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RC-13-0069

U. S. Nuclear Regulatory Commission
Document Control Desk
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ATTN: Eva Brown

Subject: VIRGIL C. SUMMER NUCLEAR STATION UNIT 1 (VCSNS)
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
REQUEST RELIEF FROM ASME CODE REQUIREMENTS IN VCSNS
4TH TEN YEAR INSERVICE INSPECTION INTERVAL
RR-4-01 (G) IST Pump and Valve Surveillance Requirements
RR-4-02 (P) IST Class 2 and 3 Pump Testing Requirements Using OMN-18
RR-4-03 (V) IST Class 3 Service Water Check Valve

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraphs (a)(3)(i) and (a)(3)(ii), South Carolina Electric & Gas Company, acting for itself and as an agent for South Carolina Public Service Authority, hereby requests NRC approval of the attached relief requests associated with the fourth inservice testing (IST) interval. The fourth interval of the VCSNS, Unit 1, IST Program will comply with the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (i.e., OM Code), 2004 Edition with addenda through 2006, which is the latest edition and addenda of the ASME OM Code incorporated by reference in 10 CFR 50.55a(b)(3). The bases for the relief requests are provided within each Attachment.

No new commitments are being made to the NRC by this letter. If you should have any questions, please contact Mr. Bruce L. Thompson at (803) 931-5042.

Very truly yours,

Thomas D. Gatlin

JMG/TDG/wm

Attachments:

RR-4-01 (G) IST Pump and Valve Surveillance Requirements
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SOUTH CAROLINA ELECTRIC & GAS CO. (SCE&G)
VIRGIL C. SUMMER NUCLEAR STATION UNIT 1 (VCSNS)

RR-4-01 (G) IST Pump and Valve Surveillance Requirements

1. ASME Code Component(s) Affected

All Pumps and Valves contained within the Inservice Testing (IST) Program scope.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through Omb-2006.

3. Applicable Code Requirement(s)

This request applies to the frequency specifications of the ASME OM Code. The frequencies for tests given in the ASME OM Code do not include a tolerance band.

ISTA-3120(a)	The frequency for inservice testing shall be in accordance with the requirements of Section IST.
ISTB-3400	Frequency of Inservice Tests; "An inservice test shall be run on each pump as specified in Table ISTB-3400-1." Table ISTB-3400-1 lists two frequencies – quarterly and biennially.
ISTC-3510	Exercising Test Frequency; "Active Category A, Category B, and Category C check valves shall be exercised nominally every 3 months,..."
ISTC-3540	Manual Valves; "Manual Valves shall be full-stroke exercised at least once every 2 years, except where adverse conditions may require the valve to be tested more frequently to ensure operational readiness."
ISTC-3630(a)	Frequency; "Tests shall be conducted at least once every 2 years."
ISTC-3700	Position Verification Testing; "Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated."
ISTC-5221(c)(3)	"At least one valve from each group shall be disassembled and examined at each refueling outage; all valves in a group shall be disassembled and examined at least once every 8 years."

Appendix I, I-1320	Test Frequencies, Class 1 Pressure Relief Valves; "Class 1 pressure relief valves shall be tested at least once every 5 years..."
Appendix I, I-1330	Test Frequency, Class 1 Nonreclosing Pressure Relief Devices; "Class 1 nonreclosing pressure relief devices shall be replaced every 5 years..."
Appendix I, I-1340	Test Frequency, Class 1 Pressure Relief Valves that are used for Thermal Relief Application; Refers to I-1320 for test frequency.
Appendix I, I-1350	Test Frequency, Classes 2 and 3 Pressure Relief Valves; "Classes 2 and 3 pressure relief valves, with the exception of PWR main steam safety valves, shall be tested every 10 years, ..."
Appendix I, I-1360	Test Frequency, Classes 2 and 3 Nonreclosing Pressure Relief Devices; "Classes 2 and 3 nonreclosing pressure relief devices shall be replaced every 5 years, ..."
Appendix I, I-1370	Test Frequency, Classes 2 and 3 Primary Containment Vacuum Relief Valves; "Tests shall be performed on all Classes 2 and 3 containment vacuum relief valves at each refueling outage or every 2 years, ..."
Appendix I, I-1380	Test Frequency, Classes 2 and 3 Vacuum Relief Valves Except for Primary Containment Vacuum Relief Valves; "All Classes 2 and 3 vacuum relief valves shall be tested every 2 years, ..."
Appendix I, I-1390	Test Frequency, Classes 2 and 3 Pressure Relief Devices that are used for Thermal Relief Application; "Tests shall be performed on all Classes 2 and 3 relief devices used in thermal relief application every 10 years,"
Appendix II, II-4000(a)(1)(e)	Performance Improvement Activities; Subparagraph (1)(e) requires the identification of the interval for each activity.
Appendix II, II-4000(b)(1)(e)	Optimization of Condition Monitoring Activities; Subparagraph (1)(e) requires the identification of the interval for each activity.

