



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

October 3, 2019

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENT NOS. 237 AND 200 RE: REVISE TECHNICAL
SPECIFICATIONS TO ALLOW PENETRATION FLOW PATH ISOLATION FOR
INOPERABLE ISOLATION ACTUATION INSTRUMENTATION
(EPID L-2018-LLA-0282)

Dear Mr. Hanson:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment Nos. 237 and 200 to Renewed Facility Operating License Nos. NPF-39 and NPF-85 for the Limerick Generating Station, Units 1 and 2, respectively, in response to your application dated October 19, 2018.

The amendments modify the technical specification requirements for inoperable isolation actuation instrumentation to allow for isolation of the flow path(s) that penetrate the primary containment boundary instead of requiring closure of specific primary containment isolation valves. The changes also clarify the technical specification action for inoperable isolation actuation instrumentation for the reactor enclosure manual isolation function.

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

Sincerely,

/RA Jennifer C. Tobin for/

V. Sreenivas, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosures:

1. Amendment No. 237 to Renewed NPF-39
2. Amendment No. 200 to Renewed NPF-85
3. Safety Evaluation

cc: Listserv



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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 237
Renewed License No. NPF-39

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (Exelon Generation Company), dated October 19, 2018, 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 Renewed Facility Operating License No. NPF-39 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 237, are hereby incorporated into this renewed 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 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: October 3, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 237

LIMERICK GENERATING STATION, UNIT 1

RENEWED FACILITY OPERATING LICENSE NO. NPF-39

DOCKET NO. 50-352

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
Page 3

Insert
Page 3

Replace the following pages of 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
3/4 3-15
3/4 3-16

Insert
3/4 3-15
3/4 3-16

- (2) Pursuant to the Act and 10 CFR Part 70, to receive, possess and to use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (3) Pursuant to the Act and 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;
- (4) Pursuant to the Act and 10 CFR Parts 30, 40, 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; and
- (5) 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, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

C. This renewed 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 (except as exempted from compliance in Section 2.D. below) 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 3515 megawatts thermal (100% rated power) in accordance with the conditions specified herein and in Attachment 1 to this license. The items identified in Attachment 1 to this renewed license shall be completed as specified. Attachment 1 is hereby incorporated into this renewed license.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 237, are hereby incorporated into this renewed license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

TABLE 3.3.2-1 (Continued)
ISOLATION ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION</u>	<u>ISOLATION SIGNAL ^{(a),(c)}</u>	<u>MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM ^(b)</u>	<u>APPLICABLE OPERATIONAL CONDITION</u>	<u>ACTION</u>
7. <u>SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Vessel Water Level Low, Low - Level 2	B	2	1, 2, 3	25
b. Drywell Pressure - High	H	2	1, 2, 3	25
c.1. Refueling Area Unit 1 Ventilation Exhaust Duct Radiation - High	R	2	*#	25
2. Refueling Area Unit 2 Ventilation Exhaust Duct Radiation - High	R	2	*#	25
d. Reactor Enclosure Ventilation Exhaust Duct Radiation - High	S	2	1, 2, 3	25
e. Deleted				
f. Deleted				
g. Reactor Enclosure Manual Initiation	NA	1	1, 2, 3	27
h. Refueling Area Manual Initiation	NA	1	*	25

TABLE 3.3.2-1 (Continued)
ISOLATION ACTUATION INSTRUMENTATION
ACTION STATEMENTS

- ACTION 20 - Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24-hours.
- ACTION 21 - Be in at least STARTUP with the associated penetration flow path(s) isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 6 hours or be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.
- ACTION 22 - Be in at least STARTUP within 6 hours.
- ACTION 23 - In OPERATIONAL CONDITION 1 or 2, verify the affected penetration flow path(s) are isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 1 hour and declare the affected system inoperable. In OPERATIONAL CONDITION 3, be in at least COLD SHUTDOWN within 12 hours.
- ACTION 24 - Restore the manual initiation function to OPERABLE status within 8 hours or isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within the next hour and declare the affected system inoperable or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- ACTION 25 - Establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within 1 hour.
- ACTION 26 - Isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 1 hour.
- ACTION 27 - Restore the manual initiation function to OPERABLE status within 8 hours or establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

