



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

July 6, 2018

Mr. William R. Gideon, Vice President
Brunswick Steam Electric Plant
Duke Energy Progress, LLC
8470 River Rd., SE (M/C BNP001)
Southport, NC 28461

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 – ISSUANCE
OF AMENDMENT REGARDING REQUEST TO ALLOW PERFORMANCE-
BASED FIRE PROTECTION ALTERNATIVE FOR THERMAL INSULATION
MATERIAL (EPID L-2017-LLA-0397)**

Dear Mr. Gideon:

The U.S. Nuclear Regulatory Commission (NRC or the Commission) has issued the enclosed Amendment Nos. 284 and 312 to Renewed Facility Operating License Nos. DPR-71 and DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2, respectively. These amendments are in response to your license amendment request dated November 15, 2017, as supplemented by letter dated May 23, 2018.

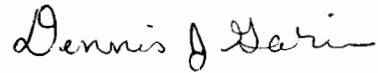
The amendments approve the use of a performance based method to justify the licensee's current and future use of certain currently-installed thermal insulation materials that meet the flame spread rating criteria but do not meet the definition of noncombustible or limited combustible regarding heat value content as described in National Fire Protection Association Standard 805.

W. Gideon

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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,



Dennis J. Galvin, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

Enclosures:

1. Amendment No. 284 to DPR-71
2. Amendment No. 312 to DPR-62
3. Safety Evaluation

cc: Listserv



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

DUKE ENERGY PROGRESS, LLC

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 284
Renewed License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Duke Energy Progress, LLC, dated November 15, 2017, as supplemented by letter dated May 23, 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 as indicated in the in the attachment to this license amendment, and Paragraphs 2.B.(6) and 2.C.(2) of Renewed Facility Operating License No. DPR-71 are hereby amended to read as follows:

2.B.(6) Fire Protection

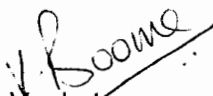
Duke Energy Progress, LLC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated September 25, 2012, and November 15, 2017, as supplemented by letters dated December 17, 2012; June 28, 2013; July 15, 2013; July 31, 2013; August 29, 2013; September 30, 2013; February 28, 2014; March 14, 2014; April 10, 2014; June 26, 2014; August 15, 2014; August 29, 2014; November 20, 2014; December 18, 2014; and May 23, 2018; and as approved in the safety evaluations dated January 28, 2015, and July 6, 2018. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

2.C.(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 284, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating License

Date of Issuance: July 6, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 284

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace the following pages of Renewed Facility Operating License No. DPR-71 with the attached revised pages. The revised pages are identified by amendment number and contains marginal lines indicating the areas of change.

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- (2) Pursuant to the Act and 10 CFR Part 70, to receive, possess, and 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, and 70, to receive, possess and use in amounts as required any byproduct, source and special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 and 70 to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of Brunswick Steam Electric Plant, Unit Nos. 1 and 2, and H. B. Robinson Steam Electric Plant, Unit No. 2.

(6) Fire Protection

Duke Energy Progress, LLC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated September 25, 2012, and November 15, 2017, as supplemented by letters dated December 17, 2012; June 28, 2013; July 15, 2013; July 31, 2013; August 29, 2013; September 30, 2013; February 28, 2014; March 14, 2014; April 10, 2014; June 26, 2014; August 15, 2014; August 29, 2014; November 20, 2014; December 18, 2014; and May 23, 2018; and as approved in the safety evaluations dated January 28, 2015, and July 6, 2018. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

(a) Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk

(c) Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2. below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in 2. above.
2. The licensee shall implement the modifications to its facility, as described in Table S-1, "Plant Modifications Committed," of Duke letter BSEP 14-0122, dated November 20, 2014, to complete the transition to full compliance with 10 CFR 50.48(c) by the startup of the second refueling outage for each unit after issuance of the safety evaluation. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
3. The licensee shall complete all implementation items, except item 9, listed in LAR Attachment S, Table S-2, "Implementation Items," of Duke letter BSEP 14-0122, dated November 20, 2014, within 180 days after NRC approval unless the 180th day falls within an outage window; then, in that case, completion of the implementation items, except item 9, shall occur no later than 60 days after startup from that particular outage. The licensee shall complete implementation of LAR Attachment S, Table S-2, Item 9, within 180 days after the startup of the second refueling outage for each unit after issuance of the safety evaluation.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2923 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 284, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 203 to Renewed Facility Operating License DPR-71, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 203. For SRs that existed prior to Amendment 203, including SRs with modified acceptance criteria and SRs whose frequency of



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DUKE ENERGY PROGRESS, LLC

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 312
Renewed License No. DPR-62

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Duke Energy Progress, LLC, dated November 15, 2017, as supplemented by letter dated May 23, 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 as indicated in the in the attachment to this license amendment, and Paragraphs 2.B.(6) and 2.C.(2) of Renewed Facility Operating License No. DPR-62 are hereby amended to read as follows:

2.B.(6) Fire Protection

Duke Energy Progress, LLC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated September 25, 2012, and November 15, 2017, as supplemented by letters dated December 17, 2012; June 28, 2013; July 15, 2013; July 31, 2013; August 29, 2013; September 30, 2013; February 28, 2014; March 14, 2014; April 10, 2014; June 26, 2014; August 15, 2014; August 29, 2014; November 20, 2014; December 18, 2014; and May 23, 2018; and as approved in the safety evaluations dated January 28, 2015, and July 6, 2018. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

2.C.(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 312, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating License

Date of Issuance: July 6, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 312
BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2
RENEWED FACILITY OPERATING LICENSE NO. DPR-62
DOCKET NO. 50-324

Replace the following pages of Renewed Facility Operating License No. DPR-62 with the attached revised pages. The revised pages are identified by amendment number and contains marginal lines indicating the areas of change.

