Enclosure 8, HED #13.
36	RNS pump does not restart on Diesel Generator (DG) Sequencer	1410-09	6000	SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. The [ ]a,c.
37	EDS battery performance	TO-04	5679	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16. V&V testing was performed successfully. SCE&G replicated the initial conditions that existed at the time the issue was first identified and re-tested the EDS battery performance. The V&V test consisted of inserting [ ]a,c.
38	Main Steam System (MS) radiation] monitors do not respond during Steam Generator Tube Rupture (SGTR)	~~TO-89~~ {TO-10}	5682	SCE&G evaluated this item and determined that the detectors are responding per the AP1000 plant design. SCE&G closed this item as invalid based on WEC input. The RMS is functioning correctly as designed. The simulator results are correct. There two sets of radiation detectors on each Main Steam Line (MSL), SGS-RE026B/RE027B and SGS-RE026A/RE027A. SGS-RE026B/RE027B are for detecting low level radioactivity such as a primary-to-secondary leak. SGS-RE026A/RE027A are for detecting high levels of radioactivity during post-accident

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				conditions. Low level primary-to-secondary leakage would only be detected by SGS-RE026B/RE027B not SGS-RE026A/RE027A. If a SG tube rupture does not emit large concentrations of activity it will only be detected by RE026B/RE027B. The measuring range for SGS-RE026A/RE027A rad monitors is consistent with operating plants and the DCD as dictated by Reg. Guide 1.97. It is a Reg. Guide 1.97 Variable Type E with a dictated range of 1E-1 to 1E+3 µCi/cc for the purpose of measuring noble gas effluent releases. NUREG-0737 and Reg. Guide 1.97 mandated plants add high range detectors on the MSL for the purpose of measuring accident level (magnitude) effluent releases from the MSL relief or atmospheric dump valves for the purpose of evaluation off-site dose releases. SGS-RE026A/RE027A are intended for accident (high range) measurements (Range: [ ]a,c µCi/cc). SGS-RE026B/RE027B are intended for low range measurements (Approximate Range: [ ]a,c µCi/cc). SGS-RE026B/RE027B were added to the design to support Tech Spec 3.4.7, RCS Operation Leakage, specifically to address the tech spec limit for detecting 150 gpm per day per SG resulting from primary-to-secondary tube leakage. Note, not all operating plants have N-16 detectors on their MSLs and cannot detect primary-to-secondary leakage via on-line radiation measurements. They use alternate indications. In summary, SGS-RE026B/RE027B are for activity or low range measurements. SGS-RE026A/RE027A are for post-accident measurements. The measurement range is dictated by Reg. Guide 1.97. The AP1000 RMS present design for the MSL is in compliance with the licensing basis.
39	When Containment Air Filtration System had no flow, VFS-RY102 alarmed for high iodine	1503-25	6192 5914	Closed. Fixed with CAS 123 patch and retested successfully 2/19/16.. V&V testing was [ ]a,c. and no alarm set point was reached..
40	As the licensee notes in their RAI response, the computer support applications provided by (NAPs) would not be used for Job Performance Measures because they do not assess the applicant's knowledge. Calculations would be performed manually.			SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. WEC provided a patch to SCE&G on August 14, 2015, that included corrections to Nuclear Applications (NAPs). SCE&G conducted V&V testing for each of the corrections under simulator conditions replicating those under which each issue was first identified. <u>The following four NAPs corrections successfully passed V&V testing</u>: 1. The Plant Mode Application automatically updates plant mode from [ ]a,c. V&V testing was performed with similar conditions to those when the issue first identified. V&V testing was satisfactory. 2. The Redundant Sensor Algorithm for Power Range Nuclear Power was updated to [

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
	This is why many of the discrepancies were considered to be not significant. However, NAPs provides data to the operator during event diagnosis and response. Given the number of NAPs discrepancies the staff concludes that they could impact operator workload in an inconsistent manner. The staff concludes that there needs to be a reduction in the number of NAPs related discrepancies including those already identified as significant.			]a,c. SCE&G determined that V&V testing was satisfactory. 3. The Inverse Count Ratio application was corrected for proper response of the Intermediate Range 1/M plot. [ ]a,c. V&V testing was satisfactory. 4. The Critical Shutdown Safety Function application was corrected to properly display whether a cooldown or heatup was uncontrolled on the Mode 5/6 Critical Safety Function WPIS display. V&V testing was conducted under similar initial conditions to when the issue was first identified. [ ]a,c. After waiting for RCS temperature to stabilize, the [ ]a,c. V&V testing was satisfactory. <u>The following two NAPS corrections failed V&V testing</u>: SCE&G evaluated this issue and determined that it does not impact the suitability of the simulator for the conduct of operating tests. These two issues were evaluated individually and in aggregate by members of the team that performed the initial Aggregate Study using the same evaluation criteria as before. The team determined that these items do not substantially impact the simulator's suitability for the conduct of operating tests for the reasons given at the end of each issue. 1. The Leak Rate Monitoring Application was updated as part of this patch. After performing V&V testing, SCE&G determined that the update was not successful. The operators were still unable to perform a leak rate determination with the NAP. The V&V test consisted of operator performance of an RCS and Main Steam Leak Determination Surveillance in accordance with the surveillance procedure. [ ]a,c. The surveillance was unable to be performed. This V&V test failed. The Leak Rate Monitoring Application is informational only and does not drive any alarms based upon the calculated leakage. For this reason, any leak rate calculations would have to be performed manually per plant procedures vice using the NAP calculated values.

Table E5-1 (continued)

NRC # {*}	NRC UI Description {*}	Ref # {*}	SNC SCR #	SCE&G Evaluation
				2. Updates to the Time to Boil indications were included as part of this patch. After performing V&V testing, SCE&G personnel determined that the update was not successful. Time to Boil indication on the Mode 5/6 Primary trend WPIS was observed to be displayed in exponential minutes for the RCS time to boil. The same was true for the Spent fuel pool time to boil. V&V testing was conducted under similar initial conditions as when the issue was first identified. The values indicated by each of these displays should be in hours and minutes. This V&V test failed. The Time to Boil NAP is a tool that is used for information only. The NAP is active when in Mode 5/6 conditions for RCS time to boil and when fuel is present in the spent fuel pool for spent fuel pool time to boil. The value is displayed in exponential units versus hh:mm. This means that operators will need to convert the scientific notation values into hours and minutes. Although this does take a short amount of time, the net effect is that it does not remove the ability to monitor the time to boil and it has no impact on actions the operator may, or may not, take in response to plant conditions.
41	Provide documentation that the Westinghouse Electric Company's resolution of HED-1 discrepancies is consistent with the VC Summer (VCS) conclusions provided in the Commission-approved simulator request and its supplements.			See Enclosure 8.
42	Include all open discrepancy reports when the docketed list of simulator discrepancies is submitted.			See Enclosure 9

Note: {*} Numbers and descriptions correspond to the table "Summary of Unresolved Items as of 06-30-2015" as it appeared in an NRC letter dated July 2, 2015 (Reference 2)

2.0 References

Table E5-1 (continued)

1. NRC Email dated 2015-05-13, Meeting Materials for May 14, 2015- VCSNS 2 and 3 Commission-Approved Simulator - CAS-Summer-RAI 5-7-15_b Redacted, ML#15133A497

2. Virgil C. Summer Nuclear Station Units 2 and 3 - Request For A Commission-Approved Simulation Facility dated July 2, 2015, ML#15182A097

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 6

Commission Approved Simulator Aggregate Study - Simulator Training System Deficiency Impact on 10 CFR 55.45

(Non-Proprietary)

(This Enclosure consists of 2 pages, including this cover page)

The Commission Approved Simulator Aggregate Study - Simulator Training System Deficiency Impact on 10 CFR 55.45 was provided in letter NND-15-0467, "Request for a Commission-Approved Simulation Facility - Response to Unresolved Items," dated November 13, 2015, as Enclosure 6. This study encompasses the two aggregate assessments described in various enclosures in this document.

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 7

List of Westinghouse Simulator Corrective Actions

(This Enclosure consists of 14 pages, including this cover page)

1.0 Summary Description of Westinghouse' Simulator Corrective Actions

SCE&G commissioned a team to perform an aggregate study of all open simulation discrepancies.

In two different studies, dated April 28th and September 1, 2015, SCE&G evaluated a total of 216 open discrepancies associated with its simulator. SCE&G evaluated these discrepancies and their impact on the suitability of the simulation facility for the conduct of operating tests. The second assessment, on September 1 of 2015, also rolled up the remaining open significant items from the April 28th assessment. Out of that assessment, 97 were determined to be relevant to 9 of the 13 criteria listed under 10 CFR 55.45(a). SCE&G evaluated each of these 97 discrepancies and determined that no singular issue challenged the simulation facility's suitability for the conduct of operating tests. It was further determined that these criteria would no longer be challenged if a specified subset of discrepancies could be corrected by WEC.

In September of 2015, SCE&G confirmed that the scope of this subset satisfied the near term request to support the VCS Units 2 and 3 STS CAS.

2.0 Itemized List of Westinghouse' Simulator Corrective Actions

Table E7-1 lists the 48 items addressed that Westinghouse included in a patch delivered to SCE&G in the third quarter of 2015.

Table E7-2 lists an additional 37 SDRs which the additional Westinghouse patches also resolved. Verification and Validation (V&V) testing was performed when the patches were deployed in the first quarter of 2016.

