Exelon Generation.

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10 CFR 50.90
10 CFR 50.55a

February 5, 2020

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

Limerick Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: TS Change and Relief Requests Related to Safety Relief Valve Testing

This letter submits a License Amendment Request and two relief requests (RRs) all of which are related to the Inservice Testing (IST) Program of the Safety Relief Valves (SRVs) for Limerick Generating Station (LGS), Units 1 and 2.

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon) requests an amendment to the Technical Specifications (TS) Appendix A of the Renewed Facility Operating License Nos. NPF-39 and NPF-85 for LGS, Units 1 and 2, respectively. The proposed changes would modify the TS surveillance requirements (SRs) for testing of the SRVs to retain the frequency and certain testing requirements only in the IST Program. These changes will remove duplication of requirements contained in both the LGS TS and the IST Program and relocate to the TS Bases other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. This change is consistent with Improved Standard Technical Specifications (ISTS), NUREG 1433, Standard Technical Specifications, Revision 4.

The proposed amendment to the TS has been reviewed by the LGS Plant Operations Review Committee in accordance with the requirements of the Exelon Quality Assurance Program.

Exelon has concluded that the proposed TS changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92, "Issuance of amendment."

Attachment 1 provides a description and assessment of the proposed TS changes. Attachment 2 provides the existing TS pages marked up to show the proposed changes. Attachment 3 provides the existing TS Bases pages marked up to show the proposed changes (information only).

Additionally, in accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), Exelon requests NRC approval of the attached two RRs associated with IST Program requirements for the Main Steam SRVs for LGS, Units 1 and 2.

The proposed RRs would extend the SRV testing interval for SRVs at LGS, Units 1 and 2. Attachment 4 provides proposed RR GVRR-9 involving use of ASME OM Code Case OMN-17 related to testing of the SRVs at LGS, Units 1 and 2. Attachment 5 provides RR 41-VRR-7 involving extension of the test interval to eight years for the SRVs. These RRs are associated with the fourth IST interval for LGS, Units 1 and 2, which started on January 8, 2020. The fourth interval of the LGS, Units 1 and 2 IST program complies with the American Society of Mechanical Engineers (ASME) Code of Operation and Maintenance of Nuclear Power Plants (i.e., OM Code), 2012 Edition. The latest edition and addenda of the code incorporated by reference in 10 CFR 50.55a(b)(3) of the regulation is the 2012 Edition.

Exelon is requesting approval of these TS changes and IST program RRs by February 5, 2021.

There are no regulatory commitments contained within this submittal.

If you have any questions concerning this submittal, please contact Mr. David Neff at (267) 533-1132.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 5th day of February 2020.

Sincerely,

Shannon Rafferty-Czincila
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachments:
1. Evaluation of Proposed Changes
2. Markup of Proposed Technical Specifications Pages
3. Markup of Proposed Technical Specifications Bases Pages (For Information Only)
4. 10 CFR 50.55a Relief Request GVRR-9 Related to Safety Relief Valve (SRV) Testing and Use of ASME OM Code Case OMN-17
5. 10 CFR 50.55a Relief Request 41-VRR-7 Related to Safety Relief Valve (SRV) Testing 8-Year Test Interval

| | | |
|---|---|---|
| cc: | USNRC Region I, Regional Administrator | w/attachments |
| | USNRC Project Manager, LGS | " |
| | USNRC Senior Resident Inspector, LGS | " |
| | R. R. Janati, Pennsylvania Bureau of Radiation Protection | " |

**ATTACHMENT 1**

**License Amendment Request**

**Limerick Generating Station, Units 1 and 2**

**Docket Nos. 50-352 and 50-353**

**EVALUATION OF PROPOSED CHANGES**

**Subject:** **License Amendment Request to Revise Technical Specifications Surveillance Requirements for Testing of the Safety Relief Valves**

## 1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License (RFOL) Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively. The proposed changes would modify the TS Surveillance Requirements (SRs) for testing of the Safety Relief Valves (SRVs) to retain the SRV testing frequency and certain testing requirements only in the Inservice Testing (IST) Program and relocate to the TS Bases other requirements not required to be contained in the TS.

The LGS TS SR 4.4.2.2 contains certain testing requirements that are also required by 10 CFR 50.55a(f), Preservice and inservice testing requirements, and the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code). LGS Units 1 and 2 are required to perform the IST program testing of SRVs in accordance with the ASME OM Code as required by 10 CFR 50.55a(f) or by authorized alternatives pursuant to 10 CFR 50.55a(z). For the fourth IST Program ten-year interval that started on January 8, 2020, the 2012 edition of the ASME OM Code is used. ASME OM Code 2012, Division 1, Mandatory Appendix I paragraphs I-1320 and I-3310 contain most of the sampling and testing requirements of TS SR 4.4.2.2. A comparison of the TS SR 4.4.2.2 and ASME OM Code requirements has been performed and indicates which requirements are duplicative and which are only in the TS SR. The change to TS SR 4.4.2.2 proposes to retain the duplicated requirements in the IST Program and remove the duplication of requirements from the TS SR, and relocate to the TS Bases other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. These changes are consistent with 10 CFR 50.36, Improved Standard Technical Specifications (ISTS, Reference 1) and Technical Specifications Task Force (TSTF) Traveler TSTF-545 (Reference 2) and in compliance with the ASME OM Code requirements for the testing of SRVs.

## 2.0 DETAILED DESCRIPTION

To remove duplication of requirements in the LGS TS and the IST Program, changes to the TS SR for testing of the SRVs are proposed in this License Amendment Request (LAR). The current TS SR 4.4.2.2 contains certain testing requirements that are also required by the ASME OM Code and are implemented in the LGS IST Program. A comparison of the TS SR 4.4.2.2 for testing of SRVs and ASME OM Code requirements has been performed that indicates which requirements are duplicated and can be removed from the TS SR, which requirements are only in the TS SR and are to be retained in the TS SR, and which are not required by regulation to be in TS or the IST Program and are to be relocated to the TS Bases Section 3/4.4.2. A comparison of the ISTS for SRVs and the ASME OM Code testing requirements has been performed that indicates which ISTS requirements are not duplicated in the ASME OM Code and hence are to be retained in the TS. Refer to Section 3 and Tables 1 and 2 below for the comparison details.

The specific changes requested by this LAR are described below.

Current TS SR 4.4.2.2 states:

> At least 1/2 of the safety relief valves shall be removed, 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, and they shall be rotated such that all 14 safety relief valves are removed, 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. All safety valves will be recertification tested to meet a ±1% tolerance prior to returning the valves to service.

**Proposed revised wording to TS SR 4.4.2.2:**

> Verify the specified code safety valve function lift setting of each of the 14 safety/relief valves in accordance with Specification 4.0.5. All safety valves will be recertification tested to meet ±1% tolerance prior to returning the valves to service.

The marked-up pages that reflect the proposed changes are provided in Attachment 2 (Markup of Proposed Technical Specifications Pages) and Attachment 3 (Markup of Proposed Technical Specifications Bases Pages – For Information Only).

## 3.0 TECHNICAL EVALUATION

The proposed changes to the TS would modify the TS SR 4.4.2.2 for testing of the SRVs to retain the frequency and certain testing requirements for SRVs only in the IST Program and relocate to the TS Bases other requirements not required to be contained in the TS. These changes will remove duplication of requirements contained in both the LGS TS and the IST Program. These changes are consistent with the requirements of 10 CFR 50.36(c), ISTS (Reference 1) and TSTF-545 (Reference 2).