4. Reason for Request

Pursuant to 10 CFR 50.55a(a)(3)(ii), an alternative is requested to the frequency specifications of the ASME OM Code. The basis of this request is that the Code requirements present an undue hardship without a compensating increase in the level of quality or safety.

ASME OM Code Section IST establishes the inservice test frequencies for all components within the scope of the Code. The frequencies (e.g., quarterly) have always been interpreted as "nominal" frequencies (generally as defined in Table 3.2 of NUREG 1482, Revision 1) and Owners routinely applied the surveillance extension time period (e.g., grace period) contained in the plant Technical Specifications (TS) Surveillance Requirements (SRs). The TS typically allow for a less than or equal to 25 percent extension of the surveillance test interval to accommodate plant conditions that may not be suitable for conducting the surveillance (SR 4.0.2). However, regulatory issues have been raised concerning the applicability of the TS "Grace Period" to ASME OM Code required inservice test frequencies irrespective of allowances provided under TS Administrative Controls, for example, TS 4.0.5, "Surveillance Requirements for inservice inspection and testing of ASME Code Class 1, 2, and 3 components...", invokes SR 4.0.2 for various OM Code frequencies.

The lack of a tolerance band on the ASME OM Code inservice test frequencies restricts operational flexibility. There may be a conflict where a surveillance test is required but where it is not possible or not desired that the test be performed until sometime after a plant condition or associated Limiting Condition for Operation (LCO) is within its applicability.

The NRC recognized this potential issue in the TS by allowing a frequency tolerance as described in TS SR 4.0.2. The lack of a similar tolerance applied to OM Code testing places an unusual hardship on the plant to adequately schedule work tasks without operational flexibility.

As with TS required surveillance testing, some tolerance is needed to allow adjusting OM Code testing intervals to suit the plant conditions and other maintenance and testing activities. This assures operational flexibility when scheduling surveillance tests that minimize the conflicts between the need to complete the surveillance and plant conditions.

5. Proposed Alternative and Basis for Use

The ASME OM Code establishes component test frequencies that are based either on elapsed time periods (e.g., quarterly, 2 years, etc.) or on the occurrence of plant conditions or events (e.g., cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc.).

- a. Components whose test frequencies are based on elapsed time periods shall be tested at the frequencies specified in ASME OM Code Section IST with a specified time period between tests as shown in the table below.

Frequency	Specified Time Period Between Tests (all values are 'not to exceed'; no minimum periods are specified)
Quarterly (or every 3 months)	92 days
Semiannually (or every 6 months)	184 days
Annually (or every year)	366 days
x Years	x calendar years where 'x' is a whole number of years ≥ 2

- b. The specified time period between tests may be reduced or extended as follows:
- 1) For periods specified as less than 2 years, the period may be extended by up to 25 percent for any given test. This is consistent with VCSNS TS Section 4.0.5.
 - 2) For periods specified as greater than or equal to 2 years, the period may be extended by up to 6 months for any given test.
 - 3) All periods specified may be reduced at the discretion of the owner (for example, there is no minimum period requirement).
 - 4) Period extensions may also be applied to accelerated test frequencies (e.g., pumps in Alert Range) and other less than two year test frequencies not specified in the table above.
- c. Components whose test frequencies are based on the occurrence of plant conditions or events, for example, cold shutdown, refueling outage, upon detection of a sample failure, following maintenance, etc. may not have their period between tests extended except as allowed by the ASME OM Code.

