



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

July 6, 2018

Mr. Joel P. Gebbie  
Senior Vice President and  
Chief Nuclear Officer  
Indiana Michigan Power Company  
Nuclear Generation Group  
One Cook Place  
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF  
AMENDMENTS RE: REQUEST FOR DEVIATION FROM NATIONAL FIRE  
PROTECTION ASSOCIATION 805 REQUIREMENTS (EPID L-2017-LLA-0374)

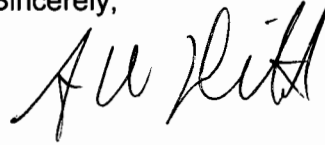
Dear Mr. Gebbie:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 340 to Renewed Facility Operating License No. DPR-58 and Amendment No. 322 to Renewed Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the license in response to your application dated November 7, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17317A472), as supplemented by letter dated May 4, 2018 (ADAMS Accession No. ML18128A275).

The amendments approve a deviation from the requirements of National Fire Protection Association Standard 805, Section 3.3.5.1, regarding the use of non-plenum listed cables above suspended ceilings, and Section 3.3.5.2, regarding the use of electric metallic tube and embedded/buried polyvinyl chloride conduit. The licensee submitted the proposed license amendment request in accordance with Title 10 of the *Code of Federal Regulations*, Section 50.48(c)(2)(vii), requesting to use a performance based method in a fire protection program element.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Allison W. Dietrich". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Allison W. Dietrich, Project Manager  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

Enclosures:

1. Amendment No.340 to DPR-58
2. Amendment No.322 to DPR-74
3. Safety Evaluation

cc: Listserv



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

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 340  
License No. DPR-58

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Indiana Michigan Power Company (the licensee), dated November 7, 2017, as supplemented by letter dated May 4, 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, paragraph 2.C.(4) of Renewed Facility Operating License No. DPR-58 is hereby amended to read as follows:

Fire Protection

Indiana Michigan Power Company 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 licensee's amendment request dated July 1, 2011, as supplemented by letters dated September 2, 2011, April 27, 2012, June 29, 2012, August 9, 2012, October 15, 2012, November 9, 2012, January 14, 2013, February 1, 2013, May 1, 2013, June 21, 2013, and September 16, 2013; and the license amendment request dated November 7, 2017, as supplemented by letter dated May 4, 2018, and as approved in the Safety Evaluations dated October 24, 2013 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.

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION



David J. Wrona, Chief  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Operating License

Date of Issuance: July 6, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 340

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 1

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Replace the following pages of Renewed Facility Operating License DPR-58 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

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May 1, 2013, June 21, 2013, and September 16, 2013; and the license amendment request dated November 7, 2017, as supplemented by letter dated May 4, 2018, and as approved in the Safety Evaluations dated October 24, 2013 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 assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed Fire PRA (FPRA) model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

1. Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
2. Prior NRC review and approval is not required for individual changes that result in a risk increase less than  $1 \times 10^{-7}$ /year (yr) for CDF and less than  $1 \times 10^{-8}$ /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

(b) Other Changes that May Be Made Without Prior NRC Approval

1. Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program and Design Elements

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or adequate for the hazard. The licensee may use an engineering evaluation to demonstrate that a change to an NFPA 805, Chapter 3, element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component,

system, procedure, or physical arrangement, using a relevant technical requirement or standard.

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3, elements are acceptable because the alternative is "adequate for the hazard." Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is adequate for the hazard. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- "Fire Alarm and Detection Systems" (Section 3.8);
- "Automatic and Manual Water-Based Fire Suppression Systems" (Section 3.9);
- "Gaseous Fire Suppression Systems" (Section 3.10); and,
- "Passive Fire Protection Features" (Section 3.11).

This License Condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC safety evaluation dated October 24, 2013, to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

(c) Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2.C.(4)(c)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.C.(4)(b)2. above.
2. The licensee shall implement the modifications to its facility, as described in Enclosure 5, Attachment S, Table S-2, "Plant Modifications Committed," of I&M letter AEP-NRC-2013-75, dated September 16, 2013, to complete the transition to full compliance with 10 CFR 50.48(c) by October 24, 2014. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.

3. The licensee shall implement the items listed in Enclosure 5, Attachment S, Table S-3, "Implementation Items," of I&M letter AEP-NRC-2013-75, dated September 16, 2013, by October 24, 2014.
4. The licensee shall complete an FPRA focused scope peer review and resolve findings associated with the revised FPRA LERF values, prior to self-approval of changes that result in more than a minimal increase in risk.
5. The licensee shall complete a focused scope peer review and resolve findings of the PRA upgrade related to reduced mission times for cutsets containing a test and maintenance event combined with a running failure, prior to self-approval of changes that result in more than a minimal increase in risk.