The NRC regulatory requirements related to the content of the TS are set forth in 10 CFR 50.36. Section 10 CFR 50.36(c)(3) requires that the TS include surveillance requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. The current LGS TS SR contains a testing requirement that all 14 SRVs are set pressure tested to verify the valves are within the existing tolerance of the code safety valve function lift setting. This requirement is to be retained in the TS SR.

The sampling and testing requirements for SRVs contained in LGS TS SR 4.4.2.2 implement a portion of the requirements in the ASME OM Code, Division 1, Mandatory Appendix I Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants as depicted in Table 1 below. TS SR and the IST Program tests meet the requirements of ASME OM code 2012, Division 1, Mandatory Appendix I including paragraphs I-1320, I-3310, and I-3410. ASME OM Code testing requirements will be retained in the IST Program and duplicative testing requirements in the LGS TS SR will be removed. The sample size and testing frequency are included in the LGS IST program as required by 10 CFR 50.55a(f) and ASME Code paragraph I-1320, Test Frequencies, Class 1 Pressure Relief Valves.

The NRC staff has issued guidance for a regulatory standardization effort and issued Standard Technical Specifications (STS) (aka ISTS) for each of the light-water reactor nuclear designs. NUREG-1433, Revision 4, "Standard Technical Specifications, General Electric BWR [Boiling Water Reactor]/4 Plants" (Reference 1) contains the ISTS for General Electric BWR/4 plants. The ISTS TS SR 3.4.3.1 for SRV testing states to verify the safety function lift setpoints are per the valve's specified value and that the frequency may be set to be in accordance with the IST Program or the Surveillance Frequency Control Program (SFCP). The ISTS TS and TS SRs do not contain other details of the SRV testing (e.g., sample size and test frequency are not included) that are required by 10 CFR 50.55a(f) or the IST program. The proposed changes to the LGS TS SR 4.4.2.2 will contain the requirements of ISTS SR 3.4.3.1.

The NRC issued Amendments 255 and 188 to the LGS Units 1 and 2 RFOLs (Reference 3), respectively, to adopt TSTF Traveler 545, "TS Inservice Testing Program Removal & Clarify SR Usage Rule Application to Section 5.5 Testing" (Reference 2). Consistent with TSTF-545, these Amendments removed the IST detailed program requirements from TS SR 4.0.5, "Inservice Inspection and Inservice Testing Program," and replaced the requirements with the following note. "The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." These Amendments also added a new definition for INSERVICE TESTING PROGRAM to the LGS TSs, which is defined as "the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." Consistent with TSTF-545, these Amendments removed potentially conflicting requirements between 10 CFR 50.55a(f) and the LGS TSs. Most of the LGS TS SRs that contain frequency or other testing requirements from the IST program state the testing is performed pursuant to TS SR 4.0.5. The new note and definition maintain consistency throughout the TS. TS SR 4.4.2.2 for testing of the SRVs was not included in that Amendment request because the LGS TS SR 4.4.2.2 contained the testing frequencies but did not include any reference to the IST Program or TS SR 4.0.5 and hence was not identified as requiring a change to be consistent with TSTF-545.

The original LGS TS were created based on NUREG-0123, "Standard Technical Specifications," Revision 3 (Reference 5), which did not contain the SRV testing or manufacturer storage recommendations contained in the LGS TS SR 4.4.2.2. The TS SR 4.4.2.2 requirement for 'storage in accordance with manufacturer's recommendations' does not meet the 10 CFR 50.36(c) criteria or ISTS guidance for inclusion in the TS SR. Therefore, consistent with the NRC Commission Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, the TS SR 4.4.2.2 requirements for storage in accordance with manufacturer's recommendations is to be relocated to the TS Bases, which is a Licensee-Controlled document.

A separate LAR was submitted (Reference 7) requesting a change to the TS Section 4.0.5 to reflect the allowance provided in 10 CFR 50.69 and to support implementation of LGS Units 1 and 2, Amendments 230 and 193, respectively. That LAR seeks to clarify requirements for structures, systems, and components (SSCs) that have been categorized as a Risk-Informed Safety Class (RISC) of RISC-3 (i.e., shown to be of low safety significance) in accordance with 10 CFR 50.69. The SRVs do not meet the RISC criteria to be categorized as RISC-3 and therefore, the LAR submitted by Reference 7 and the LAR in this Attachment can be processed independently and are not linked submittals.

The design function of the SRVs is provided in LGS Updated Final Safety Analysis Report (UFSAR) Section 5.2.2, "Overpressure Protection." There are no physical or design changes to the SRVs as a result of this LAR and the UFSAR design function remains unchanged. The SRV

testing required to maintain the design assumptions will still be required by the TS SR and the IST Program and any changes will be reviewed and approved under the requirements of 10 CFR 50.90 and 10 CFR 50.55a, respectively.

To remove duplicative requirements contained in both the LGS TS and the IST Program, changes to the TS SR for testing of the SRVs are proposed in this LAR. The current TS SR 4.4.2.2 contains certain testing requirements that are also required by the ASME OM Code and the LGS IST Program. LGS Units 1 and 2 are required to perform the IST program testing of safety relief valves in accordance with the ASME OM Code as required by 10 CFR 50.55a(f) or by authorized alternatives pursuant to 10 CFR 50.55a(z). For the fourth IST Program ten-year interval that started on January 8, 2020, the 2012 edition of the ASME OM Code is used. ASME OM Code 2012, Division 1, Mandatory Appendix I paragraphs I-1320 and I-3310 contain most of the sampling and testing requirements in TS SR 4.4.2.2. A comparison of the TS SR 4.4.2.2 and ASME OM Code requirements is provided in Table 1 below that indicates which requirements are duplicated and which are only in the TS SR. This comparison also identified TS SR requirements that are not required to be contained in the TS and therefore, these specific requirements are to be relocated to the TS Bases Section 3/4.4.2. Table 1 below provides a disposition (i.e., retain only in the IST Program or retain in the LGS TS SR or relocate to the TS Bases) for each requirement in the TS SR 4.4.2.2.

TS Section 3.4.3, "Safety/Relief Valves (S/RVs) of the ISTS specifies testing requirements for SRVs in SR 3.4.3.1 and SR 3.4.3.2. A comparison of the ISTS SR 3.4.3.1/3.4.3.2, the ASME OM Code requirements and the LGS SR 4.4.2.2 is provided in Table 2 below. This table provides a disposition of the ISTS SRs to be retained in the LGS TS to be consistent with the ISTS content.

