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PSEG
Nuclear LLC

10 CFR 50.55a

LR-N15-0250

DEC 18 2015

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

Hope Creek Generating Station
Renewed Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: Inservice Testing (IST) Program - Fourth Ten-Year Interval

In accordance with 10 CFR 50.55a, "Codes and standards," paragraphs (z)(1) and (z)(2), PSEG Nuclear LLC (PSEG), hereby requests NRC approval of the attached requests for the fourth 10-year interval inservice testing program for the Hope Creek Generating Station (HCGS).

The requests propose alternatives to the requirements of the ASME OM – 2012 Edition, no addenda, which is expected to be incorporated by reference into 10 CFR 50.55a prior to implementation of HCGS IST Program Fourth 10-year interval. Where applicable, the requests are identified by the same request number for the third interval. As noted in the attachments, three of the requests are approved for the current 10-year interval. The fourth 10-year interval will begin on December 21, 2016. The details of the 10 CFR 50.55a request(s) are attached.

PSEG requests approval of the attached requests by December 19, 2016.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Lee Marabella at 856-339-1208.

Respectfully,

Paul Duke
Manager - Licensing

Attachments:
1. GENERAL AND PUMP 10CFR50.55a REQUESTS
2. VALVE 10CFR50.55a REQUESTS

cc: D. Dorman, Regional Administrator - NRC Region I
C. Parker, Project Manager - Hope Creek, USNRC
NRC Senior Resident Inspector - Hope Creek
P. Mulligan, Chief, NJBNE
Tom MacEwen, Hope Creek Commitment Coordinator
Lee Marabella, Corporate Commitment Coordinator

Attachment 1

GENERAL AND PUMP 10CFR50.55a REQUESTS

GENERAL AND PUMP 10CFR50.55a REQUEST INDEX

NUMBER	DESCRIPTION	REVISION
GR-01	Inservice Test Frequency Per Code Case OMN-20	0
PR-01	HPCI Pump Flow Instrument Accuracy	0
PR-02	RCIC Pump Flow Instrument Accuracy	0

10 CFR 50.55a Request GR-01
Inservice Test Frequency Per Code Case OMN-20
Proposed Alternative In Accordance with 10 CFR 50.55a(z)(2)
--Hardship or Unusual Difficulty
without Compensating Increase in Level of Quality and Safety--

1. **ASME Code Components Affected:**

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

2. **Applicable Code Edition and Addenda:**

American Society of Mechanical Engineers (ASME) Operation and Maintenance of Nuclear Power Plants (OM) -2012 Edition, no Addenda

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) – Inservice Examination and Test Interval; "Examination and test frequency 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 mo,…"

ISTC-3540 – Manual Valves; "Manual Valves shall be full-stroke exercised at least once every 2 yr, except where adverse conditions may require the valve to be tested more frequently to ensure operational readiness."

ISTC-3630(a) – Leakage Rate for Other Than Containment Isolation Valves, Frequency; "Tests shall be conducted at least once every 2 yr."

ISTC-3700 – Position Verification Testing; "Valves with remote position indicators shall be observed locally at least once every 2 yr to verify that valve operation is accurately indicated."

Relief Request GR-01
Inservice Test Frequency Per Code Case OMN-20
(Continued)

3. Applicable Code Requirements (Cont):

ISTC-5221(c)(3) – Check Valves, Valve Obturator Movement; "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 yr."

ISTC-5260(b) – Explosively Actuated Valves; "Concurrent with the first test and at least once every 2 yr,..."

ISTC-5260(c) – Explosively Actuated Valves; "At least 20% of the charges in explosively actuated valves shall be fired and replaced every 2 yr."

Appendix I, I-1320(a) – Test Frequencies, Class 1 Pressure Relief Valves, 5-Yr Test Interval; "Class 1 pressure relief valves shall be tested at least once every 5 yr,…"

Appendix I, I-1330 – Test Frequency, Class 1 Nonreclosing Pressure Relief Devices; "Class 1 nonreclosing pressure relief devices shall be replaced every 5 yr,…"

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(a) – Test Frequency, Classes 2 and 3 Pressure Relief Valves, 10-Yr Test Interval; "Classes 2 and 3 pressure relief valves, with the exception of PWR main steam safety valves, shall be tested every 10 yr,…" and "…20% of the valves from each valve group shall be tested within any 48-mo interval…."

Appendix I, I-1350(b)(1) – Test Frequency, Classes 2 and 3 Pressure Relief Valves, Replacement With Pretested valves, partial complement; "… the valves removed from service shall be tested within 3 mo of removal from the system…"

Appendix I, I-1350(b)(2) – Test Frequency, Classes 2 and 3 Pressure Relief Valves, Replacement With Pretested valves, full complement; "… the valves removed from service shall be tested within 12 mo of removal from the system."

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 yr, …"

Appendix I, I-1370(a) – 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 yr,…"

Relief Request GR-01
Inservice Test Frequency Per Code Case OMN-20
(Continued)

3. Applicable Code Requirements (Cont.):

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 yr,…"

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 yr,..."

Appendix II, II-4000(a)(1) – Condition-Monitoring Activities, Performance Improvement Activities; "…the following activities shall be performed at sufficient intervals over an interim period of the next 5 yr or two refueling outages, whichever is less, …"

Appendix II, II-4000(a)(1)(e) – Condition-Monitoring Activities, Performance Improvement Activities; Subparagraph (1)(e) requires the identification of the interval for each activity.