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- (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, and 70, to receive, possess and use in amounts as required any byproduct, source and special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 and 70 to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of Brunswick Steam Electric Plant, Unit Nos. 1 and 2, and H. B. Robinson Steam Electric Plant, Unit No. 2.
- (6) Fire Protection

Duke Energy Progress, LLC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated September 25, 2012, and November 15, 2017, as supplemented by letters dated December 17, 2012; June 28, 2013; July 15, 2013; July 31, 2013; August 29, 2013; September 30, 2013; February 28, 2014; March 14, 2014; April 10, 2014; June 26, 2014; August 15, 2014; August 29, 2014; November 20, 2014; December 18, 2014; and May 23, 2018; and as approved in the safety evaluations dated January 28, 2015, and July 6, 2018. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

- (a) Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk

(c) Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2. below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in 2. above.
2. The licensee shall implement the modifications to its facility, as described in Table S-1, "Plant Modifications Committed," of Duke letter BSEP 14-0122, dated November 20, 2014, to complete the transition to full compliance with 10 CFR 50.48(c) by the startup of the second refueling outage for each unit after issuance of the safety evaluation. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
3. The licensee shall complete all implementation items, except Item 9, listed in LAR Attachment S, Table S-2, "Implementation Items," of Duke letter BSEP 14-0122, dated November 20, 2014, within 180 days after NRC approval unless the 180th day falls within an outage window; then, in that case, completion of the implementation items, except item 9, shall occur no later than 60 days after startup from that particular outage. The licensee shall complete implementation of LAR Attachment S, Table S-2, Item 9, within 180 days after the startup of the second refueling outage for each unit after issuance of the safety evaluation.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2923 megawatts (thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 312, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 233 to Renewed Facility Operating License DPR-62, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 233. For SRs that existed prior to Amendment 233,



UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENTS NOS. 284 AND 312

TO RENEWED FACILITY OPERATING LICENSE NOS. DPR-71 AND DPR-62

DUKE ENERGY PROGRESS, LLC

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

On September 25, 2012 (Reference 1), Duke Energy Progress, Inc. (Duke Energy, the licensee), requested to revise the Brunswick Steam Electric Plant, Units 1 and 2 (BSEP), fire protection program (FPP) in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.48(c). On January 28, 2015 (Reference 2), the U.S. Nuclear Regulatory Commission (NRC or the Commission) issued Amendment No. 266 to Renewed Facility Operating License (RFOL) No. DPR-71 for BSEP, Unit 1; and Amendment No. 294 to RFOL No. DPR-62 for BSEP, Unit 2. The amendments consisted of changes to the operating licenses to transition the BSEP FPP to a risk-informed, performance-based (RI/PB) program based on National Fire Protection Association Standard 805 (NFPA 805), "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition (Reference 3), in accordance with 10 CFR 50.48(c). NFPA 805 allows the use PB methods such as fire modeling and RI methods such as fire probabilistic risk assessment (FPRA) to demonstrate compliance with the nuclear safety performance criteria (NSPC).

By letter dated November 15, 2017 (Reference 4), as supplemented by letter dated May 23, 2018 (Reference 5), Duke Energy, submitted a license amendment request (LAR) for BSEP, Units 1 and 2. Specifically, the licensee requested approval of a PB method to justify its current and future use of certain currently-installed thermal insulation materials (polyisocyanurate/foam insulation) that meet the flame spread rating criteria but do not meet the definition of noncombustible or limited combustible regarding heat value content as described in NFPA 805, Section 3.3.4, "Insulation Materials." The licensee submitted its proposed LAR in accordance with 10 CFR 50.48(c)(2)(vii) requesting the use a PB method in a FPP element.

The supplement dated May 23, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 13, 2018 (83 FR 6221).

2.0 REGULATORY EVALUATION

Section 50.48, "Fire protection," of 10 CFR, provides the NRC requirements for nuclear power plant fire protection. The NRC regulations include specific requirements for requesting approval for an RI/PB FPP based on the provisions of NFPA 805. Paragraph 50.48(c)(3)(i) of 10 CFR states, in part, that:

A licensee may maintain a fire protection program that complies with NFPA 805 as an alternative to complying with [10 CFR 50.48(b)] for plants licensed to operate before January 1, 1979, or the fire protection license conditions for plants licensed to operate after January 1, 1979. The licensee shall submit a request to comply with NFPA 805 in the form of an application for license amendment under [10 CFR] 50.90. The application must identify any orders and license conditions that must be revised or superseded, and contain any necessary revisions to the plant's technical specifications and the bases thereof.

