Thomas D. Gatlin
Vice President, Nuclear Operations
803.345.4342

SCE&G®
A SCANA COMPANY

April 18, 2011
RC-11-0062

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

ATTN: R. E. Martin

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS)
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
LICENSE AMENDMENT REQUEST - LAR 04-02961
License Amendment Request For Slave Relay Surveillance Testing

References: Reliability Assessment of Westinghouse Type AR Relays Used As SSPS Slave Relays [ML003754227]

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, South Carolina Electric and Gas Company (SCE&G), acting for itself and as an agent for South Carolina Public Service Authority (Santee Cooper), hereby requests the following amendment for Virgil C. Summer Nuclear Station (VCSNS), Technical Specifications (TS). The proposed change would revise TS table 4.3-2 and TS Basis 3/4.3.2. This change will allow the surveillance frequency to be expanded from quarterly to every 18 months or refueling. The change is specific to the Engineered Safety Feature Actuation System Instrumentation where Westinghouse type AR relays are used as Solid State Protection System slave relays or auxiliary relays. The change to the Basis section 3/4.3.2 will add reference to the Westinghouse topical report WCAP-13877-P-A, Revision 2 as the basis for extending the frequency.

SCE&G requests approval of the proposed amendment by April 18, 2012. Once approved, the amendment shall be implemented within 120 days.

This proposed change has been reviewed and approved by both the VCSNS Plant Safety Review Committee (PSRC) and the VCSNS Nuclear Safety Review Committee (NSRC).

If you should have any questions regarding this submittal, please contact Mr. Bruce L. Thompson at (803) 931-5042.

A001
NRR

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

4/18/11
Executed on

Thomas D. Gatlin

JMG/TDG/jw

Enclosures:
- Licensee's evaluation of the proposed change(s)

Attachments:
1. Proposed Technical Specification Changes (mark-up)
2. Proposed Technical Specification pages (Retyped)
3. List of Regulatory Commitments

cc: K. B. Marsh
S. A. Byrne
J. B. Archie
N. S. Carns
J. H. Hamilton
R. J. White
W. M. Cherry
V. M. McCree
R. E. Martin
NRC Resident Inspector
K. M. Sutton
T. P. O'Kelley
Paulette Ledbetter
NSRC
CR (LAR-04-02961)
File (813.20)
PRSF (RC-11-0062)

Enclosure
Virgil C. Summer Nuclear Station (VCSNS)
Docket No. 50/395
Operating License No. NPF-12

Licensee's Evaluation Of The Proposed Change(s)

Subject: LICENSE AMENDMENT REQUEST – LAR-04-02961 EVALUATION OF THE PROPOSED TECHNICAL SPECIFICATION CHANGE(S) TO TABLE 4.3-2 AND TS BASIS 3/4.3.2

1.0 DESCRIPTION

This license amendment request (LAR) is a request to amend the Technical Specifications (TS) for Virgil C. Summer Nuclear Station (VCSNS).

The proposed change would revise TS table 4.3-2 and TS Basis 3/4.3.2. The proposed change will allow the surveillance frequency to be expanded to every 18 months or refueling from quarterly. The change is specific to the Engineered Safety Feature Actuation System equipment where Westinghouse type AR relays are used as Solid State Protection System slave relays or auxiliary relays. The change to the Basis section 3/4.3.2 will add reference to the Westinghouse topical report WCAP-13877-P-A, Revision 2 as the basis for extending the frequency.

WCAP-13877-P-A, Revision 2 provides the technical justification for relaxing the slave relay surveillance test interval from quarterly to the refueling interval (18 months) for Westinghouse AR type slave relays only. The basis for relaxing the surveillance interval is the reliability assessment, which establishes that for normally de-energized relays the reliability will not change with time and there are no significant factors that will cause the relays to wear out. In normally energized applications aging will have an affect on the reliability therefore a replacement interval is needed in accordance with the guidelines provided in the mentioned WCAP Report.

2.0 PROPOSED CHANGE

The proposed change will revise VCSNS TS table 4.3-2 to reflect a surveillance frequency of 18 months or every refueling versus the current quarterly requirement. Additionally, TS Basis 3/4.3.2 is being revised to add the basis for extending the frequency interval once approved by the NRC.

The proposed change to the surveillance frequency is specific to Westinghouse type AR relays used as Solid State Protection System slave relays or auxiliary relays. WCAP-13877-P-A, Revision 2 is applicable to the Westinghouse Type AR slave relays with AC coils utilized at VCSNS. While some testing at power is essential, safety can be improved, equipment degradation decreased, and unnecessary personnel burden may be prevented by reducing the amount of testing performed. These four criteria form the basis for attempting to justify changes to existing surveillance intervals.

1. The surveillance could lead to a plant transient
2. The surveillance results in unnecessary wear to equipment
3. The surveillance results in radiation exposure to plant personnel that are not justified by the safety significance of the surveillance.
4. The surveillance places an unnecessary burden on plant personnel because the time required is not justified by the safety significance of the surveillance.

Based on VCSNS operating experience, surveillance testing of the Solid State Protection System has resulted in a plant transient where the Letdown System was inadvertently isolated based on a containment isolation signal. The Solid State Protection System when energized to actuate provides output to the following devices through the slave relays:

1. Safety Injection System (pump and valve actuators).
2. Containment isolation (Phase A - "T" signal isolates all nonessential process lines on receipt of safety injection signal; Phase B - "P" signal isolates remaining process lines (which do not include engineered safety features lines) on receipt of 2/4 Hi-3 containment pressure signal).
3. Diesel start.
4. Feedwater isolation.
5. Ventilation isolation valve and damper actuators.
6. Steam line isolation valve actuators.
7. Reactor Building spray pump and valve actuators.