TABLE NOTATIONS

- * Required when handling RECENTLY IRRADIATED FUEL in the secondary containment.
- ** May be bypassed under administrative control, with all turbine stop valves closed.
- *** Isolation valves closed to satisfy these requirements may be reopened on an intermittent basis under administrative control.
- # During operation of the associated Unit 1 or Unit 2 ventilation exhaust system.
- (a) DELETED
- (b) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter. Trip functions common to RPS Actuation Instrumentation are shown in Table 4.3.2.1-1. In addition, for the HPCI system and RCIC system isolation, provided that the redundant isolation valve, inboard or outboard, as applicable, in each line is OPERABLE and all required actuation instrumentation for that valve is OPERABLE, one channel may be placed in an inoperable status for up to 8 hours for required surveillance without placing the channel or trip system in the tripped condition.



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

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-353

LIMERICK GENERATING STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 200
Renewed License No. NPF-85

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (Exelon Generation Company), dated October 19, 2018, 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 Renewed Facility Operating License No. NPF-85 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 200, are hereby incorporated into this renewed 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 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: October 3, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 200

LIMERICK GENERATING STATION, UNIT 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-85

DOCKET NO. 50-353

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
Page 3

Insert
Page 3

Replace the following pages of 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
3/4 3-15
3/4 3-16

Insert
3/4 3-15
3/4 3-16

- (2) Pursuant to the Act and 10 CFR Part 70, to receive, possess and to use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (3) Pursuant to the Act and 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;
- (4) Pursuant to the Act and 10 CFR Parts 30, 40, 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; and
- (5) 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, and to receive and possess, but not separate, such source, byproduct, and special nuclear materials as contained in the fuel assemblies and fuel channels from the Shoreham Nuclear Power Station.

C. This renewed 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 (except as exempted from compliance in Section 2.D. below) 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 of 3515 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 200, are hereby incorporated into this renewed license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

TABLE 3.3.2-1 (Continued)
ISOLATION ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION</u>	<u>ISOLATION SIGNAL ^{(a),(c)}</u>	<u>MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM ^(b)</u>	<u>APPLICABLE OPERATIONAL CONDITION</u>	<u>ACTION</u>
7. <u>SECONDARY CONTAINMENT ISOLATION</u>				
a. Reactor Vessel Water Level Low, Low - Level 2	B	2	1, 2, 3	25
b. Drywell Pressure - High	H	2	1, 2, 3	25
c.1. Refueling Area Unit 1 Ventilation Exhaust Duct Radiation - High	R	2	*#	25
2. Refueling Area Unit 2 Ventilation Exhaust Duct Radiation - High	R	2	*#	25
d. Reactor Enclosure Ventilation Exhaust Duct Radiation - High	S	2	1, 2, 3	25
e. Deleted				
f. Deleted				
g. Reactor Enclosure Manual Initiation	NA	1	1, 2, 3	27
h. Refueling Area Manual Initiation	NA	1	*	25

TABLE 3.3.2-1 (Continued)
ISOLATION ACTUATION INSTRUMENTATION
ACTION STATEMENTS

- ACTION 20 - Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.
- ACTION 21 - Be in at least STARTUP with the associated penetration flow path(s) isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 6 hours or be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.
- ACTION 22 - Be in at least STARTUP within 6 hours.
- ACTION 23 - In OPERATIONAL CONDITION 1 or 2, verify the affected penetration flow path(s) are isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 1 hour and declare the affected system inoperable. In OPERATIONAL CONDITION 3, be in at least COLD SHUTDOWN within 12 hours.
- ACTION 24 - Restore the manual initiation function to OPERABLE status within 8 hours or isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within the next hour and declare the affected system inoperable or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- ACTION 25 - Establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within 1 hour.
- ACTION 26 - Isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 1 hour.
- ACTION 27 - Restore the manual initiation function to OPERABLE status within 8 hours or establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