(5) Deleted by Amendment No. 279

(6) Deleted by Amendment No. 80

(7) Deleted by Amendment No. 287

(8) Deleted by Amendment No. 279

(9) Deleted by Amendment No. 279

(10) Deleted by Amendment No. 279

(11) Deleted by Amendment No. 279

(12) The 72 hour allowed outage time of Technical Specifications 3.1.2.4 and 3.5.2, Action "a," which was entered at 0130 on January 13, 2005, may be extended by an additional 24 hours to complete repair and testing of the 1 West Centrifugal Charging Pump.

(13) The 72 hour allowed outage time of Technical Specifications 3.8.1.1 Action "a" may be extended to 14 days one time for the 69 kilovolt (alternate) independent offsite power circuit when it is made inoperable to complete connection of the Supplemental Diesel Generators to the existing plant electrical system and to perform upgrades to the alternate offsite power supply circuit.

(14) Implementation of Amendment No. 287

This amendment authorizes the relocation of certain current Technical Specification requirements and operating license conditions to other licensee-controlled documents. Implementation of this amendment shall include the relocation of these requirements to the other documents, as described in (1) Section 5.0 of the NRC staff's Safety Evaluation and (2) Table LA of Removed Details and Table R of Relocated Specifications attached to the NRC staff's Safety Evaluation, which is enclosed with this amendment.

The schedule for the performance of new and revised Surveillance Requirements (SRs) shall be as follows:





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

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 322  
License No. DPR-74

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Indiana Michigan Power Company (the licensee), dated November 7, 2017, as supplemented by letter dated May 4, 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, paragraph 2.C.(3)(o) of Renewed Facility Operating License No. DPR-74 is hereby amended to read as follows:

Fire Protection

Indiana Michigan Power Company 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 licensee's amendment request dated July 1, 2011, as supplemented by letters dated September 2, 2011, April 27, 2012, June 29, 2012, August 9, 2012, October 15, 2012, November 9, 2012, January 14, 2013, February 1, 2013, May 1, 2013, June 21, 2013, and September 16, 2013; and the license amendment request dated November 7, 2017, as supplemented by letter dated May 4, 2018, and as approved in the Safety Evaluations dated October 24, 2013 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.

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION



David J. Wrona, Chief  
Plant Licensing Branch III  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Operating License

Date of Issuance: July 6, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 322  
DONALD C. COOK NUCLEAR PLANT, UNIT NO. 2  
TO RENEWED FACILITY OPERATING LICENSE NO. DPR-74  
DOCKET NO. 50-316

Replace the following pages of Renewed Facility Operating License DPR-74 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

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residual heat removal, safety injection and boron injection systems in accordance with the specifications of Section XI of the American Society of Mechanical Engineers Code. In addition, prior to completion of the first inservice testing interval, test connections which allow individual leak testing of the charging pump system discharge check valves shall be installed and the check valves shall be leak tested. The tests shall be repeated at the conclusion of each subsequent inservice inspection interval.

- (d) Deleted by Amendment No. 39
- (e) Deleted by Amendment No. 5
- (f) Deleted by Amendment No. 2
- (g) Deleted by Amendment No. 60
- (h) Deleted by Amendment No. 63
- (i) Deleted by Amendment No. 19
- (j) Power Operation with Fewer than Four Reactor Coolant Pumps in Operation

Indiana Michigan Power Company shall not operate the reactor at power levels above P-7 (as defined in Table 3.3.1-1 of Specification 3.3.1 of Appendix A to this renewed operating license) with fewer than four reactor coolant loops in operation until safety analyses for fewer than four loop operation have been submitted and approval for fewer than four loop operation at power levels above P-7 has been granted by the Commission by Amendment of this license.

- (k) Deleted by Amendment No. 16
- (l) Deleted by Amendment No. 63
- (m) Deleted by Amendment No. 19
- (n) Deleted by Amendment No. 28
- (o) Fire Protection Program

Indiana Michigan Power Company 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 licensee's amendment request dated July 1, 2011, as supplemented by letters dated September 2, 2011, April 27, 2012, June 29, 2012, August 9, 2012, October 15, 2012, November 9, 2012, January 14, 2013, February 1, 2013, May 1, 2013, June 21, 2013, and September 16, 2013; and the license amendment request dated November 7, 2017, as supplemented by letter dated May 4, 2018, and as approved in the Safety Evaluations dated October 24, 2013 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 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.

