



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

March 27, 2017

Mr. Brad Berryman
Site Vice President
Susquehanna Nuclear, LLC
769 Salem Boulevard
NUCSB3
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 – ISSUANCE
OF AMENDMENTS RE: SECONDARY CONTAINMENT ACCESS OPENINGS
(CAC NOS. MF8214 AND MF8215)

Dear Mr. Berryman:

The U.S. Nuclear Commission (Commission) has issued the enclosed Amendment No. 267 to Renewed Facility Operating License No. NPF-14 and Amendment No. 249 to Renewed Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2, respectively. These amendments consist of changes to the technical specifications (TSs) in response to your application dated July 27, 2016, as supplemented by letter dated September 13, 2016.

These amendments revise TS 3.6.4.1, "Secondary Containment," to provide an allowance for brief, inadvertent, simultaneous opening of redundant secondary containment access doors during normal entry and exit conditions.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Tanya E. Hood".

Tanya E. Hood, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosures:

1. Amendment No. 267 to License
No. NPF-14
2. Amendment No. 249 to License
No. NPF-22
3. Safety Evaluation

cc w/enclosures: Distribution via Listserv

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS RE: SECONDARY CONTAINMENT ACCESS OPENINGS (CAC NOS. MF8214 AND MF8215) DATED MARCH 27, 2017

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*by e-mail

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

SUSQUEHANNA NUCLEAR, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-387

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 267
Renewed License No. NPF-14

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Susquehanna Nuclear, LLC, dated July 27, 2016, as supplemented by letter dated September 13, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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-14 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 267, and the Environmental Protection Plan contained in Appendix B are hereby incorporated in the license. Susquehanna Nuclear, LLC 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 issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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: March 27, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 267
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1
RENEWED FACILITY OPERATING LICENSE NO. NPF-14
DOCKET NO. 50-387

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 marginal lines indicating the areas of change.

REMOVE
Page 3

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Page 3

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE
3.6-37

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3.6-37

- (3) Susquehanna Nuclear, LLC, 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 neutron sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) Susquehanna Nuclear, LLC, 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; and
- (5) Susquehanna Nuclear, LLC, 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.

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

Susquehanna Nuclear, LLC is authorized to operate the facility at reactor core power levels not in excess of 3952 megawatts thermal in accordance with the conditions specified herein. The preoperational tests, startup tests and other items identified in License Conditions 2.C.(36), 2.C.(37), 2.C.(38), and 2.C.(39) to this license shall be completed as specified.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 267, and the Environmental Protection Plan contained in Appendix B are hereby incorporated in the license. Susquehanna Nuclear, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

For Surveillance Requirements (SRs) that are new in Amendment 178 to Facility Operating License No. NPF-14, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 178. For SRs that existed prior to Amendment 178, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 178.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p style="text-align: center;">-----NOTE-----</p> <p>Single door access openings between required zones within the secondary containment boundary may be opened for entry and exit.</p> <hr/> <p>SR 3.6.4.1.3 Verify one secondary containment access door in each access opening is closed, except when the access opening is being used for entry and exit.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.6.4.1.4 -----NOTE-----</p> <p>The maximum time allowed for secondary containment draw down is dependent on the secondary containment configuration.</p> <hr/> <p>Verify each standby gas treatment (SGT) subsystem will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in less than or equal to the maximum time allowed for the secondary containment configuration that is OPERABLE.</p>	<p style="text-align: center;">-----NOTE-----</p> <p>Test each configuration at least one time every 60 months.</p> <hr/> <p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.6.4.1.5 -----NOTE-----</p> <p>The maximum flow allowed for maintaining secondary containment vacuum is dependent on the secondary containment configuration.</p> <hr/> <p>Verify each SGT subsystem can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment for at least 1 hour at a flow rate less than or equal to the maximum flow rate permitted for the secondary containment configuration that is OPERABLE.</p>	<p style="text-align: center;">-----NOTE-----</p> <p>Test each configuration at least one time every 60 months.</p> <hr/> <p>In accordance with the Surveillance Frequency Control Program</p>



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SUSQUEHANNA NUCLEAR, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 249
Renewed License No. NPF-22

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Susquehanna Nuclear, LLC, dated July 27, 2016, as supplemented by letter dated September 13, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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.