**Table 1 –LGS TS SR Requirements Retention or Relocation to IST Program**

| LGS TS SR 4.4.2.2 Requirement | ASME OM Code Requirement | Compare to IST Content: Reword, Retain in IST Program or Retain in LGS TS SR |
|---|---|---|
| At least 1/2 of the safety relief valves | I-1320(a) | Retain only in IST Program |
| shall be removed, set pressure tested and | I-3310(c) | Retain only in IST Program |
| reinstalled or replaced with spares that have been previously set pressure tested | I-1320(b) | Retain only in IST Program |
| and stored in accordance with manufacturer's recommendations | No Code Requirement | Relocate to TS Bases Section B3/4.4.2 |
| in accordance with the SFCP, | Frequency per I-1320(a) | Reword TS SR to "In accordance with IST Program" |
| they shall be rotated such that all 14 safety relief valves are removed, 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 SFCP | I-1320(a) | Retain only in IST Program |
| and stored in accordance with manufacturer's recommendations. | No Code Requirement | Relocate to TS Bases Section B3/4.4.2 |
| All safety valves will be recertification tested to meet a ±1% tolerance prior to returning the valves to service. | No Code Requirement | Retain existing LGS TS wording to agree with ISTS. "All safety valves will be recertification tested to meet a ±1% tolerance prior to returning the valves to service." |

**Table 2 - ISTS SR 3.4.3 Requirements vs. LGS TS SR 4.4.2.2**

| ISTS TS SR Requirement | ASME OM Code Requirement | Compare to ISTS Content: Reword, Retain only in IST Program or Retain in LGS TS SR 4.4.2.2 |
|---|---|---|
| ISTS SR 3.4.3.1 Verify the safety function lift setpoints of the [required] S/RVs are as follows: Number of S/RVs and the Setpoint are listed in a table (different format in LGS TS) | Wording not required by the Code | Retain the table of SRV numbers and setpoints within the LGS Limiting Condition for Operation 3.4.2. Add to TS SR 4.4.2.2 a phrase "Verify the specified code safety valve function lift setting for each of the 14 SRVs." |
| Following testing, lift setpoints shall be within ±1% | No Code Requirement | Retain existing LGS TS SR 4.4.2.2 wording. "All safety valves will be recertification tested to meet a ±1% tolerance prior to returning the valves to service." |
| ISTS SR 3.4.3.1 Frequency In accordance with the IST Testing Program Or the SFCP | Wording not required by the Code | Change TS SR 4.4.2.2 from the SFCP to the IST Program |
| ISTS SR 3.4.3.2 Verify each [required] S/RV opens when manually actuated. (not currently in LGS TS) | I-3310(d) and (e) | Retain in IST Program |
| ISTS SR 3.4.3.2 Frequency [18] months or in accordance with the SFCP | I-3310 (following valve maintenance) | Retain in IST Program as required by the Code |

The proposed changes do not alter the physical design of any plant structure, system, or component; therefore, the proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. The proposed changes do not require any new or unusual operator actions. The proposed changes do not introduce any new failure modes that could result in a new accident. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes.

The proposed changes to the LGS TS SR 4.4.2.2 are consistent with the requirements of 10 CFR 50.36(c), meet the content specified in ISTS SR 3.4.3 and assure the required testing is performed to maintain the design function of the overpressure protection function provided by the SRVs. The evaluation verified that the testing required to meet 10 CFR 50.55a(f) will still be performed and that any duplication of requirements between the ASME OM Code and the LGS TS SR was properly dispositioned.

**TS Bases Section B 3/4.4.2 and SFCP**

The TS Bases for Safety/Relief Valves (TS Bases Section 3/4.4.2) will be revised to reflect changes to the frequency of SRV testing is specified in the IST Program. The marked-up TS Bases pages that reflect the proposed changes are provided in Attachment 3 for information purposes only. This section of the TS Bases already contains the storage in accordance with manufacturer's storage recommendations and no additional wording changes are necessary for the relocation from TS SR 4.4.2.2.

The SFCP and the IST Program both specify the sample size and testing frequency for the SRVs. The SFCP item TS 4.4.2.2 for the SRVs will be revised to remove the frequency and certain testing requirements that are required by the IST Program.

## 4.0 REGULATORY EVALUATION

### 4.1 Applicable Regulatory Requirements/Criteria

The NRC regulatory requirements related to the content of the TS are set forth in 10 CFR 50.36. This regulation requires that the TS include items in five categories, including: (1) safety limits, limiting safety system settings, and limiting control settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls. Section (c)(3) states in part, (c) Technical specifications will include items in the following categories: (3) Surveillance requirements. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

On July 22, 1993, the Commission issued the "Final Policy Statement: Technical Specifications Improvements for Nuclear Power Reactors," in the Federal Register (58 FR 39132). The policy statement established a set of objective criteria and guidance for determining which regulatory requirements and operating restrictions should be included in the TSs. The Final Policy Statement gave guidance for evaluating the required scope of the ISTS and defined the guidance criteria for determining which LCOs and associated SRs should remain in the ISTS. Using this approach, licensees should keep existing LCO requirements that fall within or satisfy any of the Final Policy Statement criteria in the TS. Those LCO requirements that do not fall into or satisfy these criteria may be relocated to licensee-controlled documents, such as the IST Program or the TS Bases. These criteria were later codified in 10 CFR 50.36.

The NRC staff's guidance for review of TSs is in Chapter 16, Revision 3, "Technical Specifications" (ADAMS Accession No. ML 100351425) of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." As described therein, as part of the regulatory standardization effort, the NRC staff has prepared Standard Technical Specifications (STS) (aka ISTS) for each of the light-water reactor nuclear designs. NUREG-1433, Revision 4, "Standard Technical Specifications, General Electric BWR [Boiling Water Reactor]/4 Plants" (ADAMS Accession No. ML12104A192) contains the ISTS for General Electric BWR/4 plants.

The NRC approved TSTF-545, Revision 3 (Reference 2), that provides guidance on how to request license amendments that would eliminate conflicting requirements between 10 CFR 50.55a and TS. TSTF-545 proposed elimination of the IST Program from the Administrative Controls Section of the TS. The TS contain SRs that require testing or test intervals in accordance with the IST program. To avoid uncertainty regarding the application of IST Program-related TS SRs, TSTF-545 included a new definition for the Inservice Testing Program stating that the IST Program is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements for preservice and inservice testing (referred to in this paragraph collectively as inservice testing) of the ASME BPV Code and ASME OM Code as required by 10 CFR 50.55a(f). The fourth interval of the LGS, Units 1 and 2 IST program complies with the ASME OM Code, 2012 Edition. Testing and maintenance requirements for the LGS SRVs is provided in ASME OM Code 2012, Division 1, Mandatory Appendix I paragraphs I-1320, I-3310 and I-3410.

Paragraph I-1320 Test Frequencies, Class 1 Pressure Relief Valves states

*(a) 5-Yr Test Interval.* Class 1 pressure relief valves shall be tested at least once every 5 yr, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-mo interval. This 20% shall consist of valves that have not been tested during the current 5-yr interval, if they exist. The test interval for any installed valve shall not exceed 5 yr. The 5-yr test interval shall begin from the date of the as-left set pressure test for each valve.

*(b) Replacement With Pretested Valves.* The Owner may satisfy testing requirements by installing pretested valves to replace valves that have been in service, provided that

(1) for replacement of a partial complement of valves, the valves removed from service shall be tested prior to resumption of electric power generation or

(2) for replacement of a full complement of valves, the valves removed from service shall be tested within 12 mo of removal from the system

*(c) Requirements for Testing Additional Valves.* Additional valves shall be tested in accordance with the following requirements:

(1) For each valve tested for which the as-found set-pressure (first test actuation) exceeds the greater of either the plus/minus tolerance limit of the Owner established set-pressure acceptance criteria of subpara. I-1310(e) or ±3% of valve nameplate set-pressure, two additional valves shall be tested from the same valve group.

(2) If the as-found set-pressure of any of the additional valves tested in accordance with subpara. I-1320(c)(1) exceeds the criteria noted therein, then all remaining valves of that same valve group shall be tested.

(3) The Owner shall evaluate the cause and effect of valves that fail to comply with the set-pressure acceptance criteria established in subpara. I-1320(c)(1) or the Owner-established acceptance criteria for other required tests, such as the acceptance of auxiliary actuating devices, compliance with Owner's seat tightness criteria, etc. Based upon this evaluation, the Owner shall determine the

need for testing in addition to the minimum tests specified in subpara. I-1320(c) to address any generic concerns that could apply to valves in the same or other valve groups.

