UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 11, 2021

Mr. David P. Rhoades
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO)
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT NO. 239 RE: ONE-TIME EXTENSION OF CONTAINMENT TYPE A INTEGRADED LEAKAGE RATE TEST FREQUENCY (EPID L-2021-LLA-0031 [COVID-19])

Dear Mr. Rhoades:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 239 to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit No. 1. The amendment is in response to your application dated February 24, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21055A822).

The amendment revises Technical Specifications Section 5.5.13, "Primary Containment Leakage Rate Testing Program," to allow a one-time extension of the current Type A integrated leakage rate testing interval of 15 years to be extended by 8 months, to allow the next Type A test to be performed no later than October 31, 2023. In addition, the revised TS states that if the Type A test has not been performed by October 31, 2023, and the unit is in Mode 4 or 5, the Type A test shall be performed prior to entering Mode 2.

A copy of the Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next monthly *Federal Register* notice.

Sincerely,

/RA/

Joel S. Wiebe, Senior Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-461

Enclosures:
1. Amendment No. 239 to NPF-62
2. Safety Evaluation

cc: Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-461

CLINTON POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 239
License No. NPF-62

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee), dated February 24, 2021, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-62 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 239, are hereby incorporated in the license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado

Digitally signed by Nancy L. Salgado
Date: 2021.08.11 14:56:47 -04'00'

Nancy L. Salgado, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating License and Technical Specifications

Date of Issuance: August 11, 2021

ATTACHMENT TO LICENSE AMENDMENT NO. 239

FACILITY OPERATING LICENSE NO. NPF-62

CLINTON POWER STATION, UNIT NO. 1

DOCKET NO. 50-461

Replace the following pages of the Facility Operating License No. NPF-62 and the Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
Page 3	Page 3

Technical Specifications

REMOVE	INSERT
5.0-16a	5.0-16a

(4) Exelon Generation Company, pursuant to the Act and to 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) Exelon Generation Company, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(6) Exelon Generation Company, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility. Mechanical disassembly of the GE14i isotope test assemblies containing Cobalt-60 is not considered separation; and

(7) Exelon Generation Company, pursuant to the Act and 10 CFR Parts 30, to intentionally produce, possess, receive, transfer, and use Cobalt-60.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Exelon Generation Company is authorized to operate the facility at reactor core power levels not in excess of 3473 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 239, are hereby incorporated into this license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

5.5 Programs and Manuals (continued)

5.5.13 Primary Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012, and the conditions and limitations specified in NEI 94-01, Revision 2-A, dated October 2008, as modified by the following exceptions: (1) Bechtel Topical Report BN-TOP-1 is also an acceptable option for performance of Type A tests, (2) the next Type A test performed after the February 2008 Type A test shall be performed no later than October 31, 2023, and (3) if the Type A test has not been performed by October 31, 2023, and the unit is in MODE 4 or 5, the Type A test shall be performed prior to entering MODE 2.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 9.0 psig.

The maximum allowable primary containment leakage rate L_a, at P_a, shall be 0.65% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

a. Primary containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leak rate acceptance criteria are $\leq 0.60\ L_a$ for the Type B and Type C tests and $\leq 0.75\ L_a$ for Type A tests;

b. Air lock testing acceptance criteria are:

   1) Overall air lock leakage rate is $\leq$ 5 scfh when tested at $\geq P_a$,

   2) For each door, leakage rate is $\leq$ 5 scfh when the gap between door seals is pressurized $\geq P_a$.

The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Primary Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Primary Containment Leakage Rate Testing Program.

(continued)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 239 TO

FACILITY OPERATING LICENSE NO. NPF-62

EXELON GENERATION COMPANY, LLC

CLINTON POWER STATION, UNIT NO. 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated February 24, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21055A822), Exelon Generation Company, LLC (Exelon or the licensee) submitted a license amendment request (LAR) for Clinton Power Station, Unit 1 (Clinton or CPS) to allow a one-time extension of the Type A integrated leakage rate testing (ILRT) frequency. The proposed amendment revises Technical Specification (TS) 5.5.13, "Primary Containment Leakage Rate Testing Program," to add two exceptions:

- An exception to allow the next Type A test to be performed no later than October 31, 2023, which represents an extension of 8 months.

- An exception to allow the Type A test interval to be further extended if the Type A test has not been performed by October 31, 2023, and the unit is in Mode 4 or 5, in which case the Type A test is to be performed prior to entering Mode 2.

Exelon is requesting this one-time extension of the Clinton Type A test interval in response to concerns of a continuation of the Coronavirus Disease 2019 (COVID-19) public health emergency (PHE) in the interest of personnel safety and to preclude the potential for transmittal and spread of COVID-19.

