

10 CFR 50.90
10 CFR 50.55a

June 26, 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 –
Response to Request for Additional Information

- References:
1. Exelon letter to the NRC, “TS Change and Relief Requests Related to Safety Relief Valve Testing,” dated February 5, 2020 (ADAMS Accession No. ML20036E488)
 2. Email from V. Sreenivas (USNRC) to D. Neff (Exelon), “Limerick Generating Station, Units 1 and 2: RAI for LAR to Use Inservice Testing Program Safety Relief Valve Testing EPID No. L-2020-LLA-0052),” dated May 28, 2020 (ADAMS Accession No. ML20149K701)
 3. Email from V. Sreenivas (USNRC) to D. Neff (Exelon), “Limerick Generating Station, Units 1 and 2: RAI for RR to Use Inservice Testing Program Safety Relief Valve Testing EPID No. L-2020-LLA-0043),” dated June 4, 2020 (ADAMS Accession No. ML20156A299)

In accordance with 10 CFR 50.90 and 10 CFR 50.55a Exelon Generation Company, LLC (Exelon) requested NRC approval of 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, and two proposed relief requests (RRs) associated with the Inservice Testing (IST) Program for the LGS Units 1 and 2 (Reference 1). Specifically, the request proposes to modify the TS surveillance requirements (SRs) for testing of the Safety Relief Valves (SRVs) to retain the frequency and certain testing requirements only in the IST Program. Additionally, the proposed RRs would support extending the SRV testing interval for SRVs at LGS, Units 1 and 2. During their technical review of the application, the NRC Staff identified the need for additional information. References 2 and 3 provided the Requests for Additional Information (RAIs). Attachment 1 to this letter provides the responses to the RAIs.

Attachment 2 provides revised markups of TS Page 3/4 4-7 for LGS Units 1 and 2. These revised markups supercede the TS Page 3/4 4-7 markups submitted in the Reference 1 application. No changes are being made to the TS Bases pages submitted in the Reference 1 application.

Exelon has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the U.S. Nuclear Regulatory Commission in Reference 1. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Further, the additional information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Exelon is notifying the Commonwealth of Pennsylvania of this response by transmitting a copy of this letter to the designated State Official.

There are no regulatory commitments contained in this response.

Should you have any questions concerning this letter, please contact Mr. David Neff at (610) 765-5631.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 26th day of June 2020.

Respectfully,



David P. Helker
Sr. Manager - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment 1: Responses to Requests for Additional Information
Attachment 2: Revised Markups of Proposed Technical Specifications

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

Attachment

Limerick Generating Station, Units 1 and 2

**Proposed Alternative to Extend Reactor Pressure Vessel SRV Testing Frequency
Responses to Requests for Additional Information**

**Responses to NRC Staff's
Request for Additional Information**

By application dated February 5, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20036E488), Exelon Generation Company, LLC (Exelon) submitted a request in accordance with paragraphs 50.90 and 50.55a(z)(1) of Title 10 of the Code of Federal Regulations (10 CFR) for a proposed Technical Specifications Change and Relief Requests Related to Safety Relief Valve Testing alternative to the requirements of 10 CFR 50.55a and the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) at the Limerick Generating Station (LGS), Units 1 and 2. The proposed alternative would allow the licensee to extend the safety relief valve (SRV) test interval.

In emails dated May 28, 2020, and June 4, 2020, from the NRC (V. Sreenivas) to Exelon (David Neff) (ADAMS Accession Nos. ML20149K701 for EPID No. L-2020-LLA-0052 and ML20156A299 for EPID No. L-2020-LLA-0043, respectively), the NRC provided Requests for Additional Information (RAIs) seeking clarification of certain issues related to those RAIs. Exelon agreed to provide a response to the RAIs by June 29, 2020.

RAI EMIB-LAR-1 (EPID No. L-2020-LLA-0052)

Attachment 1 of the submitted LAR provides the proposed changes mark-up for Specification 4.4.2.2. The licensee's proposed changes for TS Section are as below:

~~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 recommendation in accordance with the Surveillance Frequency Control Program, and they shall be rotated such that all 14 safety related valves are removed, set pressure tested and reinstalled and replace with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendation in accordance with the Surveillance Frequency Control Program. All safety valves will be recertification tested to meet a $\pm 1\%$ 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.