Appendix II, II-4000(b)(1)(e) – Condition-Monitoring Activities, Optimization of Condition-Monitoring Activities; Subparagraph (1)(e) requires the identification of the interval for each activity.

Appendix II, II-4000(b)(1)(g) – Condition-Monitoring Activities, Optimization of Condition-Monitoring Activities; "Intervals shall not exceed the maximum intervals shown in Table II-4000-1." Table II-4000-1 lists three intervals – 10, 12, and 16 yr.

Appendix III, III-3310(b) – Inservice Test Interval; "If insufficient data exist to determine the inservice test interval in accordance with para. III-6400, then MOV inservice testing shall be conducted every two refueling cycles or 3 yr (whichever is longer)…"

Appendix III, III-3310(c) – Inservice Test Interval; "The maximum inservice test interval shall not exceed 10 yr."

Appendix III, III-3722(c) – Risk-Informed Criteria, LSSC MOVs; "LSSC MOVs that are not associated with an established group shall be inservice tested,…using an initial test interval of three refueling cycles or 5 yr (whichever is longer)…"

Appendix III, III-3722(d) – Risk-Informed Criteria, LSSC MOVs; "LSSC MOVs shall be inservice tested at least every 10 yr…"

Relief Request GR-01
Inservice Test Frequency Per Code Case OMN-20
(Continued)

4. Reason for Request:

Pursuant to 10 CFR 50.55a(z)(2), 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 been interpreted as "nominal" frequencies (generally as defined in Table 3.2 of NUREG-1482, Revision 2) and Owners routinely applied the surveillance extension time period (i.e., 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 (i.e., TS 6.8.4.i, “Inservice Testing Program," invokes SR 4.0.2 for various OM Code frequencies of 2 years or less).

The lack of a tolerance band on the ASME OM Code inservice test frequencies restricts operational flexibility. There may be a conflict where an OM Code test is required (i.e., its Frequency could expire), but where it is not possible or not desired that the test be performed until the necessary supporting plant conditions can be established.

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.

Thus, just 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 OM Code required tests that minimizes the conflicts between the need to complete the tests and plant conditions.

Relief Request GR-01
Inservice Test Frequency Per Code Case OMN-20
(Continued)

5. Proposed Alternative and Basis for Use:

HCGS proposes the use of test frequency grace as allowed in ASME OM Code Case OMN-20, Inservice Test Frequency, for flexibility in IST scheduling for applicable code requirements noted in Section 3 above.

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 OM Code Section IST with a specified time period between tests as shown in Table 1.

Table 1: Specified Test Frequencies

Frequency	Specified Time Period Between Tests
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

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% for any given test.
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 (i.e., there is no minimum period requirement).

Period extension is to facilitate 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).

Relief Request GR-01
Inservice Test Frequency Per Code Case OMN-20
(Continued)

5. Proposed Alternative and Basis for Use (Cont.):

Period extensions are not intended to be used repeatedly merely as an operational convenience to extend test intervals beyond those specified.

Period extensions may also be applied to accelerated test frequencies (e.g., pumps in Alert Range) and other fewer than two-year test frequencies not specified in Table 1.

(b) Components whose test frequencies are based on the occurrence of plant conditions or events (e.g., 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 ASME OM Code-2012 Edition.

In conclusion, as currently written, the ASME OM Code requirements do not allow testing period extensions that provide an allowance for operational flexibility for the performance of ASME OM Code testing. As a result, this places a hardship on the ability for HCGS to schedule and perform ASME OM Code testing without a compensating increase in level of quality and safety. Using the provisions of this request as an alternative to the specific frequency requirements of the OM Code identified above will provide operational flexibility while still providing reasonable assurance that the affected components are operationally ready. Therefore, pursuant to 10 CFR 50.55a(z)(2), HCGS requests approval of the alternative, which is consistent with ASME-approved Code Case OMN-20, 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 December 21, 2016, and conclude on December 20, 2026.

Relief Request GR-01
Inservice Test Frequency Per Code Case OMN-20
(Continued)

7. Precedents:

Similar requests were approved for the following licensees:

1. Callaway Plant, Unit 1, Request No. PR-04, as discussed in NRC SER: Requests for Relief PR-01 through PR-06, Alternatives to ASME OM Code Requirements for Inservice Testing for the Fourth Program Interval (TAC Nos. MF2784 through MF2789), dated July 15, 2014 (ADAMS Accession No. ML14178A769).

2. Dresden Nuclear Power Station, Units 2 and 3, Request No. RV-01, as discussed in NRC SER: Safety Evaluation in Support of Request for Reliefs Associated with the Fifth 10-Year Interval Inservice Testing Program (TAC Nos. ME9865, ME9866, ME9869, ME9870, ME9871 and ME9872), dated October 31, 2013 (ADAMS Accession No. ML13297A515).

3. Quad Cities Nuclear Power Station, Units 1 and 2, Request No. RV-01, as discussed in NRC SER: Safety Evaluation in Support of Request for Relief Associated with the Fifth 10-Year Interval Inservice Testing Program (TAC Nos. ME7981, ME7982, ME7983, ME7984, ME7985, ME7986, ME7987, ME7988, ME7990, ME7991, ME7992, ME7993, ME7994 and ME7995), dated February 14, 2013 (ADAMS Accession No. ML13042A348).