Table E7-1
List of Westinghouse' Simulator Corrective Actions

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
1		RITS 37569	5584	1506-01	Rod Withdrawal button un-highlights during continuous operation	Pass
2		RITS 39523 RITS 39409 CAPAL-100025685	5597	TO-117	Containment Radiation Alarm Reset Points	Pass
3		RITS 39633	5599	TO-09, TO-120	Unidentified and Identified Leak Rate always indicates BAD quality	Pass
4	1		5627	TO-40	Sub criticality on Critical Safety Function Screen bad quality	Pass
5		RITS 37623	5643	1503-02	VWS-TE079 Labeled incorrectly	Pass
6			5644		SSS Display # 17600 incorrect	Pass
7		RITS 39605 RITS 42463	5688	TO-25	Graphic 50308 Issue	Pass
8		RITS 39466	5689	TO-28	PMS Mimic Screens	Acceptance criteria not fully met. (This item was not included in the patch received from WEC.) SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is a simulator I&C issue. PMS mimic screens are used for verification of indications only. If a question arises regarding an indication on the PMS mimic screen, operators will

Table E7-1 (continued)

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
						use primary indications from the PMS displays on the Primary Dedicated Safety Panel (PDSP). No operator action is available through the PMS mimic screens. All actions must be taken from the division's PMS PDSP.
9		RITS 42477	5702	1501-07	IDS screens in simulator show inaccurate Power supplies	Pass
10			5712	1411-06	Calorimetric Power Data Points do not have required precision	Pass
11	14		5813	1503-16, 1506-35	ISV Pri-1 HED-14 Alarm Overload	Pass
12		RITS 42461	5909	TO-59	Digital Rod Control System (DRCS) M bank rod control graphic	Pass
13		RITS 38522	5920	1410-6	Pressurizer narrow range pressure does not indicate bottom of scale on WPIS 2 for Mode 1-4 screen	Pass
14			5924	1410-2	DRPI Health Screen has alarms for Data Cabinet A and B crossed	Acceptance criteria not fully met. SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is a simulator I&C issue related to a non-consequential graphic indication.
15			5925	1410-3	DRPI Health Screen (1805) Incorrect Logic Cabinet Alarms	Pass
16	26	RITS 38825	5968	1504-09	CVS-PT040 do not function as described	Pass

Table E7-1 (continued)

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
17		RITS 40030	6009	1504-3	Uncontrolled H/U or C/D light on Mode 5/6 CSFST WPIS Display does not indicate correctly	Acceptance criteria not fully met. SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. The function is partially corrected. The RCS temperature <+ OR – 5^{o} works correctly, and can be used by the operator to monitor H/U and/or CD rates. The ability to toggle the logic to alert the software when a controlled heatup or cooldown is complete is not operating via the use of the manual mode selection as it should. This function would enable automatic monitoring for unanticipated RCS temperature changes, while this screen is not selected. The indication available provides ample indication for operation of the plant.
18			6030	1501-05	M Banks B & C Reversed on DRPI Health Screen	Pass
19			6078	1506-20	HSS Display does not include ESOP Disch Pressure	Pass
20		RITS 38306	6089	1506-16	NAP for 1/M Intermediate Range does not work	Pass
21		RITS 43153	6102	1506-10	MA Bank Rods Sometimes Stop at 263 steps during a CRE (Control Rod Exchange)	Pass (This item was verified to not occur at SCE&G. It was not included in the patch received from WEC.)
22		RITS 41846	6129	1506-23	Display 40023 units issue	Pass
23	3		6144	TO-	PLS Auto Plant Mode Selector not consistent	Acceptance criteria not fully met. This item was

Table E7-1 (continued)

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
				52	with Mode 3 to Mode 2 entry	closed, based on being fixed with CAS 123 patch and retested successfully 2/19/16. It was re-opened after the problem reappeared during scenario validation afterwards. SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. The problem now has only been observed after an extended shutdown condition which caused the reactor power input to go low enough to cause BAD quality. When this occurs, the Mode change does not occur. There is minimal impact to training or evaluation because this plant condition is not normally exercised during operator training or evaluations.
24	40	RITS 39434	6159	1506-24	NAPS display issues	Pass
25		RITS 39470	6160	1506-25	CCS Screen issue	Pass
26		RITS 39588	6164	1506-26	WPIS downscale arrow issue	Acceptance criteria not fully met. SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is a simulator I&C issue. This serves as backup indication only and has no impact on operator decision making.
27		RITS 39403	6165	1506-27	WPIS Tavg Scale	Pass
28		RITS 40059	6169	1506-	Erroneous NAP RSA behavior	Pass

Table E7-1 (continued)

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
				12		
29		RITS 39783	6170	1506-29	WRS graphic issue	Pass
30		RITS 38601	6180	1506-32	TTB unit indication	Pass
31		RITS 40314 RITS 41693	6187	1506-13	Rod stop logic	Pass
32		RITS 41193	6259	1506-40	Received Bank Sequence Out of Sequence Alarm	Acceptance criteria not fully met. (This item was not included in the patch received from WEC.) SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is an AP1000 plant design issue. The simulator models plant design. If operators encounter this condition, they will follow their procedures. The procedure provides the steps necessary for operators to respond to the condition.
33			6267	1506-41	Urgent Alarm (Causes control rods to swap to manual and stop) Occurs During Case 2 CRE	Pass
34			6278	1506-34	Battery bank indications are mislabeled for EDS1, EDS2, and EDS4	Pass
35			6302	1506-42	Improper Bank Overlap Occurs when Data Point OCB07CE00C_OUTAV Increments Improperly During Startup	Closed. Invalid. Subsequent to the Aggregate Study team forwarding this issue to WEC for correction, WEC evaluated the issue and determined that this is per the AP1000 design and that the overlap is not

Table E7-1 (continued)

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
						improper. Therefore, no correction was required.
36			6315	1506-14	Manual reactor trip alarm when one is not requested	Pass
37			6398	1507-48	Screen 22101 has incorrect indication	Pass
38			6409	1501-05	Graphic 1805 has reversed rods	Pass
			6483	1502-13	During Load Rejection events, Load Unbalance response is inconsistent	Pass
39			6621	1506-15	PR B lower detector failure is not compensated for by the RSA NAP	Pass
40	14		6651	1506-43	Inconsistent priority levels of Data Processing Unit alarms.	Pass
41		RITS 45989	6698	1506-35	Safety Mimic Display for SGS-V255A and B indicates BQ following a SFW Isolation	Pass
	35		None	1503-15	Failure to identify CCS leak	Pass
	28		6830	1410-07	Steam Dump Capacity	Pass
	37	RITS 40480	5679	TO-04	EDS performance on Battery	Pass
	5		5987	TO-89	Condensate Makeup flow rate	Pass
	10	RITS 42360	5722	1411-03	MTS Alarm at 75% Power	Pass
	9	RITS 39748	5609	TO-131	Gland Seal Steam system pressure discrepancy between procedure and actuals	Pass

Table E7-1 (continued)

Notes:

{*} Numbers and descriptions correspond to the table “Summary of Unresolved Items as of 06-30-2015” as it appeared in an NRC letter dated July 2, 2015, (Reference 1).

{1} Numbers correspond to the items as they appear in the “List of Proposed Actions” on page 13 of the SNC Aggregate Study, Enclosure 6.

Table E7-2, Additional SDRs resolved by WEC fixes at VCS

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
			5609	TO-131	GSS header pressure not maintaining	Pass
			5613	1602-34	MFP 'B' Alarm Response Differs For Identical Fault	Not observed at VCS
		RITS 48592	5618	TO-128	MSS- V016A/B Response during Reactor Shutdown	Pass
		TREC 6966 RITS 39691 and 48489 DCP4809	5808	TO-045	Rods Reject to MANUAL on Power Loss to IIS Server - non-repeatability	Pass
			5828	TO-075	VRS Rad Monitor Response on Loss of Flow	Pass
			5914	TO-076	VHS Rad Monitor Response on Loss of Flow	Pass
			5945	1507-07	After VES actuation, MCA pressure never builds up as designed	Pass
			5991 6151	TO-54, TO-58, 1506-37	Feedwater Control Transfer	Pass
		RITS 50211	6024	1507-10	Investigate reason IDSA/B/C/D-DU-1-VAC reads 205Vac	Pass
		RITS 50209	6042	1507-11	VBS-D201 does not fail close upon a loss of power	Pass

Table E7-2, Additional WEC fixes installed at VCS

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
		RITS 40257 RITS 50214	6071	1505-07	RCP stator temperature indication off scale low at lower speeds	Pass
		RITS 41432 RITS 50213	6103	1505-05	ECS penetration temperature reading off scale low	Pass
		RITS 50208	6110	1507-13	VFS Containment Purge and Exhaust Valves do not close in required time	Pass
		TREC 6823 CAPAL 100000379	6122	1502-09	Control Permissives were discovered to be not functional/operable during a steam leak/over-cooling/overpower event.	Pass
		RITS 50212	6126	1508-11	WRS sump pump B does not indicate proper discharge pressure	Pass
			6151	TO-054	SG Water Level control erratic	Pass
			6162	1507-14	Stuck Rod Recovery Malfunction	Not observed at VCS
			6171	1508-44	APS ZVS and ZBS alarm scaling	Not observed at VCS
			6179	1506-31	TTB calculation	Pass
			6192	1503-25	ISV Pre-ISV Item 11 - VFS-RY102 Alarm	Pass
		RTIS 50201	6272	1505-03	Spurious ADS Stage 4 actuation does not respond as expected	Pass
		RITS 50206	6276	1507-16	No change in current indication on ECS-EA-1333	Pass

Table E7-2, Additional WEC fixes installed at VCS

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
35			6302	1506-42	Improper Bank Overlap Occurs when Data Point OCB07CE00C_OUTAV Increments Improperly During Startup	Closed. Invalid. Subsequent to the Aggregate Study team forwarding this issue to WEC for correction, WEC evaluated the issue and determined that this is per the AP1000 design and that the overlap is not improper. Therefore, no correction was required.
		NO	6366	1507-48	During Turbine Trips, Pri 4 controller faults for Drop 21 and 34 are received	Pass
			6392	1507-49	Main Generator output breaker closes before it is supposed to when syncing the main generator to the grid.	Not observed at VCS
37			6398	1506-08	Screen 22101 has incorrect indication	Acceptance criteria not fully met. SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is a simulator I&C issue related to a non-consequential graphic indication.
		NO	6401	1507-18	Inadequate indication on IDS_-DT-1-VAC	Pass
		RITS 50240	6492	1508-47	UAT Bkr Line Undervoltage Priorities are Wrong	Pass
		RITS 50203	6547	1508-48	VES Supply Header Pressure not modeled correctly for a change in temperature w/o a change in mass	Pass
		RITS 49531 RITS 50207	6613	1507-55	Possible modeling and/or Ovation issues with WGS Sample Package MS-01 AT-032	Pass

Table E7-2, Additional WEC fixes installed at VCS

A.S. # {1}	NRC UI # {*}	WEC RITS/CAPAI:	SNC SCR #	VCS Ref #:	Summary	V&V Test Results
					(AE032)	
		RITS 50202	6634	1508-52	The Turbine Bypass Control Valve control scheme does not support multiple power supplies	Pass
		RITS 50205	6639	1507-20	EDS Static Transfer Switch Operation	Pass
		RITS 50204	6645	1508-53	Battery Temperature does not trend during battery operations	Pass
			6670	1504-02	PMS Mimics Navigation	Pass
		TREC 6966 RITS 48584, 39691, and 48489 DCP 4809	6726	1501-08	Rod Control Urgent failure on Loss of EK-12	Pass
			6741	1503-03	Unexplained RCS Pressure Drop	Pass
		RITS 39981	6068	1506-5	WLS-MP-08C will not pump monitor tank C	Pass

Notes:

{*} Numbers and descriptions correspond to the table "Summary of Unresolved Items as of 06-30-2015" as it appeared in an NRC letter dated July 2, 2015, (Reference 1).

Table E7-2, Additional WEC fixes installed at VCS

3.0 References

1. Virgil C. Summer Nuclear Station Units 2 and 3 - Request For A Commission-Approved Simulation Facility dated July 2, 2015 - ML15182A097

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 8

Evaluation of Priority One (1) Potential Human Engineering Discrepancies (PHEDs) from Integrated Systems Validation (ISV) Daily Assessments

(Non-Proprietary)

(This Enclosure consists of 10 pages, including this cover page)

1.0 Summary of Priority One (1) Potential Human Engineering Discrepancies (PHEDs) from Integrated Systems Validation (ISV) Daily Assessment

Integrated System Validation (ISV) was conducted as part of the Human Factors Engineering (HFE) Verification and Validation process. Conduct of the AP1000 ISV resulted in a number of Potential HEDs (PHEDs). These PHEDs have the potential to impact the simulator, plant design, operator training, and/or procedures.