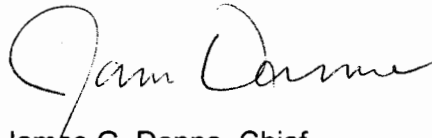
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-22 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 249, and the Environmental Protection Plan contained in Appendix B are hereby incorporated in the license. Susquehanna Nuclear, LLC 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 issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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: March 27, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 249
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2
RENEWED FACILITY OPERATING LICENSE NO. NPF-22
DOCKET NO. 50-388

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 marginal lines indicating the areas of change.

REMOVE
Page 3

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Page 3

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE
3.6-37

INSERT
3.6-37

- (3) Susquehanna Nuclear, LLC, 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 neutron sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) Susquehanna Nuclear, LLC, 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; and
- (5) Susquehanna Nuclear, LLC, 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.

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

Susquehanna Nuclear, LLC is authorized to operate the facility at reactor core power levels not in excess of 3952 megawatts thermal in accordance with the conditions specified herein. The preoperational tests, startup tests and other items identified in License Conditions 2.C.(20), 2.C.(21), 2.C.(22), and 2.C.(23) to this license shall be completed as specified.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 249, and the Environmental Protection Plan contained in Appendix B are hereby incorporated in the license. Susquehanna Nuclear, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

For Surveillance Requirements (SRs) that are new in Amendment 151 to Facility Operating License No. NPF-22, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 151. For SRs that existed prior to Amendment 151, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 151.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p style="text-align: center;">-----NOTE-----</p> <p>Single door access openings between required zones within the secondary containment boundary may be opened for entry and exit.</p> <p>-----</p> <p>SR 3.6.4.1.3 Verify one secondary containment access door in each access opening is closed, except when the access opening is being used for entry and exit.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.6.4.1.4 -----NOTE-----</p> <p>The maximum time allowed for secondary containment draw down is dependent on the secondary containment configuration.</p> <p>-----</p> <p>Verify each standby gas treatment (SGT) subsystem will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in less than or equal to the maximum time allowed for the secondary containment configuration that is OPERABLE.</p>	<p>-----NOTE-----</p> <p>Test each configuration at least one time every 60 months.</p> <p>-----</p> <p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.6.4.1.5 -----NOTE-----</p> <p>The maximum flow allowed for maintaining secondary containment vacuum is dependent on the secondary containment configuration.</p> <p>-----</p> <p>Verify each SGT subsystem can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment for at least 1 hour at a flow rate less than or equal to the maximum flow rate permitted for the secondary containment configuration that is OPERABLE.</p>	<p>-----NOTE-----</p> <p>Test each configuration at least one time every 60 months.</p> <p>-----</p> <p>In accordance with the Surveillance Frequency Control Program</p>



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 267 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-14

AND AMENDMENT NO. 249 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-22

SUSQUEHANNA NUCLEAR, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-387 AND 50-388

1.0 INTRODUCTION

By application dated July 27, 2016, as supplemented by letter dated September 13, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML16210A001 and ML16257A598, respectively), Susquehanna Nuclear, LLC (the licensee), submitted a license amendment request (LAR) for revisions to the Technical Specifications (TSs) for Susquehanna Steam Electric Station (SSES), Units 1 and 2. The proposed amendments would revise TS Surveillance Requirement (SR) 3.6.4.1.3 to allow for brief, inadvertent, simultaneous opening of redundant secondary containment access doors during normal entry and exit conditions.

The supplemental letter dated September 13, 2016, was in response to U.S. Nuclear Regulatory Commission (NRC or the Commission) request for additional information (RAI) dated August 25, 2016 (ADAMS Accession No. ML16237A144). The supplemental letter was considered in the NRC staff's original proposed no significant hazards consideration determination in the *Federal Register* on October 25, 2016 (81 FR 73441).

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance that the NRC staff considered in its review of this LAR are described below.

2.1 Regulatory Requirements

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36, "Technical specifications," establishes the regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TSs are required to include items in the following categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) SRs; (4) design features; and (5) administrative controls. The regulation does not specify the particular requirements to be included in a plant's TSs.