4. Three Mile Island Nuclear Station, Unit No. 1, Relief Request VR-02, as discussed in NRC SER: Relief Requests PR-01, PR-02, and VR-02, Associated with the Fifth 10-Year Inservice Test Interval (TAC Nos. MF0046, MF0047 and MF0048), dated August 15, 2013 (ADAMS Accession No. ML13227A024).

8. References:

1. HCGS TS Section 4.0.2 – Surveillance Requirements.

2. HCGS TS Section 6.8.4.i – Inservice Testing Program.

3. ASME Code Case OMN-20, Inservice Test Frequency.

10 CFR 50.55a Request PR-01
HPCI Pump Flow Instrument Accuracy
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)
--Alternative Provides Acceptable Level of Quality and Safety--

1. **ASME Code Components Affected:**

High Pressure Coolant Injection (HPCI) Pump–10P204 (Class 2, Group B)
HPCI Booster Pump–10P217 (Class 2, Group B)

The HPCI Pump is an Emergency Core Cooling System (ECCS) component that is also used to maintain reactor vessel inventory following reactor isolation with coincident failure of the non-ECCS reactor core isolation cooling (RCIC) system.

The HPCI Booster Pump is integral with the HPCI Pump in that they are driven off the same turbine. The Booster Pump ensures that the minimum net positive suction head requirements of the HPCI Pump are maintained for the design accident flow rates.

2. **Applicable Code Edition and Addenda:**

ASME OM-2012 Edition, no Addenda

3. **Applicable Code Requirement:**

Subsection ISTB, Paragraph ISTB-3510, General, Subparagraph (a), Accuracy, "Instrument accuracy shall be within the limits of Table ISTB-3510-1. If a parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table ISTB-3510-1 (e.g., flow rate determination shall be accurate to within +/- 2% of actual). For individual analog instruments, the required accuracy is percent of full scale..."

4. **Reason for Request:**

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirement of ASME OM Code ISTB-3510(a).

In addition to ISTB-3510(a), instrumentation is addressed in ISTB-3510(b)(1) which requires that the full–scale range of each analog instrument be not greater than three times the reference value. For instruments to be in compliance with the Code, both of these requirements must be met, individually, for each instrument. The combination of the two requirements (i.e. accuracy equal to +/- 2 % of full scale and full scale being up to 3 times the reference value) yields a permissible inaccuracy of +/- 6% of the reference value.

The permanently installed flow instrument 1FDFIC-R600-E41 does not meet the 2 percent acceptable instrument accuracy specified in Table ISTB-3510-1.

Relief Request PR-01
HPCI Pump Flow Instrument Accuracy
(Continued)

5. Proposed Alternative and Basis for Use:

As a proposed alternative, HCGS proposes to use the currently installed analog instruments for measurement of flow for the identified equipment. Although this instrument does not explicitly meet the requirements of ISTB-3510(a), it provides better indication accuracy at the reference value than that which is permitted by the Code when taking the requirements of ISTB-3510(a) and ISTB-3510(b)(1) together as a whole.

The supporting data table below lists the actual instrument loop accuracy. This loop accuracy has been calculated from the transmitter to the indicator in the main control room.

As indicated in the table below, the installed instrumentation has a full-scale range of 6000 gpm, which only slightly exceeds the pump flow reference value of 5600 gpm (full scale equals 1.07 times reference) with an accuracy of +3.83% and –0.67% of full scale. This results in flow rate measurements accurate to +4.1% or -0.72% of indicated flow at reference conditions (5600 gpm), which is more conservative than the 6% minimum accuracy allowed by the combination of instrument full-scale range and accuracy allowed in Subsection ISTB. The current instrumentation provides sufficient repeatability to allow for an evaluation of the pump hydraulic condition and detect pump degradation.

Supporting Data Table

Instrument Number: 1FDFIC-R600-E41

Actual Instrument Range: 0-6000 gpm

Actual Gauge (Loop) Accuracy: +3.83 / -0.67% of full scale

Test Reference Value: 5600 gpm

Code Allowable Instrument Range: 16,800 gpm (3X ref. value)

Code Allowable Instrument Tolerance: +/-336 gpm (2% full scale at 3X reference value)

Actual Instrument Tolerance: +229.8 gpm / -40.2 gpm

Actual Indicated Accuracy: +4.1 / -0.72% (at reference value)

Relief Request PR-01
HPCI Pump Flow Instrument Accuracy
(Continued)

5. Proposed Alternative and Basis for Use (Cont.):

NUREG-1482, Rev.2, Section 5.5.1, "Range and Accuracy of Analog Instruments," states, in part: "…the staff may grant relief when the combination of the range and accuracy yields a reading that is as at least equivalent to that achieved using instruments that meet the Code requirements (i.e., up to +/-6 percent for Group A and B tests,…" and "…the use of any available instruments that meet the intent of the Code requirements for the actual reading would yield an acceptable level of quality and safety for testing." Based on Section 5.5.1 of NUREG 1482, Rev. 2, and the information provided herein, the existing permanently installed pump flow instrumentation is considered acceptable in meeting the intent of the ASME OM Code -2012 Paragraphs ISTB 3510(a) and ISTB-3510(b)(1).

6. Duration of Proposed Alternative:

The proposed alternative identified will be utilized during the entire fourth IST interval, which is scheduled to begin December 21, 2016, and conclude on December 20, 2026.