Paragraph I-3310 Class 1 Main Steam Pressure Relief Valves states

With Auxiliary Actuating Devices. Tests before maintenance or set-pressure adjustment, or both, shall be performed for subparas. I-3310(a) through (c) in sequence. The remaining shall be performed after maintenance or set-pressure adjustments.

*(a)* visual examination
*(b)* seat tightness determination, if practicable
*(c)* set-pressure determination
*(d)* determination of electrical characteristics and pressure integrity of solenoid valve(s)
*(e)* determination of pressure integrity and stroke capability of air actuator
*(f)* determination of operation and electrical characteristics of position indicators
*(g)* determination of operation and electrical characteristics of bellows alarm switch
*(h)* determination of actuating pressure of auxiliary actuating device sensing element, where applicable, and electrical continuity
*(i)* determination of compliance with the Owner's seat tightness criteria

Paragraph I-3410 Class 1 Main Steam Pressure Relief Valves With Auxiliary Actuating Devices states

*(a)* Valves and accessories that comply with their respective acceptance criteria for the tests specified may be returned to service without further testing, except as required by subpara. I-3410(d).

*(b)* Valves and accessories that do not comply with their respective acceptance criteria shall be adjusted, refurbished, or replaced, in accordance with written procedures. Valves shall be adjusted to meet the acceptance criteria of subpara. I-1310(e).

*(c)* Refurbished equipment shall be subjected to the test(s) specified in para. I-3310, as applicable. If disassembly includes valve disk (main) components, then valve disk stroke capability shall be verified by mechanical examination or tests.

*(d)* Each valve with an auxiliary actuating device that has been removed for maintenance or testing and reinstalled after meeting the requirements of para. I-3310, shall have the electrical and pneumatic connections verified either through mechanical/electrical inspection or test prior to the resumption of electric power generation. Main disk movement and set-pressure verification are not required.

*(e)* Valves and accessories that do not comply with their respective acceptance criteria, whether the problem is associated with the component, the system, or associated equipment, shall be evaluated to determine the ability of the valve to perform its intended function until the next testing interval or maintenance opportunity. Corrective actions shall be taken, as appropriate, to ensure valve operability.

Section 5.2.2 of the LGS UFSAR cites the specific regulatory requirements of the nuclear pressure relief system that provides overpressure protection for the Reactor Coolant Pressure Boundary (RCPB). The Code of Federal Regulations 10 CFR 50, Appendix A, General Design Criteria for Nuclear Power Plants applicable to the overpressure protection and a description of applicability at LGS that is germane to the LAR is described below.

GDC 15 Reactor coolant system design

"The reactor coolant system and associated auxiliary, control, and protection systems shall be designed with sufficient margin to assure that the design conditions of the reactor coolant pressure boundary are not exceeded during any condition of normal operation, including anticipated operational occurrences."

As discussed in the UFSAR Section 5.2.2, the LGS nuclear pressure relief system is designed to perform the following functions:

a. Prevent overpressurization of the nuclear system that could lead to the failure of the RCPB
b. Provide automatic depressurization for small breaks in the nuclear system occurring with mis-operation of the HPCI system so that the LPCI and the core spray systems can operate to protect the fuel barrier
c. Permit verification of its operability
d. Withstand adverse combinations of loadings and forces resulting from normal, upset, emergency, or faulted conditions.

## 4.2 Precedence

The proposed changes are consistent with the NRC-approved ISTS, specifically in Sections 3.4.3 (Reference 1). Other nuclear power plant licensees have NRC-approved TS that are based on the ISTS. In one example, Peach Bottom Atomic Power Station, Units 2 and 3 (PBAPS), converted the TS to the ISTS in NRC-approved amendments 210 and 214 (Reference 4), respectively, and included language from the ISTS Section 3.4.3 and included SRV testing requirements in the PBAPS IST Program.

## 4.3 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of the Renewed Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively.

The proposed changes would modify the TS Surveillance Requirements (SRs) for testing of the Safety Relief Valves (SRVs) to retain the SRV testing frequency and certain testing requirements only in the Inservice Testing (IST) Program and to relocate to the TS Bases other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. The LGS TS SR 4.4.2.2 contains certain testing requirements that are also required by 10 CFR 50.55a(f), Preservice and inservice testing requirements, and the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code).

LGS Units 1 and 2 are required to perform the IST program testing of SRVs in accordance with the ASME OM Code as required by 10 CFR 50.55a(f) or by authorized alternatives pursuant to 10 CFR 50.55a(z). For the fourth IST Program ten-year interval that started on January 8, 2020, the 2012 edition of the ASME OM Code is used. ASME OM Code 2012, Division 1, Mandatory Appendix I paragraphs I-1320 and I-3310 contain most of the sampling and testing requirements of TS SR 4.4.2.2. A comparison of the TS SR 4.4.2.2 and ASME OM Code requirements has been performed and indicates which requirements are duplicative and which are only in the TS SR. The change to TS SR 4.4.2.2 proposes to retain the duplicated requirements only in the IST Program, remove the duplication of requirements from the TS SR and relocate to the TS Bases Section B 3.4.3 other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. These changes are consistent with Improved Standard Technical Specifications (ISTS), NUREG 1433, "Standard Technical Specifications," Revision 4, April 2012 (Reference 1), and Technical Specifications Task Force (TSTF) Traveler TSTF-545, "TS Inservice Testing [IST] Program Removal & Clarify SR [Surveillance Requirement] Usage Rule Application to Section 5.5 Testing," dated October 21, 2015 (ADAMS Accession No. ML15294A555) and in compliance with the ASME OM Code requirements for the testing of SRVs.

Exelon has evaluated the proposed changes, using the criteria in 10 CFR 50.92, "Issuance of amendment," and has determined that the proposed changes do not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards' consideration.

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

   Response: No

   The proposed changes would modify the TS SRs for testing of the SRVs to retain the SRV testing frequency and certain testing requirements only in the IST Program and relocate to the TS Bases other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. The current TS SR 4.4.2.2 contains certain testing requirements that are also required by the ASME OM Code and are implemented in the LGS IST Program. ASME OM Code testing requirements for the SRVs will be retained in the IST Program and duplicative testing requirements in the LGS TS SR will be removed. The proposed changes to the LGS TS SR 4.4.2.2 are consistent with the requirements of 10 CFR 50.36(c), meet the content specified in ISTS SR 3.4.3 and assure the required testing is performed to maintain the design function of the overpressure protection function provided by the SRVs. The evaluation verified that the testing required to meet 10 CFR 50.55a(f) will still be performed and that any duplication of requirements between the ASME OM Code and the LGS TS SR was properly dispositioned. The TS SR 4.4.2.2 requirement for 'storage in accordance with manufacturer's recommendations' does not meet the 10 CFR 50.36(c) criteria or ISTS guidance for inclusion in the TS SR.

   The proposed changes do not alter the physical design of any plant structure, system, or component; therefore, the proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation

equipment. The plant response to the design basis accidents does not change. The proposed changes do not require any new or unusual operator actions. The proposed changes do not introduce any new failure modes that could result in a new accident. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes. The proposed changes will maintain plant operation within the bounds of the current analysis for the accident source term dose limits in the overpressurization analysis, and therefore, the changes do not adversely affect the consequences of any accident previously evaluated.