TABLE NOTATIONS

- * Required when handling RECENTLY IRRADIATED FUEL in the secondary containment.
- ** May be bypassed under administrative control, with all turbine stop valves closed.
- *** Isolation valves closed to satisfy these requirements may be reopened on an intermittent basis under administrative control.
- # During operation of the associated Unit 1 or Unit 2 ventilation exhaust system.
- (a) DELETED
- (b) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter. Trip functions common to RPS Actuation Instrumentation are shown in Table 4.3.2.1-1. In addition, for the HPCI system and RCIC system isolation, provided that the redundant isolation valve, inboard or outboard, as applicable, in each line is OPERABLE and all required actuation instrumentation for that valve is OPERABLE, one channel may be placed in an inoperable status for up to 8 hours for required surveillance without placing the channel or trip system in the tripped condition.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 237 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-39

AND

AMENDMENT NO. 200 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-85

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By application dated October 19, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18292A451), Exelon Generation Company, LLC (Exelon, the licensee) submitted a license amendment request for Limerick Generating Station (Limerick), Units 1 and 2.

The amendments would revise Technical Specification (TS) 3.3.2, "Isolation Actuation Instrumentation," to allow for isolation of the flow path(s) that penetrate the primary containment boundary. The current TS require the licensee to close the specific, affected isolation valves to isolate the primary containment. The amendment also adds TS action for inoperable isolation actuation instrumentation for the reactor enclosure manual initiation function to simplify the description of operator actions required to be taken. The amendment is being requested to address situations where a closed isolation valve located inside the primary containment may not reopen following repairs to the isolation actuation instrumentation. The TS changes would allow the licensee to avoid the potential for extended closure of an isolation valve, and a corresponding unavailability of the flow path, for the associated plant system. These changes would also allow the licensee to avoid a potential plant shutdown necessary to allow troubleshooting and repair of a valve located inside the primary containment boundary.

The U.S. Nuclear Regulatory Commission (NRC or the Commission) staff finds these changes acceptable because closure of either the inboard or outboard containment isolation valve provides the same safety function of isolating the penetration and establishing containment integrity. By allowing closure of an outboard isolation valve or another specified means of isolating the flow path, the required isolation function can be implemented without closing the inboard valve.

2.0 REGULATORY EVALUATION

2.1 Background

Section 1.2.4, "System Description," of the Limerick Unit 1 and 2 Updated Final Safety Analysis Report (UFSAR) includes the following information about primary containment and the isolation functions:

1.2.4.2.8 Primary Containment

A pressure-suppression primary containment houses the reactor vessel, the reactor coolant recirculation loops, and other branch connections of the reactor primary system. The pressure-suppression system consists of a drywell, a pressure-suppression chamber storing a large volume of water, a connecting vent system between the drywell and the water pool, isolation valves, containment cooling systems, and other service equipment. In the event of a process system piping failure within the drywell, reactor water and steam would be released into the drywell air space. The resulting increased drywell pressure would then force a mixture of air, steam, and water through the vents into the pool of water stored in the suppression chamber. The steam would condense rapidly in the suppression pool, resulting in a rapid pressure reduction in the drywell. Air transferred from the drywell to the suppression chamber pressurizes the suppression chamber and is subsequently vented to the drywell to equalize the pressure between the two chambers. Cooling systems remove heat from the reactor core, the drywell, and from the water in the suppression chamber, thus providing continuous cooling of the primary containment under accident conditions. Appropriate isolation valves are actuated during this period to ensure containment of radioactive materials within the primary containment.

1.2.4.2.9 Primary Containment and Reactor Vessel Isolation Control System

The primary containment and reactor vessel isolation control system automatically initiates closure of isolation valves to close off all process lines that are potential leakage paths for radioactive material to the environs. This action is taken upon indication of a potential breach in the nuclear system process barrier.

