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10 CFR 50.55a

June 12, 2020

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Dresden Nuclear Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Nine Mile Point Nuclear Station, Unit 2
Renewed Facility Operating License No. NPF-69
NRC Docket No. 50-410

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR 29 and DPR 30
NRC Docket Nos. 50-254 and 50-265

Subject: Proposed Alternative to Extend Reactor Pressure Vessel Safety Relief Valve Testing Frequency – Response to Request for Additional Information

References:
1. Exelon letter to the NRC, "Proposed Alternative to Extend Reactor Pressure Vessel Safety Relief Valve Testing Frequency," dated February 4, 2020 (ADAMS Accession No. ML20036D962)
2. Email from B. Purnell (USNRC) to D. Neff (Exelon), "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)

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), Exelon Generation Company, LLC (Exelon) requested NRC approval of a proposed relief request associated with the Inservice Testing (IST) Program for the cited Exelon Nuclear Power Plants (NPPs) (Reference 1). Specifically, the request proposes to extend the Safety Relief Valve (SRV) IST Program testing frequency to 48 months for group one of one valves and to eight

years for the other grouped valves. During their technical review of the application, the NRC Staff identified the need for additional information. Reference 2 provided the Request for Additional Information (RAI). The attachment to this letter provides the responses to the RAIs.

Additionally, the NRC staff noted in Reference 2 that the relief request for the Clinton Power Station, Unit 1 (CPS), was only for the remainder of the current inservice testing interval, which ends in June 2020. This letter serves to provide a revision to the CPS relief request for the duration of the relief request. The proposed relief request for CPS will be utilized for the fourth IST Interval which is scheduled to begin on July 1, 2020.

There are no regulatory commitments contained in this response.

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

Respectfully,

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

Attachment: Responses to Request for Additional Information

cc: Regional Administrator - NRC Region I
Regional Administrator - NRC Region III
NRC Senior Resident Inspector - Clinton Power Station
NRC Senior Resident Inspector – Dresden Nuclear Power Station
NRC Senior Resident Inspector - Nine Mile Point Nuclear Station
NRC Senior Resident Inspector – Peach Bottom Atomic Power Station
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
NRC Project Manager – Exelon Fleet
NRC Project Manager - Clinton Power Station
NRC Project Manager - Dresden Nuclear Power Station
NRC Project Manager – Nine Mile Point Nuclear Station
NRC Project Manager - Peach Bottom Atomic Power Station
NRC Project Manager - Quad Cities Nuclear Power Station
Illinois Emergency Management Agency - Department of Nuclear Safety
R. R. Janati - Bureau of Radiation Protection, Commonwealth of Pennsylvania
A. L. Peterson - NYSERDA

Attachment

Clinton Power Station, Unit 1
Dresden Nuclear Power Station, Units 2 and 3
Nine Mile Point Nuclear Station, Unit 2
Peach Bottom Atomic Power Station, Units 2 and 3
Quad Cities Nuclear Power Station, Units 1 and 2

Proposed Alternative to Extend Reactor Pressure Vessel SRV Testing Frequency

Responses to Request for Additional Information

Responses to NRC Staff's Request for Additional Information

By application dated February 4, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20036D962), Exelon Generation Company, LLC (Exelon) submitted a request in accordance with paragraph 50.55a(z)(1) of Title 10 of the Code of Federal Regulations (10 CFR) for a proposed 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 Clinton Power Station (Clinton), Unit No. 1; Dresden Nuclear Power Station (Dresden), Units 2 and 3; Nine Mile Point Nuclear Station, Unit 2 (NMP-2); Peach Bottom Atomic Power Station (Peach Bottom), Units 2 and 3; and Quad Cities Nuclear Power Station (Quad Cities), Units 1 and 2. The proposed alternative would allow the licensee to extend the safety relief valve (SRV) test interval at these facilities.

In an email dated May 14, 2020, from the NRC (Blake Purnell) to Exelon (David Neff) (ADAMS Accession No. ML20135H197), the NRC provided Request for Additional Information (RAI) seeking clarification of certain issues related to those RAIs. Exelon agreed to provide responses to the RAIs within 30 days of May 14, 2020.

RAI 1

Currently, each of the licensee's facilities 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	Dikkers Model G-471
Dresden Units 2 and 3	Target Rock 3-Stage Model 67F
Nine Mile Point Unit 2	Dikkers 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

Describe any plans to coordinate and share data regarding the SRV testing program at different units and sites that have the same SRV model. Describe any measures to obtain information on the performance of the various 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.