2.0 REGULATORY EVALUATION

2.1 Proposed TS Changes

The licensee requested a change to Facility Operating License No. NPF-62 for Clinton in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, "Application for amendment of license, construction permit, or early site permit." The proposed change will allow a one-time extension of the Type A ILRT frequency. TS 5.5.13 currently states, in part:

> A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI [Nuclear Energy Institute] 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012, and the conditions and limitations specified in NEI 94-01, Revision 2-A, dated October 2008, as modified by the following exception: (1) Bechtel Topical Report BN-TOP-1 is also an acceptable option for performance of Type A tests.

The proposed change will add an exception to allow the next Type A test to be performed no later than October 31, 2023, which represents an extension of 8 months. The proposed change will add a second exception to allow the Type A test to be extended indefinitely if the test interval ends while primary containment integrity is not required. In this case, the second exception requires that the Type A test be performed prior to entering Mode 2 (startup). The revised wording states (italics indicates new text):

> A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012, and the conditions and limitations specified in NEI 94-01, Revision 2-A, dated October 2008, as modified by the following exceptions: (1) Bechtel Topical Report BN-TOP-1 is also an acceptable option for performance of Type A tests, *(2) the next Type A test performed after the February 2008 Type A test shall be performed no later than October 31, 2023, and (3) if the Type A test has not been performed by October 31, 2023, and the unit is in Mode 4 or 5, the Type A test shall be performed prior to entering Mode 2*.

2.2 Regulatory Requirements and Guidance

The regulation in 10 CFR 50.54(o) requires that primary reactor containments for water-cooled power reactors shall be subject to the requirements set forth in Appendix J to 10 CFR Part 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Appendix J specifies containment leakage testing requirements, including the types required to ensure the leak-tight integrity of the primary reactor containment and systems and components which penetrate the containment. In addition, Appendix J discusses leakage rate acceptance criteria, test methodology, frequency of testing, and reporting requirements for each type of test.

Appendix J includes two options to meet the requirements of the appendix: "Option A - Prescriptive Requirements," and "Option B - Performance-Based Requirements." The adoption of the Option B performance-based containment leakage rate testing for Type A, Type B, and Type C testing does not alter the basic method by which Appendix J leakage rate testing is performed; however, it does alter the frequency at which Type A, Type B, and Type C containment leakage tests must be performed. Under the performance-based option of 10 CFR Part 50, Appendix J, the test frequency is based upon an evaluation that reviewed as-found leakage history to determine the frequency for leakage testing which provides assurance that leakage limits will be maintained.

Electric Power Research Institute (EPRI) Technical Report (TR) TR-1009325[1], "Risk Impact Assessment of Extended Integrated Leak Rate Testing Intervals," Revision 2-A, provides a risk impact assessment for optimized ILRT intervals up to 15 years, utilizing current industry performance data and risk-informed guidance. NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," Revision 2-A, Section 9.2.3.1, (ADAMS Accession No. ML100620847) states that Type A ILRT intervals of up to 15 years are allowed by this guideline. EPRI TR-1018243[1], "Risk Impact Assessment of Extended Integrated Leak Rate Testing Intervals," (formerly TR-1009325, Revision 2-A) indicates that, in general, the risk impact associated with ILRT interval extensions for intervals up to 15 years is "small." However, plant-specific confirmatory analyses are required.

In evaluating the licensee's LAR, the U.S. Nuclear Regulatory Commission (NRC or Commission) staff reviewed NEI 94-01, Revision 2-A, and EPRI TR-1009325, Revision 2-A. For NEI 94-01, the NRC staff found that it described an acceptable approach for implementing the optional performance-based requirements of Option B to 10 CFR Part 50, Appendix J. This guidance includes provisions for extending Type A ILRT intervals up to 15 years and incorporates the regulatory positions stated in Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak-Test Program" (ADAMS Accession No. ML003740058) In RG 1.163, the NRC staff found that the Type A testing methodology described in American National Standards Institute/American Nuclear Society (ANSI/ANS) -56.8-2002, and the modified testing frequencies recommended by NEI 94-01, serve to ensure continued leakage integrity of the containment structure.

For EPRI TR-1009325, the NRC staff found that the risk-informed methodology using plant-specific risk insights and industry ILRT performance data to revise surveillance frequencies satisfies the key principles of risk-informed decision-making applied to changes to the TS as delineated in RG 1.177, "An Approach to Plant-Specific, Risk-Informed Decision-Making: Technical Specifications," (ADAMS Accession No. ML20164A034) and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-specific Changes to the Licensing Basis" (ADAMS Accession No. ML17317A256). The NRC staff found that this guidance was acceptable for referencing by licensees proposing to amend their TS regarding containment leakage rate testing subject to the limitations and conditions noted in Section 4.2 of the NRC staff's June 25, 2008, safety evaluation report (SER) for EPRI TR-1009325, Revision 2.

NEI 94-01, Revision 2, was revised to incorporate the June 25, 2008, SER and has been reissued with an "-A" (designating accepted) following the report number. The June 25, 2008, SER is referred to as the SER for EPRI TR-1009325, Revision 2-A, in the Technical Evaluation.