3.0 BACKGROUND

3.1 Surveillance History

Generic Letter (GL) 93-05, "Line Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During Power Operation," was approved in September 1993. This GL is the result of recommendations from a 1983 NRC task group formed to investigate problems with surveillance testing required by Technical Specifications (TS). The objectives of the NRC task group were: 1) to review the basis for test frequencies; 2) to ensure that the tests promote safety and do not degrade equipment; and 3) to review surveillance tests for unnecessary burden on plant personnel. The studies found by reducing the amount of testing at power; overall plant safety could be improved, equipment degradation would be decreased, and unnecessary personnel burden eliminated. The results of the studies were documented in WCAP-13877-P-A, Revision 2 that is specific to the Westinghouse Type AR slave relays with AC coils.

3.2 Solid State Protection System

The Reactor Protection and Safeguards Actuation System encompass all instrumentation, components, and equipment required to protect the reactor core. The most vital component of the system is the Solid State Protection System (SSPS) cabinets. Both reactor trip and engineered safety features actuation functions are performed by the SSPS. Permissive and block functions are also provided. Information concerning the status of the system is transmitted to the MCB and the plant computer. Provisions for testing and maintaining the system with the plant either shutdown or at power are included.

The two SSPS cabinets contain two redundant trains of decision-making and actuation circuitry. The three bays of each cabinet are organized along functional lines. The input bay detects changes in the electrical state of bistables in the four protection channels. The logic bay houses the decision-making circuitry which decides if enough coincidence exists between channels to warrant protection or safeguards actuations. The output bay controls the activation of the Reactor Protection and Safeguards Actuation System functions.

The SSPS cabinet contains the circuits required to control and test the safeguards-actuated loads. These circuits include the master and slave relays and the Output Relay Test Panel. The master relays are small, 48 VDC relays controlled by the safeguards driver cards in the logic bay card frame. Each safeguards driver card can control up to eight sets of master relays. Master relays control, in turn, up to four slave relays. The slave relays are large 120 VAC relays. When energized by their master relay, the slave relays actuate engineered safety feature (ESF) equipment through such control devices as solenoids and motor controllers. The Solid State Protection System when energized to actuate provides output to the following devices through the slave relays:

1. Safety Injection System (pump and valve actuators).
2. Containment isolation (Phase A - "T" signal isolates all nonessential process lines on receipt of safety injection signal; Phase B - "P" signal isolates remaining process lines (which do not include engineered safety features lines) on receipt of 2/4 Hi-3 containment pressure signal).
3. Diesel start.
4. Feedwater isolation.
5. Ventilation isolation valve and damper actuators.
6. Steam line isolation valve actuators.
7. Reactor Building spray pump and valve actuators.

3.3 Westinghouse Type AR Relay

The basic Westinghouse type AR relay consists of a coil assembly and a contact block assembly. The principal components of the contact block assembly are the cover, crossbar, and a set of contact cartridge assemblies. A contact assembly adder block

provides four additional contact poles and is functionally identical to the four-pole contact block assembly. Type AR relays can be equipped with a latch assembly. Some of the slave relays have mechanical latches which provide a "retentive memory" feature. That is, once the slave relay has energized, it remains latched in the energized position even if power is interrupted. These slave relays must be reset electrically.

Westinghouse type AR non-latching relays are either normally energized (NE) or normally de-energized (ND). A relay is considered to be NE if its coil is energized to maintain a desired contact position under normal plant operating conditions. A relay is considered to be ND if its coil is de-energized during normal plant operating conditions. Latching relays are ND.

Typically, a latching relay is used to control functions where loss of power should not cause an inadvertent reset, or where deliberate action is required to reset or terminate a function, such as safety injection. Type AR relays are designed to operate without the aid of gravity. The de-energized contact state is maintained or restored by a return spring. When the relay coil is energized, the upper-half armature is drawn into the coil block assembly, overcoming the resistance of the return spring. The crossbar is pulled along by the action of the relay coil assembly, causing the change of state of the relay contacts. Type AR latching relays are equipped with an ARLA (Type AR with a latch attachment) which is engaged when the relay coil is energized and do not change position when the coil is de-energized. The latch is disengaged by momentarily energizing the latch (reset) coil, allowing the contacts to return to the de-energized state.

3.4 Precedence

The staff's safety evaluation for Westinghouse Topical Reports WCAP-13877-P-A, Revision 2 is specific to the Westinghouse Type AR slave relays with AC coils. The Safety Evaluation Report provided by the NRC requires licensees to comply with the conditions and limitations listed. These conditions and limitations are addressed in Section 4.0. The NRC has allowed the surveillance frequency change in Westinghouse reactors as issued for Vogtle Electric Generating Plant (VEGP) Unit 1 and Unit 2 and Comanche Peak Steam Electric Station (CPSES).

3.4.1 Vogtle Electric Generating Plant

The request by Vogtle [ML003672880] is identical to VCSNS in that the surveillance frequency for slave relays was to be extended to an 18 month or refueling interval. Vogtle later submitted additional information [ML003726819] to the NRC to address the four questions of the Safety Evaluation performed by the NRC on WCAP-13878-P-A. The request by Vogtle was specific to Potter and Brumfield MDR relays covered by WCAP-13878-P-A where VCSNS applies Westinghouse supplied Cutler Hammer type AR relays covered by WCAP-13877-P-A.

3.4.2 Comanche Peak
The request by Comanche Peak [ML012400142] is identical to VCSNS in that the surveillance frequency for slave relays was to be extended to an 18 month or refueling interval. The request was specific to Westinghouse AR relays as addressed within WCAP-13877-P-A.

