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SCE&G®
A SCANA COMPANY

November 29, 2005
RC-05-0157

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

ATTN: Mr. Robert E. Martin

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
LICENSE AMENDMENT REQUEST - LAR 05-3664
EMERGENCY FEEDWATER SYSTEM ISOLATION VALVES

Reference: S. A. Byrne to Document Control Desk, RC-01-0106, Dated May 24, 2001, Accession Number ML011500363

Pursuant to 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, hereby requests an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS). This request is being submitted pursuant to 10 CFR 50.90.

The proposed changes will add requirements to Specification 3/4.7.1.2 to assure continued operability of the Emergency Feedwater System (EF). Six new automatic isolation valves are being added to the system to assure the capability for automatic isolation of EF in the event of a faulted steam generator. This condition was reported in LER 1998-004-00.

The purpose for this request is to expand existing surveillance requirements, (SR) 4.7.1.2.b and 4.7.1.2.c.2, to include testing requirements for the instrument air portions of the new isolation valves. This change will assure the capability of isolating the EF into a faulted steam generator with a worst case single failure present.

The VCSNS Plant Safety Review Committee and the Nuclear Safety Review Committee have reviewed and approved the proposed change. SCE&G has notified the State of South Carolina in accordance with 10CFR50.91(b).

SCE&G requests approval of the proposed amendment by October 31, 2006, to permit implementation of the change, including training, prior to the startup after Refueling Outage 16, scheduled for November 2006.

FSAR Sections 3.6, 3.9, 7.4, 9.2, 9.3, 10.1, 10.3, 10.4, 15.2, and 15.4 are affected by this change and will be reviewed for necessary revisions.

There are no other TS changes in process that will affect or be affected by this change request.

A001

No commitments are being proposed in association with this change.

If you have any questions or require additional information, please contact Mr. Robert G. Sweet at (803) 345-4080.

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

11-29-05
Executed on

Jeffrey B. Archie

AJC/JBA/dr

Enclosures:
Evaluation of the proposed change

Attachment(s): 3
I. Proposed Technical Specification Change - Mark-up
II. Proposed Technical Specification Change - Retyped
III. List of Regulatory Commitments

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CER (C-05-3664)
File (813.20)
DMS (RC-05-0157)

**Subject: LICENSE AMENDMENT REQUEST - LAR 05-3664
EMERGENCY FEEDWATER SYSTEM ISOLATION VALVES**

1.0 DESCRIPTION

The Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS), Section 3/4.7.1.2, are being revised to include the emergency feedwater system automatic isolation valves into the Surveillance Requirements (SR). SR 4.7.1.2.b is including verification of the functional capability of the check valves in the instrument air system supplying the six new automatic isolation valves. SR 4.7.1.2.c.2 is to include the six new automatic isolation valves into the requirement that assures critical valves can be closed and held closed when normal instrument air is unavailable.

The emergency feedwater automatic isolation valves are being installed to assure the system can be isolated from a faulted generator without dependence on local operator action and to provide additional train separation.

2.0 PROPOSED CHANGE

The following changes to Technical Specifications 3/4.7.1.2 are proposed:

1. Surveillance Requirement (SR) 4.7.1.2.b is being revised to include verification of the functional capability of the check valves in the instrument air system supplying the six emergency feedwater automatic isolation valve air accumulators!

2. SR 4.7.1.2.c.2 is being revised to include the verification that the six emergency feedwater automatic isolation valves can be closed and held closed when normal instrument air is unavailable.

3.0 BACKGROUND

The present design of the emergency feedwater system (EF) utilizes two lines to feed each steam generators (SG), one from the two motor driven EF pumps, the other from the turbine driven EF pump. Normally open, air operated flow control valves (FCV) are provided for each steam generator, one valve per SG from the motor driven pumps and one valve per SG from the turbine driven pump. Accumulators are provided for these air operated valves with sufficient volume to close the valves on a high flow signal for at least three hours. High flow setpoints, established to isolate feedwater to a faulted SG, ensure sufficient feedwater is provided to the non-faulted SGs to maintain their heat sink function and protect the core consistent with the safety analysis.

System configuration requires operator action to isolate excessive flow should a flow control valve in the EF line to the faulted SG fail to close (single active failure). Under specific scenarios, an operator would be required to enter into a hostile environment to manually close the valves. This action would be required to maintain the safety analysis assumptions

regarding flow to the intact SGs and environmental qualification of equipment in the vicinity of the postulated break.

VCSNS intends to add six new automatic isolation valves and associated air accumulators in the EF system to automatically isolate EF in the event of a faulted steam generator. As a result, expansion of surveillance requirements of 4.7.1.2 to include operability testing of the new isolation valves and the instrument air portions of the new isolation valves is required. These expanded requirements will assure the capability for automatic isolation of EF in the event of a faulted steam generator with a worst case single failure present.