In order to elevate simulator fidelity to a level suitable for the conduct of operating tests commensurate with the requirements of 10 CFR 55.45(b), Priority 1 PHEDs specific to the operation of the simulator have been evaluated and corrected. A list of all ISV Priority 1 PHEDs and how they were resolved appears in Table E8-1 and E8-1S. These tables also include PHEDs related to other elements of the Integrated System Validation; specifically, procedures and training.

2.0 PHED Assessment

Westinghouse performed a preliminary assessment of ISV issues during the conduct of the ISV to identify those scenario failures that could have benefited from a fourth trial run while the Utility Crews were present. These assessments identified 15 Priority 1 PHEDs.

Westinghouse' resolution of these 15 PHEDs identified four items requiring simulator model or Human System Interface (HSI) changes and 11 PHEDs specific to procedures and training. The changes resolved the Alarm Workload PHED.

2.1 Supplemental Information

Subsequent reviews of ISV test results and Design Verification results per APP-OCS-GEH-120, APP-OCS-GEH-320 and APP-OCS-GEH-420 identified 10 additional PHEDs (Table E8-1S). There are no Priority 1 HEDs related to the Task Support Verification (APP-OCS-GER-220).

Westinghouse's evaluation of the 10 additional PHEDs determined that five of the additional HEDs had initiating conditions similar to those responsible for some of the initial 15 PHEDs. Of the remaining five, two HEDs will be resolved via a procedure change, one was found to not impact the suitability of the simulator with respect to a CAS and two HEDs were specific to procedures and training (including the CPS issue). Detailed resolutions can be found in Table E8-1S.

Note that the Westinghouse evaluation of ISV results have been completed since this initial assessment. This formalized PHEDs as HEDs, which is the acronym used in other sections of the report.

Table E8-1
Priority 1 PHEDs

#	PHED Description - (# trial failures of # trials performed)	Resolution
1	[ ]a,c ([ ]a,c)	[ ]a,c [ ]a,c [ ]a,c
2	[ ]a,c ([ ]a,c) [ ]a,c [ ]a,c	[ ]a,c [ ]a,c [ ]a,c [ ]a,c
3	[ ]a,c ([ ]a,c) [ ]a,c [ ]a,c	[ ]a,c
4	[ ]a,c ([ ]a,c)	[ ]a,c The crew that failed to properly [ ]a,c. so that consistent procedure usage rules will prevent re-occurrence. [ ]a,c
5	[	[ ]a,c

#	PHED Description - (# trial failures of # trials performed)	Resolution
	]a,c. ([ ]a,c)	]a,c
6	[ ]a,c ([ ]a,c)	[ ]a,c
7	[ ]a,c ([ ]a,c)	[ ]a,c
8	[ ]a,c ([ ]a,c)	[ ]a,c
9	[ ]a,c ([ ]a,c)	[ ]a,c [ ]a,c
10	[ ]a,c ([ ]a,c) [ ]a,c	[ ]a,c [ ]a,c
11	[	[ ]a,c [

#	PHED Description - (# trial failures of # trials performed)	Resolution
	]a,c ([ ]a,c) [ ]a,c [ ]a,c	]a,c
12	[ ]a,c ([ ]a,c) [ ]a,c	[ ]a,c [ ]a,c [ ]a,c [ ]a,c
13	[ ]a,c ([ ]a,c) [ ]a,c [ ]a,c	[.]a,c [ ]a,c
14	[ ]a,c [ ]a,c [ ]a,c	[ ]a,c [ ]a,c [ ]a,c [ ]a,c Using the above criteria, WEC provided an update that enhances alarm prioritization, greatly lowering the

<table>
<tr><th>#</th><th>PHED Description - (# trial failures of # trials performed)</th><th>Resolution</th></tr>
<tr><td></td><td></td><td>number of alarms that have to be addressed by the operator post-event. In addition, SCE&G enabled the [ ]a,c that is part of the Alarm Presentation System design. As can be seen from the results below, the number of alarms are now in an acceptable range and the operator workload has been greatly reduced.
<table>
<tr><th>Event</th><th>Alarms</th></tr>
<tr><td>Turbine Trip</td><td>[ ]a,c</td></tr>
<tr><td>Reactor Trip</td><td>[ ]a,c</td></tr>
<tr><td>ES1</td><td>[ ]a,c</td></tr>
<tr><td>ES2</td><td>[ ]a,c</td></tr>
<tr><td>ES3</td><td>[ ]a,c</td></tr>
<tr><td>ES4</td><td>[ ]a,c</td></tr>
<tr><td>ES5</td><td>[ ]a,c</td></tr>
<tr><td>ES6</td><td>[ ]a,c</td></tr>
<tr><td>LOOP with TT</td><td>[ ]a,c</td></tr>
</table>
LOOP= loss of offsite power TT= turbine trip</td></tr>
<tr><td>15</td><td>]a,c
([ ]a,c)</td><td>[ ]a,c
[
]a,c</td></tr>
</table>

Table E8-1S
Additional Priority 1 PHEDs

<table>
<tr><th>#</th><th>PHED Description
(ISV Report HED #)</th><th>Resolution</th></tr>
<tr><td>16</td><td><u>Alarm Parameter Range Conditions</u>:
[
.]a,c
[
]a,c</td><td>[ ]a,c
[ ]a,c
[
]a,c
• [ ]a,c</td></tr>
</table>

#	PHED Description (ISV Report HED #)	Resolution
	[ ]a,c	• [ ]a,c • [ ]a,c • Operators performing F-0 as required by procedure direction
17	Computerized Procedure System (CPS) User Messages: [ ]a,c ISV-02-07.1: [ ]a,c (WEC # ISV-10)	[ ]a,c [ ]a,c Post ISV: WEC, SNC, and SCE&G initiated a project to review CPS procedures to ensure that; the graphics tab was populated with the most suitable graphics links, graphics links functioned properly, step logics functioned properly and met the intent of the step, procedure navigation links functioned properly and formatting of attachments provided adequate readability of the steps. Where any deficiencies were identified, actions were taken to resolve the issue. These actions included: replacing graphics with graphics that were more suitable or provided a larger portion of the required information on a single graphic, adding additional logics to ensure the step intent was thoroughly tested by the step logic, removing logic that could not properly verify the step intent due to inadequate point availability, fixing procedure navigation links, and reformatting attachments to ensure proper indentations were maintained to provide readability to the procedure. A review was performed regarding best practices for the Fold-out page/Continuous Action step notification window. [ ]a,c
18	Core Makeup Tank (CMT) Operating Status: [ ]a,c ISV-05-09.1: Non-operating CMT could be seen to meet CMT operating criteria [	[ ]a,c [ ]a,c [ ]a,c This issue does not impact the suitability of the simulator for the conduct of operating tests. Procedure and background document changes were [ ]a,c.

#	PHED Description (ISV Report HED #)	Resolution
	]a,c ISV-07-04.1: [ ]a,c (WEC-ISV-42; Linked to RIHA HEDs)	[ ]a,c.
19	Procedure Use and Adherence: FRP entry - Crews inconsistently applied rules for FRP entry conditions, delaying appropriate actions and reducing the margin of safety. ISV-05-10.1: [ ]a,c ISV-05-10.2: [ ]a,c (WEC-ISV-43; [ ]a,c	[ ]a,c [ ]a,c As indicated previously, this issue does not impact the suitability of the simulator for the conduct of operating tests. [ ]a,c That information is provided to the operators through their training programs. Procedure use and adherence will continue to be emphasized through training.
20	PMS Functionality and Indications: Functionality of PMS and missing PMS indications conflict with operator expectations or procedures. ISV-06-01.1: [ ]a,c (WEC-ISV-47; DCP 4916)	[ ]a,c [ ]a,c In addition, EOPs contain [ ]a,c

#	PHED Description (ISV Report HED #)	Resolution
21	Instrument Qualification: [ ]a,c ISV-07-04.1:]a,c (WEC-ISV-50; [ ]a,c)	[.]a,c [ ]a,c [.]a,c CMT NR level instruments are qualified detectors and provide the required information for post-accident monitoring. CMT WR level instruments [ ]a,c The expectation is for operators to use all available indications while taking accident mitigating actions. This would include CMT WR level, NR level, and temperature indications. This issue does not impact the suitability of the simulator for the conduct of operating tests.
22	Design of Procedures: Design of procedures [ ]a,c ISV-07-02: Procedure bases documents should contain all required background information for the performance of the given procedure. (WEC-ISV-51; Linked to RIHA HEDs)	[ ]a,c [ ]a,c In response to this issue, [ ]a,c The updated material is contained in [ ]a,c. Reactor Trip Or Safeguards actuation," dated August 2015.
23	Ineffective Operational Decision-making: DCIS – [.]a,c ISV-05-12.1: [ ]a,c ISV-08-05: A crew tripped the reactor when a [.]a,c. The crew did not perform ANY cross channel verification. (WEC-ISV-58; Link to Daily Assessment Issues)	[ ]a,c [ ]a,c Regarding ISV-05-12.1, [.]a,c Regarding ISV-08-05, SCE&G considers this issue to be a Training issue. The operator made a decision to trip the reactor based upon a singular instrument failure without validating the decision. At the time, there were at least seven other operable instruments available to the operator. Operators are trained to verify single indications by making use of multiple indications to validate operational decisions prior to taking an action when possible.

#	PHED Description (ISV Report HED #)	Resolution
24	Training: Gaps in operator knowledge were observed in some procedure steps, background application, and overall procedure flow. ISV-05-10.1: [ ]a,c ISV-05-10.2: [ ]a,c ISV-08-01: Operating personnel were sometimes confused by a lack of system knowledge, integration, constraints, and actuations. ISV-08-05: Operators sometimes felt the need to take quick actions leading/could possibly lead to error. There was often a sense of urgency to take actions which were not always the correct ones. (WEC-ISV-62; Link to Daily Assessment Issues)	[ ]a,c This is a training issue.
25	[ ]a,c Digital Rod Control System (DRCS) Soft Controls: [ ]a,c (WEC-DV-20)	[ ]a,c [ ]a,c [ ]a,c SCE&G has determined that this issue does not impact the suitability of the simulator for the conduct of operating tests.