The NRC staff requests the following information regarding the proposed TS change:

- (a) Please clarify the prefix "code" used with the "safety valve function" in the proposed mark-up.
- (b) Specification 4.0.5 contains (1) inservice testing program, and (2) inservice inspection program. During the review process, the NRC staff observed that in the licensee's submittal for TSTF-545 (ADAMS No. ML16210A227), the TS bases in Specification 4.0.5 needs to be verified by the licensee. Specification 4.0.5 states that that it establishes the requirement that inservice inspection of ASME Code Class 1, 2 and 3 components and inservice testing of ASME Code Class 1, 2 and 3 pumps and valves shall be performed in accordance with a periodically updated version of Section XI of the *ASME Boiler and Pressure Vessel Code* and Addenda, and the ASME Code for Operation and Maintenance of Nuclear Power Plants (ASME OM Code) and applicable Addenda as required by 10 CFR 50.55a. Please clarify the reference to Specification 4.0.5 in the proposed mark-up.

References:

1. In a submittal dated February 5, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20036E488), Exelon Generation Company, LLC (licensee) submitted a license amendment request (LAR) for approval by the U.S. Nuclear Regulatory Commission (NRC), for Limerick Units 1 and 2. The proposed amendment to the Technical Specification (TS) is to retain the TS surveillance requirements (SRs) for the testing of the Safety/Relief Valves (SRVs) frequency and certain testing requirements only in inservice testing (IST) program.
2. NRC Letter to Exelon, "Limerick Generating Station, Units 1 and 2 - Issuance of Amendments to Adopt Technical Specifications Task Force (TSTF) Traveler TSTF-545," dated May 16, 2017 (ADAMS Accession No. ML 17103A081).
3. The following sections of the current Limerick Units 1 and 2, Technical Specifications, are provided for reference:

Definition of IST is provided in TS during implementation of TSTF-545, as follows:
INSERVICE TESTING PROGRAM

1.16a The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

Specification 4.0.5 Inservice Inspection and Inservice Testing Program

The INSEVICE TESTING PROGRSM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f). The Inservice Inspection Program is the licensee program that fulfils the requirements of 10 CFR 50.55a(g).

The provisions of SR 4.0.2 and SR 4.0.3 do not apply to the INSERVICE TESTING PROGRAM unless there is specific SR referencing usage of the program.

RESPONSE

The prefix "code" used with the "safety valve function" in the proposed mark-up for the TS SR 4.4.2.2 is not used in the ASME Code when describing the requirements for the Safety and Relief valves. Therefore, the prefix is not necessary and is removed from the markup of the TS SR 4.4.2.2 as provide below.

Specification 4.0.5 and TS Bases 4.0.5, as stated in the current LGS TS and TS Bases, correctly reflects what was NRC-approved in LGS Amendments 225/188 (ADAMS Accession No. ML17103A081 dated 05/17/2017). The scope of Specification 4.0.5 includes both the inservice Testing (IST) and the Inservice Inspection (ISI) programs under 10CFR50.55a(f) and 10CFR50.55a(g), respectively. The IST Program is defined in TS Section 1.16a.

The TS change request is intended to remove duplicative requirements contained in both the LGS TS and the IST Program. The IST program, 50.55a(f) and 50.55a(z) processes will continue to govern IST program requirements and NRC approval of future reliefs from the ASME Code.

To clarify the intended scope of Specification 4.0.5 that is applicable to TS SR 4.4.2.2, the proposed revision is provided to include specific reference to the INSERVICE TESTING PROGRAM requirements. These changes provide clarifications and do not affect the intent of the original submittal.