4.0 TECHNICAL ANALYSIS

The EF system is designed to supply the required water to the SG in the event that normal feedwater is unavailable. This water provides the function of preserving the heat sink capabilities of the steam generators in the event of a major secondary side steam or feed line break. EF is used, additionally, to supply feedwater to the steam generators during testing, startup, shutdown, anticipated transients without scram events, and wet layup operations. Sufficient redundancy exists to deliver the required flow at design pressure, while sustaining a single active failure in the short term or a single passive failure in the long term.

Two EF lines feed each steam generator, one from the motor driven EF pumps, the other from the turbine driven EF pump. Normally open, pneumatically operated flow control valves are provided for each steam generator, one valve per SG from the motor driven pumps and one valve per SG from the turbine driven pump. Air accumulators are provided for these pneumatically operated valves. The accumulator volume is sufficient to close the valves on a high flow signal for at least three hours. The high flow setpoints have been established to isolate feedwater from a faulted SG. This ensures that sufficient feedwater is provided to the SGs to maintain their heat sink function and protect the core consistent with the safety analysis.

The present plant design and configuration requires operator action to isolate excessive flow should a flow control valve in the EF line to the faulted SG fail to close (single active failure) in response to the accident. Under specific scenarios, it is conceivable that an operator would have to make an entry into a hostile environment to perform manual closure of the valves. This would be required to maintain the safety analysis assumptions regarding flow to the intact SGs and environmental qualification of equipment in the vicinity of the postulated break.

Each new automatic isolation valve meets all nuclear safety-related requirements and will be installed in series with a FCV. The signal for high flow will be from an independent and opposite train transmitter than the signal for the FCV. Additionally the electrical power supplied to each isolation valve will be from the opposite train than the flow control valve. This will provide additional redundancy and preclude the need for operator action.

Each new isolation valve will fail open on loss of power or instrument air and will have a safety class air accumulator and accessories designed to hold the valve closed for a minimum of three hours following a signal to close.

This proposed change adds Surveillance Requirements for testing the six new automatic isolation valves (one for each flow control valve) to demonstrate that the capability of isolating

flow to a faulted SG is not lost, even with a single active failure. Both the check valves in the air supply line and the capacity of the accumulators will be included into the existing surveillance requirements 4.7.1.2.b and 4.7.1.2.c.2. This change will impose the same surveillance requirements for the six new automatic isolation valves as the existing flow control valves air supply and capacity.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

South Carolina Electric & Gas Company (SCE&G) has evaluated the proposed changes to the VCSNS TS described above against the significant Hazards Criteria of 10CFR50.92 and has determined that the changes do not involve any significant hazard. The following is provided in support of this conclusion.

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

Response: No.

The proposed change addresses necessary changes to the VCSNS Technical Specification (TS) 4.7.1.2.b and 4.7.1.2.c.2 associated with the installation of six new automatic isolation valves in the EF system.

The only Final Safety Analysis Report (FSAR) analyzed accident for which the EF system could contribute as an initiator would be minor secondary line break, as described in Section 15.3.2. The addition of isolation valves in the EF piping to the steam generators will not increase the likelihood of a pipe break, since the addition will be in accordance with the same codes and standards as the corresponding, existing portions of the system. Piping stress analyses have demonstrated the addition of these valves does not result in the need to postulate any additional pipe breaks.

The accidents analyzed in the FSAR, which rely on EF to mitigate consequences, are loss of normal feedwater, loss of off-site power, and major secondary system pipe ruptures. The addition of these automatic isolation valves will eliminate the need for operator action to manually close a flow control valve in response to a major secondary system line break. The elimination of operator manual action is accomplished by the addition of a new pneumatically operated isolation valve in series with each of the six existing flow control valves.

Therefore, the proposed changes do not involve a significant 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.

This proposed change does not result in changes to actual operating pressures, flow rates, flow paths, or system interfaces. There are no alterations to system operability requirements. The existing system alarm setpoints are not affected, neither is the information available to the operators. The addition of six new isolation valves will not change system design criteria and the surveillance testing will be the same as for the existing flow control valves.

This change does not introduce any new or different kind of failure mechanisms or limiting single failures. Piping analysis has concluded that no new pipe break locations or break sizes will result from this change. Equipment protection features are not impacted, the frequency of pump and valve operation remains the same. Independence and redundancy are actually improved.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No.

The design basis for the EF system is to assure the required flow and pressure to remove decay heat from the core under the worst postulated conditions. An additional function of the system is to isolate flow to a faulted SG within the time assumed in the safety analysis. The proposed change eliminates the need for operators to take actions to manually close the flow control valves in the event of a single failure.