7. Precedents:

1. Letter from T. Boyce (U. S. Nuclear Regulatory Commission) to R. Duncan II (Carolina Power & Light Company), "Shearon Harris Nuclear Plant, Unit 1- Relief Request AF-PR-1 for the Third 10-Year Inservice Inspection Interval (TAC NO. MD3894)," dated July 16, 2007 (ADAMS Accession No. ML071660054).

2. Letter from H. Chernoff (U. S. Nuclear Regulatory Commission) to W. Levis (PSEG Nuclear LLC), "Safety Evaluation of Relief Requests for the Third 10-Year Interval of the Inservice Testing Program for Hope Creek Generating Station (TAC NOS. MD3300, MD3301, MD3337, MD3338, MD3353, and MD3354)," dated April 5, 2007 (ADAMS Accession No. ML070740371).

3. Letter from H. Chernoff (U. S. Nuclear Regulatory Commission) to C. Pardee (Exelon Nuclear), "Limerick Generating Station, Units 1 and 2 – Evaluation of Relief Requests Associated with the Third Inservice Testing Interval (TAC NOS. ME0742 – ME0751)," dated November 17, 2009 (ADAMS Accession No. ML093080382).

Relief Request PR-01
HPCI Pump Flow Instrument Accuracy
(Continued)

8. References:

1. NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants."

2. SC-BJ-0001 Rev. 3, Loop Tolerance Calculation for HPCI Flow Controller 1-FD-FIC-R600-E41.

10 CFR 50.55a Request PR-02
RCIC Pump Flow Instrument Accuracy
Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)
--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Components Affected:

Reactor Core Isolation Cooling (RCIC) Pump, 10P203 (Class 2, Group B)

While not credited as an ECCS component, the RCIC Pump is safety-related and provides demineralized make-up water to the reactor vessel in the event that the reactor vessel is isolated.

2. Applicable Code Edition and Addenda:

ASME OM-2012 Edition, no Addenda

3. Applicable Code Requirement:

Subsection ISTB, Paragraph ISTB-3510, General, Subparagraph (a), Accuracy, "Instrument accuracy shall be within the limits of Table ISTB-3510-1. If a parameter is determined by analytical methods instead of measurement, then the determination shall meet the parameter accuracy requirement of Table ISTB-3510-1 (e.g., flow rate determination shall be accurate to within +/- 2% of actual). For individual analog instruments, the required accuracy is percent of full scale…"

4. Reason for Request:

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirement of ASME OM Code ISTB-3510(a).

In addition to ISTB-3510(a), instrumentation is addressed in ISTB-3510(b)(1) which requires that the full –scale range of each analog instrument be not greater than three times the reference value. For instruments to be in compliance with the Code, both of these requirements must be met, individually, for each instrument. The combination of the two requirements (i.e. accuracy equal to +/- 2 % of full scale and full scale being up to 3 times the reference value) yields a permissible inaccuracy of +/- 6% of the reference value.

The permanently installed flow instrument 1FCFIC-R600-E51 does not meet the 2 percent acceptable instrument accuracy specified in Table ISTB-3510-1.

Relief Request PR-02
RCIC Pump Flow Instrument Accuracy
(Continued)

5. Proposed Alternative and Basis for Use:

As a proposed alternative, HCGS proposes to use the currently installed analog instruments for measurement of flow for the identified equipment. Although this instrument does not explicitly meet the requirements of ISTB-3510(a), it provides better indication accuracy at the reference value than that which is permitted by the Code when taking the requirements of ISTB-3510(a) and ISTB-3510(b)(1) together as a whole.

The supporting data table below lists the actual instrument loop accuracy. This loop accuracy has been calculated from the transmitter to the indicator in the main control room.

As indicated in the table below, the installed instrumentation has a full-scale range of 700 gpm, which only slightly exceeds the pump flow reference value of 600 gpm (full scale equals 1.17 times reference) with an accuracy of +2.49% and -2.49% of full scale. This results in flow rate measurements accurate to +2.9% or -2.9% of indicated flow at reference conditions (600 gpm), which is more conservative than the 6% minimum accuracy allowed by the combination of instrument full-scale range and accuracy allowed in Subsection ISTB. The current instrumentation provides sufficient repeatability to allow for an evaluation of the pump hydraulic condition and detect pump degradation.

Supporting Data Table

Instrument Number: 1FCFIC-R600-E51

Actual Instrument Range: 0-700 gpm

Actual Gauge (Loop) Accuracy: +2.49 / -2.49%

Test Reference Value: 600 gpm

Code Allowable Instrument Range: 1,800 gpm (3X ref. value)

Code Allowable Instrument Tolerance: +/-36 gpm (2% of full scale at 3X reference value)

Actual Instrument Tolerance: 17.43 gpm / -17.43 gpm

Actual Indicated Accuracy: +2.9/ -2.9% (at reference value)

Relief Request PR-02
RCIC Pump Flow Instrument Accuracy
(Continued)

5. Proposed Alternative and Basis for Use (Cont.):

NUREG-1482, Rev.2, Section 5.5.1, "Range and Accuracy of Analog Instruments," states, in part: "…the staff may grant relief when the combination of the range and accuracy yields a reading that is as at least equivalent to that achieved using instruments that meet the Code requirements (i.e., up to +/-6 percent for Group A and B tests,…" and "…the use of any available instruments that meet the intent of the Code requirements for the actual reading would yield an acceptable level of quality and safety for testing." Based on Section 5.5.1 of NUREG 1482, Rev. 2, and the information provided herein, the existing permanently installed pump flow instrumentation is considered acceptable in meeting the intent of the ASME OM Code -2012 Paragraphs ISTB 3510(a) and ISTB-3510(b)(1).