Section 50.36(c)(2) to 10 CFR Part 50 requires, in part, that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the LCO can be met.

Section 50.36(c)(3) to 10 CFR Part 50 requires that TSs include SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

Section 50.67 to 10 CFR Part 50, "Accident source term," sets limits for the radiological consequences of a postulated design-basis accident (DBA) using an alternative source term (AST). The NRC approved a full scope implementation of an AST methodology for SSES Units 1 and 2, by License Amendment Nos. 239 (Unit 1) and 216 (Unit 2), on January 31, 2007 (ADAMS Accession No. ML070080301).

The regulations in Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants" (hereinafter referred to as GDC), establish the minimum requirements for the principal design criteria for water-cooled nuclear power plants. The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety.

The NRC staff identified the following GDCs applicable to this LAR:

- GDC 16, "Containment design," which requires, in part, that the containment establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment.
- GDC 19, "Control room," which requires, in part, that adequate radiation protection be provided to permit access and occupancy of the control room under accident conditions, without personnel receiving radiation exposures in excess of 5 roentgen equivalent man (rem) whole body, or its equivalent to any part of the body, for the duration of the accident.

2.2 Applicable Guidance

The guidance that the NRC staff considered in its review of this LAR include the following. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (hereinafter referred to as the SRP).

Relevant sections of the SRP used in the review of this LAR include the following:

- SRP Section 15.0.1, Revision 0, "Radiological Consequence Analyses Using Alternative Source Terms," July 2000 (ADAMS Accession No. ML003734190), provides guidance to the NRC staff for the review of AST amendment requests. This SRP section states that the reviewer should evaluate the proposed change against the guidance in Regulatory Guide (RG) 1.183, Revision 0, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," July 2000 (ADAMS Accession No. ML003716792).
- SRP Section 16.0, Revision 3, "Technical Specifications," March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared standard technical specifications (STS) for each of the light-water reactor nuclear designs. The STS contain guidance for the format and content of TSs that meet the requirements of 10 CFR 50.36. For this review, the NRC staff used NUREG 1433, Revision 4, "Standard Technical Specifications, General Electric BWR [Boiling-Water Reactor]/4 Plants" (ADAMS Accession No. ML12104A192), and NUREG-1434, Revision 4, "Standard Technical Specifications, General Electric BWR/6 Plants" (ADAMS Accession No. ML12104A195), for guidance on the TS format.

NUREG-1022, Revision 3, "Event Report Guidelines 10 CFR 50.72 and 50.73," January 2013 (ADAMS Accession No. ML13032A220), discusses the reporting criteria contained in 10 CFR 50.72, "Immediate notification requirements for operating nuclear power reactors," and 10 CFR 50.73, "Licensee event report system." Section 3.2.7 of NUREG-1022 discusses the reporting criteria in 10 CFR 50.72(b)(3)(v) and 10 CFR 50.73(a)(2)(v), which relate to events or conditions that could have prevented fulfillment of a safety function. This section states, in part, that there are a limited number of single-train systems that perform safety functions. For such systems, inoperability of a single train is reportable, even though the plant TSs may allow such a condition to exist for a limited time.

RG 1.183 provides an acceptable methodology for analyzing the radiological consequences of several DBAs to show compliance with 10 CFR 50.67. RG 1.183 provides guidance to licensees on acceptable application of AST submittals, including acceptable radiological analysis assumptions for use in conjunction with the accepted AST.

3.0 TECHNICAL EVALUATION

The NRC staff review evaluated the impact of the proposed change on the secondary containment functional requirements and the DBA analysis. The NRC staff review was limited to the licensee's request to provide an allowance for the brief, inadvertent, simultaneous opening of redundant secondary containment access doors during normal entry and exit conditions. Planned activities that could result in the simultaneous opening of redundant secondary containment access openings, such as maintenance of a secondary containment personnel access door or movement of large equipment through the openings that would take longer than the normal transit time, were considered outside the scope of the NRC staff's review.