The regulations in 10 CFR 50.36(c)(5), "Administrative controls," require, in part, the inclusion of administrative controls (i.e., provisions relating to organization and management, procedures, record-keeping, review and audit, and reporting) in the TS that are necessary to ensure operation of the facility in a safe manner. The licensee's LAR proposed a change to the "Administrative Controls" section of the Clinton, TS.

[1] Available from Electric Power Research Institute, 1325 G St. NW #530, Washington, DC 20005.

3.0 TECHNICAL EVALUATION

3.1 Background

TS 5.5.13 for Clinton, contains the primary containment ILRT program, which was revised by license Amendment No. 214 (ADAMS Accession No. ML17237A010) to allow the Type A test to be conducted at 15 year intervals, based on an acceptable performance history as defined in NEI 94-01, Revision 3-A, and subject to the conditions and limitations in NEI 94-01, Revision 2-A. The last Type A test at Clinton, was completed in February 2008; therefore, based on the 15-year ILRT frequency the next Type A test would need to be performed no later than February 2023. By application dated February 24, 2021, the licensee's proposed one-time change would permit the current ILRT interval of 15 years to be extended by 8 months to October 2023.

The Clinton, License Amendment No. 214 allowed for a maximum ILRT interval of 15 years with provision for a grace period of up to 9 months beyond the 15-year interval, provided that an unforeseen emergent condition exists. The NRC safety evaluation for NEI 94-01, Revision 2, Section 3.1.1.2, "Deferral of Tests Beyond the 15-year interval," states, in part:

> Section 9.2.3, NEI TR 94-01, Revision 2, states, 'Type A testing shall be performed during a period of reactor shutdown at a frequency of at least once per 15 years based on acceptable performance history.' However, Section 9.1 states that the 'required surveillance intervals for recommended Type A testing given in this section may be extended by up to 9 months to accommodate unforeseen emergent conditions but should not be used for routine scheduling and planning purposes.' The NRC staff believes that extensions of the performance-based Type A test interval beyond the required 15 years should be infrequent and used only for compelling reasons. Therefore, if a licensee wants to use the provisions of Section 9.1 in TR NEI 94-01, Revision 2, the licensee will have to demonstrate to the NRC staff that an unforeseen emergent condition exists.

In Attachment 1 to the LAR, the licensee stated the following with respect to the existence of unforeseen emergent conditions:

> On January 31, 2020, the U.S. Department of Health and Human Services declared a Coronavirus Disease (COVID-19) public health emergency (PHE) for the United States. Subsequently, the Centers for Disease Control and Prevention issued recommendations (e.g., social distancing, limiting assemblies) to limit the spread of COVID-19.
>
> In response to concerns of a continuation of the COVID-19 PHE, in the interest of personnel safety, and to preclude the potential for transmittal and spread of COVID-19, [Exelon Generation Company, LLC (EGC), the licensee] requests a one-time extension of the CPS Type A test interval. This request is part of an overall effort by EGC to reduce the number of outside personnel required onsite, and the overall outage scope, in response to the developing COVID-19 PHE while maintaining the safety and reliability of the plant for the next operating cycle. This effort assures that the overriding priority of nuclear safety is maintained while providing for plant personnel and public safety and health. Performing the Type A test would require vendor personnel from across

> the United States working alongside plant personnel in close proximity for extended periods of time. Including the ILRT in the fall outage scope would also increase the overall outage duration by approximately three days, increasing the amount of time that supplemental workforce would remain onsite. Therefore, the proposed change to extend the ILRT interval by eight months would allow CPS personnel to more effectively follow recommendations for social distancing.

The NRC staff agrees with the licensee that the COVID-19 PHE is an unforeseen emergent condition, as stipulated by the staff when issuing Clinton, license Amendment No. 214, and that the proposed change to extend the ILRT interval by 8 months would allow licensee to reduce personnel exposure to COVID-19.

As stated in Section 1.0, above, the licensee requested two exceptions. The second exception addresses the situation in which CPS containment integrity is not required (Mode 4 or 5) when the test interval ends. In this situation, the licensee requested that the Type A test be performed prior to entering Mode 2 (startup). Pursuant to TS 3.6.1.1, the reactor containment is required to be operable in Modes 1, 2 and 3. With CPS in Mode 4 (cold shutdown) or Mode 5 (refueling), the reactor coolant temperature is below 200 °F and TS 3.6.1.1 does not require containment integrity. While the temperature is below 200 °F, the operators calculate an estimated critical rod position. The Reactor Mode switch is then placed in the startup position (placing the plant in Mode 2), which allows the control rods to be withdrawn to the estimated critical position so as to achieve criticality, and heatup then begins. Mode 2 is the first mode to occur during startup in which primary containment is required by TS 3.6.1.1. The NRC staff therefore finds it acceptable to defer the ILRT prior to the time the plant enters Mode 2 Accordingly, the second exception is acceptable.

The evaluation below addresses the first exception.

