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A SCANA COMPANY

March 3, 2016
RC-16-0039

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

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
EXIGENT LICENSE AMENDMENT REQUEST - LAR (16-00848)
TECHNICAL SPECIFICATION CHANGE REQUEST FOR THE EMERGENCY FEEDWATER SYSTEM LIMITING CONDITION FOR OPERATION 3.7.1.2 ACTION b – RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Reference: SCE&G Letter from George A. Lippard to NRC Document Control Desk, "Technical Specification Change Request for the Emergency Feedwater System Limiting Condition for Operation 3.7.1.2 Action b," dated March 1, 2016 (ML16062A368)

South Carolina Electric & Gas Company (SCE&G), acting for itself and as an agent for South Carolina Public Service Authority pursuant to 10 CFR 50.90 and 10 CFR 50.91, submitted a request for an exigent amendment to Technical Specifications (TS) per the referenced letter. NRC review of this License Amendment Request determined that additional information was required. A request for additional information (RAI) was issued by email and discussed per teleconference on March 3, 2016.

The Attachment provides the VCSNS response to the RAIs.

This letter contains no new commitments. If you have any questions or require additional information, please contact Bruce Thompson at (803) 931-5042.

A001
NRR

I certify under penalty of perjury that the information contained herein is true and correct.

3/3/16
Executed on

George A. Lippard

WLT/GAL/ts

Attachment

c: K. B. Marsh
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File (813.20)
PRSF (RC-16-0039)

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

Attachment

VCSNS Response to Request for Additional Information

RAI-SBPB-01:

a. Describe if the IPTE is still be considered for the performance of STP-120.006 and describe the nuclear safety benefit for this activity.
b. Based on the response to item a, describe the "other controls in place' that benefit nuclear plant safety if an IPTE is not considered.

VCSNS Response to RAI-SBPB-01:

a. This evolution will be designated as an Infrequently Performed Test or Evolution (IPTE). An IPTE requires a member of Station Management to conduct a pre-job briefing emphasizing key aspects of the evolution. For this evolution, the additional requirements for Critical Infrequently Performed Tests or Evolutions (CIPTE) will be implemented. The Management Duty Supervisor (MDS) will be designated to provide additional management oversight assistance during the evolution.

   Below is an excerpt from SAP-123, "Procedure Use and Adherence," describing the content of the brief.

   INFREQUENTLY PERFORMED TESTS OR EVOLUTIONS (IPTE)
   A. The Shift Manager or discipline supervisor (or designee), as appropriate, shall conduct a pre-job brief with personnel prior to the performance of an Infrequently Performed Test or Evolution. The following areas should be discussed:

      1. Scope of the activity and the flowpath.

      2. Cautions and limitations.

3. Expected plant response.

4. Termination criteria.

5. Restoration steps.

CRITICAL INFREQUENTLY PERFORMED TESTS OR EVOLUTIONS (CIPTE)

A. The General Manager, Nuclear Plant Operations (GMNPO), or his designee, shall brief operating and testing personnel on management expectations prior to the performance of Critical Infrequently Performed Tests or Evolutions.

B. In addition to steps above, the following areas should be discussed:

1. The need for exercising caution and conservatism during the test or evolution, particularly when uncertainties are encountered.

2. Emphasis on maintaining the highest margins of safety, to place proper perspective on any sense of urgency that may otherwise prevail.

3. Assigned responsibilities for the activity and any deviation from the normal shift duties and accountabilities.

4. The need for open communications.

5. Application of lessons learned from pertinent in-house and industry operating experience to assist personnel involved with the test or evolution in internalizing these lessons.

6. The need to stop the test (or stop power ascension, decrease power, trip the reactor, etc.) when unexpected conditions arise or unexplained plant behavior is experienced.

C. The GMNPO, or his designee, will determine whether it is appropriate to designate a manager, senior to the Shift Manager, for oversight of a particular test or evolution:

1. If such a manager is deemed appropriate, this manager shall have the authority and experience to exercise continuous responsibility.

2. This authority should include control of the pace of the test or evolution and the resolution (or escalation) of problems encountered.

b. Since this test will be considered an IPTE with the additional requirements of a CIPTE applied, a response is not required.

RAI-SBPB-02:

a. Describe if the 24 hour time allowance to placing the plant into hot standby has adequate margin to allow a controlled reactor shutdown without initialing a reactor trip. Include the amount of time acceptable to perform a controlled shutdown.
b. Describe the time line that supports the 24 hour time allowance, given worst case components noted above (18 hours for the accumulator check valve).