3.1 Secondary Containment Safety Function

The BWR Mark I and Mark II design of the secondary containment consists of a structure that completely encloses the primary containment and those components that may contain primary system fluid. The safety function of the secondary containment is to contain airborne radioactivity that may leak from primary containment following a DBA such that the standby gas treatment system (SGTS) can collect and filter secondary containment atmosphere before release to the environment to ensure the control room operator and offsite doses are within the regulatory requirements. To prevent ground level exfiltration of radioactive material while allowing the secondary containment to be designed as a mostly conventional structure, the secondary containment requires support systems to maintain the secondary containment pressure at less than atmospheric pressure. There is no redundant train or system that can perform the secondary containment function should the secondary containment be inoperable.

In conjunction with operation of the SGTS and closure of the secondary containment isolation valves, the secondary containment is designed to reduce the activity level of the fission products that bypass or leak from primary containment, or are released from the reactor coolant pressure boundary components located in secondary containment prior to release to the environment. For the secondary containment to be considered operable, it must have adequate leak-tightness to ensure that the required vacuum can be established and maintained by a single SGTS subsystem when that subsystem is in operation. The secondary containment and the SGTS together ensure radioactive material is contained and processed.

The secondary containment and SGTS at SSES is common to both Units 1 and 2. The SSES secondary containment consists of three distinct zones. Zones I and II are the portions of the Units 1 and 2 reactor buildings below the 779-foot elevation surrounding the Units 1 and 2 primary containment, respectively. Zone III consists of the portion of the Units 1 and 2 reactor building above the 779-foot elevation with the exception of heating, ventilation, and air conditioning rooms, which are not part of the secondary containment. The reactor building is designed to limit the in-leakage to 140 percent of the secondary containment free volume per day at negative 0.25 inches of water gauge, while operating the SGTS. During postulated accidents without a loss of offsite power (LOOP), the ventilation zone associated with the unit experiencing a loss-of-coolant accident (LOCA) and Zone III will isolate. If LOOP is concurrent with LOCA, all three zones isolate, assuming all three zones are operable or required to be operable. For a fuel handling accident, only Zone III isolates, assuming a LOOP has not occurred. The building structure above the refueling floor is also designed to contain an interior pressure of negative 0.25 inches of water gauge.

3.2 Description of Proposed Technical Specification Changes

LCO 3.6.4.1 for SSES TS 3.6.4.1, "Secondary Containment," requires that the secondary containment be operable in Modes 1, 2, and 3, during movement of irradiated fuel assemblies in the secondary containment, during core alterations, and during operations with a potential for draining the reactor vessel. SSES SRs 3.6.4.1.1 through 3.6.4.1.5 provide the requirements to demonstrate that the secondary containment is operable. SR 3.6.4.1.3 requires verification that at least one secondary containment access door in each access opening is closed. The intent of this requirement is to not breach secondary containment at any time when secondary containment is required.

The licensee explained in the LAR that it is possible for an unintentional simultaneous opening of both the inner and outer secondary containment access doors during normal entry and exit.

Based on the current wording in SR 3.6.4.1.3, the secondary containment would be considered inoperable when this occurs. In addition, 10 CFR 50.72 and 10 CFR 50.73 require prompt notification and submittal of a licensee event report (LER), regardless of the length of time of inoperability. The licensee further stated that in a vast majority of cases when this has occurred, the secondary containment was restored to operable status in much less than the TS-required 4-hour completion time. The licensee considers that declaring secondary containment inoperable for these brief occurrences is not warranted.

The licensee is proposing to revise SR 3.6.4.1.3 as follows (changes shown in bold and italic): "Verify one secondary containment access door in each access opening is closed, ***except when the access opening is being used for entry and exit.***" The proposed change would eliminate the need to declare the secondary containment inoperable for brief, inadvertent, simultaneous openings of inner and outer access doors. In addition, the change would eliminate the need to submit an LER for this condition.

3.3 Radiological Consequences

SSES was approved for AST methodology and the radiological dose consequence analyses for DBAs by License Amendment Nos. 239 and 216. The AST methodology is used to determine the onsite and offsite radiological doses that result from DBAs. Each facility's Updated Final Safety Analysis Report (UFSAR) describes the DBAs and their radiological consequence analysis results. Chapter 15 of the SSES UFSAR describes the DBAs and their radiological consequence analysis results.