RESPONSE

The proposed relief requests will allow for more than 24 months to elapse between tests of an SRV model at a given site. Under the current operating cycles for each station, the maximum time elapsed between tests would be 36 months for the dual unit sites (i.e., Dresden, Peach Bottom and Quad Cities) and 48 months for single unit sites (i.e., Clinton and NMP-2). (Note: Although NMP is a dual unit site, this RAI response does not apply to NMP-1.) Since 2014, Exelon has been collecting, trending and analyzing SRV test, maintenance, inspection and performance data for the Exelon units listed in the table in the RAI-1 table as well as for Limerick Generating Station, Units 1 and 2. Trending and analyzing test data between the stations, which have the same SRV model, reduce the effective maximum elapsed time

between same model SRV tests. An Exelon SRV Best Practices Fleet Engineering program document will be established, prior to implementation of these Relief Requests, 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), and Quad Cities (74-67F) 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 valves' 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 valves' 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 2

For each facility, Exelon is requesting an alternative to the requirements in paragraph I-1320(a) of the ASME OM Code, Mandatory Appendix I. However, the facilities are not all on the same edition and addenda of the ASME OM Code. Currently, the 2004 Edition through 2006 Addenda of the ASME OM Code is applicable to Dresden and Quad Cities, and the 2012 Edition of the ASME OM Code is applicable to Clinton, NMP-2, and Peach Bottom.

Paragraph I-1320(a) of the 2004 Edition of the ASME OM Code, Mandatory Appendix I, states:

> Class 1 pressure relief valves shall be tested at least once every 5 years, 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-month interval. This 20% shall consist of valves that have not been tested during the current 5-year interval, if they exist. The test interval for any individual valve shall not exceed 5 years.

Paragraph I-1320(a) of the 2012 Edition of the ASME OM Code, Mandatory Appendix I, states:

> Class 1 pressure relief valves shall be tested at least once every 5 yr [years], 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 [month] 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.

Describe any differences in the implementation of the proposed alternative between sites that use the 2004 Edition of the ASME OM Code and sites that use the 2012 Edition of the ASME OM Code.

RESPONSE

There will be no differences in the implementation of the proposed alternative between sites that use the 2004 Edition of the ASME OM Code and sites that use the 2012 Edition of the ASME OM Code. Every station within the scope of this relief request has received NRC approval for a 72-month test interval plus a 6-month extension for SRVs equivalent to ASME Code Case OMN-17 for the SRVs which eliminates the only difference between the 2004 and 2012 I-1320(a) paragraph requirements; the 5-yr test interval shall begin from the date of the as-left set pressure test for each SRV.

Per code case OMN-17, 72-Mo Test Interval, valves shall be tested at least once every 72 months (i.e., six years). With the extension to 8 years requested in the IST relief requests (i.e., 2205 for Clinton Power Station, MSS-VR-02 for Nine Mile Point Station Unit 2, 01A-VRR-5 for Peach Bottom Atomic Power Station, and RV-09 for Quad Cities Nuclear Power Station), all SRVs would be required to be tested once every 96 months (i.e., eight years), not to exceed 102 months. The exception to this frequency is with the relief requests for the Group 1 of 1 SRVs (i.e., RV-02D for Dresden Nuclear Power Station and RV-08 for Quad Cities Nuclear Power Station); the SRVs would be tested once every 48 months (i.e., 4 years).

RAI 3

The proposed alternative relies, in part, on the implementation of the Exelon SRV Best Practices Maintenance program at the facilities. However, the application only provides limited information about this program. On June 4, 2019, Exelon described its SRV.[1] Best Practices Maintenance program at a public pre-application meeting for the proposed alternative (see ADAMS Accession No. ML19162A027). The Exelon presentation at the meeting identified four pillars of the program: (1) spring testing, which includes physical dimension measurements and compression rate evaluation; (2) SRV lapping techniques and tools; (3) SRV set pressure adjustment methodology precision; and (4) Target Rock SRV average delay time trending performance improvement.

Describe the SRV Best Practices Maintenance program and how it will be implemented to support the proposed alternative. The response should discuss each of the four pillars mentioned in the June 4, 2019, presentation.

[1] SRVs are also referred to as main steam safety valves (MSSVs) in Exelon's presentation

RESPONSE

The Exelon SRV Best Practices Maintenance program started as an SRV improvement initiative. 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 the stations covered by these Relief Requests. An Exelon SRV Best Practices Fleet Engineering program document will be established, prior to implementation of these Relief Requests, 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. Additionally, for the Dikkers SRVs, a second steam seat tightness test was added as an enhancement following post jack-and-lap maintenance to further verify seat integrity.

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 tolerances are applied to the pilot abutment and preload gaps which reduce the likelihood of vibration-induced seat leakage caused by pressure transients. Specifically for the Dresser 3777Q SRVs, tighter tolerances are applied to the spindle dimensions, replacement criteria for spindle runout, and disk to spindle movement (spindle tip rock), which reduce the likelihood of flow-induced vibration concerns. These additional inspections have minimized variation of the SRV internal components.