VCSNS Response to RAI-SBPB-02:

a. Conservatism is built into this timeline and there is adequate margin to conduct a controlled reactor shutdown without initiating a reactor trip. The worst case timeline results from failing the initial test, replacing an air accumulator check valve, subsequently failing the post-repair test, and then initiating shutdown. The ACTION statement will be entered when the test is initiated, with the pressure drop test interval for the flow control valve commencing within 15 minutes. Station In-Service Testing (IST) Engineering has provided guidance and psi/min pressure drop criteria for test personnel to determine if the leakrate will exceed acceptance criteria after the first 15 minutes. The test setup opens the air vent valve just upstream of the check valve; therefore, excessive check valve leakage will be detectable at that vent. Based on these times, it is reasonable to assume that a test failure and check valve leakage would be detected within 1 hour of entering the ACTION statement.

   The worst case repair time, based on check valve replacement, is 18 hours (see item b. below). This time, however, assumes the post-maintenance check valve leakrate is acceptable and the re-test takes 4 hours. This scenario postulates unacceptable post-maintenance check valve leakage, which would be detected within the first hour of the re-test. Therefore, this time is conservative by 3 hours in addition to the 7 hours of conservatism inherent in the repair time. The response to question (b.) below describes this repair timeline.

   The amount of time typically allotted at the station for a controlled shutdown to Hot Standby is 3 hours. The most limiting timeline for compliance with the proposed ACTION, based on the worst-case repair activity is shown in Table 1.

Table 1	
Time to perform the initial, unsatisfactory, air drop test	1 hr
Time to complete worst-case repair (includes 4 hr re-test)	18 hr
Time to shutdown to Mode 3, assuming repair is unsuccessful	3 hr
Total time for ACTION compliance (1 hr + 18 hr + 3 hr)	22 hr

b. The accumulator check valves are installed in 1/2 inch schedule 40, carbon steel piping by threaded connections at either end of the check valve body. On one of the three flow control valves, a union connection is in-line with the check valve allowing replacement without cutting or welding. On the other two flow control valves, replacement of their respective check valves requires cutting and re-welding a 90 degree socket-weld elbow connection adjacent to the check valve. The repair time estimate provided by Maintenance Planning is 5 hours for the check valve replacement and associated welding. In developing the LAR, this time was conservatively increased, to 8 hours.

Before the check valve can be replaced, a lock-out/tag-out (LOTO) on the flow control valve supply air must be hung by Operations to isolate the piping from the air supply and provide a vent path. The required LOTO boundary consists of the two instrument air supply isolation valves and the air accumulator vent valve, all located at the flow control valve. The time required for Operations to hang this LOTO and authorize the replacement work is less than 1 hour. After the repair is complete, Operations will then need to clear the LOTO, which also requires less than 1 hour to complete. For the timeline submitted in this LAR, it was conservatively assumed that 3 hours would be incurred both before the repair and after repair to bound the LOTO times and account for any other coordination issues that might occur.

The post-maintenance testing required for replacement of the check valve consists of visual examination (VT), non-ASME Section XI external leakage test at normal pressure, and re-performance of the 3 hour pressure test STP-120.006. STP-120.006 is estimated to require 4 hours to perform, allowing 1 hour in addition to the 3 hour test interval for test setup and restoration. Station In-Service Testing (IST) Engineering has provided guidance and psi/min pressure drop criteria for test personnel to determine if the leakrate will exceed acceptance criteria after the first 15 minutes of testing.

Given these estimates, the total time expected for a worst case repair is 18 hours (3hr+ 8hr + 3hr +4hr). Based on the conservatisms in the LOTO and repair times, there is 7 hours (2hr + 2hr + 3hr) of margin in this timeline.

RAI-SBPB-03:

a. Provide specific details of how the flow control valves are tested.
b. Describe if each of the three flow controls valves share any air accumulators.
c. Describe the risk and or benefit for testing all three flow control valves (3 hours hold time) at power verses testing each of the three flow control valves individually.