The proposed change will create a surveillance requirement for the new isolation valves that is the same as the existing flow control valves. The acceptance criteria will assure the operability of these valves. The design and installation of these isolation valves will maintain the requirements for independence, redundancy, separation and testability. The margins assumed in the safety analysis will be enhanced by this proposed change. Due to the automatic isolation capability, additional water will be available for the intact SGs and a reduced mass will be available to be released into the containment building. No credible single failure will be capable of preventing isolation of a faulted SG upon a high flow signal.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Pursuant to 10 CFR 50.91, the preceding analyses provide a determination that the proposed Technical Specification changes pose no significant hazard as delineated by 10 CFR 50.92.

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical Specifications," requires that a TS limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:

(A) Criterion 1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

(B) Criterion 2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(C) Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(D) Criterion 4. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

10 CFR 50.36(c)(3), "Surveillance Requirements," stipulates that surveillances be performed to assure the necessary quality of systems and components be maintained, the facility operation will be within safety limits, and that the limiting condition for operation will be met.

The EF system at VCSNS satisfies Criteria 2, 3, and 4 and as such is required to have a limiting condition for operation in the facility TS. The proposed changes to TS SR 4.7.1.2 require the acceptance criteria for these surveillances to be more restrictive than currently in TS. The regulatory requirements in 10CFR50.36 continue to be satisfied by this proposed change.

10 CFR 50 Appendix A, Criterion 3, "Fire Protection," requires that structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.

10 CFR 50 Appendix A, Criterion 34, "Residual Heat Removal," requires that a system to remove residual heat be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

10 CFR 50 Appendix A, Criterion 44, "Cooling Water," requires a system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided. The system safety function shall be to transfer the combined heat load from these structures, systems, and components under normal operating and accident conditions.

10 CFR 50 Appendix A, Criterion 54, "Piping Systems Penetrating Containment," requires piping systems penetrating primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating these piping systems.

10 CFR 50 Appendix A, Criterion 57, "Closed System Isolation Valves" requires that each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at lease one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation.

10 CFR 50 Appendix R sets forth fire protection features required to satisfy Criterion 3 of Appendix A.

The proposed changes do not violate any requirement or recommended method for assuring and maintaining the plant design and licensing basis. The EF system will continue to provide a heat sink to the core during normal plant shutdown or accidents where other methods of cooling the core are not available.

IE Bulletin 85-01, "Steam Binding of Auxiliary Feedwater Pumps," provides information pertaining to steam binding of the pumps due to leakage past check valves and requests action by the Licensees to preclude this event from occurring undetected.

The proposed changes do not impact the ability of the system to perform its design function since there are no check valves added to the fluid system. The EF system will continue to perform to the same high reliability and availability standards.

GL 81-14, "Emergency Procedures and Training for Station Blackout Events," recommended that immediate measures be taken to ensure that station blackout events can be accommodated while Generic Safety Issue (GSI) task A-44 is being conducted. The NRC staff requests that licensees review current plant operations to determine the capability to mitigate a station blackout event and promptly implement, as necessary, emergency procedures and a training program for station blackout events.

The proposed changes to the acceptance criteria for the EF pump surveillance testing has no impact on the response of the plant structures, systems, or components to coping with a loss of station power. All training and procedures required to identify,

respond to, or resolve a Station Blackout event are independent of the testing used to assure operability of the EF system.

GL 88-03, "Resolution of Generic Safety Issue 93, Steam Binding of Auxiliary Feedwater Pumps," provides the NRC's resolution of the GSI and request that Licensees continue to implement, as a minimum, the monitoring and corrective procedures previously identified for interim resolution of this issue in IE Bulletin 85-01.

VCSNS performed administrative activities to assure compliance with the GL at the time GL 88-03 was issued. The proposed changes do not impact the earlier activities or commitments that were required to comply with GL 88-03.

GL 89-18, "Resolution of Unresolved Safety Issue A-17, Systems Interactions in Nuclear Power Plants," provided the NRC's resolution to the issue and provided information to give licensees additional appreciation of the kinds of adverse systems interaction which have appeared in operating experience which can aid them in continuing evaluation of operating experience.

The proposed changes do not introduce any adverse systems interactions. The revised surveillance requirements provide assurance that the EF system will perform as designed and evaluated.

5.2.1 Design Bases (FSAR)

FSAR Sections 3.6, 7.4, 9.2, 9.3, 10.1, 10.3, 10.4, 15.2, and 15.4 are affected by this change and will be reviewed for necessary revisions.

5.2.2 Approved Methodologies

The proposed changes do not result in a change to any methodologies.

5.2.3 Analysis

The addition of six new automatic isolation valves in the EF system will assure the capability for automatic isolation of EF in the event of a faulted steam generator. The expansion of SR 4.7.1.2.b and 4.7.1.2.c.2 to include testing requirements for the air portions of these valves will assure the capability of isolating the EF into a faulted steam generator with a worst case single failure present.