The NRC staff evaluated the impact of modifying the SSES TSs to allow the secondary containment access openings to be open for entry and exit on all of the licensee's design-basis radiological consequence dose analyses to ensure that the modification will not result in an increase in the radiation dose consequences, or that any proposed increase in the radiation dose consequences remains within the design criteria specified in 10 CFR 50.67 and the accident-specific design criteria outlined in RG 1.183. The NRC staff's review of these DBAs determined that there are two DBAs that take credit for the secondary containment, and are possibly impacted by the brief, inadvertent, simultaneous opening of both an inner and outer access door during normal entry and exit conditions: a LOCA and the fuel handling accident (FHA)/equipment handling accident (EHA) in secondary containment.

3.4 Fuel Handling Accident/Equipment Handling Accident in Secondary Containment

During normal operation, non-safety-related systems are used to maintain the secondary containment at a slight negative pressure to ensure that any leakage is into the building and that any secondary containment atmosphere exiting the facility is via a pathway monitored for airborne contamination. The refuel floor is maintained at a negative 0.25 inches of water gauge by normal operating ventilation systems. The exhaust ductwork on the refuel floor is equipped with radiation monitors to detect an FHA/EHA. When a radiological release is sensed by the radiation monitors, a Zone III secondary containment isolation signal is generated. This initiates the SGTS, and the normal Zone III ventilation system trips. The radiation monitor is positioned such that it will detect the release and send a closure signal to the secondary containment isolation dampers. The distance between the isolation dampers and the radiation detectors is such that the transit time for air from the radiation detector to the secondary containment isolation damper is greater than the isolation damper closure time. This prevents any release from bypassing filtration via the SGTS. The current accident analysis for FHA/EHA in the fuel handling area (Zone III) does not include a drawdown time for secondary containment. The

dose consequence analysis assumes that there is no hold-up in secondary containment and that all activity is released to the environment over a 2-hour period.

With both airlock doors briefly open, the refuel floor pressure will decrease due to air in-leakage onto the refuel floor due to the pressure differential. SSES DBA analyses do not provide a technical basis that supports the conclusion that the SGTS has enough flow capacity to allow the refueling floor to remain at a negative 0.25 inches of water gauge with both secondary containment access doors open. During an FHA/EHA, radioactive material may be transported out of the open secondary containment access opening if the refueling floor is not maintained at a negative pressure. SSES's current radiological consequence analysis for FHA/EHA in secondary containment does not account for this flow pathway. Therefore, in order for the NRC staff to complete its technical review of the licensee's proposed change, the licensee was requested by letter dated August 25, 2016, to provide one of the following:

1. Account for a ground level release in [the SSES] fuel handling accident analysis, and any other impacted analysis, and provide atmospheric dispersion factors (x/Q 's) for the analysis, or
2. Provide a bounding analysis that addresses the ground level release including x/Q 's even for the short time proposed in the amendment request, or
3. Provide an analysis that shows that the standby gas treatment system has enough capacity to maintain the secondary containment at a negative pressure with both doors open and that no radioactivity will release through the open doors at ground level (to be bounded by the current analysis of record).

The licensee provided in its RAI response dated September 13, 2016, qualitative reasons why an inadvertent simultaneous opening of the inner and outer doors could still maintain a vacuum in the secondary containment. However, the licensee elected to conservatively bound the decreased vacuum in the refuel floor by revising the accident analysis. The revised accident analysis model includes a 10-minute drawdown time of the secondary containment for the FHA/EHA analysis. This results in no credit for SGTS filtration for the first 10 minutes, whereas the previous analysis assumes credit for SGTS filtration from the initiation of the SGTS.

Following are the current licensing basis analyzed cases involving damage to spent fuel in secondary containment, which are described in Section 15.7.4 of the SSES UFSAR:

- Case 1: The FHA is assumed to occur as a consequence of the failure of the fuel assembly lifting mechanism resulting in the drop of a channeled fuel assembly, grapple, and mast onto other fuel bundles. The FHA results in failure of 254.8 Atrium 10 fuel rods.
- Case 2: The EHA is assumed to occur as a consequence of an upper crane failure resulting in a drop of an object weighing 1,100 pounds or less onto fuel assemblies in the spent fuel pool. The EHA results in failure of 460.8 Atrium 10 fuel rods.