Pursuant to 10 CFR 50.90, whenever a holder of a license desires to amend the license or permit, application for an amendment must be filed with the Commission describing the changes desired, and following, as far as applicable, the form prescribed for original applications. Accordingly, a licensee who seeks to amend its NFPA 805 authorizations must file an amendment stating, as applicable, the desired changes to orders, license conditions, and technical specifications. Pursuant to 10 CFR 50.32, "Elimination of repetition," the licensee/applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Commission, provided that such references are clear and specific.

In addition, 10 CFR 50.48(c)(3)(i) states, in part, that:

The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the licensee has identified orders, license conditions, and the technical specifications that must be revised or superseded, and that any necessary revisions are adequate. Any approval by the Director or the designee must be in the form of a license amendment approving the use of NFPA 805 together with any necessary revisions to the technical specifications.

In addition, 10 CFR 50.48(c)(3)(ii) states that:

The licensee shall complete its implementation of the methodology in Chapter 2 of NFPA 805 (including all required evaluations and analyses) and, upon completion, modify the fire protection plan required by paragraph (a) of this section to reflect the licensee's decision to comply with NFPA 805, before changing its fire protection program or nuclear power plant as permitted by NFPA 805.

The intent of 10 CFR 50.48(c)(3)(ii) is given in the statement of considerations for the Final Rule, "Voluntary Fire Protection Requirements for Light Water Reactors; Adoption of NFPA 805

as a Risk-Informed, Performance-Based Alternative” (69 FR 33536 through 69 FR 33548; June 16, 2004), which states, in part, that:

This paragraph requires licensees to complete all of the Chapter 2 methodology (including evaluations and analyses) and to modify their fire protection plan before making changes to the fire protection program or to the plant configuration. This process ensures that the transition to an NFPA 805 configuration is conducted in a complete, controlled, integrated, and organized manner. This requirement also precludes licensees from implementing NFPA 805 on a partial or selective basis (e.g., in some Fire Areas and not others, or truncating the methodology within a given Fire Area).

Pursuant to 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Under 10 CFR 50.40, common standards for issuance of licenses include considerations of safety and satisfaction of the requirements of the National Environmental Policy Act of 1969 as implemented in 10 CFR Part 51. Under 10 CFR 50.57(a), to issue an operating license, the Commission must find, among other things, that (1) there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public; (2) there is reasonable assurance that such activities will be conducted in compliance with the regulations in this chapter; and (3) the issuance of the license will not be inimical to the common defense and security or to the health and safety of the public. Additional findings required to issue amendments related to fire protection are provided in 10 CFR 50.48, as discussed below.

The regulations also allow for flexibility that was not included in the NFPA 805 standard. Licensees who choose to adopt 10 CFR 50.48(c) but wish to use the PB methods permitted elsewhere in the standard to meet the fire protection requirements of NFPA 805, Chapter 3, “Fundamental Fire Protection Program and Design Elements,” may do so by submitting a LAR in accordance with 10 CFR 50.48(c)(2)(vii). This regulation further provides that:

The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the performance-based approach:

- (A) Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;
- (B) Maintains safety margins; and
- (C) Maintains fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).

Alternatively, licensees may choose to use RI or PB alternatives to comply with NFPA 805 by submitting a LAR in accordance with 10 CFR 50.48(c)(4), which states, in part, that:

The Director of the Office of Nuclear Reactor Regulation, or designee of the Director, may approve the application if the Director or designee determines that the proposed alternatives:

- (i) Satisfy the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;
- (ii) Maintain safety margins; and
- (iii) Maintain fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).

In addition to the conditions outlined by the rule that requires licensees to submit a LAR for NRC review and approval in order to adopt a RI/PB FPP, a licensee may submit additional elements of its FPP for which it wishes to receive specific NRC review and approval, as set forth in Regulatory Position C.2.2.1 of Regulatory Guide (RG) 1.205 (Reference 6). Inclusion of these elements in the NFPA 805 LAR is meant to alleviate uncertainty in portions of the current FPP licensing bases as a result of the lack of specific NRC approval of these elements. RGs are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in RGs will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission. Accordingly, any submittal addressing these additional FPP elements needs to include sufficient detail to allow the NRC staff to assess whether the licensee's treatment of these elements meets the 10 CFR 50.48(c) requirements.

The purpose of the FPP established by NFPA 805 is to provide assurance, through a defense-in-depth (DID) philosophy, that the NRC's fire protection objectives are satisfied. NFPA 805 Section 1.2, "Defense-in-Depth," states that:

Protecting the safety of the public, the environment, and plant personnel from a plant fire and its potential effect on safe reactor operations is paramount to this standard. The fire protection standard shall be based on the concept of defense-in-depth. Defense-in-depth shall be achieved when an adequate balance of each of the following elements is provided:

- (1) Preventing fires from starting;
- (2) Rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting fire damage; and
- (3) Providing an adequate level of fire protection for structures, systems and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed.

In addition, in accordance with Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, General Design Criterion (GDC) 3, "Fire protection," fire detection and fighting systems must be designed such that their rupture or inadvertent operation does not significantly impair the ability of the structures, systems, and components important to safety to perform their intended safety functions.