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

The proposed changes would modify the TS SRs for testing of the SRVs to retain the SRV testing frequency and certain testing requirements only in the IST Program and relocate to the TS Bases other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. The current TS SR 4.4.2.2 contains certain testing requirements that are also required by the ASME OM Code and are implemented in the LGS IST Program. ASME OM Code testing requirements for the SRVs will be retained in the IST Program and duplicative testing requirements in the LGS TS SR will be removed. The proposed changes to the LGS TS SR 4.4.2.2 are consistent with the requirements of 10 CFR 50.36(c), meet the content specified in ISTS SR 3.4.3 and assure the required testing is performed to maintain the design function of the overpressure protection function provided by the SRVs. The evaluation verified that the testing required to meet 10 CFR 50.55a(f) will still be performed and that any duplication of requirements between the ASME OM Code and the LGS TS SR was properly dispositioned. The TS SR 4.4.2.2 requirement for 'storage in accordance with manufacturer's recommendations' does not meet the 10 CFR 50.36(c) criteria or ISTS guidance for inclusion in the TS SR.

The proposed changes do not alter the physical design of any plant structure, system, or component; therefore, the proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. The proposed changes do not require any new or unusual operator actions. The proposed changes do not introduce any new failure modes that could result in a new accident. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes. The proposed changes will maintain plant operation within the bounds of the current analysis for the accident source term dose limits in the overpressurization analysis, and therefore, the changes do not adversely affect the consequences of any accident previously evaluated.

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

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

Response: No

The proposed changes would modify the TS SRs for testing of the SRVs to retain the SRV testing frequency and certain testing requirements only in the IST Program and relocate to the TS Bases other requirements not required to be contained in the TS. The TS Bases is a Licensee-Controlled document. The current TS SR 4.4.2.2 contains certain testing requirements that are also required by the ASME OM Code and are implemented in the LGS IST Program. ASME OM Code testing requirements for the SRVs will be retained in the IST Program and duplicative testing requirements in the LGS TS SR will be removed. The proposed changes to the LGS TS SR 4.4.2.2 are consistent with the requirements of 10 CFR 50.36(c), meet the content specified in ISTS SR 3.4.3 and assure the required testing is performed to maintain the design function of the overpressure protection function provided by the SRVs. The evaluation verified that the testing required to meet 10 CFR 50.55a(f) will still be performed and that any duplication of requirements between the ASME OM Code and the LGS TS SR was properly dispositioned. The TS SR 4.4.2.2 requirement for 'storage in accordance with manufacturer's recommendations' does not meet the 10 CFR 50.36(c) criteria or ISTS guidance for inclusion in the TS SR.

The proposed changes do not alter the physical design of any plant structure, system, or component; therefore, the proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. The proposed changes do not require any new or unusual operator actions. The proposed changes do not introduce any new failure modes that could result in a new accident. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes. The proposed changes will maintain plant operation within the bounds of the current analysis for the accident source term dose limits in the overpressurization analysis, and therefore, the changes do not adversely affect the consequences of any accident previously evaluated.

The proposed changes have no adverse effect on plant operation, or the availability or operation of any accident mitigation equipment. The plant response to the design basis accidents does not change. The proposed changes do not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analyses. There is no change being made to safety analysis assumptions, safety limits or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes.

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

Based on the above evaluation, Exelon concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92, paragraph (c), and accordingly, a finding of "no significant hazards consideration" is justified.

## 4.4 Conclusions

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

## 5.0 ENVIRONMENTAL CONSIDERATION

Exelon has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation." However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," paragraph (c)(9). Therefore, pursuant to 10 CFR 51.22, paragraph (b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

## 6.0 REFERENCES

1. NUREG 1433, "Standard Technical Specifications," Revision 4, April 2012 (ADAMS Accession No. ML12104A192)
2. Technical Specifications Task Force (TSTF) Traveler TSTF-545, "TS Inservice Testing [IST] Program Removal & Clarify SR [Surveillance Requirement] Usage Rule Application to Section 5.5 Testing, dated October 21, 2015." (ADAMS Accession No. ML15294A555)
3. NRC Letter to Exelon, "Limerick Generating Station, Units 1 and 2 – Issuance of Amendments to Adopt Technical Specifications Task Force (TSTF) Traveler TSTF-545 (CAC Nos. MF8193 and MF8194), dated May 16, 2017 (ADAMS Accession No. ML17103A081)
4. NRC letter to Exelon, "Issuance of Improved Technical Specifications, Peach Bottom Atomic Power Station, Unit Nos. 2 and 3, (TAC Nos. M90746 and M90746)," Amendment Nos. 210 and 214, dated August 30, 1995 (ADAMS Accession No. ML011510084)
5. NUREG 0123, "Standard Technical Specifications," Revision 3, dated Fall 1980
6. NRC Commission "Final Policy Statement: Technical Specifications Improvements for Nuclear Power Reactors," published in the Federal Register (58 FR 39132) dated July 22, 1993
7. Exelon letter to NRC, "License Amendment Request, Proposed Clarification Changes to Technical Specification to Support Implementation of 10 CFR 50.69," dated November 25, 2019 (ADAMS Accession No. ML19329A212)

**ATTACHMENT 2**

**Limerick Generating Station Units 1 and 2**
**Docket Nos. 50-352 and 50-353**

**License Amendment Request to Revise Technical Specifications Surveillance Requirements for Testing of the Safety Relief Valves**

**Markup of Proposed Technical Specifications Pages**

**<u>Unit 1 TS Pages</u>**

3/4 4-7

**<u>Unit 2 TS Pages</u>**

3/4 4-7

## 3/4.4.2 SAFETY/RELIEF VALVES

### LIMITING CONDITION FOR OPERATION

3.4.2 The safety valve function of at least 12 of the following reactor coolant system safety/relief valves shall be OPERABLE with the specified code safety valve function lift settings:*#

4 safety/relief valves @ 1170 psig ±3%
5 safety/relief valves @ 1180 psig ±3%
5 safety/relief valves @ 1190 psig ±3%

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With the safety valve function of one or more of the above required safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. DELETED

c. DELETED

### SURVEILLANCE REQUIREMENTS

4.4.2.1 DELETED

4.4.2.2 ~~At least 1/2 of the safety relief valves shall be removed, 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, and they shall be rotated such that all 14 safety relief valves are removed, 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.~~ All safety valves will be recertification tested to meet a ±1% tolerance prior to returning the valves to service.

* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.

\# Up to 2 inoperable valves may be replaced with spare OPERABLE valves with lower setpoints until the next refueling.

Verify the specified code safety valve function lift setting of each of the 14 safety/relief valves in accordance with Specification 4.0.5.

## 3/4.4.2 SAFETY/RELIEF VALVES

### LIMITING CONDITION FOR OPERATION

3.4.2 The safety valve function of at least 12 of the following reactor coolant system safety/relief valves shall be OPERABLE with the specified code safety valve function lift settings:*#

4 safety/relief valves @ 1170 psig ±3%
5 safety/relief valves @ 1180 psig ±3%
5 safety/relief valves @ 1190 psig ±3%

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With the safety valve function of one or more of the above required safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. DELETED

c. DELETED

### SURVEILLANCE REQUIREMENTS

4.4.2.1 DELETED

4.4.2.2 ~~At least 1/2 of the safety relief valves shall be removed, 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, and they shall be rotated such that all 14 safety relief valves are removed, 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.~~ All safety valves will be recertification tested to meet a ±1% tolerance prior to returning the valves to service.

Verify the specified code safety valve function lift setting of each of the 14 safety/relief valves in accordance with Specification 4.0.5.

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* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.

\# Up to 2 inoperable valves may be replaced with spare OPERABLE valves with lower setpoints until the next refueling.