VCSNS Response to RAI-SBPB-03:

a. STP-120.006 Revision 7F currently allows testing the valves simultaneously or one at a time (Precaution 2.2). Motor driven flow control valve closure in Modes 1-3 requires entry into LCO Action Statement 3.7.1.2.b (Precaution 2.1). Performance in Modes 1, 2, or 3 also requires both Diesel Generators be operable with no maintenance or testing in progress on either diesel generator. A Pre-Job brief is conducted to stress Human Performance Tool use. Following the brief, an AS FOUND equipment lineup is performed and test instrumentation is installed. If a flow control valve is closed (Normally open at power, refer to TS SR 4.7.1.2.a.4), it is opened. With the flow control valve open, the non-safety related air supply to the accumulator is isolated. Air is slowly bled-off upstream of the safety-related check valve constituting the boundary between the safety related (accumulator) and non-safety air systems. The flow control valve is then closed using air from the safety-related air accumulator, and once closed, the drop test is conducted for a period of three hours. Test acceptance is based on meeting established pressure drop (PSI/HR) criterion and the valve being held in the closed position for the three hour test duration. Subsequent to test completion, manipulated valves are restored to their pre-test positions, the flow control valve is re-opened, and field standards are removed.

b. The flow control valves do not share an accumulator. The emergency feedwater system Design Basis Document (Section 2.4.2.2) notes that a safety class control air accumulator (XTK-3531, 3541, 3551-EF) is provided for each Motor-Driven Pump Flow Control Valve. Station Drawings B-817-056, Sheets 1 and 2, detail the tubing and subcomponents associated with each motor driven and turbine driven emergency feedwater pump flow control valve.

c. The risk of testing all three control valves simultaneously has two elements. The first element is the increased risk in core damage associated with maintaining all three flow control valves closed with control air removed. In the plant risk model (EOOS), this configuration is functionally equivalent to removing both motor driven emergency feedwater pumps from service, leaving the turbine driven emergency feedwater pump as the only safety related source of shutdown feedwater. The difference in risk from testing 3 valves at once compared to testing 1 valve at a time (in series) is tied to the heat sink function of the valves. The comparison is shown in Table 2. This is due to the availability of the remaining two steam generator flowpaths from the motor driven pumps, providing additional defense in depth for the heat sink function when only one valve is undergoing test or maintenance.

Table 2	Risk Comparison of Testing Valves in Parallel or in Series			
Number of valves tested concurrently	EOOS CDF Factor	1.0E-06 Time, hours	Time to complete testing, hours	Cumulative CDF Change to complete testing
1	1.62	4562.6	72 (three 24 hr tests)	1.58E-08
3	67.2	42.7	24	5.62E-07

The second risk element is due to the potential for having multiple valve failures and repairs to manage simultaneously. With approval of this LAR, the station will avoid this risk and increased CDF exposure by performing the test on only one valve at a time, entering and exiting the ACTION statement for each valve test.

RAI-SBPB-04:

Describe the defense-in-depth and protection for other safety trains and supporting structures, systems, and components (SSCs) appropriate to maintain the safety function of EFW during testing. Include discussion for your consideration of the following:

a. Describe if during the performance of the three flow control valve test (all at the same time) if one dedicated operator is required or three dedicated operators are required.
b. Describe the actions for 'a' above and if these actions will be added to the surveillance test.
c. Describe if any electrical buses will be operable (verses available) and protected in support of this test including the turbine driven EFW pump such as direct current buses for valves and governor controls.
d. Describe all other defense-in-depth, special operator training, and protected equipment strategies that are necessary for the performance of Surveillance Test Procedure (STP)-120.006, such as feed and bleed SSCs and just-in time operator training.

VCSNS Response to RAI-SBPB-04:

a. Only one valve will be tested at a time, therefore one dedicated operator stationed at the flow control valves will be sufficient to perform local manual valve operation, if required.

b. The actions required to restore functionality to a flow control valve during this test are to close the two air vent valves previously opened, and open the air isolation valve previously closed. These actions are described in STP-120.006, Enclosure A, "Tech Spec/EOOS/Functionality Review." There will be a dedicated local operator stationed at

the flow control valves. The dedicated operator is required to be briefed on these actions prior to the test.

c. The station will protect the following equipment per OAP-114.1: the turbine driven emergency feedwater pump and both emergency diesel generators. Switchyard work that places the plant in a grid risk condition will be restricted. As stated within the referenced letter, the turbine driven emergency feedwater pump room is normally locked closed. All engineered safety features busses will be operable during the performance, up to and including instrument busses for valve control.

d. Operators are trained on local manual operation of these valves. Operators are trained on initiation of bleed and feed during a loss of Heat Sink, within the requalification training matrix of every two years. All required operator actions credited in PRA insights are within the scope of continuous operator training, at regular intervals, therefore no specialized training is required.