In addition, 10 CFR 50.32 states, in part, that the applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Commission, provided, that such references are clear and specific.

The following regulations also address fire protection:

- GDC Criterion 3, "Fire Protection," states, in part, that:

Structures, systems, and components important to safety are designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials are used wherever practical throughout the unit, particularly in locations such as the containment and control room. Fire detection and fighting systems of appropriate capacity and capability are provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Firefighting systems are designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components.
- Section 50.48(a)(1) of 10 CFR requires that each holder of an operating license have a fire protection plan that satisfies GDC 3 of Appendix A to 10 CFR Part 50.
- Section 50.48(c) of 10 CFR incorporates NFPA 805 (2001 Edition) by reference, with certain exceptions, modifications, and supplementation. This regulation establishes the requirements for using an RI/PB FPP in conformance with NFPA 805 as an alternative to the requirements associated with 10 CFR 50.48(b) and Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to 10 CFR Part 50, or the specific plant fire protection license condition.

The NRC staff review also relied on the following additional codes, RGs, and standards:

- RG 1.205, Revision 1, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," issued December 2009 (Reference 6), provides guidance for use in complying with the requirements that the NRC has promulgated for RI/PB FPPs that comply with 10 CFR 50.48 and the referenced 2001 Edition of the NFPA standard. RG 1.205 sets forth regulatory positions, emphasizes certain issues, clarifies the requirements of 10 CFR 50.48(c) and NFPA 805, clarifies the guidance in Nuclear Energy Institute (NEI) 04-02 (Reference 7), and provides exceptions to the NEI-04-02 guidance where required. Should a conflict occur between NEI 04-02 and this RG, the regulatory positions in RG 1.205 govern.
- RG 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," issued May 2011 (Reference 8), provides the NRC staff's recommendations for using risk information in support of licensee-initiated licensing basis changes to a nuclear power plant that require such review and approval.
- NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," Volumes 1 and 2 and Supplement 1, September 2005 and

September 2010, respectively (Reference 9), (Reference 10), and (Reference 11), presents a compendium of methods, data, and tools to perform an FPRA and develop associated insights.

3.0 TECHNICAL EVALUATION

3.1 Background/Discussion

In its LAR, the licensee requested approval of a PB method to demonstrate an equivalent level of fire protection for the NFPA 805, Section 3.3.4 requirement that thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials be noncombustible or limited combustible. Specifically, the licensee stated that in several areas, exposed thermal insulation materials are installed on various heating, ventilation and air conditioning (HVAC) system piping to prevent sweating and that although these materials comply with the flame spreading rating of 25 or less, these materials do not meet the definition of "limited combustible" due to the heat value exceeding 3,500 British thermal units/pound (Btu/lb).

NFPA 805, Section 1.3.1, "Nuclear Safety Goal," states that:

The nuclear safety goal is to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition.

NFPA 805, Section 1.3.2, "Radioactive Release Goal," states that:

The radioactive release goal is to provide reasonable assurance that a fire will not result in a radiological release that adversely affects the public, plant personnel, or the environment.

NFPA 805, Section 1.4.1, "Nuclear Safety Objectives," states that:

In the event of a fire during any operational mode and plant configuration, the plant shall be as follows:

- (1) *Reactivity Control.* Capable of rapidly achieving and maintaining subcritical conditions.
- (2) *Fuel Cooling.* Capable of achieving and maintaining decay heat removal and inventory control functions.
- (3) *Fission Product Boundary.* Capable of preventing fuel clad damage so that the primary containment boundary is not challenged.

NFPA 805, Section 1.4.2, "Radioactive Release Objective," states that:

Either of the following objectives shall be met during all operational modes and plant configurations.

- (1) Containment integrity is capable of being maintained.

- (2) The source term is capable of being limited.

NFPA 805, Section 1.5.1, "Nuclear Safety Performance Criteria," states that:

Fire protection features shall be capable of providing reasonable assurance that, in the event of a fire, the plant is not placed in an unrecoverable condition. To demonstrate this, the following performance criteria shall be met:

- (a) *Reactivity Control.* Reactivity control shall be capable of inserting negative reactivity to achieve and maintain subcritical conditions. Negative reactivity inserting shall occur rapidly enough such that fuel design limits are not exceeded.
- (b) *Inventory and Pressure Control.* With fuel in the reactor vessel, head on and tensioned, inventory and pressure control shall be capable of controlling coolant level such that sub-cooling is maintained for a PWR [pressurized-water reactor] and shall be capable of maintaining or rapidly restoring reactor water level above top of active fuel for a BWR [boiling-water reactor] such that fuel clad damage as a result of a fire is prevented.
- (c) *Decay Heat Removal.* Decay heat removal shall be capable of removing sufficient heat from the reactor core or spent fuel such that fuel is maintained in a safe and stable condition.
- (d) *Vital Auxiliaries.* Vital auxiliaries shall be capable of providing the necessary auxiliary support equipment and systems to assure that the systems required under (a), (b), (c), and (e) are capable of performing their required nuclear safety function.
- (e) *Process Monitoring.* Process monitoring shall be capable of providing the necessary indication to assure the criteria addressed in (a) through (d) have been achieved and are being maintained.