Period extension facilitates test scheduling and considers plant operating conditions that may not be suitable for performance of the required testing (e.g., performance of the test would cause an unacceptable increase in the plant risk profile due to transient conditions or other ongoing surveillance, test or maintenance activities). Period extensions are not intended to be used repeatedly merely as an operational convenience to extend test intervals beyond those specified. This request is not applicable to frequencies in Subsection ISTD, "Examination and Performance Testing of Nuclear Power Plant Dynamic Restraints (Snubbers)."

Using the provisions of this request as an alternative to the specific frequency requirements of the ASME OM Code identified above will provide operational flexibility and provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii) VCSNS requests approval of the alternative to the specific ASME OM Code frequency requirements identified in this request.

6. Duration of Proposed Alternative

The proposed alternative identified will be utilized during the fourth IST interval which is scheduled to begin January 1, 2014 and conclude on December 31, 2023.

7. Precedents

Generic relief has not been specifically granted to apply a tolerance band to the ASME OM code required test frequencies. The NRC has previously accepted the application of TS SR 4.0.2 tolerances to selected OM Code frequencies, as denoted in TS 4.0.5.

The prior NRC acceptance of applying TS tolerances to ASME OM code required test frequencies provides equivalent precedence for accepting and approving this relief request.

A similar Relief Request was submitted for Quad Cities for the fifth 10-year interval, as documented in Letter RS-12-026, dated February 15, 2012 [ML12046A334].

8. References

VCSNS TS Section 1.13 – Frequency Notation

VCSNS TS Section 4.0.5 – Surveillance requirements for Inservice Testing

VCSNS TS Section SR 4.0.2 – Specified Frequency (25 percent Grace Period)

VCSNS TS Section SR 4.0.4 – Mode Entry Requirements

SOUTH CAROLINA ELECTRIC & GAS CO. (SCE&G)
VIRGIL C. SUMMER NUCLEAR STATION UNIT 1 (VCSNS)

RR-4-02 (P) IST Class 2 and 3 Pump Testing Requirements Using OMN-18

1. ASME Code Component(s) Affected

XPP0013A & B, Boric Acid Transfer Pumps (Centrifugal / Group A / Class 3)

XPP0038A & B, Reactor Building Spray Pumps, (Centrifugal / Group AB / Class 2)

XPP0039A, B & C, Service Water Pumps, (Vertical Line Shaft / Group A / Class 3)

XPP0045A & B, Service Water Booster Pumps, (Centrifugal / Group AB / Class 3)

XPP0048A & B, HVAC Chilled Water Pumps, (Centrifugal / Group A / Class 3)

Component/System Function

Provide minimum flow to meet system requirements under accident conditions

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMB-2006

3. Applicable Code Requirement(s)

ISTB-3300	"Reference Values," states, in part, that "Reference values shall be established within ± 20 percent of pump design flow rate for the comprehensive test," and "Reference values shall be established within ± 20 percent of pump design flow for the Group A and Group B tests, if practicable."
ISTB-3400	"Frequency of Inservice Tests", states that an inservice test shall be run on each pump as specified in Table ISTB-3400-1.
Table ISTB-3400-1	Requires Group A and Group B tests to be performed quarterly and a comprehensive test to be performed biennially.
Table ISTB-3510-1	"Required Instrument Accuracy," specifies the instrument accuracies for Group A, Group B, comprehensive, and preservice tests.
Table ISTB-5121-1	"Centrifugal Pump Test Acceptance Criteria" defines the required acceptance criteria for Group A, Group B, and Comprehensive Tests for centrifugal pumps.