3.2 Historical Leakage Rate Test Results

The licensee provided the Clinton, historical results of Type A ILRT and the combined trend summary of Type B and C local leakage rate testing (LLRT). In addition, the LAR included a summary of the examination results of the Clinton, containment metal liner and the results of the containment concrete visual inspections completed during the first and second 10-year containment inservice inspection intervals.

3.2.1 ILRT History

In Section 3.5, “Integrated Leak Rate History,” of Attachment 1 to the LAR, the licensee provided a summary of Type A ILRT results showing that the last two Type A tests had containment performance leakage rates that were less than the maximum allowable leakage rate (L_a) of 0.65 percent containment air weight per day at the calculated design-basis loss of coolant accident (LOCA) pressure (P_a), as specified in the TSs. The licensee also stated:

> No modifications that require a Type A test are planned at CPS prior to the fall 2023 refueling outage, when the next Type A test will be performed in accordance with this proposed change. Any unplanned modifications to containment prior to the next scheduled Type A test would be subject to the special testing requirements of Section IV.A of 10 CFR 50, Appendix J. There have been no pressure or temperature excursions in the CPS

containment which could have adversely affected containment integrity. There is no anticipated addition or removal of plant hardware within containment which could affect leak-tightness.

NEI 94-01, Revision 3-A, Section 9.2.3, "Extended Test Intervals," states the following: "Type A testing shall be performed during a period of reactor shutdown at a frequency of at least once per 15 years based on acceptable performance history. Acceptable performance history is defined as successful completion of two consecutive periodic Type A tests where the calculated performance leakage rate was less than 1.0 L_a."

As shown in Section 3.5 of Attachment 1 to the LAR, the last two tests for the Clinton, primary containment, performed in November 1993 and February 2008 showed a leakage rate much less than the acceptance criterion, L_a, of 0.65 percent of primary containment air weight per day at a test pressure in excess of P_a. These results permit the ILRT at Clinton, to continue to be performed on a 15-year interval in accordance with the guidance of NEI 94-01, Revisions 2-A and 3-A. For Clinton, primary containment the margin of the test results relative to the acceptance criterion support a conclusion that exceeding the performance criterion of L_a would be unlikely with implementation of the proposed one-time interval extension. Therefore, the NRC staff concludes that the performance history of the Type A tests supports the licensee's request to extend the current Clinton, , ILRT interval of 15 years by 8 months, and that the requested extension falls within previously approved provision for a grace period of up to 9 months to accommodate unforeseen emergent conditions.

3.2.2 LLRT (Types B and C) History

Clinton, TS 5.5.13 states, in part, that: "Primary containment leakage rate acceptance criterion is 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are ≤ 0.60 L_a for the Type B and C tests and ≤ 0.75 L_a for Type A tests." The containment performance is shown by the as-found minimum pathway summations, whereas the As-Left maximum pathway summations signify the acceptance criteria for restart. In Section 3.7.4, "Type B and Type C Testing Programs" of Attachment 1 to the LAR, the licensee provided trend summaries for Clinton, from 2008 to 2019 (including a total of nine refueling outages s)) and stated the following: "A review of the Type B and Type C test results from 2008 through 2019 for Clinton has shown substantial margin between the actual as-found and As-Left outage summations and the regulatory requirements. Table 3.7.4-1 provides LLRT data trend summaries for Clinton, inclusive of the Clinton 2008 ILRT."

The data contained in Section 3.7.4 of Attachment 1 of the LAR demonstrate that the as-found minimum pathway summations and the as-left maximum pathway summations have considerable margin to the regulatory requirement of (0.60 L_a), which demonstrates a high quality of maintenance of Type B and C tested components and effective management of the 10 CFR 50, Appendix J, testing program by the licensee. As discussed in NUREG-1493, "Performance-Based Leak-Test Program," dated September 1995 (ADAMS Accession No. ML20098D498), Types B and C tests can identify the vast majority of all potential leakage paths in an ILRT. The licensee is not proposing any changes to the Types B and C test intervals and, thus, performance of the Types B and C testing during the interval between ILRT tests will continue to provide a high degree of assurance that containment integrity is maintained. Based on the above, the NRC staff concludes that continued testing of scheduled Types B and C components during the fall 2021 RFO and beyond, up to the start of the fall 2023 RFO, will provide a measure of assurance of the leak-tightness of the containment.

The NRC staff reviewed the proposed one-time change to verify that the revised program description continues to contain the appropriate administrative controls for the Containment Leak Rate Testing Program. The NRC staff concludes that the TS change continues to provide appropriate administrative controls to ensure that the requirements of 10 CFR 50.36(c)(5) will be satisfied.

3.3 Risk Evaluation

Attachment 3 of the LAR provides a plant-specific risk assessment for a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to 15.7 years and no later than October 31, 2023, or prior to entering Mode 2 if the Type A ILRT has not been performed by October 31, 2023, and the unit is in a mode (i.e., Modes 4 or 5) in which containment integrity is not required.