**ATTACHMENT 3**

**Limerick Generating Station Units 1 and 2**
**Docket Nos. 50-352 and 50-353**

**License Amendment Request to Revise Technical Specifications Surveillance Requirements for Testing of the Safety Relief Valves**

**Markup of Proposed Technical Specifications Bases Pages**
**(For Information Only)**

**Unit 1 TS Bases Pages**

B 3/4 4-2

**Unit 2 TS Bases Pages**

B 3/4 4-2

3/4.4.1 RECIRCULATION SYSTEM (continued)

Individual jet pumps in a recirculation loop normally do not have the same flow. The unequal flow is due to the drive flow manifold, which does not distribute flow equally to all risers. The flow (or jet pump diffuser to lower plenum differential pressure) pattern or relationship of one jet pump to the loop average is repeatable. An appreciable change in this relationship is an indication that increased (or reduced) resistance has occurred in one of the jet pumps. This may be indicated by an increase in the relative flow for a jet pump that has experienced beam cracks.

The deviations from normal are considered indicative of a potential problem in the recirculation drive flow or jet pump system. Normal flow ranges and established jet pump flow and differential pressure patterns are established by plotting historical data.

Recirculation pump speed mismatch limits are in compliance with the ECCS LOCA analysis design criteria for two recirculation loop operation. The limits will ensure an adequate core flow coastdown from either recirculation loop following a LOCA. In the case where the mismatch limits cannot be maintained during two loop operation, continued operation is permitted in a single recirculation loop mode.

In order to prevent undue stress on the vessel nozzles and bottom head region, the recirculation loop temperatures shall be within 50°F of each other prior to startup of an idle loop. The loop temperature must also be within 50°F of the reactor pressure vessel coolant temperature to prevent thermal shock to the recirculation pump and recirculation nozzles. Sudden equalization of a temperature difference > 145°F between the reactor vessel bottom head coolant and the coolant in the upper region of the reactor vessel by increasing core flow rate would cause undue stress in the reactor vessel bottom head.

3/4.4.2 SAFETY/RELIEF VALVES

The safety valve function of the safety/relief valves operates to prevent the reactor coolant system from being pressurized above the Safety Limit of 1325 psig in accordance with the ASME Code. A total of 12 OPERABLE safety/relief valves is required to limit reactor pressure to within ASME III allowable values for the worst case upset transient.

Demonstration of the safety/relief valve lift settings will occur only during shutdown. The safety/relief valves will be removed and either set pressure tested or replaced with spares which have been previously set pressure tested and stored in accordance with manufacturers recommendations at the frequency specified in the ~~Surveillance Frequency Control~~ Inservice Testing Program.

3/4.4.1 RECIRCULATION SYSTEM (continued)

Individual jet pumps in a recirculation loop normally do not have the same flow. The unequal flow is due to the drive flow manifold, which does not distribute flow equally to all risers. The flow (or jet pump diffuser to lower plenum differential pressure) pattern or relationship of one jet pump to the loop average is repeatable. An appreciable change in this relationship is an indication that increased (or reduced) resistance has occurred in one of the jet pumps. This may be indicated by an increase in the relative flow for a jet pump that has experienced beam cracks.

The deviations from normal are considered indicative of a potential problem in the recirculation drive flow or jet pump system. Normal flow ranges and established jet pump flow and differential pressure patterns are established by plotting historical data.

Recirculation pump speed mismatch limits are in compliance with the ECCS LOCA analysis design criteria for two recirculation loop operation. The limits will ensure an adequate core flow coastdown from either recirculation loop following a LOCA. In the case where the mismatch limits cannot be maintained during two loop operation, continued operation is permitted in a single recirculation loop mode.

In order to prevent undue stress on the vessel nozzles and bottom head region, the recirculation loop temperatures shall be within 50°F of each other prior to startup of an idle loop. The loop temperature must also be within 50°F of the reactor pressure vessel coolant temperature to prevent thermal shock to the recirculation pump and recirculation nozzles. Sudden equalization of a temperature difference > 145°F between the reactor vessel bottom head coolant and the coolant in the upper region of the reactor vessel by increasing core flow rate would cause undue stress in the reactor vessel bottom head.

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Demonstration of the safety/relief valve lift settings will occur only during shutdown. The safety/relief valves will be removed and either set pressure tested or replaced with spares which have been previously set pressure tested and stored in accordance with manufacturers recommendations at the frequency specified in the ~~Surveillance Frequency Control~~ Program.

Inservice Testing

ATTACHMENT 4
EXELON GENERATION COMPANY, LLC
IST PROGRAM – RELIEF REQUEST
Limerick Generating Station Units 1 and 2

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)
GVRR-9 – Use of Code Case OMN-17 for Testing of Pressure/Relief Valves

## 1. ASME Code Components Affected:

| Component | Description | Class | Category |
|---|---|---|---|
| PSV-41-1F013A | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-1F013B | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013C | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-1F013D | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-1F013E | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-1F013F | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013G | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-1F013H | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-1F013J | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-1F013K | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013L | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-1F013M | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-1F013N | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013S | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013A | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-2F013B | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013C | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-2F013D | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013E | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-2F013F | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013G | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |

| | | | |
|---|---|---|---|
| PSV-41-2F013H | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013J | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-2F013K | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013L | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-2F013M | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013N | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013S | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |

## 2. Applicable Code Edition

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code), 2012 Edition with no addenda.

## 3. Applicable Code Requirement(s)

ISTA-3130, *Application of Code Cases*, subparagraph *(b)* states "Code Cases shall be applicable to the edition and addenda specified in the test plan."

## 4. Reason For Request

Pursuant to 10 CFR 50.55a, *Codes and standards*, paragraph (z)(1), an alternative is proposed to ISTA-3130(b) requirements for implementing Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves" (Reference 2). The basis of this request is that the proposed alternative would provide an acceptable level of quality and safety.

ISTA-3130(b) states, "Code Cases shall be applicable to the edition and addenda specified in the test plan." ASME has approved Code Case OMN-17, Revision 0. This Code Case is unconditionally approved for use in Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 2 (Reference 3). The Limerick Generating Station (LGS), Units 1 and 2 Code-of-Record for the 3rd IST interval is ASME OM Code 2004 Edition through 2006 Addenda. The Code-of-Record for the 4th IST interval, which is scheduled to begin on January 8, 2020, will be the ASME OM Code-2012. However, Code Case OMN-17 indicates in the Inquiry (Applicability) section that it is applicable for use in lieu of the ASME OM Code 1995 Edition through the OMb-2006 Addenda. LGS will be implementing the ASME Code OM-2012 with RRs that are not associated with SRV testing requirements, as discussed in Reference 1. Exelon proposes to also implement Code Case OMN-17, once NRC approved. Code Case OMN-17 allows

for extending the test frequencies of the Class 1 Main Steam Line SRVs to a 72-month (6-year) test interval, with the allowed 6-month grace period, providing all the requirements of the Code Case continue to be satisfied. Code Case OMN-17 stipulates that during outages when there is only a partial complement of MSSVs replaced, those MSSVs removed shall be As-Found tested prior to the restart from that outage. For each MSSV that fails to meet the LGS set pressure acceptance criteria tolerance, two additional MSSVs shall be tested. If either of these two additional MSSVs are found to not meet their LGS set pressure acceptance criteria, then all remaining MSSVs shall be tested. Test failures are entered into the Exelon Corrective Action Program (CAP) for cause and corrective action determinations.