4.0 TECHNICAL

The NRC Safety Evaluation (SE) for the topical report contains conditions and limitations. The staff requires that licensees referencing the topical report will comply with these conditions and limitations as follows:

1. Confirm the applicability of the WCAP-13877-P-A analyses to their plant.
2. Ensure that the contact loading analysis for type AR relays has been performed to determine the acceptability of these relays.
3. Determine the qualified life for the type AR relays based on plant-specific Environmental conditions, and
4. Establish a program to evaluate the adequacy of the proposed test interval if two or more AR relays fail in a 12-month period.

4.1 Applicability of WCAP-13877-P -A to VCSNS
The Westinghouse WCAP-13877-P-A, Revision 2 does apply to VCSNS. The scope of the Westinghouse WCAP is for Westinghouse type AR relays when used in SSPS slave relay applications. The analysis addresses several configurations (ie. Type AR440, with or without ARLA latching assemblies) and two operating modes of energized or de-energized (normally contacted or normally open). The specific specimens included within the Westinghouse analysis are AR440AR, ARD4T, AR440A, and ARD880S. The AR/ARD relays are electromechanical convertible contact relays. AR relays are available in either 4- or 6-pole configurations. AR relays are easily converted to 8 or 10 poles simply by adding a 4-pole deck. AR relays are AC devices that are not used with DC contact cartridges in the same relay. In addition, mechanical latch and solid-state timer attachments are available with 4- and 6-pole relays.

The slave relays used within the VCSNS SSPS cabinets are large 120 VAC relays. VCSNS slave relays that perform a Technical Specification function are normally de-energized (ND). VCSNS applies the ARLA latching to specific assemblies. The SSPS slave relays and auxiliary relays used at VCSNS are Westinghouse AR440 or AR880 relays that are an AR440 relay with the 4-pole deck or adder block. The SSPS cabinets were purchased from Westinghouse Electric Corporation and were installed during construction. The SSPS cabinet contains the circuits required to control and test the safeguards-actuated loads. These circuits include the master and slave relays and

the Output Relay Test Panel. The specific relay identified within the Westinghouse vendor manual is AR440AR and latch attachment ARLA.

4.2 Contact Loading Analysis for Type AR Relays

VCSNS utilizes Westinghouse supplied, Cutler Hammer type AR relays that are specific to the contacts K600 series located within the SSPS cabinets. The contact load design for VCSNS AR relay contacts were reviewed for inductive loads and found to be within specifications. The inductive loads were reviewed in the early 1990's due to a Westinghouse Technical Bulletin NSD-TB-92-02-RO and were recently reviewed for this LAR. Additionally, surveillance history found no intermittent contact failures indicative of contact erosion of slave relays at VCSNS.

4.3 Qualified Life Determination for Type AR Relays

The design objective for type AR relays is the capability to endure 10 million cycles of operation within estimated duty life. The SSPS is designed to actuate plant engineered safety feature (ESF) components when it receives the appropriate combination of input signals. The logic circuits of the SSPS master relays actuate the slave relays that will trigger the ESF component directly. The SSPS consists of two redundant, electrically independent trains and are arranged so that a failure of either SSPS train will not result in the loss of a required safety function. VCSNS slave relays that perform a Technical Specification function are normally de-energized (ND) and are located within a climate controlled area; therefore, the aging effects are limited. The applicability of the WCAP is reinforced by the history of the component as many of the original relays are still in service.

4.3.1 Environment

The SSPS cabinets are located within an environmentally controlled area that is monitored per Technical Specification requirements. The Technical Specification Table 3.7-7 details the room temperature limit of 83 degrees Fahrenheit that is validated every 12 hours. The temperature profile for the room was reviewed from January 2007 to March 2010. The review found the room to have an average temperature of 67.74 degrees Fahrenheit, a maximum of 82.78 degrees Fahrenheit and a minimum of 59.77 degrees Fahrenheit. The average thermal temperature rise through the cabinet was found to be less than 10 degrees Fahrenheit; therefore, the AR relays are well below the suitable service environment limit of 212 degrees Fahrenheit and the Westinghouse Replacement Component Services (RCS) of 120 degrees Fahrenheit for a 40 year shelf life.

4.3.2 Failure History

Plant history was reviewed to consider the failure rate of AR type relays utilized specifically in the SSPS cabinets. The search and historical review of SSPS slave relays revealed that the only slave relay replacements had occurred in 1997 due to a

slave relay not resetting properly. An Institute of Nuclear Power Operations (INPO) Equipment Performance and Information Exchange System (EPIX) failure search was conducted for VCSNS AR440. The EPIX search returned 18 failure records for all VCSNS AR440 relays not specific to the SSPS cabinets that dated from 1984 to 1996 and were categorized as loose connection, switch wear, or failure.

4.3.3 Procurement

VCSNS utilizes Westinghouse supplied part number AR440ARY, Cutler Hammer 4-Pole type AR, relays rated for 0-120 Volt (Alternating Current), 10 Amp. The relays are purchased as safety related material and are stored in accordance with ANSI N45.2.2, 1978 Level B.