Consistent with previous ILRT extension requests for boiling-water reactor (BWR) Mark III containments, the plant-specific risk assessment includes the impact of extending the Drywell Bypass Test (DWBT) interval from 15 years to 15.7 years on the ILRT risk metrics. The DWBT is in the scope of the surveillance frequency control program; however, the DWBT has been historically associated with the ILRT frequency because the plant lineups are similar and the same equipment is used to perform both tests. The inclusion of the DWBT in the Clinton risk assessment is similar to the analysis used in the 2015/2016 Clinton ILRT/DWBT permanent 15-year ILRT interval extension that was approved by the NRC in license Amendment No. 214.

The licensee states that the plant-specific risk assessment follows the guidelines in NEI 94-01, Revision 3-A; the methodology outlined in EPRI Topical Report (TR) 104285 “Risk Impact Assessment of Revised Containment Leak Rate Testing Interval,” as updated by EPRI TR-1009325, Revision 2-A (EPRI TR 1018243); the NRC regulatory guidance on the use of probabilistic risk assessment (PRA) findings and risk insights in support of a request for a change to a plant’s licensing basis as outlined in RG 1.174; and the methodology used for Calvert Cliffs to estimate the likelihood and risk implications of corrosion-induced leakage going undetected during the extended test interval.

The licensee addresses each of the four conditions for the use of EPRI TR-1009325, Revision 2-A, contained in NEI 94-01, Revision 2-A, which are listed in Section 4.2 of the NRC staff’s SER for EPRI TR 1009325. A summary of how each condition in that SER is met is provided in Sections 3.3.1 through 3.3.4 below.

3.3.1 Technical Adequacy of the PRA

The first condition for the use of EPRI TR-1009325, Revision 2-A, stipulates that the licensee should submit documentation indicating that the technical adequacy of its PRA is consistent with the requirements of RG 1.200, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,” (ADAMS Accession No. ML202388871) relevant to the ILRT extension application. RG 1.200 describes one acceptable approach for determining whether the technical adequacy of the PRA, in total or the parts that are used to support an application, is sufficient to provide confidence in the results, such that the PRA can be used in regulatory decision-making for light-water reactors.

Consistent with the information provided in Regulatory Issue Summary (RIS) 2007-06, “Regulatory Guide 1.200 Implementation” (ADAMS Accession No. ML070650428), the NRC

staff uses Revision 2 of RG 1.200 to assess the technical adequacy of the PRA used to support risk-informed applications received after March 2010.

In Section 3.2.4.1 of the NRC staff's SER for EPRI TR-1009325, the staff states that Capability Category (CC) I of the American Society of Mechanical Engineers (ASME) PRA standard shall be applied as the standard for assessing PRA quality for ILRT extension applications since approximate values of core damage frequency (CDF) and large early release frequency (LERF) and their distribution among release categories are sufficient to support an evaluation of changes to ILRT frequencies.

The licensee's LAR provided information on the scope and technical adequacy of the Clinton full power internal events (including internal flooding) PRA model and the fire PRA model in Appendix A of Attachment 3 of the LAR. The licensee also provided information on the scope and technical adequacy of seismic CDF and LERF estimates in Appendix A of Attachment 3 of the LAR.

Internal Events

The Clinton full power internal events (including internal flooding) PRA model received a peer review in 2009. The resolution of the peer review findings and observations (F&Os) were addressed during F&O closures in 2018 and 2019. The peer review teams dispositioned one F&O as "partially resolved," one F&O as "open," and the remaining F&Os representing a gap to meeting CC II for all supporting requirements as "resolved."

The licensee included an assessment of the two open F&Os with respect to the impact on this LAR. The licensee concluded that the full power internal events (including internal flooding) PRA model is of adequate technical capability to support this ILRT extension application.

The NRC staff reviewed the two open F&Os and the licensee's assessment. The NRC staff finds that the F&Os were either appropriately dispositioned for the purposes of this application or did not have an impact on the risk assessment for this application.

Based on its review of the submitted information, the NRC staff concludes that the Clinton full power internal events (including internal flooding) PRA model is of sufficient technical adequacy to support a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to October 2023 or 15.7 years.

External Events (Fire)

The Clinton fire PRA model received a peer review in 2018. The resolution of the peer review F&Os were addressed during F&O closures in 2018 and 2019. The peer review teams

dispositioned all of the F&Os as “resolved.” Therefore, there are no open fire PRA model F&Os associated with this application.

Based on its review of the submitted information, the NRC staff concludes that the Clinton fire PRA model is of sufficient technical adequacy to support a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to October 2023 or 15.7 years.

External Events (Seismic)

In Section 3.2.4.2 of the NRC staff’s SER for EPRI TR-1009325, the staff stated:

> Although the emphasis of the quantitative evaluation is on the risk impact from internal events, the guidance in EPRI Report No. 1009325, Revision 2, Section 4.2.7, “External Events,” states that: “Where possible, the analysis should include a quantitative assessment of the contribution of external events (e.g., fire and seismic) in the risk impact assessment for extended ILRT intervals.” This section also states that: “If the external event analysis is not of sufficient quality or detail to directly apply the methodology provided in this document [(i.e., EPRI Report No. 1009325, Revision 2)], the quality or detail will be increased or a suitable estimate of the risk impact from the external events should be performed. This assessment can be taken from existing, previously submitted and approved analyses or other alternate method of assessing an order of magnitude estimate for contribution of the external event to the impact of the changed interval.”