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Enclosure 9

List of Open Simulator Discrepancies (Non-Proprietary)

(This Enclosure consists of 11 pages, including this cover page)

Summary Description of Open Simulator Discrepancies

In September 1, 2015, SCE&G evaluated 97 discrepancies associated with its simulator. SCE&G evaluated these discrepancies and their impact on the suitability of the simulation facility for the conduct of operating tests. The September 1st assessment addressed the 66 discrepancies identified between the first assessment on April 28, 2015, and September 1st, and also addressed the 31 remaining significant items from the April 28th assessment. Out of this September assessment, 77 were determined to be relevant to the criteria listed under 10 CFR 55.45(a). Since SCE&G's evaluations and conclusions for these items are reflected and/or imbedded in the Aggregate Study referenced in Enclosure 6, they are not repeated here. Table E9-1 lists these 77 items. Note that WEC fixes, further investigation, and procedure changes resulted in 47 of those discrepancies being closed since the September evaluation was conducted.

The remaining 20 discrepancies that were determined not to pose a challenge to the criteria listed under 10 CFR 55.45(a) are listed in Table E9-2. A Training Needs Assessment as defined in ANSI/ANS-3.5-1998, Section 4.2.1.4, was performed for these 20 discrepancies It was determined that none of these issues impacted any of the six criteria listed under ANSI/ANS-3.5-1998, Section 4.2.1.4. or any of the 13 criteria listed under 10 CFR 55.45(a). WEC fixes have also resulted in 3 of those discrepancies being closed since the September evaluation was conducted.

See enclosure 7 of this document for a list of fixes implemented at SCE&G.

Table E9-1
SDRs Impacting 55.45(a) Criteria Evaluated In Aggregate

SDR#	SCR#	Description	Current Status
TO-04*	5679	EDS performance on Battery	Closed
TO-10*	5682	MS Rad Monitor response during SGTR	Closed
TO-47*	5659	Inconsistent rods reject to manual based on Hi Auct Tave MERE signal during ATWAS malfunction test	Open
TO-75*	5828	VRS High Rad alarm when ES1 de-energizes and is re-energized from DG	Closed
TO-76*	5914	VHS rad monitor response on loss of flow	Closed
TO-102*	5583	BEACON inoperability calculation in reactor core model	Open
TO-122*	5619	Stage 3 ADS box unused on Divisions C and D	Open
TO-128*	5618	MSR MSS-V016A/B response during Reactor Shutdown evolution	Closed
1410-03*	5925	DRPI Health Screen (1805) Incorrect Logic Cabinet Alarms	Closed
1410-07*	5999	Steam Dump Capacity larger than expected	Closed
1410-09*	6000	RNS pump does not restart on DG sequencer	Open
1411-03*	5722	Unexpected Main Turbine System (differential expansion) alarm at power	Closed
1501-02*	6410	VAS/VRS system response to LOCA outside Containment	Closed
1501-08*	6726	Rod Control Urgent failure on loss of EK-12	Closed
1502-08*	6484	Different Pzr level response in 1 of 3 Pzr steam space LOCA training scenarios	Closed
1502-09*	6122	Improper function of C-2	Closed
1502-10*	5585	Inconsistent AO rod motion between tests	Closed
1502-12*	6484	Pzr Water level response during safety valve malfunctions has minor variations in tests	Open
1502-13*	6483	Power Load Unbalance response potential causing inconsistent LP turbine Intercept valve response	Closed
1502-14*	6434	SG Wide Range level response at dryout	Open
1503-03*	6741	RCS wide range pressure dropped from 1400 to 700 psig	Closed
1503-08*	5998	During ISV crews' determination of CMT operating affected PRA manual actuation windows	Closed
1503-09*	5998	During ISV crews' determination of CMT operating affected PRA manual DAS IRWST injection actuation window	Closed
1503-13*	none	No interlock for RNS-V061 when aligning RNS to CVS purification	Closed
1503-15*	none	Shutdown of CCS pump after Identification of CCS leak	Closed
1503-16*	5813	Alarm Response after certain events is difficult due to number of alarms	Closed
1503-21*	6075	RSR transfer display issue	Closed
1503-25*	6192	VFS radiation monitoring	Closed
1503-28*	5998	CMT operation indication in recirculation mode	Closed
1503-33*	5603	Investigate validity of low flow alarm on TCS-FT007	Open
1504-01*	6669	"Instrument Air" alarm tile has no points assigned	Closed
1505-03	6272	Spurious ADS Stage 4 actuation response	Closed
1505-05	6103	ECS penetration temperature reading off scale low	Closed
1505-07	6071	RCP stator temperature indication off scale low at lower speeds	Closed
1506-01	5584	Rod Withdrawal button un-highlights during continuous operation	Closed

Table E9-1 (continued)

SDR#	SCR#	Description	Current Status
1506-02	6217	CMT WR Level Indications go Bad Quality	Open
1506-04	6022	DHC Summary - Assembly Move NAP function doesn't work	Open
1506-05	6068	WLS-MP-08C will not pump monitor tank C	Closed
1506-12	6169	NAP RSA behavior	Closed
1506-15	6621	PR B lower detector was failed high, the RSA for Power Range Power did not eliminate this input causing an erroneous PR PWR read	Closed
1506-16	6089	NAP for 1/M Intermediate Range does not work	Closed
1506-33	6190	WPIS display for VARs	Open
1506-39	6186	Tracking issue for rod step sound problems	Open
1506-40	6259	Received Bank Sequence Out of Sequence Alarm	Open
1506-41	6267	Urgent Alarm during Case 2 CRE at 90% Power	Closed
1507-07	5945	After VES actuation, MCA pressure response	Closed
1507-09	6013	Insufficient PCS flow through single drain line	Open
1507-10	6024	Investigate reason IDS A/B/C/D-DU-1-Vac reads 205Vac	Closed
1507-11	6042	VBS-D201 does not fail close upon a loss of power	Closed
1507-12	6099	DWS-LT006 has insufficient range	Open
1507-13	6110	VFS Containment Purge and Exhaust valves do not close in required time	Closed
1507-16	6276	No change in current indication on ECS-EA-1333	Closed
1507-18	6401	Inadequate indication on IDS-DT-1-VAC	Closed
1507-20	6639	EDS Static Transfer Switch Operation	Closed
1507-25	6154	WPIS RCS inventory screen issues	Open
1507-38	5972	CNMT Recirc Actuation for Div C and D not visible on PMS ESF Screen	Open
1507-39	6019	CVS-V094 Power Failure	Open
1507-42	6168	Tuning of VBS required	Open
1507-43	6172	Polisher bypass valve control	Closed
1507-48	6366	During Turbine Trips, Pri 4 controller faults for Drop 21 and 34 are received	Closed
1507-53	6532	Any Rods at Bottom Alarm	Open
1507-54	6610	Potential issue with DG Sequencer	Open
1507-55	6613	Possible modeling and/or Ovation issues with WGS Sample Package MS-01 AT-032 (AE032)	Closed
1507-67	5661	Unexpected response from SWS-PY-S06A on loss of power	Open
1508-11	6126	WRS sump pump B does not indicate proper discharge pressure	Open
1508-13	6157	SGS MSL drain pot erratic indication	Open
1508-42	237	Simulator MCR missing Rad Monitoring Panel	Open
1508-46	6491	Diesel Fuel oil day tank level transmitters not operating correctly	Open
1508-47	6492	UAT Bkr Line Undervoltage Priorities are Wrong	Closed
1508-48	6547	VES Supply Header Pressure not modeled correctly for a change in temperature w/o a change in mass	Closed
1508-50	6612	Possible modeling and/or Ovation issues with WGS Sample Package MS-01 PS-001	Open
1508-51	6623	VZS-D014A/B and VZS-D015A/B do not fail as-is after loss of power.	Open
1508-52	6634	The Turbine Bypass Control Valve control scheme does not support	Closed

Table E9-1 (continued)

SDR#	SCR#	Description	Current Status
		multiple power supplies	
1508-53	6645	Battery Temperature does not trend during battery operations	Closed
1508-54	6657	Fire Protection System is not modeled in Containment	Open
1508-69	5901	D/G power demand point no being driven	Open
1508-108		Simulator Failures of Jstation commands when resetting < 1/day	Open
		Total Remaining Open	30
		Total Closed	47

Note:
*These SDRs were evaluated in the April 28, 2015 aggregate assessment, and rolled forward into the September 1, 2015 aggregate assessment.

Table E9-2
SDRs Not Impacting 55.45(a) Criteria

SDR#	SCR#	Summary Description	Evaluation Basis
1505-01	6775	VBS-MY-Y01 Soft Control Feedback does not work.	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is a plant design issue. VBS-MY-Y01 (MCR Operator Work Area Elec Htr) Soft Control Feedback does not work. [ ]a,c. The current indication does not impact the actions taken by the operator and does not distract from training
1505-02	N/A	LAN LEFT WPIS erratic	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. LAN LEFT WPIS on [ ]a,c. Initially operation appeared satisfactory, and then a different failure mode appeared (dark blue sections). [ ]a,c.
1505-04	6189	Trend screen plots wrong	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating training or tests. Some Navigation Trend Group displays show the wrong trends. [ ]a,c.

Table E9-2 (continued)

SDR#	SCR#	Summary Description	Evaluation Basis
			[ ]a,c.
1505-06	6098	WRS-V008 not connected to model	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating training or tests. WRS-V008 [ ]a,c. WRS-V-008 [ ]a,c. to this level of detail is beyond the level of detail attended to in License Operator Simulator training.
1506-18*	5644	<u>SSS Display # 17600 incorrect</u>: The Secondary Sampling System (SSS) display in Ovation indicates incorrect flow passing these valves SSS-V920 or SSS-V921.	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This issue is related to the system mimic presented on the graphical display. [ ]a,c The error does not change the operation of the valves or the system, just improperly represents the process fluid flow paths that will be diverted when the valves reposition. These displays are infrequently used during normal routine operations.
1506-25*	6160	CCS Screen issue for CCS header flow in scientific notation.	Closed. Fixed with patch WEC provided to SCE&G on January 2016. V&V testing was completed satisfactorily.
1507-26*	6498	Demineralized Water Feed Pump A and B (DWS-MP-01A/B) do not have a poke for operator use nor are they modeled in instructor station for the instructor to locally control.	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. Design change APP-GW-GEE-2907 replaced the motors for the DWS pumps AND moved the control of the pumps to the Local Control Station. Therefore, operation of these components from the MCR is no longer in the plant design and is consistent with the controls currently available to the MCR operators.