4.4 Surveillance Interval Adequacy Monitoring Program

Plant procedures and maintenance rule program will be revised to specifically monitor for slave relay failures. If two or more relays fail in a 12-month period, VCSNS will re-evaluate the adequacy of the extended surveillance frequency interval.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

SCE&G has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The change to the Technical Specifications does not result in a condition where the design, material, and construction standards that are applicable to slave relays has been changed or degraded. The change is to increase the allowable surveillance to a less impacting 18 month interval. The standard for Westinghouse Plants specifically required quarterly testing of slave relays in the Solid State Protection System (SSPS) instrumentation that initiates proper unit shutdown or engineered safety feature. The Solid State Protective System (SSPS) actuates the Engineered Safety Features Actuation Systems (ESFAS). Current surveillance requirements involve testing the relays at power, with the attendant risk of inadvertent actuation of the engineered safety features. In addition, the on-line testing of slave relays required plant manipulation, abnormal configurations, and removed from service various equipment making it unavailable to perform its intended safety function. Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation" identified that relay testing could be performed on a "staggered test basis over a cycle and leave the tests carrying highest risk to a refueling outage or other cold shutdown."

The SSPS can initiate safeguard functions to maintain the reactor plant in a safe shutdown condition. Safeguard actuation occurs when a train of logic senses the need for any of the particular safeguards actions. Safeguard actuation is determined by the SSPS in the same way as the need for a reactor trip. When the required logic is present, one or more master relays are energized. Each master relay typically has several slave relays energized by the master relay. The slave relays operate the contacts necessary to open and close valves, shift control room air ventilation line ups, start diesel generators, etc. Each safeguards train actuates a physically and electrically separate train of pumps and valves,

with a dedicated diesel generator for electrical power. Failure of one component of a train (or the entire train) does not prevent sufficient action by the other train. The SSPS actuated functions are: Safety Injection (causes a reactor trip, various pumps and coolers to start, and various valves to open and close), Containment Isolation (closes valves to isolate the Reactor Building interior from the environment), Steam isolation (close all three main steam isolation valves), and Reactor Building Spray (each train provides flow).

Westinghouse Electric Company, LLC (Westinghouse) topical report WCAP-13877-P-A Rev 2, dated August 2000, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays" provides the details and results that support the increased surveillance interval. The same ESFAS instrumentation is being used and the same ESFAS system reliability is expected. The proposed change will not modify any system interface or function; therefore, will not increase the likelihood of an accident. The proposed activity will not change, degrade or prevent the performance of any accident mitigation systems or alter any assumptions previously made in evaluating the radiological consequences of an accident described in the FSAR. Therefore, the proposed amendment does not result in any increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated. Increasing the surveillance interval does not alter the performance of the ESFAS mitigation systems assumed in the plant safety analysis nor will it create any new accident initiators or scenarios. Westinghouse Electric Company, LLC (Westinghouse) topical report WCAP-13877-P-A Rev 2, dated August 2000, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays" provides the details and results that support the increased surveillance interval. Current surveillance requirements involve testing the relays at power, with the attendant risk of inadvertent actuation of the engineered safety features. In addition, the on-line testing of slave relays required plant manipulation, abnormal configurations, and removed from service various equipment making it unavailable to perform its intended safety function. Generic Letter 93-05, "Line-Item Technical Specifications

Improvements to Reduce Surveillance Requirements for Testing During Power Operation" identified that relay testing could be performed on a "staggered test basis over a cycle and leave the tests carrying highest risk to a refueling outage or other cold shutdown." Each safeguards train actuates a physically and electrically separate train of pumps and valves, with a dedicated diesel generator for electrical power. Failure of one component of a train (or the entire train) does not prevent sufficient action by the other train. The SSPS actuated functions are: Safety Injection (causes a reactor trip, various pumps and coolers to start, and various valves to open and close), Containment Isolation (closes valves to isolate the Reactor Building interior from the environment), Steam isolation (close all three main steam isolation valves), and Reactor Building spray (Each train provides flow). The current SSPS functions are a potential challenge to the plant when tested at power, in that isolation or activation of major components place the unit in an unfavorable conditions that are corrected by initiating Abnormal Operating Procedures. The change will increase the allowable surveillance to a less impacting 18 month interval therefore allowing testing to be completed during a time period where activation would have less of an effect on operation. Implementation of the proposed amendment does not create the possibility of a new or different kind of accident previously evaluated within the FSAR.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The change to the Technical Specifications increasing the surveillance interval does not result or involve a significant reduction in a margin of safety. Westinghouse Electric Company, LLC (Westinghouse) topical report WCAP-13877-P-A Rev 2, dated August 2000, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays" provides the details and results that support the increased surveillance interval. The periodic slave relay functional verification should be relaxed because of the demonstrated high reliability of the relay and its insensitivity to any short term wear or aging effects. The current SSPS functions are a potential challenge to the plant when surveillance tested at power, in that isolation or activation of major components places the unit in an unfavorable condition that is corrected by initiating Abnormal Operating Procedures. The change will increase the allowable surveillance to a less impacting 18 month interval therefore allowing testing to be completed during a time period where activation would have

less of an effect on operation. Implementation of the proposed amendment does not result in a reduction in the margin of safety.