NFPA 805, Section 1.5.2, "Radioactive Release Performance Criteria," states that:

Radiation release to any unrestricted area due to the direct effects of fire suppression activities (but not involving fuel damage) shall be as low as reasonably achievable and shall not exceed applicable 10 CFR, Part 20, Limits.

Although not a part of the requirements of NFPA 805, and thus not required under 10 CFR 50.48(c), NFPA 805, Appendix A, Section A.2.4.4.3, provides the following background related to the meaning of the term "safety margins":

An example of maintaining sufficient safety margins occurs when the existing calculated margin between the analysis and the performance criteria compensates for the uncertainties associated with the analysis and data. Another way that safety margins are maintained is through the application of codes and standards. Consensus codes and standards are typically designed to ensure such margins exist.

NEI 04-02, Section 5.3.5.3, "Safety Margins," lists two specific criteria that should be addressed when considering the impact of plant changes on safety margins:

- Codes and standards or their alternatives accepted for use by the NRC are met; and,
- Safety analysis acceptance criteria in the licensing basis (e.g., Final Safety Analysis Report (FSAR), supporting analyses, etc.) are met, or provides sufficient margin to account for analysis and data uncertainty.

As a supplement to the definition of DID provided in NFPA 805, Section 1.2, the NRC-endorsed guidance in NEI 04-02, Section 5.3.5.2, states that:

In general, the defense-in-depth requirement is satisfied if the proposed change does not result in a substantial imbalance in:

- Preventing fires from starting;
- Detecting fires quickly and extinguishing those that do occur, thereby limiting fire damage; and
- Providing adequate level of fire protection for structures, systems and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions [from] being performed.

NFPA 805, Section 3.3.4, "Insulation Material," states that:

Thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials shall be noncombustible or limited combustible.

NFPA 805, Section 1.6.36, "Limited Combustible," states that:

Material that, in the form in which it is used, has a potential heat value not exceeding 3500 Btu/lb (8141 kJ/kg [kilojoule/kilogram]) and either has a structural base of noncombustible material with a surfacing not exceeding a thickness of 1/8 in. [inch] (3.2 mm [millimeter]) that has a flame spread rating not greater than 50, or has another material having neither a flame spread rating greater than 25 nor evidence of continued progressive combustion, even on surfaces exposed by cutting through the material on any plane.

NFPA 805, Section 1.6.41, "Noncombustible Material," states that:

A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat.

The licensee stated that a number of plant locations were identified where insulation material (polyisocyanurate/foam insulation) is used for maintaining efficiency of the system and/or preventing pipe sweat. The licensee further stated that the locations identified include the Control Building, Reactor Buildings, Turbine Buildings, Radioactive Waste Building, and

Augmented Off Gas Building, on piping associated with HVAC systems supporting Power Block structures including the following:

- System 8260 – Turbine Building HVAC - piping routed in the Turbine Building
- System 8185 – Reactor Building HVAC- piping routed in the Reactor Building
- System 8220 – Control Building HVAC- HVAC Equipment Room
- System 8280 – Radwaste Building HVAC - piping routed in the Radwaste Building
- System 8270 – Augmented Off-Gas Building HVAC – piping routed in Augmented Off-Gas Building

The licensee stated that the insulation materials meet the requirements for flame spread rating of 25 or less, as measured using the American Society of Testing Materials Standard E-84, “Standard Test for Surface Characteristics of Building Materials,” (ASTM E-84) (Reference 12) test method, but do not meet the current decreased heat value content requirement based on the definition of a limited combustible due to the heat value exceeding 3,500 Btu/lb. The licensee further stated that the heat contribution values of the thermal insulation materials were noted as having heat contribution values of approximately 9,000 to 11,000 Btu/lb that, while higher than the definition, are not considered to contribute appreciably to the spread of fire nor represent a secondary combustible beyond those currently analyzed in the FPRA due to the limited applications.

The licensee stated that the basis for the approval request is that the forms in which the thermal insulation are installed and the conditions anticipated meet the intent of the revised limited combustible material definition because the materials have a flame spread rating of 25 or less and will not support continued progressive combustion. The licensee also stated that, specifically, the thermal insulation materials have flame spread and smoke developed ratings of 25 and 50 per ASTM E-84, respectively, and because of this they will not contribute significantly to a fire even though the thermal insulation materials exceed the NFPA 805 heat value of 3,500 Btu/lb.

The licensee stated that the further basis for the approval request is that the forms in which the thermal insulation materials are installed and the conditions anticipated do not impact nuclear safety. The licensee further stated that the limited applications of exposed thermal insulation materials do not compromise post-fire safe shutdown capability as previously designed, reviewed, and considered and that essential safety functions are maintained and capable of being performed.

The licensee stated that the basis for the approval request is that the identified installations were evaluated against the fire scenarios supporting the FPRA, and in all instances the supporting analyses and existing fire scenarios were found to be bounding (i.e., expanded zones of influence (ZOIs) would not fail additional FPRA targets) or there were no FPRA credited targets in the area. The licensee further stated that its procedures that govern its engineering change process (ECP) are in place to review future installation impacts to the FPP and FPRA, resulting in updates to the applicable analyses and calculations as required.