Table E9-2 (continued)

SDR#	SCR#	Summary Description	Evaluation Basis
1507-41	6158	Letdown tuning: CVS letdown heat exchanger alarm comes in when CVS makeup secured and letdown is in progress.	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. SCE&G evaluated this item and determined that the simulator is modeling the AP1000 plant design. This issue represents an AP1000 design inadequacy. Current plant design [ ]$_{a,c}$ Since the actions operators are expected to take in response to this condition are identical to those they would otherwise take, the issue was determined to have no impact on the simulator's suitability for the conduct of operating tests. This issue is similar to SCR-5649.
1507-45	6182	Primary trend screen rendering issue for RCS Tcold and RNS flow when called up from two locations at the same time	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. SCE&G could not reproduce all aspects of the problem as noted at SNC, however there is a potential to impact WPIS trending if the trend screens are aligned to a different mode than the rest of the WPIS panels, concurrent with a print demand. This fluctuation has no impact on actions the operator may or may not take in response to plant conditions.
1507-46	6185	Default trend screen color for ovation trend screen is yellow and makes reading text difficult	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. The ovation trend program was opened and the settings associated with trend color were observed. The first two points that are selected to be trended default to red and light blue. If more points than this are required the operator is able to change the trend color using the properties menu. The operator is also able to shift to a tabular view vice a graphical view to see the information. Although, inconvenient, the capability is available to change the trend color if sufficient trends are added to a single trend window that results in one of them being yellow and therefore does not affect the indications available to or actions taken

Table E9-2 (continued)

SDR#	SCR#	Summary Description	Evaluation Basis
			by an operator.
1507-52	6447	PCS Indications - Inconsistent Naming for containment pressure	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. The issue is associated with the nomenclature associated with CTMT pressure on the Critical Safety Function (CSF) WPIS display. On this display the CTMT pressures are labeled as 'ExtR' and 'NormR', meaning 'Extended Range' and 'Normal Range'. Although the naming of the points on the graphics is not consistent, the information being provided by the graphics is readily identifiable. On the PCS graphic, which contains the instruments that provide the input to the CSF display, the instruments are labeled as 'Wide Range' and 'Narrow Range'. For this reason it does not affect the indications provided to or actions taken by an operator.
1507-58*	6752	Units for Division D RCS Tavg has wrong units	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. PMS Screen 000005 for RCS variables provides the correct number, but has incorrect units for Division D RCS Average Coolant Temperature for l cold leg 2B. Indication is in % Span, should be in degrees F. This is also seen on the PMS mimic displays in PLS. Point: PMSD-RCTA (2B). The primary indication to check this parameter is the PMS RCS variables, page 2 (PMS screen 000005). This screen is correct in every regard. Ovation also provides a PMS mimic screen, which should be identical to the actual PMS screen. On the mimic the units on the Division D RCS Average Coolant Temperature for l cold leg 2B is in % Span, but should be in degrees F. The impact of this is minimal, given that the correct value is displayed in both locations, the primary screen used for this variable is correct, and the indication of this parameter is provided for all four divisions in a row, which allows the operator to easily recognize that this values is a temperature, not a % of span.
1507-61	6791	OPDMS AFD Screen (32400) does not update	The OPDMS AFD screen provides a "live" graphical display of AFD, showing the target value, and the target range. The current target value ramps from (0) at

Table E9-2 (continued)

SDR#	SCR#	Summary Description	Evaluation Basis
			0% power to (-7) at 100% power. There is a “blue dot” which plots actual AFD on this graph as plant conditions change. The "blue dot" does move with actual AFD, as power changes. The “target value” at the top of the graph should display the actual changing AFD setpoint, but only appears to display the target at 100% power. There is minimal impact to this because the primary focus is directed to the “blue dot”, which does track correctly.
1507-69	6618	GCF for WGS-AIT031 and 032 do not work.	SCE&G has determined that this issue does not impact the simulator’s suitability for the conduct of operating tests. These two WGS instruments are the Hydrogen monitors for the waste gas carbon bed vault, and the waste gas system sample panel cabinet. Although the global component failures do not function for these components, it is always possible to perform a remote override of the instrumentation value, to drive whatever output is desired.
1508-14	6188	Plant Mode NAP Temperature Input for the Automatic plant mode calculation uses average cold leg temperature instead of RCS average temperature.	SCE&G has determined that this issue does not impact the simulator’s suitability for the conduct of operating tests. The plant conditions which have [ ]$_{a,c}$ and the input that caused the MODE change is transparent to the operator.
1508-55	233	<u>Simulator MCR missing cooling fins</u>: Simulator MCR is missing cooling fins as designated by the Unit 2 design documentation	SCE&G has determined that this issue does not impact the simulator’s suitability for the conduct of operating tests. Missing [ ]$_{a,c}$ was determined to be a physical fidelity issue that imposes no operational restrictions on the indications available to or actions taken by the operator. A Training Needs Assessment was performed and it was determined that this issue does not impact any of the six criteria listed under ANSI/ANS-3.5-1998, Section 4.2.1.4 or any of the 13 criteria listed under 10 CFR 55.45(a).
1508-56	235	<u>Simulator MCR lights not hanging from chains</u>: Simulator Main Control Room (MCR) lights are not located as designated by the Unit 3 Design	SCE&G has determined that this issue does not impact the simulator’s suitability for the conduct of operating tests. The MCR lights not hanging from chains in the MCR was determined to be a minor physical difference between MCR and simulation facility that imposes no

Table E9-2 (continued)

SDR#	SCR#	Summary Description	Evaluation Basis
		Document APP-1242-EL-001.	operational restrictions on the indications available to or actions taken by the operator. The current MCR lighting responds properly to loss of power scenarios. A Training Needs Assessment was performed and it was determined that this issue does not impact any of the six criteria listed under ANSI/ANS-3.5-1998, Section 4.2.1.4 or any of the 13 criteria listed under 10 CFR 55.45(a).
1508-60	6091	Kirk Key interlock not operable on spare battery LOAs	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. The Kirk Key indication in question is associated [ ]$_{a,c}$ the booth operator can make the appropriate reports to the MCR and this issue is transparent to the MCR operators.
1508-61	6092	EDSS-DF-1 nomenclature and switch operability issue on simulator diagram for EDS system.	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This issue is similar to SDR 1508-60. The spare battery is still able to be placed in service when required. The nomenclature and operability issues are related to the simulator instructor station and are transparent to the operator.
1508-62	6246	<u>SMS Detector ranges not consistent with design statements</u>: Maximum indication on Ovation screens is [ ]$_{a,c}$. Design documents list peak values of [ ]$_{a,c}$	SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. Current training material directs the booth operator to insert user defined alarms to generate the alarms to allow operators to respond accordingly prior to the initiation of the training event, thus making this issue transparent to the operators.

<u>Note:</u>

*These SDRs have been closed since the completion of the September 1, 2015 aggregate assessment.

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Enclosure 10

BEACON

(This Enclosure consists of 2 pages, including this cover page)

1.0 Summary Description of BEACON

Definition

BEACON (Best Estimate Analyzer for Core Operations – Nuclear) is a Westinghouse reactor core monitoring application. BEACON converts plant instrument readings and performs calculations in order to provide measurement and analysis of core performance.

Description

The AP1000 seamlessly integrates BEACON into everyday plant operations; all calculations and programming are transparent to the Control Room operators. BEACON directly interfaces with the plant data network. This allows operators to monitor core performance using the same workstations and software used for daily operations. This data (originating from BEACON) is literally one click from their top-level display. Unlike the AP1000, BEACON was a post-design modification for legacy Westinghouse plants. Those plants were originally designed with other means to monitor in-core reactor performance. Starting in approximately 1990, legacy plants began slowly incorporating BEACON into their systems in varying degrees, requiring additional hardware and software in the plant and simulator.

2.0 BEACON Simulation

Core power distribution data in the AP1000 simulator is generated by complex algorithms and code to accurately represent reactor behavior. Because the AP1000 core monitoring interface is fully integrated with the normal control system (and simulator), there is no need for any additional hardware or software systems in the simulator. The simulator has the ability to model a BEACON failure. With this level of functionality, the core parameters modeled and displayed in the simulator are indistinguishable from the actual plant.

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NND-16-0109

Enclosure 11

Acronyms & Definitions

(This Enclosure consists of 6 pages, including this cover page)

1.0 Acronyms

ADS	Slow Primary System Depressurization to Saturated Condition
ANS	American National Standards
AO	Axial Offset
APP	Application
APS	Alarm Presentation System
ATWS	Anticipated Transient Without SCRAM
BEACON	Best Estimate Analyzer for Core Operations – Nuclear
BL7	Baseline 7
BL8	Baseline 8
CAP	Corrective Action Program
CAPAL	Corrective Action, Prevention and Learning (WEC electronic document control)
CAS	Commission Approved Simulator
CB&I	Chicago Bridge and Iron
CET	Core Exit Thermocouple
CLFs	Component Level Failures
CFR	Code of Federal Regulations
CMS	Configuration Management System
CMT	Core Makeup Tank
CR	Condition Report
CSF	Critical Safety Function
CSV	Comma-Separated Value
CTMT	Containment
DCP	Design Change Package
DG	Diesel Generator

DRCS	Digital Rod Control System
EHC	Electro-Hydraulic Control
FW	Feedwater
FRP	Functional Restoration Procedure
GOP	General Operating Procedure
GSE	GSE Systems. This is the name of the simulator vendor contracted by Westinghouse
HEDs	Human Engineering Discrepancies
HFE	Human Factors Engineering
HSI	Human-System Interface
HX	Heat Exchanger
I&C	Instrumentation and Controls
IC	Initial Condition
ICRR	Inverse Count Rate Ratio
IIS	Incore Instrumentation System
ISV	Integrated Systems Validation
ITAAC	Inspection, Test, Analysis and Acceptance Criteria
IR	Intermediate Range Power
IRWST	In-Containment Refueling Water Storage Tank
IVR	In-Vessel Retention
LOAs	Local Operator Actions
LOCA	Loss of Coolant Accident
MS	Main Steam
MSL	Main Steam Line
MSR	Moisture Separator Reheater
NAPS	Nuclear Application Programs

NRC	Nuclear Regulatory Commission
OPDMS	Online Power Distribution Monitoring System
P1	Priority 1
P2	Priority 2
PBX	Private Branch Exchange
PDSP	Primary Dedicated Safety Panel
PHED	Potential Human Engineering Discrepancy
PORVs	Power-Operated Relief Valves
PRA	Probabilistic Risk Assessment
PRS	Plant Referenced Simulator
PZR	Pressurizer
RAIs	Requests for Additional Information
RCPs	Reactor Cooling Pumps
REN-MAN03	Reference to a specific RIHA
RIHA	Risk Informed Human Actions
RITS	RRAS Issue Tracking System (WEC CAP)
ROPCS	Reactor Operator Peer Check System
RX	Reactor
SAT	Systematic Approach to Training
SBT	Simulator Scenario-Based Testing
SCANA	SCANA is not an acronym, but is taken from the letters in South Carolina
SDR	Simulator Discrepancy Report
SFCVs	Start-up Feedwater Control Valves
SFW	Startup Feedwater
SG	Steam Generator
SGWL	Steam Generator Water Level

SCE&G	South Carolina Electric & Gas Company
SNC	Southern Nuclear Company
SOP	System Operating Procedure
STGR	Steam Generator
STS	Simulator Training System
TB	Turbine Building
TNA	Training Needs Analysis
UIs	Unresolved Items
UFSAR	Updated Final Safety Analysis
VCS	Virgil C. Summer Nuclear Station
V&V	Verification and Validation
VEGP	Vogtle Electric Generating Plant
VHS	Health Physics and Hot Machine Shop HVAC System
WEC	Westinghouse Electric Company
WPIS	Wall Panel Information System
WPNS	Wall Panel Navigation System
WR	Wide Range

2.0 Definitions

Priority 1	Westinghouse Alarm Criteria (based on App-DDS-J4-010, Appendix B, Rev 2) - Less than five minutes to respond, consequence can be a plant trip or ESF actuation. This also includes radiation release or protection of personnel.
Priority 2	Westinghouse Alarm Criteria (based on App-DDS-J4-010, Appendix B, Rev 2) - five to 20 minutes to respond prior to degradation to a P1 condition. This may also include alarms that are important to operability requirements with time-sensitive actions. Examples include bistable trips that result in a P1 condition.
Simulator	Simulator Training System

Training Needs Assessment

An appraisal by a subject matter expert of a simulator deviation, deficiency, or modification, and its relative importance to the operator as required tasks are performed.