The proposed changes to TS 3.3.2 are related to the isolation functions for systems that penetrate the primary containment and interface directly with the reactor coolant system. These isolation functions are described in Section 6.2.4.3.1.2.2.1, "Main Steam, RCIC [Reactor Core Isolation Cooling] and HPCI [High Pressure Coolant Injection] Steam Lines, and RHR [Residual Heat Removal] Shutdown Cooling Supply Line," of the Limerick UFSAR as follows:

The main steam lines extend from the RPV to the main turbine and condenser system and penetrate the primary containment. For these lines, isolation is provided by automatically actuated globe valves, one inside the containment and one just outside the containment. The MSIVs are spring-loaded, pneumatic, piston-operated globe valves designed to fail closed on loss of pneumatic pressure or loss of power to the solenoid-operated pilot valves. Each valve has two independent pilot valves supplied from independent power sources. Each MSIV has an accumulator to assist in its closure upon loss of normal supply. The

springs and accumulator provide a local stored energy source dedicated to closure of an MSIV under all conditions which requires MSIV closure.

The RCIC turbine steam supply line from main steam line B is provided with two motor-operated, normally open globe valves, one inside and one outside the containment. These valves are closed on receipt of an RCIC isolation signal. The HPCI system turbine steam supply line from main steam line C is provided with motor-operated, normally open globe valves, one inside and one outside containment. These valves are closed on receipt of a HPCI isolation signal.

The RCIC and HPCI steam lines are each also provided with a normally closed motor-operated globe valve that bypasses the outboard isolation valve for steam supply line warmup purposes only. The valve in the RCIC steam line is closed upon receipt of an RCIC isolation signal, and the HPCI steam line valve is closed upon receipt of an HPCI isolation signal. The isolation signals are considered adequate because there is no consequence if the valves open or leak while the system is in operation and appropriate isolation signals are provided to secure the line when system isolation is required.

The RHR shutdown cooling supply line is provided with motor-operated gate valves, one inside and one outside containment, that receive an automatic isolation signal when isolation is required....

In addition, a Reactor Water Cleanup (RWCU) System is provided to clean up the reactor cooling water, to reduce the amounts of activated corrosion products in the water, and to remove excess reactor coolant from the nuclear system under controlled conditions. The RWCU supply from the reactor coolant system contains two motor-operated isolation valves, which automatically close in response to signals from reactor low water level, leak detection system signals based on either high temperature or differential flow, and actuation of the standby liquid control system (SLCS). This isolation prevents the loss of reactor coolant, release of radioactive material from the reactor, and prevents removal of liquid reactivity control material by the cleanup system if the SLCS is in operation.

2.2 Proposed Change

The licensee requested to revise the Limerick, Unit 1, and Limerick, Unit 2, TS Table 3.3.2-1, as follows:

- Revise Action 21 to replace the current TS action phrase, "isolation valves closed," with the following: "penetration flow path(s) are isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange."
- Revise Action 23 to replace the current TS action phrase, "system isolation valves," with the following: "penetration flow path(s) are isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange."
- Revise Actions 24 and 26 to replace the current TS action phrase, "close the affected system isolation valves," with the following: "isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange."

- Action 21 applies to automatic main steam line isolation on low reactor water level, low condenser vacuum, and MSIV room, turbine enclosure, or main steam line tunnel high temperatures.
 - Action 23 applies to automatic isolation of the RHR system shutdown cooling mode, the RWCU system, the HPCI system, and the RCIC system, and primary containment isolation on high radiation levels in ventilation systems.
 - Action 24 applies to manual initiation of main steam line isolation, RHR system shutdown cooling mode isolation, RWCU system isolation, HPCI system isolation, RCIC system isolation, and primary containment isolation.
 - Action 26 applies to primary containment isolation based on pressure indications.
- Add a table notation to Actions 21, 23, 24, and 26 to allow for the reopening of isolation valves on an intermittent basis under administrative control.
 - Add a new Action 27 to replace Action 24 for isolation actuation instrument Function 7.g (reactor enclosure [secondary containment] manual initiation).