The licensee stated that the limited applications of exposed thermal insulation material were not of a quantity that would impact the fire scenarios or zones of influences and target failures developed in support of the fire and PRA analysis, and do not compromise automatic fire suppression functions, manual fire suppression functions, or post-fire safe shutdown capability as previously designed, reviewed and considered.

The licensee stated that the use of thermal insulation material other than noncombustible and more than limited combustible in the plant does not affect nuclear safety and that the limited applications of exposed thermal insulation materials do not compromise post-fire safe shutdown capability as previously designed, reviewed, and considered, and that essential safety functions are maintained and capable of being performed.

The licensee stated that the forms in which the thermal insulation materials are installed and the conditions anticipated meet the intent of the revised limited combustible material definition because the materials have a flame spread rating of 25 or less and will not support continued progressive combustion. The licensee further stated that the selection and application of thermal insulation material is controlled per its piping and equipment thermal insulation specification. The licensee further stated that the FPRA development requires the inclusion of the effect of intervening or secondary combustibles to be documented and included in the analysis where determined to have fire effects as part of the PB approach and that its procedures that govern its ECP are in place to review future installation impacts to the FPP and FPRA, resulting in updates to the applicable analyses and calculations as required.

The licensee stated that the plant walkdowns concluded that there were no large concentration installations of thermal insulation in the plant and that the most common applications are for maintaining efficiency of the system and/or preventing pipe sweat. The licensee further stated that the impact of the negligible quantities of exposed materials was noted to be bounded by the currently analyzed fire scenario ZOIs, and did not result in new or expanded ZOIs that impacted additional FPRA targets and that no existing fire scenarios as considered in the FPRA were adversely impacted.

The licensee stated that the use of insulation material other than noncombustible and more than limited combustible has no impact on the radiological release performance criteria and that the radiological release review was performed based on the manual fire suppression activities in areas containing or potentially containing radioactive materials and is not dependent on the type of thermal insulation material.

The licensee stated that the future installations of these insulation materials (i.e., polyisocyanurate/foam insulation) will be controlled by its design engineering change process, as described in its procedures, which will ensure the necessary fire protection reviews are completed, and new installations and affects they would have on fire safety analyses and the FPRA will be evaluated. The licensee further stated that installation of polyisocyanurate/foam, and other insulations greater than 3,500 Btu/lb, require a design change and fire protection review.

3.2 Safety Margins/Defense-in-Depth

The licensee stated that the forms in which the thermal insulation are installed and the conditions anticipated meet the intent of the revised limited combustible material definition because the materials have a flame spread rating of 25 or less and will not support continued progressive combustion. The licensee further stated that the insulation material, and specifically the increase in heat contribution in conjunction with the limited applications, does not compromise automatic fire suppression functions, manual fire suppression functions, or post-fire safe shutdown capability as previously designed, reviewed, and considered, and therefore, the safety margin inherent in the analysis for the fire event has been preserved.

The licensee stated that the insulation materials in the current configurations are considered as non-cable intervening combustibles and are bound by the FPRA, and safety margin is not affected. The licensee further stated that the selection and application of thermal insulation material is controlled per its piping and equipment thermal insulation specification and that its procedures that govern the ECP are in place to review future installation impacts to the FPP and FPRA, resulting in updates to the applicable analyses and calculations as required. The licensee further stated that precautions and limitations on the use of these materials do not impact the fire safety analysis of the fire event, and therefore, the inherent safety margin and conservatism in these analysis methods remain unchanged.

The licensee stated that the three echelons of DID are: (1) to prevent fires from starting (combustible/hot work controls), (2) to rapidly detect, control, and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans), and (3) to provide an adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, recovery actions).

The licensee stated that the use of an insulation material that is noncombustible, or more than limited combustible, does not affect Echelons 1, 2, and 3 and that the insulation material, and specifically the increase in heat contribution, does not introduce new ignition sources, does not exceed the design bases of installed fire protection systems, does not compromise manual fire suppression functions, and does not adversely impact fire protection systems and features or post-fire safe shutdown capability as previously designed, reviewed and considered.

In regards to Echelon 1, the licensee stated that the thermal insulation does not introduce new ignition sources and presents a negligible hazard in terms of secondary or intervening combustibles. The licensee further stated that the forms in which the thermal insulation are installed and the conditions anticipated meet the intent of the revised limited combustible material definition because the materials have a flame spread rating of 25 or less and will not support continued progressive combustion. The licensee further stated that the thermal insulation materials have a smoke developed rating of 50 per ASTM E-84, and that because of this and the flame spread rating of 25, they will not contribute significantly to a fire even though the materials exceed the NFPA 805 heat value of 3,500 Btu/lb.

In regards to Echelon 2, the licensee stated that the limited applications of exposed thermal insulation materials installed for industrial personnel safety and on miscellaneous system piping do not result in increased combustible loading that would challenge the design bases of the installed fire protection systems. The licensee further stated that the presence of the thermal insulation and associated procedural controls do not impact the ability of the automatic suppression and detection systems to perform credited functions as the materials are limited in application and will not support continued progressive combustion. The licensee further stated that portable fire extinguishers and hose stations are available for manual firefighting activities by the site fire brigade, and if a fire was to occur, damage would be limited.