6. Duration of Proposed Alternative:

The proposed alternative identified will be utilized during the entire fourth IST interval, which is scheduled to begin December 21, 2016, and conclude on December 20, 2026.

7. Precedents:

1. Letter from T. Boyce (U. S. Nuclear Regulatory Commission) to R. Duncan II (Carolina Power & Light Company), "Shearon Harris Nuclear Plant, Unit 1- Relief Request AF-PR-1 for the Third 10-Year Inservice Inspection Interval (TAC NO. MD3894)," dated July 16, 2007 (ADAMS Accession No. ML071660054).

2. Letter from H. Chernoff (U. S. Nuclear Regulatory Commission) to W. Levis (PSEG Nuclear LLC), "Safety Evaluation of Relief Requests for the Third 10-Year Interval of the Inservice Testing Program for Hope Creek Generating Station (TAC NOS. MD3300, MD3301, MD3337, MD3338, MD3353, AND MD3354)," dated April 5, 2007 (ADAMS Accession No. ML070740371).

3. Letter from H. Chernoff (U. S. Nuclear Regulatory Commission) to C. Pardee (Exelon Nuclear), "Limerick Generating Station, Units 1 and 2 – Evaluation of Relief Requests Associated with the Third Inservice Testing Interval (TAC NOS. ME0742 – ME0751)," dated November 17, 2009 (ADAMS Accession No. ML093080382).

Relief Request PR-02
RCIC Pump Flow Instrument Accuracy
(Continued)

8. References:

1. NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants."

2. SC-BD-0039, Rev 3, "Loop Tolerance Calculation for RCIC Flow Controller 1-FC-FIC-R600-E51.

Attachment 2

VALVE 10CFR50.55a REQUESTS

VALVE 10CFR50.55a REQUESTS INDEX

NUMBER	DESCRIPTION	REVISION
VR-01	Excess Flow Check Valves Test Frequency	0
VR-02	Main Steam Safety Relief Valves	0

10 CFR 50.55a Request VR-01
Excess Flow Check Valves Test Frequency
Proposed Alternative In Accordance with 10CFR50.55a(z)(1)
--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Components affected:

Excess flow check valves (EFCVs) in the following table:

Component ID.	ASME Class	Category	P&ID (Sh #)
1ABXV-3666A	1	C	M41-1(1)
1ABXV-3666B	1	C	M41-1(2)
1ABXV-3666C	1	C	M41-1(2)
1ABXV-3666D	1	C	M41-1(2)
1ABXV-3667A	1	C	M41-1(1)
1ABXV-3667B	1	C	M41-1(2)
1ABXV-3667C	1	C	M41-1(2)
1ABXV-3667D	1	C	M41-1(2)
1ABXV-3668A	1	C	M41-1(1)
1ABXV-3668B	1	C	M41-1(2)
1ABXV-3668C	1	C	M41-1(2)
1ABXV-3668D	1	C	M41-1(2)
1ABXV-3669A	1	C	M41-1(1)
1ABXV-3669B	1	C	M41-1(2)
1ABXV-3669C	1	C	M41-1(2)
1ABXV-3669D	1	C	M41-1(2)
1BBXV-3621	1	C	M42-1(1)
1BBXV-3649	1	C	M41-1(1)
1BBXV-3725	1	C	M42-1(1)
1BBXV-3726A	1	C	M42-1(1)
1BBXV-3726B	1	C	M42-1(1)
1BBXV-3727A	1	C	M42-1(1)
1BBXV-3727B	1	C	M42-1(1)
1BBXV-3728A	1	C	M42-1(1)
1BBXV-3728B	1	C	M42-1(1)
1BBXV-3729A	1	C	M42-1(1)
1BBXV-3729B	1	C	M42-1(1)
1BBXV-3730A	1	C	M42-1(1)
1BBXV-3730B	1	C	M42-1(1)
1BBXV-3731A	1	C	M42-1(1)
1BBXV-3731B	1	C	M42-1(1)
1BBXV-3732A	1	C	M42-1(1)
1BBXV-3732B	1	C	M42-1(1)

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Excess Flow Check Valves Test Frequency
(Continued)

1. **ASME Code Components affected (Cont):**

Component ID.	ASME Class	Category	P&ID (Sh #)
1BBXV-3732C	1	C	M42-1(1)
1BBXV-3732D	1	C	M42-1(1)
1BBXV-3732E	1	C	M42-1(1)
1BBXV-3732F	1	C	M42-1(1)
1BBXV-3732G	1	C	M42-1(1)
1BBXV-3732H	1	C	M42-1(1)
1BBXV-3732J	1	C	M42-1(1)
1BBXV-3732K	1	C	M42-1(1)
1BBXV-3732L	1	C	M42-1(1)
1BBXV-3732M	1	C	M42-1(1)
1BBXV-3732N	1	C	M42-1(1)
1BBXV-3732P	1	C	M42-1(1)
1BBXV-3732R	1	C	M42-1(1)
1BBXV-3732S	1	C	M42-1(1)
1BBXV-3732T	1	C	M42-1(1)
1BBXV-3732U	1	C	M42-1(1)
1BBXV-3732V	1	C	M42-1(1)
1BBXV-3732W	1	C	M42-1(1)
1BBXV-3734A	1	C	M42-1(1)
1BBXV-3734B	1	C	M42-1(1)
1BBXV-3734C	1	C	M42-1(1)
1BBXV-3734D	1	C	M42-1(1)
1BBXV-3737A	1	C	M42-1(1)
1BBXV-3737B	1	C	M42-1(1)
1BBXV-3738A	1	C	M42-1(1)
1BBXV-3738B	1	C	M42-1(1)
1BBXV-3783	1	C	M43-1(1)
1BBXV-3785	1	C	M43-1(1)
1BBXV-3787	1	C	M43-1(1)
1BBXV-3789	1	C	M43-1(1)
1BBXV-3801A	1	C	M43-1(1)
1BBXV-3801B	1	C	M43-1(1)
1BBXV-3801C	1	C	M43-1(1)
1BBXV-3801D	1	C	M43-1(1)
1BBXV-3802A	1	C	M43-1(1)
1BBXV-3802B	1	C	M43-1(1)
1BBXV-3802C	1	C	M43-1(1)
1BBXV-3802D	1	C	M43-1(1)