Based on the above, SCE&G concludes that the proposed amendment present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

5.2 Applicable Regulatory Requirements/Criteria

Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation" identified that relay testing could be performed on a "staggered test basis over a cycle and leave the tests carrying highest risk to a refueling outage or other cold shutdown." Westinghouse Electric Company, LLC (Westinghouse) topical report WCAP-13877-P-A Revision 2, dated August 2000, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays" provides the details and results that support the increased surveillance interval. Based on the potential to challenge the plant during surveillance testing, while the plant is at normal operation, the actuated functions of Safety Injection, Containment Isolation, Feedwater isolation, Steam isolation, and Reactor Building spray could be safely extended to 18 months. The changes will not increase the probability of an accident of a different type nor will it introduce an accident not previously evaluated. Therefore this activity does not introduce or represent a change to any procedures described in the FSAR or FPER nor will a malfunction or failure occur to safe shutdown equipment or components that are important to safety. Acceptable levels of protection for the health and safety of the public and personnel have not been degraded therefore the basis of the Technical Specifications remain unchallenged.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. (Westinghouse) Topical Reports WCAP-13877-P-A, Revision 2 and WCAP-13878-P-A, Revision 2 On Solid State Protection System (SSPS) Slave Relays (TAC NO. MA7264).
2. Reliability Assessment of Westinghouse Type AR Relays Used As SSPS Slave Relays [ML003754227]
3. Generic Letter (GL) 93-05, "Line Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During Power Operation.
4. Vogtle Electric Generating Plant (VEGP) Unit 1 and Unit 2, Request To Revise Technical Specifications Slave Relay Test Frequency Surveillance Requirement 3.3.6.5 [ML011280134]
5. Comanche Peak Steam Electric Station (CPSES) Docket 50-445 AND 50-446 License Amendment Request (LAR) 01-008 Revision To Technical Specification (TS) 3.3.2. ESFAS Instrumentation And 3.3.6, Containment Ventilation Isolation Instrumentation [ML012400142]

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS)
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12

ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Proposed Technical Specification Changes Summary

Replace the following pages of the Appendix A to Operating License Number NPF-12, Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages	Insert Pages
3/4 3-35	3/4 3-35
3/4 3-36	3/4 3-36
3/4 3-37	3/4 3-37
3/4 3-38	3/4 3-38
3/4 3-40	3/4 3-40
B 3/4 3-1	B 3/4 3-1

SCE&G - EXPLANATION OF CHANGES

Page	Affected Section	Bar #	Description of Change	Reason for Change
3/4 3-35	4.3.2.1	1	Slave Relay Test from "Q" to "R(3)"	WCAP-13877-P-A
3/4 3-36	4.3.2.1	1	Slave Relay Test from "Q" to "R(3)"	WCAP-13877-P-A
3/4 3-37	4.3.2.1	1	Slave Relay Test from "Q" to "R(3)"	WCAP-13877-P-A
3/4 3-38	4.3.2.1	1	Slave Relay Test from "Q" to "R(3)"	WCAP-13877-P-A
3/4 3-40	4.3.2.1	1	Added note 3.	WCAP-13877-P-A
B 3/4 3-1	4.3.2.1	1	Describe bases for surveillance frequency.	WCAP-13877-P-A

No Changes Required

INSTRUMENTATION

3/4 3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4 and with RESPONSE TIMES as shown in Table 3.3-5.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS Instrumentation or Interlock Trip Setpoint trip less conservative than the value shown in the Trip Setpoint Column but more conservative than the value shown in the Allowable Value Column of Table 3.3-4, adjust the Setpoint consistent with the Trip Setpoint value.

b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Value Column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION statement requirements of Table 3.3-3 until the channel is restored to its OPERABLE status with its setpoint adjusted consistent with the Trip Setpoint value.

c. With an ESFAS instrumentation channel or interlock inoperable take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated OPERABLE by performance of the engineered safety feature actuation system instrumentation surveillance requirements specified in Table 4.3-2.

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

Add comma

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. SAFETY INJECTION, REACTOR TRIP FEEDWATER ISOLATION, CONTROL ROOM ISOLATION START DIESEL GENERATORS, CONTAINMENT COOLING FANS AND ESSENTIAL SERVICE WATER								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
c. Reactor Building Pressure-High-1	S	R	Q	N.A.	N.A	N.A.	N.A.	1, 2, 3
d. Pressurizer Pressure--Low	S	R	Q	N.A	N.A.	N.A.	N.A.	1, 2, 3
e. Differential Pressure Between Steam Lines--High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
f. Steam Line Pressure Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
2. REACTOR BUILDING SPRAY								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
c. Reactor Building Pressure-High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

R(3)

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. CONTAINMENT ISOLATION								
a. Phase "A" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Safety Injection	See 1 above for all Safety Injection Surveillance Requirements.							
3) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
b. Phase "B" Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
2) Reactor Building Pressure-High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Purge and Exhaust Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q(1)	1, 2, 3, 4
2) Containment Radioactivity-High	S	R	M	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
3) Safety Injection	See 1 above for all Safety Injection Surveillance Requirements.							

R(3)

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. STEAM LINE ISOLATION								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Reactor Building Pressure High-2	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
d. Steam Flow in Two Steam Lines—High Coincident with T_{avg} Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Steam Line Pressure Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
5. TURBINE TRIP AND FEEDWATER ISOLATION								
a. Steam Generator Water Level—High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2
b. Automatic Actuation Logic and Actuation Relay	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2
6. EMERGENCY FEEDWATER								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Steam Generator Water Level—Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

R(3)

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
EMERGENCY FEEDWATER (Continued)								
d. Undervoltage - Both* ESF Busses	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
e. Safety Injection	See 1 above for all Safety Injection Surveillance Requirements							
f. Undervoltage - One ESF Bus	N.A.	R	N.A	R	N.A	N.A	N.A.	1, 2, 3
g. Trip of Main Feedwater Pumps	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2
h. Suction transfer on low pressure	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
7. LOSS OF POWER								
a. 7.2 kV Emergency Bus Undervoltage (Loss of Voltage)	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. 7.2 kV Emergency Bus Undervoltage (Degraded Voltage)	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
8. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP								
a. RWST Level low-low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3

R(3)

No Changes Required

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
9. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS								
a. Pressurizer Pressure, P-11	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
b. Low, Low T_{avg}, P-12	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Reactor Trip, P-4	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3

INSTRUMENTATION

TABLE 4.3-2 (Continued)

TABLE NOTATION

(1) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(2) The 36 inch containment purge supply and exhaust isolation valves are sealed closed during Modes 1 through 4, as required by TS 3.6.1.7. With these valves sealed closed, their ability to open is defeated; therefore, they are excluded from the quarterly slave relay test.