In License Amendment Nos. 239 and 216, the NRC staff found that both the FHA and EHA cases were modeled conservatively, the dose consequences for both cases were determined to meet applicable acceptance criteria, and the licensee's models were determined to be

acceptable. The NRC staff has reviewed the impact of SSES's request to include a 10-minute drawdown time of the secondary containment on the previously analyzed FHA/EHA models. Other than revising SGTS filtration to be 0 percent for the first 10 minutes, the licensee did not propose any changes to the current licensing basis source term, inputs, assumptions, or methodology for the FHA/EHA in secondary containment.

Case 2 stated above results in higher offsite and onsite radiological doses than Case 1 due to the larger number of failed rods and, therefore, will bound Case 1. The proposed inclusion of a 10-minute drawdown time of the secondary containment slightly raises the resultant offsite and onsite radiological doses because the release is unfiltered and at ground level for the first 10 minutes.

The accident-specific dose acceptance criteria for the SSES FHA/EHA are a total effective dose equivalent (TEDE) of 6.3 rem at the exclusion area boundary for any 2 hours; 6.3 rem at the outer boundary of the low population zone for the duration of the accident; and 5 rem for access to, and occupancy of, the control room for the duration of the accident. The acceptance criteria for the exclusion area boundary and the outer boundary of the low population zone are explained in RG 1.183. The NRC staff's review has found that the licensee used conservative analysis assumptions and inputs consistent with applicable regulatory guidance identified in Section 2.0 of this safety evaluation. The NRC staff performed independent confirmatory calculations of the dose consequences of the postulated FHA and EHA releases using the licensee's assumptions for input to the RADTRAD computer code, to ensure a thorough understanding of the licensee's methods. The NRC staff's calculations confirmed the licensee's dose results. The major parameters and assumptions used by the licensee, and found acceptable to the NRC staff, are presented in the NRC safety evaluation for License Amendment Nos. 239 and 216, as stated above; SSES UFSAR Section 15.7.4, as stated above; and in Table 1 of this safety evaluation.

The results of the licensee's design-basis radiological consequence calculations are provided in Table 2 below. The exclusion area boundary, low population zone, and control room doses estimated by the licensee for the EHA were found to meet the applicable accident dose acceptance criteria and bound those of the FHA and are, therefore, acceptable.

Table 1

Input Parameter	Current Licensing Basis	Proposed Change
SGTS filter efficiency	99% all iodine species	0% all iodine species for the first 10 minutes, then 99% thereafter for the duration of the event

Table 2

Location	EHA Calculated TEDE Dose (rem)	Regulatory Limit TEDE (rem)
Exclusion Area Boundary	2.33	6.3
Low Population Zone	0.137	6.3
Control Room	0.178	5.0

The NRC staff finds, with reasonable assurance, that the licensee's proposed changes to the TSs will continue to comply with the criteria identified in Section 2.0 of this safety evaluation and that the licensee's estimates of the dose consequences of a design-basis FHA/EHA will comply with the requirements of 10 CFR 50.67 and the accident-specific dose guidelines specified in

RG 1.183. Therefore, the NRC staff concludes this change is acceptable with respect to the radiological consequences of DBAs.

3.5 Loss-of-Coolant Accident

Following a LOCA, the current analyses for the secondary containment structure is maintained at a negative pressure ensuring that leakage from primary containment to secondary containment can be collected and filtered prior to release to the environment. The SGTS performs the function of maintaining a negative pressure within the secondary containment, as well as collecting and filtering the leakage from primary containment. SSES credits the SGTS for mitigation of the radiological releases from the secondary containment.

In the revised LOCA analysis, the secondary containment drawdown analysis assumes that the pressure within the affected secondary containment zones at time 0 seconds is 0.0-inches water gauge relative to the outside environment. The analysis is further based on an allowable SGTS exhaust flow rate equal to 140 percent of the secondary containment free air volume/day. This analysis demonstrates that SGTS can draw down the secondary containment to the required vacuum within 5 minutes (300 seconds). The LOCA dose consequence analysis conservatively assumes double the drawdown time of 10 minutes at the design flow rate of the SGTS to compute the onsite and offsite radiological doses.