Therefore, the NRC staff’s review of the contribution of seismic events for this application is framed by the context that an order of magnitude estimate for the corresponding risk contribution is sufficient.

In Section 5.7 of Attachment 3 of the LAR, the licensee stated that the Clinton seismic PRA model has not been approved for general use in risk applications. However, the licensee provided estimates of seismic CDF and LERF from calculations that were performed, and it submitted in an LAR for NRC approval of its adoption of the Technical Specifications Task Force 505 (TSTF-505) program. In Appendix A of Attachment 3 of the TSTF-505 LAR, the licensee further stated that the seismic CDF and LERF derived for use in the TSTF-505 program reflect best estimates using available information and potentially conservative assumptions.

The licensee described the methodology for these calculations in Enclosure 4 of the TSTF-505 LAR, dated April 30, 2020 (ADAMS Accession No. ML20121A178). The licensee described an alternative approach taken to calculate the seismic CDF based on the current Clinton seismic hazard curve and assuming the seismic capacity of a component whose seismic failure would lead directly to core damage. The licensee described the approach taken to calculate the seismic LERF by estimating an average seismic conditional large early release probability (SCLERP), based on the spectrum of seismic CDF accident sequence types, and multiplying the seismic CDF by the average SCLERP estimate.

Based on its review of the submitted information, the NRC staff concludes that the Clinton seismic analysis represents an acceptable method of assessing an order of magnitude estimate

of the seismic risk contribution and is of sufficient technical adequacy to support a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to 15.7 years.

Finally, the NRC staff notes that the licensee submitted documentation indicating that the technical adequacy of its PRA is consistent with the requirements of RG 1.200 relevant to the ILRT extension application. Accordingly, the first condition for the use of EPRI TR-1009325, Revision 2-A, contained in NEI 94-01, Revision 2-A, is met.

3.3.2 Estimated Risk Increase

The second condition for the use of EPRI TR-1009325, Revision 2 A, stipulates that the licensee should submit documentation indicating that the estimated risk increase associated with extending the ILRT interval is small and consistent with the clarification provided in the staff's SER for that topical report. Section 3.2.4.6 of the NRC staff's SER for EPRI TR-1009325 contains the clarification of the acceptance criteria. The clarification states:

> The methodology contained in EPRI Report No. 1009325, Revision 2, quantitatively evaluates the impact of the ILRT extension in terms in terms of the increase in LERF and uses the acceptance guidelines in RG 1.174 to assess the acceptability of the increase. The relevant risk metric is LERF, since the Type A test does not generally impact CDF. However, the methodology includes guidance for plants that rely on containment over-pressure for net positive suction head (NPSH) for emergency core cooling system (ECCS) injection for certain accident sequences, and which may experience an increase in CDF as a result of the proposed change in the ILRT interval. For those plants, the impacts on both CDF and LERF will be considered in the ILRT evaluation and compared with the risk acceptance guidelines in RG 1.174.

The second condition further stipulates that a small increase in population dose should be defined as an increase in population dose of less than or equal to either 1.0 person-rem/yr (roentgen equivalent man/year) or 1 percent of the total population dose, whichever is less restrictive. In addition, a small increase in conditional containment failure probability (CCFP) should be defined as a value marginally greater than that accepted in previous one-time ILRT extension requests. This would require that the increase in CCFP be less than or equal to 1.5 percentage points.

In Section 1.3 of Attachment 3 of the LAR, the licensee states that Clinton does not credit containment accident pressure to maintain NPSH for pumps that take suction from the suppression pool. Therefore, the associated risk metrics include LERF, population dose, and CCFP.

The licensee provided a summary of the plant-specific risk assessment results in Section 3.6.2 of the LAR, and it provided details of the plant-specific risk assessment in Attachment 3 of the LAR. The risk assessment results are summarized below.

> The increase in internal events LERF for a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to 15.7 years, with corrosion included, is 9.80E 10/yr. To determine the potential impact from external events, an additional assessment of the risk associated with external

events was performed. The total increase in LERF due to internal events and external events is 4.22E 08/yr.

The change in population dose for a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to 15.7 years, measured as an increase to the total integrated dose risk for all accident sequences, is 3.78E 04 person-rem/yr using the EPRI guidance with the corrosion included.

The change in CCFP for a one-time extension of the current 15 year Type A ILRT interval by approximately 8 months to 15.7 years is 0.03%.

RG 1.174 defines "very small" changes in risk as resulting in increases in CDF less than 1.0E 06/yr and increases in LERF less than 1.0E 07/yr. Since the ILRT does not impact CDF, the relevant criterion is LERF. Based on the review of the plant-specific risk assessment results, the NRC staff concludes that the increase in LERF is "very small" and within the acceptance guidelines of RG 1.174.