(3) Slave Relay Testing will be conducted every 18 months for Westinghouse type AR relays and preferably during a refueling outage to preclude the risk of actuation. Replacement relays other than Westinghouse type AR or reconciled Cuttler Hammer relays will require further analysis and NRC approval to maintain the established frequency.

3/4.3 INSTRUMENTATION

BASES

3/4.3.1 and 3/4.3.2 REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

The OPERABILITY of the Reactor Protection System and Engineered Safety Feature Actuation System Instrumentation and interlocks ensure that 1) the associated action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoints, 2) the specified coincidence logic and sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance consistent with maintaining an appropriate level of reliability of the Reactor Protection and Engineered Safety Features instrumentation and, 3) sufficient system functions capability is available from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses. The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. Specified surveillance intervals have been determined in accordance with WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for Reactor Protection Instrumentation System," and supplements to that report. Specified surveillance and maintenance outage times have been determined in accordance with WCAP-14333-P-A, Rev. 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," and Westinghouse letter CGE-05-46. Surveillance intervals and out of service times were determined based on maintaining an appropriate level of reliability of the Reactor Protection System and Engineered Safety Features instrumentation.

The Slave Relay Test is performed on an 18-month frequency that is specific to Westinghouse AR relays. This test frequency is based on relay reliability assessments presented in WCAP-13877-P-A, Revision 2, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays," that is dependent on the qualified life and environmental conditions of the AR relays. Replacement relays other than Westinghouse type AR or reconciled Cuttler Hammer relays will require further analysis and NRC approval.

Consistent with the requirement in Regulatory Guide 1.177 to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a logic train is inoperable for maintenance are included (note that these restrictions do not apply when a logic train is being tested under the 4-hour bypass Note). Entry into Actions 12, 14, 21, or 25 is not a typical, pre-planned evolution during power operation, other than for surveillance testing. Since Actions 12, 14, 21, or 25 are typically entered due to equipment failure, it follows that some of the following restrictions may not be met at the time of entry into Actions 12, 14, 21, or 25. If this situation were to occur during the 24-hour AOT of Actions 12, 14, 21, or 25, the configuration risk assessment procedure will assess the emergent condition and direct activities to restore the inoperable logic train and exit Actions 12, 14, 21, or 25, or fully implement these restrictions, or perform a unit shutdown, as appropriate from a risk management perspective. The following restrictions will be observed:

- To preserve ATWS mitigation capability, activities that degrade the availability of the emergency feedwater system, RCS pressure relief system (pressurizer PORVs and safety valves), AMSAC, or turbine trip should not be scheduled when a logic train is inoperable for maintenance.
- To preserve LOCA mitigation capability, one complete ECCS train that can be actuated automatically must be maintained when a logic train is inoperable for maintenance.

No Changes Required

INSTRUMENTATION

BASES

REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION (continued)

- To preserve reactor trip and safeguards actuation capability, activities that cause master relays or slave relays in the available train to be unavailable and activities that cause analog channels to be unavailable should not be scheduled when a logic train is inoperable for maintenance.

- Activities on electrical systems (e.g., AC and DC power) and cooling systems (e.g., service water and component cooling water) that support the systems or *functions listed in the first three bullets should not be scheduled when a logic train* is inoperable for maintenance. That is, one complete train of a function that supports a complete train of a function noted above must be available.

The Engineered Safety Feature Actuation System Instrumentation Trip Setpoints specified in Table 3.3-4 are the nominal values at which the bistables are set for each functional unit. A setpoint is considered to be adjusted consistent with the nominal value when the "as measured" setpoint is within the band allowed for calibration accuracy.

To accommodate the instrument drift assumed to occur between operational tests and the accuracy to which setpoints can be measured and calibrated, Allowable Values for the setpoints have been specified in Table 3.3-4. Operation with setpoints less conservative than the Trip Setpoint but within the Allowable Value is acceptable since an allowance has been made in the safety analysis to accommodate this error.

The methodology to derive the trip setpoints is based upon combining all of the uncertainties in the channels. Inherent to the determination of the trip setpoints are the *magnitudes of these channel uncertainties*. Sensor and rack instrumentation utilized in these channels are expected to be capable of operating within the allowances of these uncertainty magnitudes. Rack drift in excess of the Allowable Value exhibits the behavior that the rack has not met its allowance. Being that there is a small statistical chance that this will happen, an infrequent excessive drift is expected. Rack or sensor drift, in excess of the allowance that is more than occasional, may be indicative of more serious problems and should warrant further investigation.

The measurement of response time at the specified frequencies provides assurance that the reactor trip and the engineered safety feature actuation associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Response time may be verified by actual response time tests in any series of sequential, overlapping, or total channel measurements, or by the summation of allocated sensor, signal processing, and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained

No Changes Required

REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION (continued)

from: (1) historical records based on acceptable response time tests (hydraulic, noise or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component into operational service and re-verified following maintenance or modification that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for the repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing element of a transmitter.

Westinghouse letter CGE-00-018, dated March 28, 2000, provided an evaluation of the Group 05 (11NLP and 6NSA) 7300 process cards. These cards were revised after the submittal of WCAP-14036, Revision 1. This letter concluded that the failure modes and effects analysis (FMEA) performed for the older versions of these cards and documented in WCAP-14036-P-A, Revision 1, is applicable for these Group 05 cards. The bounding time response values determined by test and evaluation and reported in the WCAP are valid for these redesigned cards.