The revised TS SR 4.4.2.2 would be changed as follows with inserted text highlighted in red and deleted text highlighted with strikethrough markings:

~~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 recommendation in accordance with the Surveillance Frequency Control Program, and they shall be rotated such that all 14 safety related valves are removed, set pressure tested and reinstalled and replace with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendation in accordance with the Surveillance Frequency Control Program.~~

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

A revised TS markup Page 3/4 4-7 for both units is provided in Attachment 2. The proposed changes to the TS Bases 3/4.4.2 would not be changed from that submitted in the LAR. The TS and TS Bases for 4.0.5 would not be changed from the current wording.

RAI EMIB-1 (Revised) EPID No. L-2020-LLA-0043

Currently, each of the Exelon facilities in the below table¹ is required to test at least 20 percent of the SRVs every 24 months. As an alternative to this requirement, the licensee proposes to test 40 percent of the SRVs at each facility within a 48-month interval. For each facility, the SRV models affected by the proposed alternative are listed in the table below. Under the proposed alternative, it is possible for more than 24 months to elapse between tests of an SRV model.

Facility	SRV Models
Clinton	Dijkers Model G-471
Dresden Units 2 and 3	Target Rock 3-Stage Model 67F
Nine Mile Point Unit 2	Dijkers Model G-471
Peach Bottom Units 2 and 3	Target Rock Models 73-67F and 74-67F
Quad Cities Units 1 and 2	Target Rock 3-Stage Model 74-67F and Dresser Model 3777Q
Limerick Units 1 and 2	Target Rock Model 98-67F

Describe any plans to coordinate and share data regarding the SRV testing program at different units and sites that have the same SRV Target Rock model as Limerick Units 1 and 2. Describe any measures to obtain information on the performance of the Target Rock model SRVs at intervals more frequent than once every 48 months, such as staggering the testing at different reactor units that have the same SRV model.

¹ Reference "Exelon Generation Company, LLC - Request for Additional Information Regarding Request to Extend Safety Relief Valve Test Interval," dated May 14, 2020 (ADAMS Accession No. ML20135H197)

RESPONSE

The proposed relief request (RR) 41-VRR-7 will allow for more than 24 months to elapse between tests of the SRVs used on each LGS unit. Under the current operating cycles for LGS Units 1 and 2, the maximum time elapsed between SRV tests, considering both units, would be 36 months. Since 2014, Exelon has been collecting, trending and analyzing SRV test, maintenance, inspection and performance data for each of the Exelon units listed in the table in the RAI-EMIB-1 table, which includes LGS, Units 1 and 2. Trending and analyzing test data between the Exelon stations that have Target Rock 3-Stage Model 67F SRVs reduce the effective maximum elapsed time between Target Rock 3-Stage Model 67F SRV tests. An Exelon SRV Best Practices Fleet Engineering program document will be established, prior to implementation of the LGS RR 41-VRR-7, to define the program elements and will establish Exelon fleet-wide performance tracking and trending guidelines.

All of the Exelon Target Rock 3-Stage SRVs used at the Dresden (74-67F), Peach Bottom (73-67F and 74-67F), Quad Cities (74-67F) and Limerick (98-67F) stations are the same base model; Target Rock 3-Stage Safety Relief Valve Model 67F. The year the valve was designed was added in front of the Model number for tracking purposes. Over the years, the manufacturer changed some valve materials to improve the valve's structural integrity. Additionally, the manufacturer changed the relative valve component orientation to improve the in-plant valve replacement maintenance work to address plant-specific valve lifting-path clearances. None of these changes affected the valve's functions. The Exelon SRV Best Practices Maintenance program elements continue to be applied to each valve in a model group (e.g., Target Rock 3-Stage) regardless of the model year.

RAI EMIB-2

During a public meeting on June 4, 2019, Exelon provided a presentation to the NRC staff to discuss the proposal to extend the SRV test interval at Exelon boiling water reactor (BWR) nuclear power plants to 8 years with 40% of the group tested every 48 months, instead of 20% every 24 months with a shorter test interval. See ADAMS Accession No. ML19151A660. The Exelon presentation specified four pillars of Exelon SRV/MSSVs Best Practices: (1) Spring Testing – includes physical dimension measurements and compression rate evaluation; (2) SRV/MSSVs Lapping Techniques and Tools; (3) SRV/MSSVs Set Pressure Adjustment Methodology Precision; and (4) Target Rock SRV/MSSVs Average Delay Time Trending Performance Improvement. The licensee's submitted alternative request for Limerick Units 1 and 2 refers to the Exelon SRV Best Practices described during the public meeting on June 4, 2019. For implementing the proposed alternative request at Limerick Units 1 and 2, please describe the planned implementation of the Exelon SRV/MSSVs Best Practices, including the four pillars of Exelon SRV/MSSVs Best Practices.