2.3 Regulatory Requirements

The NRC staff identified the following regulatory requirements and guidance as being applicable to the proposed amendment:

- Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.36 requires that TSs include limiting conditions for operation (LCOs) for any structures, systems, or components, which operating experience or probabilistic risk assessment has shown to be significant to public health and safety. 10 CFR 50.36 also requires that TS surveillance requirements be requirements relating to test, calibration, or inspection, to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.
- In accordance with 10 CFR 50.36(c)(2), LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When LCOs are not met, the licensee must shut down the facility or follow any remedial action permitted by the TSs.
- As described in the introduction to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria (GDC) for Nuclear Power Plants," the principal design criteria of a power plant establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. The GDC establish minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission.
 - Criterion 13—Instrumentation and control. Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor

coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

- NUREG-1433, Revision 4.0, "Standard Technical Specifications General Electric BWR/4 Plants," includes Volume 1, "Specifications" (ADAMS Accession No. ML12104A192), and Volume 2, "Bases" (ADAMS Accession No. ML12104A193).
 - Condition B of Standard Technical Specification (STS) 3.3.6.1, Primary Containment Isolation Instrumentation," allows 1 hour to restore an isolation function that has not been maintained. Otherwise, Condition C requires implementation of specified actions associated with each individual isolation function, as described below.
 - Condition D of STS 3.3.6.1 requires isolation of the steam line associated with the automatic isolation function that was not maintained within 12 hours . Otherwise, the action requires entering Mode 3 (Hot Shutdown) within 12 hours and Mode 4 (Cold Shutdown) within 36 hours.
 - Condition F of STS 3.3.6.1 requires isolation of the affected penetration flow path(s) within 1 hour if the isolation function is not maintained for automatic isolation of primary containment on high drywell radiation, HPCI, RCIC, RWCU (other than isolation due to SLCS actuation), and Shutdown Cooling mode of RHR on high steam dome pressure. Otherwise, Condition H applies, which specifies entering Mode 3 (Hot Shutdown) within 12 hours and in Mode 4 (Cold Shutdown) within 36 hours. Condition H also applies directly for primary containment automatic isolation functions other than high drywell radiation.
 - Condition G of STS 3.3.6.1 requires isolation of the affected penetration flow path(s) within 12 hours if the isolation function is not maintained for manual initiation of main steam line isolation, RHR system shutdown cooling mode isolation, RWCU system isolation, HPCI system isolation, RCIC system isolation, and primary containment isolation. Otherwise, Condition H applies, which specifies entering Mode 3 (Hot Shutdown) within 12 hours and in Mode 4 (Cold Shutdown) within 36 hours.
 - Condition I of STS 3.3.6.1 requires isolation of the RWCU flow path within 1 hour or declaration of the associated SLCS subsystem as inoperable if the isolation function is not maintained for automatic isolation of RWCU due to SLCS actuation.
 - Condition J of STS 3.3.6.1 requires immediate restoration of the function or isolation of the affected penetration flow path if the shutdown cooling isolation function on low reactor vessel water level is not maintained in Mode 3, Mode 4, or Mode 5 (Refueling).
 - A note applicable to the above STS 3.3.6.1 Conditions states that penetration flow paths may be unisolated intermittently under administrative controls.
 - When the manual initiation function is not maintained, STS 3.3.6.2, "Secondary Containment Isolation Instrumentation," specifies that, if the function cannot be restored within one hour, the secondary containment zone either be isolated, the affected secondary containment isolation valves be declared inoperable and the standby gas treatment system placed in operation, or the standby gas treatment subsystem be declared inoperable.

- NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 16.0, Technical Specifications, Revision 3, ADAMS Accession No. ML100351425.
 - The proposed TS are reviewed for whether content and format are consistent with the applicable reference TS (the current STS, the certified generic TS, or both). Special attention is given to TS provisions that depart from the reference TS to determine whether proposed differences are justified by uniqueness in plant design or other considerations so that 10 CFR 50.36 is met.

3.0 TECHNICAL EVALUATION

Because the plant is designed to GDC 13, which requires instrumentation to be provided to monitor containment isolation variables and systems over normal operations, AOOs, and accident conditions, the technical specifications include limiting conditions for operation on those instruments to assure that those instruments can meet their GDC-13 functions. Where the LCO is not met, in that the associated containment isolation instrument is incapable of controlling the containment isolation valves or monitoring the parameters of the containment system, the technical specifications allow continued operation for specified periods of time to allow the licensee a reasonable chance to correct the problem. During the period when the LCO is not met, the technical specifications require the licensee to re-establish and maintain containment integrity using alternate means. The performance of the separate task will provide the licensee with essentially the same ability to monitor and control the containment systems.