The proposed changes comply with the requirements of 10CFR50.36(c)(3), Surveillance Requirements, to assure that operation of the plant will be within the safety limits.

5.2.4 Conclusion

The proposed changes to Surveillance Requirements 4.7.1.2.b and 4.7.1.2.c.2 assure the capability of isolating flow to a faulted steam generator, even with a single active failure. These changes will impose the same surveillance requirements for the six new automatic isolations valves as the existing flow control valves air supply and capacity.

6.0 ENVIRONMENTAL CONSIDERATION

This proposed Technical Specification change has been evaluated against criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. It has been determined that the proposed change meets the criteria for categorical exclusion as provided for under 10 CFR 51.22(c)(9). The following is a discussion of how the proposed Technical Specification change meets the criteria for categorical exclusion.

10 CFR 51.22(c)(9): Although the proposed change involves change to requirements with respect to inspection, Surveillance, or Design Requirements,

(i) the proposed change involves No Significance Hazards Consideration (refer to the No Significance Hazards Consideration Determination section of this Technical Specification Change Request);

(ii) there are no significant changes in the types or significant increase in the amounts of any effluents that may be released offsite since the proposed change does not affect the generation of any radioactive effluents nor does it affect any of the permitted release paths; and

(iii) there is no significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Based on the aforementioned and pursuant to 10 CFR 51.22 (b), no environmental assessment or environmental impact statement need be prepared in connection with issuance of an amendment to the Technical Specifications incorporating the proposed change.

7.0 REFERENCES

There are no technical references.

ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

Attachment to License Amendment No. XXX
To Facility Operating License No. NPF-12
Docket No. 50-395

Replace the following pages of the Appendix A 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 7-5	3/4 7-5

SCE&G -- EXPLANATION OF CHANGES

PAGE	AFFECTED SECTION	BAR #	DESCRIPTION	REASON
3/4 7-5	4.7.1.2.b	1	Increasing scope of surveillance requirement	Include the motive force for the automatic valves being added under ECR 50157 into the surveillance requirement.
3/4 7-5	4.7.1.2.c.2	2	Increasing scope of surveillance requirement	Assure that the automatic valves, being added under ECR 50157, will continue to satisfy their licensing basis requirements.

and the six emergency feedwater automatic isolation valve air accumulators

SURVEILLANCE REQUIREMENTS (Continued)

4. Verifying that each automatic valve in the flow path from the condensate storage tank to the steam generators is in the fully open position whenever the emergency feedwater system is placed in automatic control or when above 10% RATED THERMAL POWER.

5. Verifying that valves 1010-EF and 1007-EF are locked in the open position.

b. At least once per 3 months by verifying that the check valve in the instrument air supply line to the six emergency feedwater control valve air accumulators closes when the normal instrument air supply is not available.

c. At least once per 18 months during shutdown by verifying that:

1. Each emergency feed pump starts as designed automatically upon receipt of an emergency feedwater actuation test signal.

2. The six emergency feedwater control valves can be closed and held closed for three hours with air from the accumulators when the normal instrument air supply is not available.

3. The turbine driven emergency feedwater pump can be manually stopped from the main control board by closing the steam supply valve with air from the accumulator when the normal instrument air supply is not available.

4. Each automatic valve in the flow path actuates to its correct position on receipt of an emergency feedwater actuation test signal.

and the six automatic isolation valves

ATTACHMENT II

PROPOSED TECHNICAL SPECIFICATION CHANGES (RETYPED)

SURVEILLANCE REQUIREMENTS (Continued)

4. Verifying that each automatic valve in the flow path from the condensate storage tank to the steam generators is in the fully open position whenever the emergency feedwater system is placed in automatic control or when above 10% RATED THERMAL POWER.

5. Verifying that valves 1010-EF and 1007-EF are locked in the open position.

b. At least once per 3 months by verifying that the check valve in the instrument air supply line to the six emergency feedwater control valve air accumulators and the six emergency feedwater automatic isolation valve air accumulators closes when the normal instrument air supply is not available.

c. At least once per 18 months during shutdown by verifying that:

1. Each emergency feed pump starts as designed automatically upon receipt of an emergency feedwater actuation test signal.

2. The six emergency feedwater control valves and the six automatic isolation valves can be closed and held closed for three hours with air from the accumulators when the normal instrument air supply is not available.

3. The turbine driven emergency feedwater pump can be manually stopped from the main control board by closing the steam supply valve with air from the accumulator when the normal instrument air supply is not available.

4. Each automatic valve in the flow path actuates to its correct position on receipt of an emergency feedwater actuation test signal.

ATTACHMENT III
LIST OF REGULATORY COMMITMENTS

There are no commitments made in this submittal.