The Engineered Safety Features response times specified in Table 3.3-5 which include sequential operation of the RWST and VCT valves (Notes 2 and 3) are based on values assumed in the non-LOCA safety analyses. These analyses are for injection of borated water from the RWST. Injection of borated water is assumed not to occur until the VCT charging pump suction isolation valves are closed following opening of the RWST charging pumps suction valves. When the sequential operation of the RWST and VCT valves is not included in the response times (Note 1) the values specified are based on the LOCA analyses. The LOCA analyses take credit for injection flow regardless of the source. Verification of the response times specified in Table 3.3-5 will assure that the assumptions used for the LOCA and non-LOCA analyses with respect to the operation of the VCT and RWST valves are valid.

The Engineered Safety Features Actuation System senses selected plant parameters and determines whether or not predetermined limits are being exceeded. If they are, the signals are combined into logic matrices sensitive to combinations indicative of various accidents, events, and transients. Once the required logic combination is completed, the system sends actuation signals to those engineered safety features components whose

No Changes Required

INSTRUMENTATION

BASES

REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION (continued)

aggregate function best serves the requirements of the condition. As an example, the following actions may be initiated by the Engineered Safety Features Actuation System to mitigate the consequences of a steam line break or loss of coolant accident 1) safety injection pumps start and automatic valves position, 2) reactor trip, 3) feedwater isolation, 4) startup of the emergency diesel generators, 5) containment spray pumps start and automatic valves position, 6) containment isolation, 7) steam line isolation, 8) turbine trip, 9) auxiliary feedwater pumps start and automatic valves position, 10) containment cooling fans start and automatic valves position, 11) essential service water pumps start and automatic valves position, and 12) control room isolation and ventilation systems start.

Several automatic logic functions included in this specification are not necessary for Engineered Safety Feature System actuation but their functional capability at the specified setpoints enhances the overall reliability of the Engineered Safety Features functions. These automatic actuation systems are purge and exhaust isolation from high containment radioactivity, turbine trip and feedwater isolation from steam generator high-high water level, initiation of emergency feedwater on a trip of the main feedwater pumps, automatic transfer of the suctions of the emergency feedwater pumps to service water on low suction pressure, and automatic opening of the containment recirculation sump suction valves for the RHR and spray pumps on low-low refueling water storage tank level.

The service water response time includes: 1) the start of the service water pumps and, 2) the service water pumps discharge valves (3116A,B,C-SW) stroking to the fully opened position. This condition of the valves assures that flow will become established through the component cooling water heat exchanger, diesel generator coolers, HVAC chiller, and to the suction of the service water booster pumps when these components are placed in-service. Prior to this time, the flow is rapidly approaching required flow and sufficient pressure is developed as valves finish their stroke. Each of the above-listed components will be starting to perform their accident mitigation function, either directly or indirectly depending upon the use of the component, and will be operational within the service water response time of 71.5/81.5 seconds[11]. Only the service water booster pumps have a direct impact on the accident analysis via the RBCUs' heat removal capability as discussed below.

[11] Total time is 1.5 second instrument response after setpoint is reached, plus 10 seconds diesel generator start, plus 10 seconds to reach service water pump start and begin 3116-SW opening via Engineered Safety Features Loading Sequencer, plus 60 seconds stroke time for 3116-SW. During this total time, the service water pumps start and the service water pump discharge valve begins to open at 11.5 seconds and the pump discharge valve is fully open at 71.5 seconds without a diesel generator start required and 21.5 seconds and 81.5 seconds including a diesel generator start.

No Changes Required

INSTRUMENTATION

BASES

REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION (continued)

The RBCU response time includes: 1) the start of the RBCU fan and the service water booster pumps and, 2) all the service water valves which must be driven to the fully opened or fully closed position. This condition of the valves allows the flow to become fully established through the RBCU. Prior to this time, the flow is rapidly approaching required flow as the valves finish their stroke. Although the RBCU would be removing heat throughout the Engineered Safety Features response time, the accident analysis does not assume heat removal capability from 0 to 71.5 seconds [2] because the industrial cooling water system is not completely isolated until 71.5 seconds. A linear ramp increase from 95% full heat removal capability to 100% full heat removal capability is assumed by the accident analysis to start at 71.5 seconds and end at 86.5 seconds[3]. Full heat removal capability is assumed at 86.5 seconds based on the position of the valve 3107-SW.

[2] Total time is 1.5 second instrument response after setpoint is reached, plus 10 second diesel start plus 60 seconds* for valves to isolate industrial cooling water system.

[3] Total time is 1.5 second instrument response after setpoint is reached, plus 10 second diesel generator start plus 75 seconds to stroke valves 3107A, B-SW.

* During this time period, the Engineered Safety Features Loading Sequencer starts the RBCU fans at 25 seconds and service water booster pumps at 30 seconds after the valves begin to stroke.