In regards to Echelon 3, the licensee stated that the applications of exposed thermal insulation materials installed for industrial personnel safety and on miscellaneous system piping do not adversely impact the installed fire protection systems and features, and essential safety functions are maintained and capable of being performed. The licensee stated that the insulation material does not compromise post-fire safe shutdown capability as previously designed, reviewed and considered and that the forms in which the thermal insulation are installed and the conditions anticipated meet the intent of the revised limited combustible

material definition because the materials have a flame spread rating of 25 or less and will not support continued progressive combustion. The licensee further stated that the identified installations were evaluated against the fire scenarios supporting the FPRA and in all instances, the supporting analyses and existing fire scenarios are found to be bounding (i.e., expanded ZOI would not fail additional FPRA targets) or there were no FPRA credited targets in the area. The licensee further stated that its procedures which govern the ECP are in place to review future installation impacts to the FPP and FPRA, resulting in updates to the applicable analyses and calculations as required. The licensee further stated that the presence of the thermal insulation does not compromise automatic/manual fire protection functions, or post-fire safe shutdown capability and will not prevent essential safety functions from being performed.

3.3 Staff Evaluation

The NRC staff reviewed the information provided by the licensee in its LAR, which included discussions of the impact of the proposed change on the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release, DID, and safety margins as required by 10 CFR 50.48(c)(2)(vii).

The NRC staff determined that the proposed change has no impact on the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release because the insulation materials: (1) Are installed in limited quantities throughout the plant; (2) Are not installed in any large concentrations in each area; (3) Will not contribute significantly to fire because they do not support continued progressive combustion; (4) Meet the intent of the revised limited combustible material definition because the materials have a flame spread rating of 25 or less; (5) Do not represent a secondary combustible beyond those currently analyzed in the FPRA due to the limited quantities and concentrations; and, (6) Will not impact the fire scenarios or ZOIs and target failures developed in support of the FPRA due to the limited quantities and concentrations.

The NRC staff determined that the proposed change has no impact on any of the DID echelons because the insulation materials are not considered a method for preventing fires from starting, or detecting, controlling, or extinguishing fires. In addition, the level of fire protection that will be provided so that a fire will not prevent essential safety functions from being performed is not changed because the limited quantities and concentrations of insulation materials do not impact the availability and reliability of fire protection systems and features.

The NRC staff also determined that the proposed change continues to maintain adequate safety margins. The NRC staff determined that the change does not impact any codes and standards, or their alternatives accepted for use by the NRC because the licensee demonstrated that the insulation materials meet the flame spread and smoke developed criteria in ASTM E 84 and will not support progressive continues combustion. The NRC staff further determined that the change does not impact any safety analysis acceptance criteria used in the licensing basis because the licensee demonstrated that the thermal insulation materials will not compromise automatic or manual fire suppression functions and post fire safe shutdown capability, and are bound by the FPRA.

3.4 Conclusion

Based on its review of the information submitted by the licensee, and in accordance with 10 CFR 50.48(c)(2)(vii), the NRC staff concludes that the proposed PB method to justify the continued use of certain thermal insulation materials (polyisocyanurate/foam insulation) is an

acceptable alternative to the corresponding NFPA 805, Section 3.3.4 requirement, because it satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release, maintains safety margins, and maintains fire protection DID (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).

4.0 FIRE PROTECTION LICENSE CONDITION

On January 28, 2015, the NRC issued Amendment Nos. 266 and 294 that revised the existing fire protection license conditions for BSEP to ones that address the transition to a RI/PB FPP under NFPA 805 in accordance with 10 CFR 50.48(c)(3)(i). The new license conditions adopted the guidelines of the standard fire protection license condition promulgated in RG 1.205, Revision 1, Regulatory Position C.3.1, as issued on December 18, 2009 (74 FR 67253). Plant-specific changes were made to the sample license condition; however, the plant-specific FPP license conditions are consistent with the standard fire protection license condition and incorporated all of the relevant features of the transition to NFPA 805 at BSEP.

In its letter dated November 15, 2017, the licensee requested a license amendment to modify Fire Protection License Condition 2.B.(6). The licensee proposed that the license condition be revised to add the licensee's November 15, 2017, LAR and add the issuance date of this safety evaluation (SE) to the first paragraph under 2.B.(6). The licensee also proposed that the issuance date of this SE be added to license condition paragraph 2.B.(6)(b)2 in regards to the use of its screening process which was approved in the NRC SE dated January 28, 2015. In a letter dated May 23, 2018 (Reference 5), the licensee indicated that it is not proposing any changes to its screening criteria and therefore its proposed change to license condition paragraph 2.B.(6)(b)2 is not needed and is withdrawn. Because this LAR did not include any changes to the licensee's screening process, the NRC staff concluded that the withdrawal of the licensee's request to change license condition 2.B.(6)(b)2 is acceptable since the licensee's screening process continues to be as described in the NRC SE dated January 28, 2015 as required by license condition 2.B.(6)(b)2. No other changes to the license condition were requested by the licensee or identified by the NRC staff. As described in Section 3.0 of this SE, the NRC staff reviewed the information provided by the licensee and concludes that the proposed changes to the BSEP Units 1 and 2 licenses are acceptable, and therefore, the NRC staff concludes that the revision of the license conditions, identifying the associated submittal and SE dates, is appropriate and acceptable.