As stated above, the second condition for the use of EPRI TR-1009325, Revision 2-A, stipulates that a small increase in population dose should be defined as an increase in population dose of less than or equal to either 1.0 person-rem/yr or 1 percent of the total population dose, whichever is less restrictive. Based on the NRC staff's review of the plant-specific risk assessment results, the staff concludes that the increase in population dose is less than 1.0 person-rem/yr.

The second condition also stipulates that the increase in CCFP be less than or equal to 1.5 percentage points. Based on the NRC staff's review of the plant-specific risk assessment results, the staff concludes that the increase in CCFP is less than 1.5 percentage points.

The NRC staff finds that the defense in depth philosophy is maintained, since the independence of barriers will not be degraded as a result of the requested change, and the use of the three quantitative risk metrics collectively ensures that the balance between prevention of core damage, prevention of containment failure, and consequence mitigation is preserved. Accordingly, the second condition for the use of EPRI TR-1009325, Revision 2-A, contained in NEI 94-01, Revision 2-A, is met.

3.3.3 Leak Rate for the Large Preexisting Containment Leak Rate Case

The third condition for the use of EPRI TR-1009325, Revision 2-A, stipulates that the average leak rate for the preexisting containment large leak rate accident case (accident case 3b) used by the licensees shall be 100 La instead of 35 La in order to make the methodology in EPRI TR-1009325 acceptable. In Section 3.0 of Attachment 3 of the LAR, the licensee stated the representative containment leakage for class 3b sequences is 100 La. Accordingly, the third condition for the use of EPRI TR-1009325, Revision 2-A, contained in NEI 94-01, Revision 2-A, is met.

3.3.4 Applicability if Containment Over-Pressure is Credited for ECCS Performance

The fourth condition for the use of EPRI TR-1009325, Revision 2-A, stipulates that a LAR is required in instances where containment over-pressure is relied upon for ECCS performance. In Section 1.3 of Attachment 3 of the LAR, the licensee states that Clinton does not credit containment accident pressure to maintain NPSH for pumps that take suction from the

suppression pool. Accordingly, the fourth condition for the use of EPRI TR-1009325, Revision 2-A, contained in NEI 94-01, Revision 2-A, is not applicable.

3.4 Containment Inservice Testing Program

The containment inservice inspection (CISI) requirements in 10 CFR 50.55a(b)(2)(viii) and (ix) also provide for the continued leak-tight and structural integrity of the containment during its service life. The results of these programs are indications of the containment's ability to meet its design functions, and the programs are designed to identify any degrading conditions that might affect that capability.

In its LAR, the license provided the results of its inspections and testing programs that ensure the containment structure remains capable of meeting its design functions and are designed to identify any degrading conditions that might affect that capability. These programs are discussed below.

3.4.1 Protective Coating Program

The containment liner forms part the pressure boundary for the Type A test. Protective coatings protect the liner surface from corrosion that has the potential to result in leakage. In its LAR, the licensee stated that it has committed to follow RG 1.54, "Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants," Revision 0 (ADAMS Accession No. ML003740182). The RG describes a method to comply with requirements of Appendix B to 10 CFR Part 50 and invokes several ANSI Standards. The ANSI Standards that are pertinent to coatings are ANSI N101.2[2], "Protective Coatings (Paints) for Light-Water Nuclear Reactor Containment Facilities," ANSI N101.4[2], "Quality Assurance for Protective Coatings Applied to Nuclear Facilities," and ANSI N5.12[2], "Protective Coatings for the Nuclear Industry." (ANSI N5.9, referenced in ANSI N101.2, was replaced by ANSI N5.12[2] in 1974, prior to CPS obtaining a construction permit).

Protective coating programs are designed to inspect the protective coatings in the containment building, including the drywell, during every refueling outage (i.e., every 24 months). A program to maintain containment coatings was developed by the licensee to meet the requirements of RG 1.54, Revision 0. Every refueling outage (i.e., every 24 months), a preventive maintenance activity to inspect the protective coatings in the containment building, including the drywell, is performed.

The most recent inspection was performed during refueling outage C1R19 in September 2019. During refueling outage C1R19, all elevations of the Drywell Liner Plate, Inner Wall and floors, Containment Liner Plate, Inner Wall and Floors and Containment Steam Tunnel were inspected to identify degraded coatings.

CPS procedures require that a visual inspection be performed to establish the baseline condition of Containment and Drywell coatings, and to identify Unqualified and Degraded coatings. The baseline condition is the first item identified in the Combined Degraded and Unqualified Coatings list. CPS completed this task on August 19, 1998.

The licensee stated that its coating assessment identified areas of coating degradation requiring repair. Importantly, no current coating conditions were identified that impact structural integrity,

[2] Available from American National Standards Institute, 1899 L Street, NW, Washington DC 220036.

plant operations, or the safe shutdown of the plant. Many of the degraded areas have been identified in previous reports and have been previously repaired by the CPS Protective Coating Program to protect surfaces and equipment from contamination and corrosion. The objective of the CPS Protective Coating Program is to protect plant systems, structures and components from degradation by applying and maintaining protective coatings. The timely repair of degraded coatings provides assurance that the integrity of the containment liner will be maintained.