Table ISTB-5221-1	“Vertical Line Shaft Centrifugal Pumps Test Acceptance Criteria” defines the required acceptance criteria for Group A, Group B, and Comprehensive Tests for Vertical Line Shaft centrifugal pumps.
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4. Reason for Request

The ASME Code committees have approved Code Case OMN-18, Alternate Testing Requirements for Pumps Tested Quarterly within ± 20 percent of Design Flow. This Code Case has not been approved for use in Regulatory Guide 1.192, “Operation and Maintenance Code Case Acceptability, ASME OM Code,” June 2003.

This Code Case allows the Owner to not perform the Comprehensive Pump Test (CPT) with the associated acceptance criteria, if the quarterly test is performed at ± 20 percent of design flow and the instrumentation meets the accuracy requirements of Table ISTB-3510-1 for the comprehensive and preservice tests. The basis for the testing strategy in this Code Case is that a quarterly Group A pump test, performed at the CPT flow rate with more accurate instrumentation, is more effective in assessing a pump’s operational readiness than a standard Group A test in conjunction with a biennial CPT.

Additionally, ISTB allows the Owner to categorize the pumps in their program. As such, an Owner could categorize a pump that otherwise meets the requirements of Group B, as a Group A (or AB) pump, and test according to the provisions of Code Case OMN-18. In doing this, the owner is obtaining additional data (vibration and flow or differential pressure) quarterly, rather than once every two years.

As a result of the increased requirements on the parameters imposed by the proposed alternative during applicable quarterly tests, there is no added value in performing the biennial comprehensive test on the subject pumps.

5. Proposed Alternative and Basis for Use

VCSNS is proposing to utilize the provisions of Code Case OMN-18 and perform a modified Group A test in lieu of performing the Code-required CPT. The modified Group A test will be run at ± 20 percent of the pump’s design flow rate using ± 0.5 percent accurate digital gauges or better to determine the pump differential pressure. Vibration tests will be performed with the same vibration acceptance criteria as the standard Group A pump test. Additionally, VCSNS will utilize an Acceptable Range High limit of 106 percent or lower for quarterly testing, which is also consistent with the planned Code change applicable to CPT.

The use of more accurate pressure gauges and a more limiting Acceptable Range during every modified quarterly Group A test compensates for the elimination of the CPT. The CPT has a more limiting Acceptable Range upper bound for differential pressure of 103 percent. Regular testing with more accurate instrumentation and

tighter acceptance criteria will provide for better trending of pump performance. Instead of performing seven tests with pressure instruments with ± 2 percent accuracy and then performing the eighth test with pressure instruments with a minimum of ± 0.5 percent accuracy, all eight tests will be performed with the same ± 0.5 percent accurate digital instruments or better. Due to the improved accuracy, consistent testing methodology, and the addition of quarterly vibration monitoring on Group AB pumps, deviations in actual pump performance indicative of impending degradation are more easily recognized during quarterly performance trending activities.

The provisions of this request as an alternative to the requirements of ISTB-3400 and Tables ISTB-3400-1, ISTB-5121-1, & ISTB-5221-1 provides a reasonable alternative to the Code requirements based on the determination that the proposed alternative will provide adequate indication of pump performance, permit detection of component degradation, and continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10CFR50.55a(a)(3)(i), VCSNS requests approval of this alternative to the specific ISTB requirements identified in this request.

6. Duration of Proposed Alternative

The proposed alternative identified will be utilized during the fourth IST interval which is scheduled to begin January 1, 2014 and conclude on December 31, 2023.

7. Precedents

The following relief requests were approved by the NRC in the recent past:

1. Relief Request (PR-01) was approved for the Oyster Creek Nuclear Generating Station as discussed in the U.S. Nuclear Regulatory Commission Safety Evaluation Report dated June 21, 2012 (TAC NO. ME7616).
2. Relief Request (PR-9) was approved for the St. Lucie, Units 1 and 2 as discussed in the U.S. Nuclear Regulatory Commission Safety Evaluation Report dated July 1, 2011 (TAC NOS. ME5190 and ME5191).
3. Relief Request (PR-3) was approved for the Perry Nuclear Power Plant, Unit 1, as discussed in the U.S. Nuclear Regulatory Commission Safety Evaluation Report dated October 8, 2009 (TAC NO. ME0820).