RESPONSE

The Exelon SRV Best Practices Maintenance program started as an SRV improvement initiative and includes LGS Units 1 and 2. The program is comprised of vendor procedures and additional specific testing, maintenance, inspection, and repair criteria that are approved by Exelon through purchase orders. Major program elements include specific performance and inspection criteria and maintenance steps that exceed Original Equipment Manufacturer (OEM) specifications and/or Industry established guidelines. The program elements include Spring Testing, Lapping Techniques and Tools, Set Pressure Adjustment Methodology Precision, Average Delay Time (ADT) trending, and Internal Component Condition Variations that are

further discussed below. Collectively, use of these elements have supported a trend in improved setpoint retention of SRVs in service at LGS. An Exelon SRV Best Practices Fleet Engineering program document will be established, prior to implementation of LGS RR 41-VRR-7, to provide governance over the Exelon-approved vendor SRV maintenance procedures, to define the program elements, and to establish performance tracking and trending guidelines. This program document and the Exelon-approved vendor procedures are updated to incorporate advances in technology and operating experience from the Exelon fleet, the OEM and the industry. Major elements of the program are further described below:

Spring Testing

Spring testing is performed periodically based on valve type. The Exelon SRV Best Practices Maintenance program requires the spring characteristics meet physical dimensions requirements that are tighter than previous acceptance criteria based on Exelon operating experience. This has minimized spring compression rate variations.

Lapping Techniques and Tools

The lapping technique includes multiple lapping passes that develops tighter tolerances using an Exelon designed lapping tool based on Exelon operating experience. The Exelon SRV Best Practices Maintenance program requires this additional lapping to meet the tighter seat leakage tightness criteria. This technique has minimized variation of the seat-to-disk surfaces.

Set Pressure Adjustment Methodology Precision

The SRV set pressure adjustment process includes a spring adjustment factor methodology for the first set pressure adjustment. The Exelon SRV Best Practices Maintenance program document will include a calculated spring adjustment factor based on the SRV set pressure adjustment during the pre-certification testing and Exelon operating experience. A more accurate set pressure adjustment is obtained with fewer lifts and will minimize introducing variations of the seat to disk surfaces.

Average Delay Time Trending

For the Target Rock 3-Stage SRVs, the ADT measures the time between the pilot valve opening and the main disk opening. The Exelon SRV Best Practices Maintenance program has trended the ADTs for the Target Rock 3-Stage SRVs for determining if additional maintenance should be performed. The Exelon SRV Best Practices Maintenance program will include a tighter tolerance than the industry standard criteria for ADT. An SRV with an ADT value outside this criterion is further evaluated for additional maintenance prior to installation.

Internal Component Condition Variations

The SRV inspection and maintenance processes include additional inspections for internal components with criteria that are more restrictive than previous acceptance criteria based on Exelon operating experience. Specifically for the TR 3-Stage SRVs, tighter than previous acceptance criteria based on Exelon operating experience are applied to the pilot abutment and preload gaps which reduce the likelihood of vibration induced seat leakage caused by pressure transients.

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

Unit 1 TS Pages

3/4 4-7

Unit 2 TS Pages

3/4 4-7

REACTOR COOLANT SYSTEM

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 $\pm 3\%$
- 5 safety/relief valves @ 1180 psig $\pm 3\%$
- 5 safety/relief valves @ 1190 psig $\pm 3\%$

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 $\pm 1\%$ 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 safety valve function lift setting of each of the 14 safety/relief valves in accordance with the INSERVICE TESTING PROGRAM requirements of Specification 4.0.5.

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ACTION:

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