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Excess Flow Check Valves Test Frequency
(Continued)

1. **ASME Code Components affected (Cont):**

Component ID.	ASME Class	Category	P&ID (Sh #)
1BBXV-3803A	1	C	M43-1(1)
1BBXV-3803B	1	C	M43-1(1)
1BBXV-3803C	1	C	M43-1(1)
1BBXV-3803D	1	C	M43-1(1)
1BBXV-3804A	1	C	M43-1(1)
1BBXV-3804B	1	C	M43-1(1)
1BBXV-3804C	1	C	M43-1(1)
1BBXV-3804D	1	C	M43-1(1)
1BBXV-3820	1	C	M43-1(1)
1BBXV-3821	1	C	M43-1(1)
1BBXV-3826	1	C	M43-1(1)
1BBXV-3827	1	C	M43-1(1)
1BCXV-4411A	1	C	M51-1(2)
1BCXV-4411B	1	C	M51-1(1)
1BCXV-4411C	1	C	M51-1(2)
1BCXV-4411D	1	C	M51-1(1)
1BCXV-4429A	1	C	M51-1(2)
1BCXV-4429B	1	C	M51-1(1)
1BCXV-4429C	1	C	M51-1(2)
1BCXV-4429D	1	C	M51-1(1)
1BEXV-F018A	1	C	M52-1(1)
1BEXV-F018B	1	C	M52-1(1)
1BGXV-3882	1	C	M44-1(1)
1BGXV-3884A	1	C	M44-1(1)
1BGXV-3884B	1	C	M44-1(1)
1BGXV-3884C	1	C	M44-1(1)
1BGXV-3884D	1	C	M44-1(1)
1FCXV-4150A	1	C	M49-1(1)
1FCXV-4150B	1	C	M49-1(1)
1FCXV-4150C	1	C	M49-1(1)
1FCXV-4150D	1	C	M49-1(1)
1FDXV-4800A	1	C	M55-1(1)
1FDXV-4800B	1	C	M55-1(1)
1FDXV-4800C	1	C	M55-1(1)
1FDXV-4800D	1	C	M55-1(1)

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Excess Flow Check Valves Test Frequency
(Continued)

2. Applicable Code Edition and Addenda:

ASME OM Code-2012 Edition, no Addenda

3. Applicable Code Requirement:

ISTC-3522(c), Category C Check Valves, "If exercising is not practicable during operation at power and cold shutdown, it shall be performed during refueling outages."

ISTC-3700, Position Verification Testing, "Valves with remote position indicators shall be observed locally at least once every 2 yr to verify that valve operation is accurately indicated…"

4. Reason for Request:

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirements of ASME OM Code ISTC-3522(c) and ISTC-3700 for the subject valves. The basis of the relief request is that the proposed alternative would provide an acceptable level of quality and safety.

The OM Code requires check valves to be exercised quarterly during plant operation, or if valve exercising is not practicable during plant operation and cold shutdown, it shall be performed during refueling outages. The OM Code also requires verification of valve position indication at least once every 2 years. HCGS tests a representative sample of EFCVs every 18 months such that all valves (except for 1BBXV-3469, as exempted by TS note) are tested once in 10 years per TS SR 4.6.3.4 (reference 8.4).

The EFCVs have position indication at local panels in the reactor building. Check valve remote position indication is excluded from Regulatory Guide 1.97, Revision 2, dated, May 1983, as a required parameter for evaluating containment isolation. The remote position indication is verified accurate at the same frequency as the exercise test prescribed in TS SR 4.6.3.4.

The testing described above requires removal of the associated instrument or instruments from service. Since these instruments are in use during plant operation, removal of any of these instruments from service may cause a spurious signal, which could result in a plant trip or an unnecessary challenge to safety systems.

10 CFR 50.55a Request VR-01
Excess Flow Check Valves Test Frequency
(Continued)

4. Reason for Request (Cont.):

Additionally, process fluid will be contaminated to some degree, requiring special measures to collect flow from the vented instrument side and also contribute to an increase in personnel radiation exposure.

The EFCVs are classified as ASME Code Category C and are also containment isolation valves. However, these valves are excluded from 10CFR50, Appendix J, Type C leak rate testing, due to the size of the instrument lines and upstream orifices. Therefore, they have no safety-related seat leakage criterion.

5. Proposed Alternative and Basis for Use:

Excess flow check valves will be tested on a representative sample basis at the frequency specified in TS SR 4.6.3.4.