SOUTH CAROLINA ELECTRIC & GAS CO. (SCE&G)
VIRGIL C. SUMMER NUCLEAR STATION UNIT 1 (VCSNS)

RR-4-03 (V) IST Class 3 Service Water Check Valve

1. ASME Code Component(s) Affected

XVC03130A, SW POND SW RETURN HDR A INLET CHECK VLV
XVC03130B, SW POND SW RETURN HDR B INLET CHECK VLV

Function: These normally open Service Water (SW) system discharge check valves perform an active safety function in the open position to allow SW return flow to the Service Water pond. Unimpaired return flow is required for the SW system to provide maximum cooling of essential heat loads during accident conditions. The valves perform no safety function in the closed position.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through Omb-2006.

3. Applicable Code Requirement(s)

ISTC-3522	"Category C Check Valves," specifies check valve exercising requirements and sub-paragraph (a) states that "...each check valve shall be exercised or examined in a manner that verifies obturator travel by using the methods in ISTC-5221. Each check valve exercise test shall include open and close tests."
ISTC-5221	"Valve Obturator Movement," sub-paragraph (a) specifies that "The necessary valve obturator movement shall be demonstrated by performing both an open and close test." Sub-paragraph (a)(2) also states "Check valves that have a safety function in only the open direction shall be exercised by initiating flow and observing that the obturator has traveled either the full open position or to the position required to perform its intended function(s) (see ISTA-1100), and verify closure."

4. Impracticality of Compliance

Pursuant to 10CFR50.55a(f)(5)(iii), relief is requested from the listed requirements of the ASME OM Code. The majority of the SW return piping is underground including these SW system discharge check valves. The system configuration does not provide a means to employ non-intrusive test methods or disassembly to confirm valve closure. The valves are buried without direct access, making these alternate techniques impractical.

5. Burden Caused by Compliance

To comply with the Code bi-directional testing requirements, either routine excavations or a system modification would be required. Since the valves are buried without direct access, excavation would be required every outage to allow access to the valves to facilitate valve disassembly and inspection or to employ non-intrusive test methods. Alternatively, a design modification of the SW system would be required to allow routine access to the valves to allow testing the valves in the closed direction using non-intrusive test methods or system operation.

6. Proposed Alternative and Basis for Use

VCSNS will perform full stroke exercise testing to the safety related open position during refueling outages without performing bi-directional exercise testing to the non-safety related closed position.

The design close function of these check valves is to prevent siphoning of the pond in the event of a postulated crack of a large diameter pipe in the SW system piping and to prevent inadvertent flooding during SW system maintenance from an incorrect valve lineup. The SW piping is moderate energy piping. Therefore, the design rules require that cracks, not breaks, must be postulated. Calculations for the postulated crack project a leak flow range less than the capacities of the sump pumps in the affected areas.

Due to the relatively small size of the resulting crack, the existing plant can easily handle a leak without requiring the valves to shut. Therefore, the back-seat function has been determined to not be required, since the SW system and the Auxiliary and Intermediate buildings are designed to accommodate all postulated cracks. Also, due to the design of the valve (duo-disc), age related degradation of the valve would not affect the valve's ability to perform its safety related function.

Based on the absence of a safety function in the closed position, elimination of the bi-directional reverse flow closure testing for these valves has no safety impact. Therefore, pursuant to 10 CFR 50.55a(f)(5)(iii), VCSNS requests approval of relief from the specific ISTC requirements identified in this request.

7. Duration of Proposed Alternative

The requested relief will be utilized during the fourth IST interval which is scheduled to begin January 1, 2014 and conclude on December 31, 2023.

8. Precedents

This relief request (RR3-V-1) was previously approved for Virgil C. Summer Nuclear Station Unit 1 for the 3rd Ten Year Interval by NRC Safety Evaluation Report dated August 18, 2004 (TAC No. MC2623). The requirements in the newest edition of the ASME OM Code (2004 edition with 2006 addenda) have not changed from the requirements in the edition/addenda currently in use by VCSNS (1998 edition with 2000 addenda).