- Action 21 is being revised to replace the current TS action phrase requiring closure of the affected main steam line isolation valve with the following:

Be in at least STARTUP with the associated penetration flow path(s) isolated by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 6 hours or be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

The revised action requires isolation of the penetration flow path(s) instead of requiring closure of the associated isolation valves. Isolation of the associated flow path can, therefore, be accomplished by other specified means in lieu of associated isolation valve closure. The intent of this action is to reestablish containment integrity by isolating the flow path associated with the inoperable component. Although closure of the affected valve is one method for accomplishing this objective, the NRC staff determined that alternate means of isolating the flow path provided in the revised action are also acceptable because the objective of establishing containment integrity is satisfied. Furthermore, the proposed action meets the intent of the comparable STS 3.3.6.1 Condition D action, and the completion time is conservative with respect to the comparable completion time of STS 3.3.6.1. The revised Action 21 is, therefore, acceptable.

- Action 23 is being revised to replace the current TS action phrase requiring closure of the affected system isolation valves with the following:

In OPERATIONAL CONDITION 1 or 2, verify the affected penetration flow path(s) are isolated by use of one deactivated automatic valve secured in the

isolated position, or one closed manual valve or blind flange*** within 1 hour and declare the affected system inoperable. In OPERATIONAL CONDITION 3, be in at least COLD SHUTDOWN within 12 hours.

The revised action requires isolation of the penetration flow path(s) instead of requiring closure of the associated isolation valves. Isolation of the associated flow path can, therefore, be accomplished by other specified means in lieu of associated isolation valve closure. The intent of this action is to reestablish containment integrity by isolating the flow path associated with the inoperable component. Although closure of the affected valve is one method for accomplishing this objective, the NRC staff determined that alternate means of isolating the flow path provided in the revised action are also acceptable because the objective of establishing containment integrity is satisfied. Furthermore, the proposed action meets the intent of the comparable STS 3.3.6.1 Condition F action, and the completion time is identical to the completion time of STS 3.3.6.1. The revised Action 23 is, therefore, acceptable.

- Action 24 is being revised to replace the current TS action phrase requiring closure of the affected system isolation valves with the following:

Restore the manual initiation function to OPERABLE status within 8 hours or isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within the next hour and declare the affected system inoperable or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

The revised action requires isolation of the penetration flow path(s) instead of requiring closure of the associated isolation valves. Isolation of the associated flow path can, therefore, be accomplished by other specified means in lieu of associated isolation valve closure. The intent of this action is to reestablish containment integrity by isolating the flow path associated with the inoperable component. Although closure of the affected valve is one method for accomplishing this objective, the NRC staff determined that alternate means of isolating the flow path provided in the revised action are also acceptable because the objective of establishing containment integrity is satisfied. The revised Action 24 is, therefore, acceptable.

- Action 26 is being revised to replace the current TS action phrase requiring closure of the affected system isolation valves with the following:

Isolate the affected penetration flow path(s) by use of one deactivated automatic valve secured in the isolated position, or one closed manual valve or blind flange*** within 1 hour.

The revised action requires isolation of the penetration flow path(s) instead of requiring closure of the associated isolation valves. Isolation of the associated flow path can, therefore, be accomplished by other specified means in lieu of associated isolation valve closure. The intent of this action is to reestablish containment integrity by isolating the flow path associated with the inoperable component. Although closure of the affected valve is one method for accomplishing this objective, the NRC staff determined that alternate means of isolating the flow path provided in the revised action are also acceptable because the objective of establishing containment integrity is satisfied. Furthermore, the proposed action

meets the intent of the comparable STS 3.3.6.1 Condition G action, and the completion time is conservative with respect to the comparable completion time of STS 3.3.6.1. The revised Action 26 is, therefore, acceptable.

- The following table notation is being added to Table 3.3.2-1 for Actions 21, 23, 24, and 26:

*** Isolation valves closed to satisfy these requirements may be reopened on an intermittent basis under administrative control.