Industry experience as documented in NEDO-32977-A (reference 8.3), indicates that EFCVs have a very low failure rate. A review of the maintenance history for Hope Creek EFCVs has shown that they have been extremely reliable over the life of the plant, showing less than 1% failure rate associated with testing of these valves. Examples of causes for the failures include alarm problems, position indication (limit switch adjustment), and bent instrument tubing. Review of surveillance test history shows no evidence of time based failure mechanisms or common mode failures associated with EFCVs. The Hope Creek test experience is consistent with the findings in the NEDO document. The NEDO document indicates similarly that many reported test failures at other plants were related to test methodologies and not actual EFCV failures. Thus, the EFCVs at Hope Creek, consistent with the industry, have exhibited a high degree of reliability, availability, and provide an acceptable level of quality and safety.

Surveillance 4.6.3.4 requires demonstration that a representative sample of reactor instrumentation line excess flow check valves are tested to demonstrate that the valve actuates to check flow on a simulated instrument line break. This surveillance requirement provides assurance that the instrument line EFCVs will perform so that the predicted radiological consequences will not be exceeded during a postulated instrument line break event as evaluated in the Updated Final Safety Analysis Report (UFSAR). The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program (TS 6.8.4.j). Operating experience has demonstrated that these components are highly reliable and that failures to isolate are very infrequent. Therefore, testing of a representative sample was concluded to be acceptable from a reliability standpoint.

10 CFR 50.55a Request VR-01
Excess Flow Check Valves Test Frequency
(Continued)

5. Proposed Alternative and Basis for Use (Cont.):

The remote position indication will be verified accurate at the same frequency as the exercise test prescribed in TS SR 4.6.3.4. Although inadvertent actuation of an EFCV during operation is highly unlikely due to the spring poppet design, corrective action documents are initiated for any EFCV with abnormal position indication displays.

6. Duration of proposed alternative:

The proposed alternative identified will be utilized during the fourth IST interval, which is scheduled to begin December 21, 2016, and conclude on December 20, 2026.

7. Precedents:

1. Susquehanna Steam Electric Station, Request No. RR-03, as discussed in NRC SER: Susquehanna Steam Electric Station, Units 1 and 2, Third 10-Year Interval Inservice Testing (IST) Program Plans (TAC Nos. MC3382, MC3383, MC3384, MC3385, MC3386, MC3387, MC3388, MC3389, MC4421, MC4422), dated March 10, 2005. (ADAMS Accession No. ML050690239).
2. Nine Mile Point Nuclear Station– Safety Evaluation of Relief Requests for the Unit No. 1 Fourth 10-Year and Unit No. 2 Third 10-Year Pump and Valve Inservice Testing Program (TAC Nos. MD9202 and MD9203) re-iterated approval of similar relief request GV-RR-08 for Nine Mile Point Unit 2 for duration of the operating license (ADAMS Accession No. ML083500039). The NRC previously authorized the alternative regarding EFCV testing frequency in GV-RR-08 (TAC No. MB1491) via the safety evaluation dated September 17, 2001 (ADAMS Accession No. ML012340462).
3. Hope Creek Generating Station – Safety Evaluation of Inservice Testing Program Relief Request V-005 for Excess Flow Check Valves (TAC No. MB1724), dated August 27, 2001 (ADAMS Accession No. ML012210185).
4. Fermi 2 – Evaluation of In-Service Testing Program Relief Requests VRR-011, VRR-012, and VRR-013 (TAC No. ME2558, ME2557, and ME2556, dated September 28, 2010) (ADAMS Accession No. ML102360570).

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Excess Flow Check Valves Test Frequency
(Continued)

8. References:

1. Hope Creek Technical Specifications (SR 4.6.3.4 and 6.8.4.j).
2. LS-HC-1000-1001, Hope Creek Generating Station Surveillance Frequency Control Program List of Surveillance Frequencies.
3. GE Nuclear Energy, NEDO-32977-A, DRF B21-00658-01, Class I, Excess Flow Check Valve Testing Relaxation, June 2000.
4. HCGS License Amendment No. 132, "Issuance of Amendment re: Excess Flow Check Valve Testing Requirements (TAC No. MB1723)," dated August 28, 2001 (ADAMS Accession No. ML012130156).
5. RG 1.97, Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants, Revision 2.

10 CFR 50.55a Request VR-02
Main Steam Safety Relief Valves
Proposed Alternative In Accordance with 10CFR50.55a(z)(1)
--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Components Affected:

Main Steam and Automatic Depressurization System (ADS) Valves:
1SNPSV-F013A, B, C, D, E (Class 1, Category C)
1ABPSV-F013F, G, H, J, K, L, M, P, R (Class 1, Category C)

These valves have a safety function in the open position to provide overpressure protection for the main steam header and the reactor vessel. Additionally, valves 1SNPSV-F013A-E also serve an ECCS function in the ADS to depressurize the reactor vessel in the event of a small break LOCA coincident with a failure of the HPCI system.

2. Applicable Code Edition and Addenda:

ASME OM-2012 Edition, no Addenda

3. Applicable Code Requirement:

Paragraph I-3310 of Mandatory Appendix I specifies the periodic testing requirements of ASME Class 1 main steam pressure relief valves with auxiliary actuating devices. The Code required periodic testing for these valves includes, in part: seat tightness determination; set pressure determination; determination of electrical characteristics and pressure integrity of solenoid valve(s); determination of pressure integrity and stroke capability of air actuator; and determination of operation and electrical characteristics of position indicators.