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 12

Westinghouse Authorization Letter CAW-16-4363, Application for Withholding Proprietary Information From Public Disclosure, Accompanying Affidavit, Proprietary Information Notice and Copyright Notice

(This Enclosure consists of 10 pages, including this cover page)

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CAW-16-4363

April 20, 2016

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: Transmittal of "Evaluation of AP1000 Simulation Facility Summary of Unresolved Items (UIs) Issued By the NRC," "Evaluation of Priority One (1) Potential Human Engineering Discrepancies (PHEDs) from Integrated Systems Validation (ISV) Daily Assessments," "List of Open Simulator Discrepancies," and "NRC Requests for Additional Information (RAIs) related to Southern Nuclear Company's request for a Commission-Approved Simulator"

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-16-4363 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by South Carolina Electric and Gas Company (SCE&G).

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-16-4363, and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

Very truly yours,

Paul A. Russ, Director
Licensing & Regulatory Support

ATTACHMENT 2

AFFIDAVIT

CAW-16-4363
April 20, 2016

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, Paul A. Russ, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Paul A. Russ, Director
Licensing & Regulatory Support

(1) I am Director, Licensing & Regulatory Support, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in NND-16-0109 Enclosure 5P, "Evaluation of AP1000 Simulation Facility Summary of Unresolved Items (UIs) Issued By the NRC" (Proprietary), NND-16-0109 Enclosure 8P, "Evaluation of Priority One (1) Potential Human Engineering Discrepancies (PHEDs) from Integrated Systems Validation (ISV) Daily Assessments" (Proprietary), NND-16-0109 Enclosure 9P, "List of Open Simulator Discrepancies" (Proprietary), and NND-16-0109 Enclosure 13P, "NRC Requests for Additional Information (RAIs) related to Southern Nuclear Company's request for a Commission-Approved Simulator" (Proprietary), for submittal to the Commission, being transmitted by South Carolina Electric and Gas Company (SCE&G) letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control

Desk. The proprietary information as submitted by Westinghouse is that associated with V. C. Summer commission approved simulator, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to:

(i) Manufacture and deliver products to utilities based on proprietary designs.

(b) Further this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of similar information to its customers for the purpose of licensing new nuclear power stations.

(ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

ATTACHMENT 3

PROPRIETARY INFORMATION NOTICE

CAW-16-4363
April 20, 2016

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station (VCS) Units 2 and 3

NND-16-0109

Enclosure 13

NRC Requests for Additional Information (RAIs) related to Southern Nuclear Company's request for a Commission-Approved Simulator

(This Enclosure consists of 19 pages, including this cover page)

Three Requests for Additional Information (RAIs) were issued by the NRC for the Southern Nuclear Operating Company (SNC) Request for a Commission-Approved Simulation Facility that was submitted to the NRC by letter dated September 18, 2015 (ML15265A107). This attachment addresses each RAI as they pertain to South Carolina Electric & Gas Company's (SCE&G) request for a Commission Approved Simulation Facility.

First Request for Information

On November 16, 2015, (ML 15327A009) SNC provided information to supplement its Request for a Commission-Approved Simulation Facility.

The supplemental information related to 10 Potential Human Engineering Discrepancies (PHEDs) that have been identified by Westinghouse as Priority 1 PHEDs. These PHEDs were not included in the list of Priority 1 PHEDs that SNC provided to the NRC in its initial submittal. The 10 additional PHEDS were the result of further analysis of Integrated System Validation (ISV) test results and Design Verification by Westinghouse human factors engineering. The information provided by replaced Enclosure 8 of SNC's letter dated September 18, 2015, in its entirety.

Accordingly, Enclosure 8 of this submittal reflects the SNC RAI PHEDs with regard to the South Carolina Electric & Gas Company's request for a Commission Approved Simulation Facility.

Second Request for Information

The NRC issued an additional RAI to SNC on November 9, 2015 (ML15313A561). Table S-1 (see below) provides the SCE&G response to these RAIs.

Since the CAS submittal, some of the items for which the NRC requested additional information have been closed. For those issues, VCS did not provide detailed closure information in its response. However, additional closure details are available should the NRC require this information.

The items in Table S-1 (see below) generally follow the sequence of questions that appeared in the RAI that SNC received from the NRC. However, some questions are regrouped to enhance clarity and understanding when commonality amongst the issues existed.

Third Request for Information

The NRC issued an additional RAI to SNC on February 10, 2016 (ML16041A153). The following provides the SCE&G response to this RAI.

VCS 2&3 is compliant with 10 CFR 55.49 requirements. SCE&G has not engaged in any activity that compromises the integrity of any application, test, or examination required by 10 CFR 55.49. Specifically, as required by this Part and relating to the number and type of known simulator discrepancies (including Integrated System Validation discrepancies), the actions taken in response to these discrepancies have not affected the equitable and consistent administration of the test or examination.

In order to determine the effects of simulator discrepancies, an independent assessment of the known simulator discrepancies (including Integrated System Validation discrepancies) was performed. The actions identified as a result of that assessment did not result in a reduction in meeting the quality and quantity criterion I attributes of exam scenarios as defined by NUREG-1021.

SNC CAS Request Supplements – Scenario Based Training

On March 18, 2016, and March 23, 2016, SNC provided supplements to their CAS request for an issue identified during the NRC initial licensing examination preparation week. SCE&G has reviewed this issue for applicability to VCS Units 2 and 3, and makes the following commitments:

1. VCS commits to NEI 09-09, “Nuclear Power Plant-Referenced Simulator Scenario Based Testing Methodology,” Rev. 1.

2. VCS will communicate final SBT runtimes to the NRC Region II Operator Licensing Branch prior to the NRC examination preparation week.

VCS will discontinue this modified process (Items 1 and 2) upon declaration of its simulation facility as a plant-referenced simulator as defined by 10 CFR 55.46(c).

Table S-1

RAI	Table	Description	Ref #	SNC Evaluation
• Have additional changes been made since the ISV to manage feedwater flow oscillations? • For the simulator, what is the expected performance for SFW valve cycling and when will it be obtained? • Please confirm that this discrepancy is limited to shutdown conditions. It was the staff's understanding from ISV observations that this discrepancy was observed at low power during startup activities. • The first 3 discrepancies were noted as key drivers associated with secondary plant challenges. The last two (6157/6172) were not included. None of the 5 are on the index of proposed corrections. Please explain what corrective actions are being taken to address the secondary control challenges. • Please address the following staff concern: Increased workload distracts from operator's attention from analysis and decision making requirements of exam scenario. The workload is being created by incomplete modeling of expected plant performance. This creates the potential for a license applicant who does not pass the exam scenario to challenge the results knowing that the simulator doesn't model actual workload.	E5-1 E9-1	Feedflow oscillations	SDR# TO-54 SCR# 6151	Multiple corrections have been implemented in the plant secondary side systems since the Integrated Systems Validation (ISV). These include: - Adjustments to the tuning characteristics of the [ ]a,c. - Main Steam System Steam Dump modeling, Condenser Hotwell Makeup/Reject modeling and timing sequence of secondary plant system component calculations performed by the model. Observations of these indications, prior to corrections, [ ]a,c. After corrections were made, [ ] a,c. Operator intervention was not required to maintain plant secondary side system tank levels. VCS has determined DST level and feedflow oscillations no longer impact the complexity or workload on the operator and the resolution of these issues removes any impact on the suitability of the simulator for the conduct of operating tests.
	E9-1	Plant issue with automatic control of DST level and autostart of standby Condensate pump	SDR# TO-88 SCR# 5655	
	E9-1	FWS-V037 Control issue	SDR# 1506-37 SCR# 6156	

RAI	Table	Description	Ref #	SNC Evaluation
• The first 3 discrepancies (6151/5655/6156) were noted as key drivers associated with secondary plant challenges. The last two were not included. None of the 5 are on the index of proposed corrections. Please explain what corrective actions are being taken to address the secondary control challenges. • Please address the following staff concern: Increased workload distracts from operator's attention from analysis and decision making requirements of exam scenario. The workload is being created by incomplete modeling of expected plant performance. This creates the potential for a license applicant who does not pass the exam scenario to challenge the results knowing that the simulator doesn't model actual workload.	E9-1	SGS MSL drain pot erratic indication	SDR# 1508-13 SCR# 6157	The main steam line drain pot erratic indications were observed twice during testing. There have been no occurrences during training scenarios and no operator action was required in either of the occurrences during testing. [ ]a,c. Operators will respond to the drain pot high level alarm per the Alarm Response Procedure. [ ]a,c. These actions have minimal impact on the workload or complexity of operator actions required. VCS has determined Main Steam Line Drain Pot erratic indications do not impact the suitability of the simulator for the conduct of operating tests.
	E9-1	Polisher bypass valve control	SDR# 1507-43 SCR# 6172	The condensate polisher bypass valve operation requires experience with the operation of the valve and system response to obtain stable flow conditions when the condensate polishers are in service. At the time this discrepancy was identified, operators did not have this experience. However, operators have now demonstrated that they are able to achieve stable flow conditions and proper operation of the condensate polisher bypass valve has been observed. VCS has determined the condensate polisher bypass valve control does not impact the suitability of the simulator for the conduct of operating tests.
• Why is an alarm reflecting a power loss occurring when the power loss has not occurred? • The CAS submittal appears to address an inconsistent alarm initiation following a power loss. Is the problem statement accurate? (Current problem statement, "Rod control urgent failure on loss of EK-12 appears inconsistently without loss of power.")	E5-1	Rod control urgent failure on loss of EK-12 appears inconsistently without loss of power	SDR# 1501-08 SCR# 6726	Closed. Fixed with CAS 123 patch set, and retested satisfactorily. V&V testing was performed successfully.