## 5. Proposed Alternative and Basis for Use

The proposed alternative to ISTA-3130(b) would allow LGS to implement Code Case OMN-17, although the Code Case Inquiry (Applicability) statement addresses only the 1995 Edition through the 2006 Addenda and ISTA-3130(b) requires applicability to the edition specified in the test plan, which would be the ASME OM Code-2012. Code Case OMN-17 was issued in 2007 and first published in the ASME OM Code-2009 Edition. A review of the 2012 Edition of the OM Code and Code Case OMN-17 confirmed that there are no changes in the applicable Code sections referenced within the Code Case when comparing the 2009 edition to the 2012 edition.

RG 1.192, Revision 2, Table 1, "Acceptable OM Code Cases," lists Code Case OMN-17 (2012 Edition) as acceptable to the NRC for application in a licensee's IST program without conditions.

Using the provisions of this request as an alternative to the requirements of ISTA-3130(b) will continue to provide assurance of the Main Steam SRVs' operational readiness and provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

## 6. Duration of Proposed Alternative

The proposed alternative, upon approval, shall be utilized for LGS, Units 1 and 2, during the entire 4th ten-year IST interval, which began on January 8, 2020 and is scheduled to end on January 7, 2030.

## 7. Precedent

1. Letter from U.S. NRC (J. G. Danna) to Exelon Generation (B. C. Hanson), "Nine Mile Point Nuclear Station, Units 1 and 2 – Relief from the Requirements of the ASME Code (EPID L-2017-LLR-0145 through EPID-L-2017-LLR-0152)," Relief Request MS-VR-01, dated November 13, 2018 (ADAMS Accession No. ML18275A139)

## 8. References

1. Exelon letter to NRC, "Relief Requests Associated with Fourth Ten-Year Inservice Testing Interval," dated December 17, 2018 (ADAMS Accession No. ML18352A227)
2. ASME OM Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves"
3. NRC Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 2, dated March 2017, published January 2018 (ML 16321A337)

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(1)
41-VRR-7, – Reactor Pressure Vessel Safety Relief Valve (SRV) Testing 8-Year Interval

## 1. ASME OM Code Component(s) Affected

| Component | Description | Class | Category |
|---|---|---|---|
| PSV-41-1F013A | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-1F013B | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013C | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-1F013D | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-1F013E | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-1F013F | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013G | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-1F013H | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-1F013J | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-1F013K | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013L | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-1F013M | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-1F013N | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-1F013S | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013A | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-2F013B | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013C | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-2F013D | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013E | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-2F013F | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013G | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-2F013H | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |

| | | | |
|---|---|---|---|
| PSV-41-2F013J | Main Steam Line Safety/Relief Valve on MSL 'A' | 1 | C |
| PSV-41-2F013K | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013L | Main Steam Line Safety/Relief Valve on MSL 'C' | 1 | C |
| PSV-41-2F013M | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |
| PSV-41-2F013N | Main Steam Line Safety/Relief Valve on MSL 'B' | 1 | C |
| PSV-41-2F013S | Main Steam Line Safety/Relief Valve on MSL 'D' | 1 | C |

2. **Applicable Code Edition**

American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code), 2012 Edition with no addenda.

3. **Applicable Code Requirement(s)**

Division 1, Mandatory Appendix I, Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants, paragraph I-1320, Test Frequencies, Class 1 Pressure Relief Valves, subparagraph (a) 5-Year Test Interval, which states:

"Class 1 pressure relief valves shall be tested at least once every 5 yr, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-mo interval. This 20% shall consist of valves that have not been tested during the current 5-yr interval, if they exist. The test interval for any installed valve shall not exceed 5 yr. The 5-yr test interval shall begin from the date of the as-left set pressure test for each valve."

4. **Reason For Request**

Pursuant to 10 CFR 50.55a, *Codes and standards,* paragraph (z)(1), an alternative is proposed to SRV testing requirements of the ASME OM-2012 Code. The basis of the request is that an SRV set pressure performance assessment supports the conclusion that the proposed alternative would provide an acceptable level of quality and safety.

At Limerick Generating Station (LGS), Units 1 and 2, there are 14 Target Rock Model 98-67F Main Steam SRVs installed on each unit's Main Steam lines inside the drywell. These valves are classified into the same IST program valve group. Mandatory Appendix I, paragraph I-1320 requires the installed SRVs be pressure tested within five years from the date of the as-left set pressure test for each valve. Relief request GVRR-9, contained in this submittal package (Attachment 4), requests use of Code Case OMN-17, related to testing requirements for SRVs. Relief Request GVRR-9 extends the I-1320(a), five-year test interval to six years, along with the potential use of a six-month grace period. LGS, Units 1 and 2 are currently operating on 24-month refueling cycles. Relief Request GVRR-9 allows

LGS, Units 1 and 2 to go from testing all the SRVs on each unit over two refueling outages, to testing all the SRVs on each unit over three refueling outages, potentially reducing the number of SRVs being tested over three refueling outages by seven SRVs per unit.

Relief Request 41-VRR-7 will establish the testing interval and test sampling size requirements in leu of the test interval and sample size specified in Code Case OMN-17. Relief Request 41-VRR-7 modifies a portion of the Code Case OMN-17 requirements as discussed in Section 5 below. The LGS, Units 1 and 2 SRVs have continued to show reliable set pressure test performance as described in Section 5 below.

A performance assessment of the LGS Units 1 and 2 Target Rock SRVs concluded that there is reasonable assurance that each SRV will retain the set pressure within the required drift tolerances after extending the test interval from the current five -year interval to a proposed eight-year interval. Extending the SRV test interval from five to eight years will further reduce the number of valves required to be tested every outage, thereby reducing occupational radiological exposures.

## 5. Proposed Alternative and Basis for Use

As an alternative to the Code-required five-year test interval per Mandatory Appendix I, paragraph I-1320(a), and the six-year test interval as permitted by Code Case OMN-17, Exelon proposes that relief be granted to allow utilization of ASME Code Case OMN-17 (Reference Attachment 4) with two modifications as discussed below. Exelon proposes that the subject SRVs be tested at least once every eight years from the date of the as-left set pressure test for each valve, with an allowed six-month grace period to coincide with the combined certification testing and refueling outage time periods, and with the interval not to exceed 8.5 years. The second change increases the minimum number of SRVs from each valve group to be tested from '20% within any 24-month interval' to '40% within any 48-month interval' with the 40% population made up of SRVs which have not been tested during the current 96-month interval, if they exist. The additional requirements stipulated within ASME Code Case OMN-17 will be retained.

At LGS Units 1 and 2, Exelon implemented an SRV Best Practices Maintenance program in 2010 and incorporated several enhancements between 2010 and 2014 that resulted in improved SRV set point drift performance. Improvements to this program continued after 2014 to further increase the SRV reliability. Exelon recently performed an assessment pertaining to the performance of each unit's Target Rock SRVs. The SRV set point drift performance of each unit's SRVs has steadily improved due to this enhanced maintenance program. This assessment concluded that there is reasonable assurance that each SRV will retain the set pressure within the required drift tolerances after extending the test interval from the current five-year interval to a proposed eight-year interval which is two years longer than the current Code Case OMN-17, six-year allowed test interval.

This assessment reviewed As-Left/As-Found set pressure data going back to 2014 and identified: 1) Whether the valves' set pressure drifted up or down, and 2) The absolute set pressure change between tests. Based on the time between the As-Left and As-Found set pressure test of each SRV, the set pressure drift was then linearly extrapolated to determine

whether the SRV's set pressure would still be within the site's required ± 3.0% tolerance following an eight-year period. An evaluation concluded that use of linear extrapolation provides the best mathematical approach.