Attachment 2
Virgil C. Summer Nuclear Station (VCSNS)
Docket No. 50/395
Operating License No. NPF-12

Proposed Technical Specification Pages (Retyped)

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. SAFETY INJECTION, REACTOR TRIP, FEEDWATER ISOLATION, CONTROL ROOM ISOLATION, START DIESEL GENERATORS, CONTAINMENT COOLING FANS AND ESSENTIAL SERVICE WATER								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3, 4
c. Reactor Building Pressure-High-1	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
d. Pressurizer Pressure--Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Differential Pressure Between Steam Lines--High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
f. Steam Line Pressure Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
2. REACTOR BUILDING SPRAY								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3, 4
c. Reactor Building Pressure-High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

TABLE 4.3-2 (Continue)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. CONTAINMENT ISOLATION								
a. Phase "A" Isolation 1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Safety Injection		See 1 above for all Safety Injection Surveillance Requirements.						
3) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3, 4
b. Phase "B" Isolation 1) Automatic Actuation Logic and Actuation Relays	N.A	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3, 4
2) Reactor Building Pressure-High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Purge and Exhaust Isolation 1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3, 4
2) Containment Radioactivity-High	S	R	M	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
3) Safety Injection		See 1 above for all Safety Injection Surveillance Requirements.						

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. STEAM LINE ISOLATION								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3
c. Reactor Building Pressure-High-2	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
d. Steam Flow in Two Steam Lines--High Coincident	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
with T_{avg}--Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Steam Line Pressure Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
5. TURBINE TRIP AND FEEDWATER ISOLATION								
a. Steam Generator Water Level--High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2
b. Automatic Actuation Logic and Actuation Relay	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2
6. EMERGENCY FEEDWATER								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3
c. Steam Generator Water Level--Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
EMERGENCY FEEDWATER (Continued)								
d. Undervoltage - Both ESF Busses	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
e. Safety Injection		See 1 above for all Safety Injection Surveillance Requirements.						
f. Undervoltage - One ESF Bus	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
g. Trip of Main Feedwater Pumps	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2
h. Suction transfer on low pressure	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
7. LOSS OF POWER								
a. 7.2 kV Emergency Bus Undervoltage (Loss of Voltage)	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. 7.2 kV Emergency Bus Undervoltage (Degraded Voltage)	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
8. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP								
a. RWST level low-low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	R(3)	1, 2, 3

TABLE 4.3-2 (Continued)

TABLE NOTATION

(1) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(2) The 36 inch containment purge supply and exhaust isolation valves are sealed closed during Modes 1 through 4, as required by TS 3.6.1.7. With these valves sealed closed, their ability to open is defeated; therefore, they are excluded from the quarterly slave relay test.

(3) Slave Relay Testing will be conducted every 18 months for Westinghouse type AR relays and preferably during a refueling outage to preclude the risk of actuation. Replacement relays other than Westinghouse type AR or reconciled Cutler-Hammer relays will require further analysis and NRC approval to maintain the established frequency.

3/4.3.1 and 3/4.3.2 REACTOR TRIP AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

The OPERABILITY of the Reactor Protection System and Engineered Safety Feature Actuation System Instrumentation and interlocks ensure that 1) the associated action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoints, 2) the specified coincidence logic and sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance consistent with maintaining an appropriate level of reliability of the Reactor Protection and Engineered Safety Features instrumentation and, 3) sufficient system functions capability is available from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses. The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. Specified surveillance intervals have been determined in accordance with WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for Reactor Protection Instrumentation System," and supplements to that report. Specified surveillance and maintenance outage times have been determined in accordance with WCAP-14333-P-A, Rev. 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," and Westinghouse letter CGE-05-46. Surveillance intervals and out of service times were determined based on maintaining an appropriate level of reliability of the Reactor Protection System and Engineered Safety Features instrumentation. The Slave Relay Test is performed on an 18-month frequency that is specific to Westinghouse AR relays. This test frequency is based on relay reliability assessments presented in WCAP-13877-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays," that is dependent on the qualified life and environmental conditions of the AR relays. Replacement relays other than Westinghouse type AR or reconciled Cutler-Hammer relays will require further analysis and NRC approval.

Consistent with the requirement in Regulatory Guide 1.177 to include Tier 2 insights into the decision-making process before taking equipment out of service, restrictions on concurrent removal of certain equipment when a logic train is inoperable for maintenance are included (note that these restrictions do not apply when a logic train is being tested under the 4-hour bypass Note). Entry into Actions 12, 14, 21, or 25 is not a typical, pre-planned evolution during power operation, other than for surveillance testing. Since Actions 12, 14, 21, or 25 are typically entered due to equipment failure, it follows that some of the following restrictions may not be met at the time of entry into Actions 12, 14, 21, or 25. If this situation were to occur during the 24-hour AOT of Actions 12, 14, 21, or 25, the configuration risk assessment procedure will assess the emergent condition and direct activities to restore the inoperable logic train and exit Actions 12, 14, 21, or 25, or fully implement these restrictions, or perform a unit shutdown, as appropriate from a risk management perspective. The following restrictions will be observed:

- To preserve ATWS mitigation capability, activities that degrade the availability of the emergency feedwater system, RCS pressure relief system (pressurizer PORVs and safety valves), AMSAC, or turbine trip should not be scheduled when a logic train is inoperable for maintenance.
- To preserve LOCA mitigation capability, one complete ECCS train that can be actuated automatically must be maintained when a logic train is inoperable for maintenance.

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS)
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12

ATTACHMENT 3

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Virgil C. Summer Nuclear Station (VCSNS) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Bruce L. Thompson at (803) 931-5042.

Commitment	Due Date
The Safety Related SSPS slave relays will be managed to limit the qualified life to less than or equal to 40 years without refurbishment or replacement.	Continuous for the life of the component and managed per the Preventative Maintenance Program.
The environmental conditions of the SSPS cabinet will be monitored to ensure the assumptions of the qualified life analysis provided within the WCAP are maintained.	Continuous, the room is currently monitored per Technical Specification requirements and administrative procedures.
SCE&G commits to tracking of failures for Safety Related slave relays utilized within the SSPS cabinets.	Continuous, to be incorporated into the Maintenance Rule Program per 10CFR50.65.