The licensee stated that there will be no change to the schedule for protective coating inspections due to the extended ILRT interval authorized by this amendment. Based on the above, the NRC staff finds that the licensee's Protective Coating Program, will not change as a result of the extended ILRT interval authorized by this amendment and it therefore continues to meet RG 1.54.

3.4.2 ASME Code Section XI IWE and IWL Inservice Inspection Requirements

In its LAR, the licensee stated that CPS performs a comprehensive primary containment inspection pursuant to the requirements of ASME Section XI, "Inservice Inspection," Subsections IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Power Plants," and Subsection IWL, "Requirements of Class CC Concrete Components of Light-Water Cooled Power Plants." The CPS Containment Inservice Inspection Program was developed commencing in 1996, and the initial inspections were completed in September 2001. The components subject to Subsection IWE and IWL requirements are those which make up the containment structure, its leak-tight barrier (including integral attachments), and components that contribute to the containment's structural integrity. Specifically included are Class MC pressure retaining components, including metallic shell and penetration liners of Class CC pressure retaining components, and their integral attachments. The ASME Code Inspection Plan was developed in accordance with the requirements of the 1992 Edition with the 1992 Addenda of the ASME Boiler and Pressure Vessel Code, Section XI, Division 1, Subsections IWE and IWL, as modified by the NRC's final rulemaking for 10 CFR 50.55a, as published in the Federal Register on August 8, 1996.

The licensee stated that the initial inspections of the CPS metal/concrete containment have been completed. Various indications were observed, documented, and evaluated and determined to be acceptable. No areas of the containment liner surfaces require augmented examination. No loss of structural integrity of primary containment was observed.

The licensee stated that there will be no change to the schedule for these inspections because of the extended ILRT interval.

The most recent CISI summary report for CPS was submitted to the NRC in "Post Outage 90-Day Inservice Inspection (ISI) Summary Report," dated January 15, 2020 (ADAMS Accession No. ML20021A106). As stated in that report, all Class MC components required to be examined, and all Class CC components, were scheduled and examined in C1R19. No unacceptable indications were identified. Based on the above, the NRC staff finds that the ASME Section XI

inspection results do not identify conditions that would be impacted by the extended ILRT interval authorized by this amendment.

3.4.3 CISI on Concrete Containment

In its LAR, the licensee stated that an inservice inspection of the concrete containment was performed during refueling outage C1R19 following ASME Section XI IWL inspection requirements. An inservice inspection of containment penetrations, from inside and outside containment, was also performed during refueling outage C1R19 following ASME Section XI IWE inspection requirements. All containment penetrations from outside were inspected utilizing VT-3 inspectors. Several indications of minor significance were identified, such as paint or coating damage, flaking, light rust, missing paint, peeling, corrosion, cracked paint, tear, and discoloration. There was no apparent loss of material identified. Section XI, IWE, wetted surfaces of submerged areas and BWR vent system were completed during refueling outage C1R18 (May 2018). All results were acceptable. The above observations identified through inservice inspections on the containment liner, concrete containment, and containment penetrations (i.e., from inside and outside containment) were evaluated. No adverse effect on the metallic liner with respect to the design intent and overall structural integrity of the liner system was identified. The NRC staff finds that the actual conditions identified above are acceptable and will not be impacted by the extended ILRT interval authorized by this amendment.

3.4.4 Summary

Based on the above evaluation, the NRC staff finds that (1) the previous CPS ILRT results have confirmed that the containment's condition is acceptable, with considerable margin, (2) the initial CISI in September 2001 indicated that no areas of the containment liner surfaces require augmented examination and that no loss of structural integrity of primary containment was observed, and (3) the most recent CISI summary report, dated January 15, 2020 , stated that no unacceptable indications were identified for both Class MC components (ASME IWE requirements) and Class CC components (ASME IWL requirements). These successful results indicate that the containment has maintained its structural integrity during its service life and that there is reasonable assurance that the health and safety of the public will not be endangered by allowing, on a one-time basis, the Type A test 15-year interval to be extended by eight months due to the COVID-19 PHE.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendment on May 12, 2021. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility's components located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational or public radiation exposure. The Commission has previously issued a proposed finding that the amendment involve no significant hazards consideration (86 FR 20530, April 20, 2021), and there has been no public comment on such finding. Accordingly, the amendment

meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that 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 to the health and safety of the public.

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Date of issuance: August 11, 2021

SUBJECT: CLINTON POWER STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT NO. 239 RE: ONE-TIME EXTENSION OF CONTAINMENT TYPE A INTEGRADED LEAKAGE RATE TEST FREQUENCY (EPID L-2021-LLA-0031 [COVID-19]) DATE AUGUST 11, 2021

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