Conservatively, the DBA LOCA radiological consequence analysis in UFSAR Chapter 15 assumes that following the start of a DBA LOCA, the reactor building pressure of negative 0.25 inches of water gauge is achieved at approximately 10 minutes. SSES assumes that releases into the reactor building prior to the 10-minute drawdown time leak directly to the environment as a ground level release with no filtration. After the assumed 10-minute drawdown, these releases are filtered by the SGTS and released via the SGTS exhaust vent.

The licensee provided in its RAI response dated September 13, 2016, the most recent drawdown times obtained during surveillance testing for a different combination of the three zones. The higher volume of all three zones resulted in the highest drawdown time of 84 seconds, which is conservative, in comparison to the calculated time of 300 seconds, and significantly more conservative when compared to the assumed drawdown time of 600 seconds. Based on this information, the NRC staff concludes that SSES DBA LOCA analysis has sufficient conservatism by assuming a drawdown time of 10 minutes from the start of the DBA LOCA. Margin exists to ensure that the secondary containment can be reestablished during a brief, inadvertent, simultaneous opening of the inner and outer doors, and there is reasonable assurance that a failure of a safety system needed to control the release of radioactive material to the environment will not result. The secondary containment drawdown test results are considerably lower than the calculated time of 300 seconds. The existing SR to verify the drawdown time of the secondary containment would satisfy both LOCA and FHA/EHA analyses.

The NRC staff finds that the licensee's proposed changes to the TSs will not impact the design bases and will not result in an increase in any onsite or offsite dose. Therefore, the NRC staff concludes that these changes are acceptable with respect to the radiological consequences of the DBAs.

3.6 Evaluation of Technical Specification Changes

SR 3.6.4.1.1 verifies that the secondary containment vacuum during the applicable modes is ≥ 0.25 inch of vacuum water gauge. During emergency conditions, the SGTS is designed to be capable of drawing down the secondary containment to a required vacuum within a prescribed time and continue to maintain the negative pressure as assumed in the accident analysis. SR 3.6.4.1.2 requires verification that all required secondary containment removable walls and equipment hatches required to be closed are closed and sealed. SR 3.6.4.1.4 requires verification that each SGTS subsystem will draw down the secondary containment to ≥ 0.25 inch of vacuum water gauge in less than or equal to the maximum allowable time of 300 seconds for the secondary containment configuration that is operable. SR 3.6.4.1.5 requires verification that each SGTS subsystem can maintain ≥ 0.25 inch of vacuum water gauge in the secondary containment for at least 1 hour at a flow rate less than or equal to the maximum flow rate permitted for the secondary containment configuration that is operable. The proposed change to SR 3.6.4.1.3 has no impact on SRs 3.6.4.1.1, 3.6.4.1.2, 3.6.4.1.4, and 3.6.4.1.5.

The NRC staff reviewed the proposed changes to the TSs to assess the radiological impacts of the changes to the secondary containment in the SSES TSs by considering whether the proposed SRs would continue to meet the requirements of 10 CFR 50.36. The NRC staff finds, with reasonable assurance, that the licensee's changes to the TSs will continue to comply with regulatory requirements and guidance identified in Section 2.0 of this safety evaluation. For each facility, the proposed changes to SR 3.6.4.1.3 would add an exception to allow both doors, in a secondary containment access opening, to be opened simultaneously for normal entry or exit. This change clarifies the applicability of the requirement but does not change the method of verifying secondary containment integrity.

The TSs for SSES are based on the improved STS. The NRC staff reviewed the content of the corresponding STSs in NUREG-1433, Revision 4, and NUREG-1434, Revision 4, to determine whether the proposed changes are consistent with the format and content of the NUREGs. The NRC staff found that the proposed changes are consistent with the format of NUREG-1433 and NUREG-1434 and are consistent with the content of NUREG-1434. The corresponding STS in NUREG-1434 has a similar SR to the proposed revised SR for the facilities in consideration. The licensee's application provided revised TS Bases pages to be implemented with the associated TS changes. These pages were provided for information only and will be revised by the licensee in accordance with the TS Bases Control Program.

Based on the above evaluation, the NRC staff concludes that the proposed changes are acceptable.

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 March 9, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. 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 published in the *Federal Register* on October 25, 2016 (81 FR 73441). 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

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