Since 2014, 43 LGS Unit 1 and Unit 2, valves were removed and as-found tested, and, using the linear extrapolation method, 39 valves were projected to have lift set points within the ± 3.0% set pressure tolerance for more than eight years. Table 1 summarizes the setpoint drift projection, in years of service, predicting when each SRV would exceed the ± 3.0% set pressure tolerance for SRVs removed and tested since 2014. An evaluation of the four valves that did not meet the eight-year set point tolerance criteria was performed and the table notes for each valve provide a summary identifying the cause for the set point drift, how the Exelon SRV Best Practices Maintenance program addresses the cause, and the corrective actions performed.

The improved valve performance can be attributed to both the utilization of the Exelon SRV Best Practices Maintenance program which includes disassembly and inspection of all valves prior to As-Left testing and installation. This program is comprised of methods and philosophies concerning maintenance, inspection and techniques which uses the SRV manufacturer's recommended maintenance practices and enhancements identified by Exelon that have been broadly termed "Best Practices." This includes as-left testing for setpoint and seat leakage. Exelon SRV Best Practices are developed from the application of the EPRI/NMAC Safety and Relief Valve Testing and Maintenance Guide (Reference 1) and from Exelon Operational Experience (OE). The Exelon SRV Best Practices have been implemented through Exelon's oversight of the valve vendor's test and rebuild processes.

The Code Case OMN-17 includes a requirement that at least 20% of the SRVs be tested every 24 months, with these 20% made up of SRVs which have not been tested during the current 72-month interval, if they exist. Testing of a minimum number of SRVs from each valve group within any 24-month interval is intended to have some SRVs tested throughout the six-year interval that would allow for more timely discovery of performance issues than would happen if all the testing was scheduled at the end of the six-year interval. This relief request proposes to revise the 20% and 24-month testing requirements to a '48-month interval' with at least a minimum of 40% of the SRVs to be tested every 48 months, with these 40% made up of SRVs which have not been tested during the current 96-month interval, if they exist. The '40% sample size testing within any 48-month interval' continues to meet the intent of this OMN-17 requirement.

LGS will continue to implement all other requirements contained within ASME Code Case OMN-17 as included in relief request 41-VRR-7 (Attachment 4). During outages when there is only a partial complement of SRVs replaced, those SRVs removed shall be As-Found tested prior to resumption of electrical generation. For each SRV that fails to meet the LGS set pressure acceptance criteria tolerance, two additional SRVs shall be tested. If either of these two additional SRVs are found to not meet their LGS set pressure acceptance criteria, then all remaining SRVs within the same group shall be tested.

LGS shall also continue to disassemble and inspect each subject SRV following As-Found set pressure testing to verify that parts are free of defects resulting from time-related degradation or service-induced wear. Each valve shall be disassembled and inspected prior

to As-Left testing and installation to the requirements provided above as well as all other requirements stipulated in ASME OM Code Case OMN-17.

Extending the test interval from six to eight years and revising the intervening outage testing sample size and frequency are viewed acceptable based upon past performance and a mathematical evaluation which shows that the LGS Units 1 and 2 SRVs are capable of maintaining their set point within tolerance over an eight-year period. This proposed relief request will also contribute to the principals of maintaining radiation dose As Low As Reasonably Achievable (ALARA).

Using recent dose measurements associated with LGS, Units 1 and 2 SRVs' removal and replacement, the average radiological exposure incurred per valve has been approximately 0.940 Rem. Extending the OMN-17 SRV testing interval from six to eight years would allow extending the schedule for testing of the 14 SRVs on each unit from three to four refueling outages, potentially providing a reduction of three SRVs tested every ten years per unit. This can result in a potential radiological exposure savings of approximately 5.6 Rem for the station over a ten-year IST interval.

Based on the application of the Exelon SRV Best Practices Maintenance program, the past performance of the SRVs at LGS and a mathematical evaluation of valve performance, there is reasonable assurance that each SRV will remain within the set point tolerance over the extended eight-year testing interval. This proposal provides an alternative which would maintain an acceptable level of valve operational readiness, provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1) and provide for reduced occupational radiological exposure.

Table 1
SRV Setpoint Performance Projection

| Year As-Found Tested | Projection to Exceeding ± 3% Setpoint Tolerance (Years) For Each SRV Removed and Tested | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2014 U1 | 9.8 | 10.9 | 14.4 | 25.9 | 47.3 | 70.8 | 200+[5] | 200+[5] |
| 2015 U2 | 14.2 | 18.5 | 20.7 | 24.6 | 34.9 | 61.8 | 200+[5] | N/A |
| 2016 U1 | 23.1 | 24.1 | 24.9 | 35.4 | 49.9 | 51.4 | 58.2 | N/A |
| 2017 U2 | 5.1[1] | 6.8[2] | 19.8 | 22.8 | 44.2 | 46.1 | 200+[5] | N/A |
| 2018 U1 | 12.4 | 66.2 | 139.2 | 29.3 | 38.2 | 75.9 | 131.7 | N/A |
| 2019 U2 | 4.4[3] | 7.1[4] | 17.0 | 42.5 | 55.0 | 57.5 | 84.3 | N/A |

Notes:

1 This valve was disassembled, inspected and tested before being re-installed in 2014 and was then removed in 2017 and as-found tested. The January 2014 maintenance and testing occurred prior to the addition of a seat leak tightness and

refinement of the SRV set point optimization techniques that were added to the Exelon SRV Maintenance Best Practices later in 2014. Consequently, the 2017 as-found test results were out of tolerance low with elevated seat leakage. The Exelon SRV Maintenance Best Practices were completed during the valve refurbishment and increased valve performance is expected.

2 This valve was disassembled, inspected and tested before being certified tested in 2012 and was then removed in 2017 and as-found tested. The 2012 maintenance and testing occurred prior to the addition of refinement of the SRV set point optimization techniques that were added to the Exelon SRV Maintenance Best Practices in 2014. Consequently, the 2017 as-found test results were out of tolerance high with elevated seat leakage. The Exelon SRV Maintenance Best Practices were completed during the valve refurbishment and increased valve performance is expected.

3 This valve was disassembled, inspected and tested in 2014, re-certified tested in 2015 before being re-installed and was then removed in 2019 and as-found tested. The 2014 maintenance and 2014 and 2015 testing occurred prior to the 2018 refinement of the seat leak tightness and SRV set point optimization techniques that were included in the Exelon SRV Maintenance Best Practices established in 2014. Consequently, the 2019 as-found test results were out of tolerance low with elevated seat leakage. The full Exelon SRV Maintenance Best Practices will be completed during the valve refurbishment and increased valve performance is expected.

4 This valve was disassembled, inspected and tested in 2014 before being re-installed and was then removed in 2019 and as-found tested. The refurbishment included a set pressure change from 1170 PSIG to 1190 psig but the post adjustment set pressure testing did not include the multiple pressure test lifts that were added to the Exelon SRV Maintenance Best Practices after 2014. Consequently, the 2019 as-found test results were out of tolerance low with elevated seat leakage. The Exelon SRV Maintenance Best Practices will be completed during the valve refurbishment and increased valve performance is expected.

5 These valves retained their setpoints during the as-found testing and there was no drift so the setpoint drift projection is very high. (200+ valve 21-175, 23-164, 15-193, 08-155)

## 6. Duration of Proposed Alternative

The proposed alternative will be utilized for the remainder of the current IST interval.

## 7. Precedent

None

## 8. <u>References</u>

1. Electric Power Research Institute / Nuclear Maintenance Applications Center (EPRI/NMAC) Safety and Relief Valve Testing and Maintenance Guide, Revision of TR-105872, Technical Report 3002005362, August 2015