The frequency of the required testing is specified in paragraph I-1320(a), which requires that these main steam relief valves be periodically tested at least once every five years, with a minimum of 20% of the valves tested within any 24 months, where the 20% shall be previously untested valves, if they exist.

4. Reason for Request:

Pursuant to 10 CFR 50.55a, "Codes and Standards," paragraph (z)(1), relief is requested from the requirements of ASME OM Code I-1320(a) for the subject valves. The basis of the relief request is that the proposed alternative would provide an acceptable level of quality and safety.

Hope Creek UFSAR 5.2.2.4.2.1.3 discusses the testing frequency of the safety relief valves (SRVs). This section states that Hope Creek "can achieve optimum SRV operability by disassembly of the pilot section of at least 50 percent of the operating SRVs after each cycle." PSEG implements the appropriate inspection guidance specified in General Electric Service Information Letter (SIL) No. 196.

10 CFR 50.55a Request VR-02
Main Steam Safety Relief Valves
(Continued)

4. Reason for Request (Cont):

Based on valve design, proper SRV operation and its ability to perform its intended function at the required set point are primarily determined by the pilot stage assembly of the valve. Target Rock Safety / Relief Valve Technical Manuals (Hope Creek VTD Documents PN1-B21-F013-0162 for 2-stage, and 432429 for 3-stage) describe the pilot stage assembly as the "pressure sensing and control element" of the valve. A review of NRC Information Notices 82-41, 83-39, 83-82, 86-12 and 88-30 supports the conclusion that it is the pilot stage assemblies that require the most diligent testing.

Hope Creek TS SR 4.4.2.2 requires that at least one half (1/2) of the safety relief valve pilot stage assemblies be removed, set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested and stored per manufacturer's recommendations in accordance with the Surveillance Frequency Control Program (18 months), and they shall be rotated such that all 14 SRV pilot stage assemblies are removed, set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested and stored in accordance with the manufacturer's recommendations in accordance with the Surveillance Frequency Control Program (40 months). All safety relief valves will be re-certified to meet a ±1% tolerance prior to returning the valves to service after set point testing.

Hope Creek TS SR 4.4.2.3 requires that the safety relief valve main (mechanical) stage assemblies shall be set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendations in accordance with the Surveillance Frequency Control Program (5 years).

5. Proposed Alternative and Basis for Use:

The Hope Creek Main Steam SRVs will be tested in accordance with TS SR 4.4.2.2 and 4.4.2.3. One-half (1/2) of the SRV's pilot stages will be removed and set pressure tested or replaced with previously tested assemblies every 18 months. In the event the "as-found" setpoint fails the setpoint testing, sample expansion of the other pilot valves will be conducted in accordance with paragraph I-1320(c) of Mandatory Appendix I. All 14 main stages (with the entire assembly) will be removed, tested and reinstalled or replaced every 5 years.

The true setpoint adjustment (and operability determination) of the valve is contained within the pilot portion of the SRV.

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Main Steam Safety Relief Valves
(Continued)

5. Proposed Alternative and Basis for Use (Cont.):

By applying the SRV testing frequency required by Mandatory Appendix I to the pilot portion (achieved by meeting TS SR 4.4.2.2), set point accuracy and pilot sticking verification can be maintained, providing an acceptable level of safety. Testing of the main body (mechanical portion), which contains only the main disc, piston rings and a preload spring that is non-adjustable, at the Mandatory Appendix I specified frequency will not result in a significant increase in the level of safety. Testing of the mechanical portion of all 14 SRVs to provide verification of blowdown and flow rates is conducted every 5 years when the valves are tested as a complete assembly per TS SR 4.4.2.3.

6. Duration of Proposed Alternative:

The proposed alternative identified will be utilized during the fourth IST interval, which is scheduled to begin December 21, 2016, and conclude on December 20, 2026.

7. Precedents:

The proposed alternative was previously authorized pursuant to 10CFR50.55a(a)(3)(i) (currently 10CFR50.55a(z)(2)) for Hope Creek:

1. Third 10-Year Interval per NRC SER dated April 5, 2007 (TAC Nos. MD3300, MD3301, MD3337, MD3338, MD3353, and MD3354)(ADAMS Accession No. ML070740371).
2. Second 10-Year Interval per NRC SER dated March 18, 1999 (TAC Nos. MA0425 and MA1430)(ADAMS Accession No. ML003680090).
3. First 10-Year Interval per NRC SER per NRC SER dated January 27, 1994. (TAC No. M86733)(ADAMS Accession No. ML011760536).

8. References:

1. Hope Creek UFSAR 5.2.2.4.2.1.3.
2. General Electric Service Information Letter 196 (SIL 196).
3. NRC Information Notices 82-41, 83-39, 83-82, 86-12 and 88-30.
4. Hope Creek Technical Specification SRs 4.4.2.2 and 4.4.2.3.
5. LS-HC-1000-1001, Hope Creek Generating Station Surveillance Frequency Control Program List of Surveillance Frequencies.

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Main Steam Safety Relief Valves
(Continued)

8. References (Cont.):

6. VTD PN1-B21-F013-0162, Sheet 0, Rev. 9, Target Rock Safety / Relief Valve Model 7567F Technical Manual.

7. VTD 432429, Sheet 1, Rev. 1, Target Rock Safety / Relief Valve Model 0867F-001 Technical Manual.