RAI	Table	Description	Ref #	SNC Evaluation
• Does training reinforce the procedural direction to maintain plant conditions within the more restrictive operating curves?	E9-1	RCP Net Positive Suction Head Curve - Display 60029 needs extension	SDR# 1506-03 SCR# 5577	The graphical display in question is an operator aid used during transition in plant conditions where Net Positive Suction Head (NPSH) margins are reduced. The actual limits associated with maintaining NPSH are in the System Operating Procedure (3-RCS-SOP-001 Att. 9) with individual graphs for each Reactor Coolant Pump (RCP) speed setting. Crews adhere to the requirements of the procedure. The use of the procedure graphs provide correct limitations for the transition period when the crew shifts to and from the use of the Normal Residual Heat Removal System (RNS) suction pressure for determination of NPSH margin. VCS has determined display graphic 60029 does not impact the suitability of the simulator for the conduct of operating tests.
• What is the design condition that must be alleviated? Explain how it affects the simulator capability to support license exams.	E5-1 E9-2	Determine if ventilation system response is correct (VAS, VRS, (VFS) systems)	1 SDR# 1501-02 SCR# 6410	Closed. Fixed with CAS 123 patch (changes made in logic timing to align flowpath earlier) and retested successfully 2/16/16. V&V testing was performed successfully.
• Significant CET swings were noted during the ISV but were not addressed in the aggregate study. Explain how these swings were addressed for the SNC simulators.	N/A	CET temperature goes erratic after a LBLOCA with no passive cooling in place	SDR# 1502-07 SCR# 6428	[ ]a,c

RAI	Table	Description	Ref #	SNC Evaluation
• Response appears to address NRC#22 (PZR water level variation) but not NRC#20 (Decreasing PZR water level). Explain why water level goes down on a leak through the PZR safety.	E5-1	Pressurizer (PZR) Level went down in 2 of 3 training scenarios with the leak through the PZR safety PZR Water Level response during Safety valve malfunctions has variations in tests	SDR# 1502-08 1502-12 SCR# 6484	A review of NRC Unresolved Items #20 and #22 was performed. These issues are related in that they both pertain to Pressurizer (PZR) level response to a leak through the PZR Safety Valve. [ ]a,c The focus of the issue for UI #20 was that the level went down, as expected, for 2 crews, but up for the 3rd crew. That 3rd crew was observed to have an [ ]a,c. During this prolonged time the pressurizer level became low enough that surge line flooding began to occur. This item is closed. The SDR associated with UI #22 was written during [ ]a,c. the plant response is now concluded to be as expected. In all tests conducted, the station has only ever observed the repeatable, minor differences/oscillations as described in the SDR. The minor differences in the timing of the inventory recovery and the highest observed Pzr level do not affect operator decision points during this accident sequence. ANSI 3.5 does not require a tolerance on plant parameters during malfunctions, just that parameters move in the same direction as those expected from the reference unit. The stated responses move in the direction expected and the variances do not introduce challenges to operational analysis, decision making and action.

RAI	Table	Description	Ref #	SNC Evaluation
• Explain how updated procedure basis documents ensure the timely assessment of CMT operating status. • Does 6217 (bad quality on WR level indication) affect this assessment? • Did HED#2 contribute to HED#3? (In Table E8-1, HED#3 says see #2.)	E5-1	Manual DAS ADS stage 1-3 and 4 actuation. Manual DAS IRWST injection actuation.	SDR# 1503-08 SCR# 5998	Reactor Trip or Safeguards Actuation (E-0) Step 8.b was changed as follows: [.]a,c A discussion on the design of the Core Makeup Tank (CMT) outlet check valves and the proper temperature indications to verify proper CMT operation was added to the basis document. In addition, another "KNOWLEDGE" item was added to the basis document to clarify the proper temperature response as follows [ ]a,c The CMT Wide Range (WR) level does affect the evaluation of CMT status in that the WR level instruments are one of three different indications that could be used during this diagnosis. The Narrow Range (NR) level and CMT top temperature indications can be used and therefore, the lack of a CMT WR level indication does not prevent operators from making this determination. Both requirements have a specified time window for actions to be taken. Delays resulting from crew discussions regarding the determination of CMT operation ultimately prevented those time requirements from being met. The two HEDs are related in that they share the same solution. The procedure and basis document changes provide the operator with the required direction and understanding to properly determine the CMT status. As a result of these changes, this issue no longer impacts the suitability of the simulator to conduct operator tests.

RAI	Table	Description	Ref #	SNC Evaluation
• Explain how updated procedure basis documents ensures the timely operation for:	N/A	Failure to recognize the need and failure to open recirculation valves to flood reactor cavity after core damage.	HED #5	The updated background document for F-0 now specifies that [ ]a,c Specifically, the following statement was added: [ ]a,c In addition, the portion of the background document which provided guidance regarding a condition coming in and clearing was modified to include: [ ]a,c The basis document change provides the operator with the required knowledge to implement FR-C.1 when conditions warrant. The clarification of the condition where plant indications are oscillating around an entry condition aid in proper entry of FR-C.1 and any other FRP where this may occur. As a result of these changes, this issue no longer impacts the suitability of the simulator to conduct operator tests.
		Failure to manually actuate DAS containment recirculation/IRWST drain	HED #6	
		Failure to manually actuate VLS using DAS	HED #8	
• Need more info on why this condition is acceptable. Why does this not challenge approach to criticality? • What Is the impact on the automatic functions (demin water isolation from the RCS and charging makeup pump trips)?	E9-1	Flux doubling difference between divisions	SDR# 1506-38 SCR# 6175	Closed. Corrected prior to simulator delivery. This issue was incorrectly identified as an outstanding open item by the vendor on simulator delivery due to incomplete documentation closeout by vendor.

RAI	Table	Description	Ref #	SNC Evaluation
• Understand the aggregate but not the individual impact. • Do M1 and M2 banks always move together so the correct RIL alarm on M1 provides sufficient alarm?	E9-1	OPDMS RIL for M2 does not match COLR Rev. 0	SDR# 1504-06 SCR# 5736	Per the Core Operating Limits Report (COLR) M2 rods are required to be fully withdrawn for all power levels. M2 and M1 rods overlap during the last [ ]a,c steps of M2 rod withdrawal. Therefore, when M1 rods are at [ ]a,c steps withdrawn, M2 rods are at the top and meet the required Rod Insertion Limit (RIL). M1 rods have a linear RIL based on current power levels with the lowest RIL level being [ ]a,c. steps withdrawn at [ ]a,c. power. The M1 RIL alarms, established at [ ]a,c respectively, before M2 rods begin to move with normal rod sequencing. This will result in operators taking action per the M1 RIL alarm to restore rod positions. If a malfunction were to occur, causing M2 rods to begin inserting before the bank overlap was met, a "Bank Out of Sequence" alarm would occur, directing operators to the Rod Control Malfunction Abnormal Operating Procedure which, in turn, would lead them to identify the RIL violation and to initiate the appropriate actions. For this reason, VCS has determined that this does not impact the suitability of the simulator for the conduct of operating tests.
• Will Bank overlap indication still be in error? • If so what is the expected operator action? • From the problem statement and disposition it appears that indication is changing but the change has no meaning yet it is part of the design. This seems like a very confusing situation for the operator on a reactivity related parameter.	E7-1 E9-1	Improper bank overlap occurs when data point OCB07CE00C_OUTAV is incremented during Rx startup	SDR# 1506-42 SCR# 6302	Westinghouse provided input that invalidates this issue. This point is internal to the Instrumentation & Control (I&C) control sheet only and is transparent to the operator. VCS has determined this issue has no impact on the suitability of the simulator for the conduct of operating tests.
• When these alarms occur, what priority is assigned by APS? • How frequently do they occur? • Do the answers to the previous questions cause one to think they could be a distraction?	E9-2	Simulator Operations (SIMOPS) datalink alarms incorrect	SDR# TO-134 SCR# 5608	These alarm points only occur on a datalink failure. These alarms are low priority, and are addressed after all higher priority alarms. Operator action for these alarms is to check a display and notify I&C to investigate. Datalink failures have not occurred during training or evaluation scenarios. VCS has determined that this does not impact the suitability of the simulator for the conduct of operating tests.

RAI	Table	Description	Ref #	SNC Evaluation
• These discrepancies (5603/5621/6186/5686/6099/5903) contain generic disposition statements that do not directly explain why the discrepancy does not affect the simulator's ability to implement exam scenarios. However, the staff was able to reach a conclusion on the discrepancy without additional information. Since we quoted your disposition and noted that the disposition delta in our safety evaluation conclusions, we are providing this list so you can provide additional basis information if you choose too.	E9-1	Investigate validity of low flow alarm on TCS-FT007	SDR# 1503-33 SCR# 5603	SCE&G has determined that this issue is acceptable and that it does not impact the simulator's suitability for the conduct of operating tests. The simulator is correctly modeling the present plant design. This issue is based on the inability of the TCS temperature control valve, controlling H2 cooler temperature, to establish a steady state position. Corrective Action Program And Learning (CAPAL) 100221278 was sent to CB&I for a design or I&C change. CB&I responded by informing SCE&G that the heat exchanger is too large. This corresponds to the Simulator response. Because the heat exchanger is too large, the temperature control valve is forced closed to prevent over-cooling. Because the valve is fully closed, when the temperature reaches a point where the valve needs to open, the response time is too slow and temperature doesn't begin to lower before a high temperature alarm is received. As the valve continues to open, temperature turns and begins to lower, but the temperature drop occurs faster than the valve can respond and the valve is once again forced closed. However, even in steady-state conditions a small modulation of the temperature control valve will result in temperature lowering. CB&I will need a better control scheme or an actual heat exchanger design change. This cycling of temperature from a low to a high value occurs over approximately 2 hours (from points where the over-cooling has occurred and high temperature alarm is received). A mitigating strategy has been put in place to establish the initial conditions and then save those initial conditions immediately after the temperature has been lowered. This provides the maximum amount of time before a high temperature alarm is received. Most training scenarios are either less than 2 hours OR result in placing the plant in a condition where H2 cooling is no longer required prior to this 2 hour window expiring. [ ]a,c.

RAI	Table	Description	Ref #	SNC Evaluation
	E9-1	Problems with Alarm Cutout and RWS pressure alarms	SDR# 1508-67 SCR# 5621	This SDR is associated with VNP site specific SCRs. The VCS site specific system does not have these discrepancies.
	E9-1	Tracking issue for rod step sound problems	SDR# 1506-39 SCR# 6186	Although the audible step counter does not synchronize exactly with the actual rod step indication, the operator is still alerted to automatic rod motion. Operators are trained to use all indications when monitoring rods while in automatic or manual. VCS has determined that since the audible step counter still alerts the operator of rod movement it does not impact the suitability of the simulator for the conduct of operating tests.
	E9-1	Degasifier Level Alarm Limits	SDR# TO-17 SCR# 5686	The Liquid Waste System (WLS) degasifier works as designed. Operators use the alarm procedure to respond to degasifier alarms. For that reason, this issue is transparent to the operator. If the High-3 value is reached, the system responds as designed and provides all the correct indications to an operator via the control graphics. VCS has determined the Point Information page issue does not impact the suitability of the simulator for the conduct of operating tests.