As revised, the first paragraph of BSEP, Units, 1 and 2 License Condition 2.B.(6), will read as shown below (changes in bold):

Fire Protection

Duke Energy Progress, LLC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated September 25, 2012, **and November 15, 2017**, as supplemented by letters dated December 17, 2012; June 28, 2013; July 15, 2013; July 31, 2013; August 29, 2013; September 30, 2013; February 28, 2014; March 14, 2014; April 10, 2014; June 26, 2014; August 15, 2014; August 29, 2014; November 20, 2014; ~~and~~ December 18, 2014; **and May 23, 2018**; and as approved in the safety evaluations dated January 28, 2015, **and July 6, 2018**. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement

would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendment on April 6, 2018. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments approve a PB method to use certain installed thermal insulation materials in plant areas in limited applications subject to appropriate engineering reviews and controls, as a method of complying with the requirements of NFPA 805 Chapter 3, Section 3.3.4. As such, the amendment changes requirements with the installation of thermal insulation materials. 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 February 13, 2018 (83 FR 6221). 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.

7.0 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.

8.0 REFERENCES

- 1 Annacone, Michael J., Carolina Power and Light Company, letter to U.S. Nuclear Regulatory Commission, "Brunswick Steam Electric Plant, Unit Nos. 1 and 2, Docket Nos. 50-325, 50-324, License Amendment Request to Adopt NFPA 805 Performance Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition)," September 25, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12285A428).
- 2 Hon, Andrew, U.S. Nuclear Regulatory Commission, letter to William R. Gideon, Brunswick Steam Electric Plant, "Brunswick Steam Electric Plant, Units 1 and 2 - Issuance of Amendment Regarding Transition to a Risk-Informed, Performance-Based, Fire Protection Program in Accordance with 10 CFR 50.48(c) (TAC Nos. ME9623 and ME9624)," January 28, 2015 (ADAMS Accession No. ML14310A808).

- 3 National Fire Protection Association, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," Standard 805 (NFPA 805), 2001 Edition, Quincy, Massachusetts.
- 4 Gideon, William R., Duke Energy Progress, LLC, letter to U.S. Nuclear Regulatory Commission, "Brunswick Steam Electric Plant, Unit Nos. 1 and 2, Renewed Facility Operating License Nos. DPR-71 and DPR-62, Docket Nos. 50-325 and 50-324, Request for License Amendment for Performance-Based Fire Protection, Alternative for Thermal Insulation Material," November 15, 2017 (ADAMS Accession No. ML17331A484).
- 5 Gideon, William R., Duke Energy Progress, LLC, letter to U.S. Nuclear Regulatory Commission, "Brunswick Steam Electric Plant, Unit Nos. 1 and 2, Renewed Facility Operating License Nos. DPR-71 and DPR-62, Docket Nos. 50-325 and 50-324, Supplement to Request for License Amendment for Performance-Based Fire Protection, Alternative for Thermal Insulation Material," May 23, 2018 (ADAMS Accession No. ML18143B743).
- 6 U.S. Nuclear Regulatory Commission, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," Regulatory Guide 1.205, Revision 1, December 2009 (ADAMS Accession No. ML092730314).
- 7 Nuclear Energy Institute, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Washington, DC, NEI 04-02, Revision 2, April 2008 (ADAMS Accession No. ML081130188).
- 8 U.S. Nuclear Regulatory Commission, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Regulatory Guide 1.174, Revision 2, May 2011 (ADAMS Accession No. ML100910006).
- 9 U.S. Nuclear Regulatory Commission, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, Volume 1: Summary and Overview," NUREG/CR-6850, September 2005 (ADAMS Accession No. ML052580075).
- 10 U.S. Nuclear Regulatory Commission, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, Volume 2: Detailed Methodology," NUREG/CR-6850, September 2005 (ADAMS Accession No. ML052580118).
- 11 U.S. Nuclear Regulatory Commission, "Fire Probabilistic Risk Assessment Methods Enhancements," NUREG/CR-6850, Supplement 1, September 2010 (ADAMS Accession No. ML103090242).
- 12 American Society of Testing Materials, "Standard Test for Surface Characteristics of Building Materials," Standard E-84 (ASTM E-84), West Conshohocken, Pennsylvania.

Principal Contributors: Naeem Iqbal
Jay Robinson

Date: July 6, 2018

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENT REGARDING REQUEST TO ALLOW PERFORMANCE-BASED FIRE PROTECTION ALTERNATIVE FOR THERMAL INSULATION MATERIAL (EPID L-2017-LLA-0397) DATED JULY 6, 2018

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****by memorandum**

OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DRA/APLB/BC**
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DATE	06/04/18	06/04/18	03/06/18
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DATE	06/18/18	07/06/18	07/06/18

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