This notation allows intermittent opening of isolation valves that have been shut in accordance with Actions 21, 23, 24, and 26. The notation is consistent with current Limerick TS Section 3.6.3, Action a as well as the STS (NUREG-1433, Revision 4). This NUREG contains an action note in TS 3.3.6.1 that states the following: "Penetration flow paths may be unisolated intermittently under administrative controls." This note modifying Table 3.3.2-1 of the Limerick TS serves the same function as the comparable note modifying STS 3.3.6.1 actions.

The actions of this note do not apply to secondary containment isolation valve and therefore, the NRC staff did not evaluate the effects of this change on secondary containment isolation. The NRC staff verified that this note is not applied to isolation actuation instrumentation Function 7.g, "Reactor Enclosure Manual Initiation" which is a secondary containment function. This note and provision was determined to be acceptable by the NRC staff because it would support troubleshooting or maintenance of the isolation actuation instrumentation by allowing a failed valve to be re-positioned without compromising containment integrity. This change is also consistent with existing Limerick TS Section 3.6.3 and allowances.

As such, timely isolation of affected flow paths can be achieved during activities supporting troubleshooting or maintenance of the isolation actuation instrumentation.

- TS Table 3.3.2-1, Trip Function 7.g, Action 24 (reactor enclosure manual initiation) is being replaced with the following new Action 27:

ACTION 27 - Restore the manual initiation function to OPERABLE status within 8 hours or establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

This change is being performed to provide clarity on operational actions to be taken for inoperable secondary containment isolation actuation instrumentation for the reactor enclosure manual isolation function. When compared to the existing Action 24, this new action provides an allowance for continued plant operation when secondary containment integrity is established with the standby gas treatment system operating.

The existing Action 24 requires closing the affected secondary containment isolation valve and declaring the associated system inoperable and does not allow continued operation of the standby gas treatment system. The proposed changes would modify the TS action to establish secondary containment integrity for the unit's reactor enclosure zone with the standby gas treatment system operating. The NRC staff reviewed existing Limerick TS

actions for inoperable secondary containment isolation valve (TS 3.6.5.2.1), "Reactor Enclosure Secondary Containment Automatic Isolation Valves," and verified this TS allows for isolation of the affected penetration and does not require closure of a specific inboard or outboard secondary containment isolation valve. Furthermore, the proposed actions meet the intent of the comparable STS 3.3.6.2 actions. The new Action 27 is thus acceptable because these actions are consistent with TS 3.6.5.2.1, and because the proposed change does not alter the actions needed to isolate the affected penetration for this condition.

Based on the TS evaluations performed, the NRC staff determined that the LGS instrumentation that is used to monitor containment isolation variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions are not being changed as a result of the TS changes being proposed. Furthermore, the NRC staff confirmed that controls provided to maintain the LGS containment isolation systems and containment parameters within their prescribed operating ranges are sufficient and will remain in effect.

3.2 Summary and Conclusion

Based on a review of the licensee's application, the proposed TS changes provide reasonable assurance of adequate protection of public health, safety, and security. The NRC staff's evaluation determined that the proposed TS changes do not affect the surveillance requirements relating to test, calibration, and inspection of containment isolation instrumentation.

The revised TSs include acceptable provisions to address inoperable penetration flow path instrumentation situations where specified LCOs are not met. The TSs also specify remedial actions that were determined to be acceptable based on alternate means of establishing containment isolation, consistent with the guideline standard TSs included in NUREG-1433.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments on July 30, 2019. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted areas as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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 radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (December 18, 2018; 83 FR 64893). Accordingly, the amendments 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 amendments.

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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: S. Jones
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Date: October 3, 2019

B. Hanson

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – ISSUANCE OF
AMENDMENT NOS. 237 AND 200 RE: REVISE TECHNICAL
SPECIFICATIONS TO ALLOW PENETRATION FLOW PATH ISOLATION FOR
INOPERABLE ISOLATION ACTUATION INSTRUMENTATION
(EPID L-2018-LLA-0282) DATED OCTOBER 3, 2019

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