RAI	Table	Description	Ref #	SNC Evaluation
	E9-1	DWS-LT006 has insufficient range	SDR# 1507-12 SCR# 6099	The current range indication functions as designed. The control circuit closes the Condensate Storage Tank (CST) makeup valve at the required level and an alarm is received at the design level of [ ]$_{a,c}$ The issue with the total inches of the indication in the calculation note relates to the model and where the model begins to initiate overflow out of the CST. The model initiates overflow before the alarm is received and therefore prevents level from rising to a point which would result in an alarm. However, there is no indication of overflow available to an operator in the Main Control Room and the CST level indications available to an operator are able to be manipulated at the simulator instructor station to raise level indications to cause a high level alarm and force operator action if desired. VCS has determined this issue is transparent to the operator and has no impact on the suitability of the simulator for the conduct of operating tests.
	E9-1	Inconsistent OPDMS QPTR Indications	SDR# 1504-07 SCR# 5903	The Quadrant Power Tilt Ratio (QPTR) indications in the Online Power Distribution Monitoring System (OPDMS) are correct for both upper and lower excore detectors and the incore detectors. The issue is related to how these indications are oriented on the respective graphics (i.e. "North" side of core points toward the top of the display monitor on one graphic and points toward left side of display monitor on the other graphic). The orientation of the graphics have no impact on an operator's ability to determine QPTR VCS has determined this does not impact the suitability of the simulator for the conduct of operating tests.
• Describe impact of this discrepancy. When are the indications used and for what? • Does the "Crossed alarms" create potential confusion in understanding rod position?	E7-1 E9-1	DRPI Health Screen has alarms for Data Cabinet A and B crossed	SDR# 1410-02 SCR# 5924	Closed. Fixed with CAS 123 patch and retested successfully 2/16/16. V&V testing was performed successfully

RAI	Table	Description	Ref #	SNC Evaluation
• Alarm labeling appears to introduce confusion on the status of a significant component. This confusion could challenge exam consistency. Explain why this does not happen. The discrepancy disposition in the CAS submittal addressed impact on training rather than the impact on the simulator's capability to support license exams.	E9-1	RCP Vibration Alarms	SDR# 1506-19 SCR# 6025	When a Reactor Coolant Pump (RCP) vibration alarm is received, the text description shown in Alarm Presentation System (APS) uses [ ]a,c with the intention for these to mean [ ]a,c Standard AP1000 practice is the [ ]a,c. would indicate [ ]a,c A level of alarm [ ]a,c appears in the next APS column and the correct alarm response procedure is linked to each of the alarm points. When the alarm is received, the operator accesses the Alarm Response Procedure and takes action as directed by the procedure. VCS has determined that this does not impact the suitability of the simulator for the conduct of operating tests.
• Clarify disposition statement. What is meant by 'other faults are available? Are other independent alarms and indications available to identify the regulator failure?	E9-1	APS ZVS and ZBS alarm scaling	SDR# 1508-44 SCR# 6171	Closed. This issue was identified during Integrated Systems Validation. All ZVS and ZBS alarms at VCS have been verified to have proper alarm scaling
• Is the operator able to use the narrow range for all procedural requirements (including verification of plant performance)?	E9-1	CMT WR Level Indications go Bad Quality	SDR# 1506-02 SCR# 6217	Verification of proper Core Makeup Tank (CMT) operation is verified using CMT Wide Range (WR) level, Narrow Range (NR) level and/or Top temperature. [ ]a,c. For this reason, VCS has determined that this issue does not impact the suitability of the simulator for the conduct of operating tests.
• Provide more information on the impact of this discrepancy on the simulator's capability to implement exam scenarios. • How frequently does the initiating condition occur? (It is acknowledged that any alarm condition can be addressed by an operator response following procedures. But it the condition occurs without being scripted in the exam scenario it can create complexity and confusion that challenge the exam objectives)	E7-1 E9-1	Received Bank Sequence Out of Sequence Alarm	SDR# 1506-40 SCR# 6259	Acceptance criteria not fully met. (This item was not included in the patch received from WEC.) SCE&G has determined that this issue does not impact the simulator's suitability for the conduct of operating tests. This is an AP1000 plant design issue. The simulator models plant design. If operators encounter this condition, they will follow their procedures. The procedure provides the steps necessary for operators to respond to the condition.

RAI	Table	Description	Ref #	SNC Evaluation
• Verify the problem statement is correct – the first paragraph seems to imply two cases but it is not clear what the second case is. Is the alarm valid? • If the simulator reflects the plant design what is the discrepancy? • Provide more information on the impact of this discrepancy on the simulator's capability to implement exam scenarios.	E7-1 E9-1	Urgent Alarm during Case 2 CRE at 90% Power	SDR# 1506-41 SCR# 6267	Closed. Corrected with training-load, simulator software; version 1.2.0. Verification and validation testing was performed successfully.
• Are there alternate indications the operator would use that have sufficient range to address procedure requirement for isolation? Note: This is another example of where the disposition does not address the simulator capability to support licensing exams.	E9-1	During simulator scenario validation CDS-TE040A/B range found to be inadequate.	SDR# 1504-08 SCR# 5921	The Blowdown System (BDS) Heat Exchangers (HXs) only have one Condensate System (CDS) outlet temperature for each BDS HX and there are no alternate indications available to an operator. Instrument indications are provided with an up or down triangle next to the reading to indicate the detector has reached the top or bottom of the indicating range, respectively. The detector in question displays this triangle when the temperature reaches [ ]a,c The indication continues to rise to a max reading of [.]a,c At [ ]a,c the BDS should, and does, isolate as expected. The information associated with the detector range requires correction to cause the end of range (up or down triangle) to appear at the correct level. This issue does not prevent an automatic function from occurring and therefore does not impact the complexity or workload of actions taken by an operator. VCS has determined that this issue does not impact the suitability of the simulator for the conduct of operating tests.
• The discrepancy states that the procedure may not be correct yet the disposition credits the procedure for providing appropriate guidance. Resolve this disconnect. Explain why the graphic issue does not affect operational decisions.	E9-1	WPIS RCS inventory screen issues	SDR# 1507-25 SCR# 6154	Hot legs are shown as [ ]a,c diameter on Wall Panel Information System (WPIS) graphic & procedure but are actually[ ]a,c per APP-RCS-M6-001. Operators are trained to utilize the procedure. This graphic would only be used during mid-loop operations and therefore is infrequently used. This is a design issue with regards to display of the hot leg level span on the Ovation graphic. VCS has determined that this issue does not impact the suitability of the simulator for the conduct of operating tests.

RAI	Table	Description	Ref #	SNC Evaluation
• Explain the impact of missing power supplies on the simulator's capability to support license exams	E9-1	EDS Power Supply to PLS/DDS cabinets not IAW EDS Load List	SDR# TO-71 SCR# 5546	The impact of the non-modeled power supplies with regard to Ovation "Drops" only impacts Priority 4 Equipment alarms. The action required by an operator in response to a Priority 4 Equipment alarm is to notify I&C. This does not impact the complexity or workload of actions required by an operator and, as such, does not impact the suitability of the simulator for the conduct of operating tests.
• Discrepancy is characterized as occurring with low frequency. Quantify low frequency. How complicated are the recovery actions? • How does the loss of communication between WPIS displays and operator stations affect analysis and decision making?	E9-2	OCS Wall Panel Navigation System (WPNS) and Reactor Operator Peer Check System (ROPCS) Rebuild Required	SDR# TO-109 SCR# 6197	This issue appears most commonly during the initial setup of the simulator prior to operators entering the simulator. To date, no occurrences of this issue have been reported during training scenarios on SNC's simulator. If communication is lost during a scenario, the operator would respond per the Abnormal Operating Procedure, Malfunction of Data Display and Processing System (DDS). The actions required would be to verify conditions are stable and then contact I&C to investigate. All indications would still be available to an operator at the operating station. For this reason, VCS has determined this issue does not impact the suitability of the simulator for the conduct of operating tests.
• The disposition indicates the discrepancy is acceptable because there is a design change tracking it and current documentation states that the behavior is correct. This seems contradictory. Explain how the condition affects the simulator's capability to support license exams.	E9-1	VCS fan response due to loss of power	SDR# 1501-03 SCR# 216	The issue was identified when [ ] a,c The simulator responded as designed. Westinghouse is evaluating a possible change to the control scheme to change the inputs used for the auto-start feature. Containment Recirculation Cooling System (VCS) fan configuration is checked in multiple Emergency Network procedures. If the fans are not aligned properly, the operator is required to establish the correct configuration by starting fans and opening dampers. These actions do not impact the complexity or workload of actions taken by an operator. VCS has determined that this design feature and its affect on the operators does not impact the suitability of the simulator for the conduct of operating tests.

RAI	Table	Description	Ref #	SNC Evaluation
• Are procedures, operator aids, mimics and training consistent with current power supply lineup?	E9-1	CVS-V094 Power Failure	SDR# 1507-39 SCR# 6019	The power supply for CVS-V094 is inconsistent with current design documents in that it is [ ]a,c.The only time this would cause a possible concern is if a [ ]a,c. There are no concerns associated with the indications available to, the procedures used or the controls manipulated by an operator due to the alternate power supply. VCS has determined this has no impact on the suitability of the simulator for the conduct of operating tests.

RAI	Table	Description	Ref #	SNC Evaluation
• Which loads are not modeled? • Which of these loads requires some kind of operator action and what is that action? • Do these actions add limitations or significant confusion or complexity to exam scenarios?	E9-1	Model ECS-EC-313 loads	SDR# 1508-48 SCR# 6593	The loads which are not modeled are: - [- -]a,c. The loss of ECS-EC-313 requires no operator action and adds no limitations, significant confusion or complexity to exam scenarios. VCS has determined that these loads not being modeled has no impact on the suitability of the simulator for the conduct of operating tests.

RAI	Table	Description	Ref #	SNC Evaluation
• Explain why the failure to repower multiple busses is transparent to the operator and why the operator would not notice this condition (these statements come from the disposition paragraph). These statements seem to contradict the general procedure practice to verify automatic actions have occurred. This discrepancy appears to introduce additional workload which adds complexity and potential confusion into the operational analysis and decision making process and thus challenges the ability to administer consistent exam scenarios. If this is not the case please explain why.	E9-1	Potential issue with DG Sequencer	SDR# 1507-54 SCR# 6610	The busses in question are [ ]a,c busses/panels that supply power to respective building lighting, receptacles and small pieces of equipment (e.g. water fountains, water heaters, etc.). Loss of these busses does not require entry into any Abnormal or Emergency Operating procedure (AOP and EOP). Additionally, AOPs and EOPs only require verifying the restoration of power to the [ ]a,c. tier (EC busses). Ovation screens available to the control room operators provide indication of the feeder breaker to these busses/panels. However, there is no control function available for the various loads. Verifying the restoration of power to these busses/panels is not required by AOPs or EOPS and does not add additional complexity or workload to the control room operators. VCS has determined this issue poses no impact on the suitability of the simulator for the conduct of operating tests.