I. 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 assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed Fire PRA (FPRA) model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

1. Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
2. Prior NRC review and approval is not required for individual changes that result in a risk increase less than  $1 \times 10^{-7}$ /year (yr) for CDF and less than  $1 \times 10^{-8}$ /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

II. Other Changes that May Be Made Without Prior NRC Approval

1. Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program and Design Elements

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or adequate for the hazard. The licensee may use an engineering evaluation to demonstrate that a change to an NFPA 805, Chapter 3, element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 340 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-58

AND

AMENDMENT NO. 322 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-74

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

By application dated November 7, 2017 (Reference 1), as supplemented by letter dated May 4, 2018 (Reference 2), Indiana Michigan Power Company (I&M, the licensee), requested changes to the licenses for Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2 (CNP). The proposed changes would revise the licenses to allow a performance-based (PB) method to justify the current use of non-plenum listed cables above suspended ceilings, and the use of electric metallic tube and embedded/buried polyvinyl chloride. The licensee submitted its proposed license amendment request (LAR) in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48(c)(2)(vii), requesting to use a PB method in a fire protection program (FPP) element.

Previously, on October 24, 2013 (Reference 3), the U.S. Nuclear Regulatory Commission (NRC or the Commission) issued Amendment No. 322 to Renewed Facility Operating License (RFOL) No. DPR-58 (CNP Unit 1) and Amendment No. 305 to RFOL No. DPR-74 (CNP Unit 2). The amendments consisted of changes to the operating licenses to transition the CNP FPP to a risk-informed, performance-based (RI/PB) program based on National Fire Protection Association (NFPA) 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition (Reference 4), in accordance with 10 CFR 50.48(c). NFPA 805 allows the use of 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).

The supplemental letter dated May 4, 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 January 2, 2018 (83 FR 169).

## 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 which 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.

As stated, in part, in 10 CFR 50.48(c)(3)(i):

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.

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 an 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 an 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 5). 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. The 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 GDC regulations 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 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 5), 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, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," (Reference 6), 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 7), 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, September 2005, and Supplement 1, September 2010 (Reference 8, Reference 9, and Reference 10, respectively), 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 3.3.5.1, requirement that wiring above suspended ceiling shall be kept to a minimum, and where installed, electrical wiring shall be listed for plenum use, routed in armored cable, routed in metallic conduit, or routed in cable trays with solid metal top and bottom covers. Specifically, the licensee stated that it could not confirm with certainty that all of the cables above suspended ceilings that are not enclosed in metal raceways are listed for plenum use. The licensee further stated that its LAR is based on the assumption that some population of the cables that are exposed are also not listed for plenum use.

In its LAR, the licensee requested approval of a PB method to demonstrate an equivalent level of fire protection for the NFPA 805, Section 3.3.5.2, requirements that only metal tray and metal conduits shall be used for electrical raceways; that thin wall metallic tubing shall not be used for power, instrumentation, or control cables; and that flexible metallic conduits shall only be used in short lengths to connect components. Specifically, the licensee stated that it has used electrical metallic tubing (EMT) extensively throughout the CNP power block and that per its specification for cables, all exposed rigid metal conduit 2" or smaller inside the plant (excluding containment) is EMT, except as noted on drawings. The licensee further stated that other sizes of EMT are not prohibited and that EMT is used for power, instrumentation, and control cables. The licensee further stated that per its cable specification, some conduit used in structural slabs is polyvinyl chloride (PVC) which is a plastic and is nonmetallic.

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

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:

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:

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:

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:

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 subcooling 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:

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.

Nuclear Energy Institute (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., FSAR [Final Safety Analysis Report], 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.

### 3.2 Use of Non-Plenum Listed Cables above Suspended Ceilings

The licensee stated that based on walk downs, it has been verified that most of the cables above suspended ceilings in the CNP power block are either enclosed in metal raceways or listed for plenum use in compliance with NFPA 805, Section 3.3.5.1. The licensee further stated that it is not confirmed with certainty that all of the cables that are not enclosed in metal raceways are listed for plenum use and that its request is based on the assumption that some

population of the cables that are exposed are also not listed for plenum use. The licensee referred to these cables in its LAR as "unverified cables."

The licensee stated that the unverified cables above suspended ceilings are located in the following areas and may not comply with the requirements of NFPA 805, Section 3.3.5.1. The licensee provided a description of the spaces, including the size and purpose of each.

Fire Analysis Area AA2:

- Fire Zone 87 (Makeup Water Plant Office)
- Fire Zone 126 (Shift Manager's Office (SMO) and Technical Support Center (TSC))
- Fire Zone 129 (Auxiliary Equipment Operator (AEO) Break Room, On-Line Laboratory, and Turbine office)

Fire Analysis Area AA36/42:

- Fire Zone 43 (Turbine/Auxiliary Building Access (TRPAC))

The licensee provided the following basis for its request, which it stated applies to all zones except when stated otherwise:

- Suspended ceiling finishes comply [...] with NFPA 805, Section 3.3.3, Interior Finishes. Their supports are noncombustible.
- All NSCA cables in Fire Zone 43 meet the criteria defined in Section 3.3.5.1 of NFPA 805. The population of unverified cabling consists of low-voltage communications and data network cables, which are less susceptible to self-ignition and electrical shorts that could result in a fire in the enclosed space.
- CNP areas currently with suspended ceilings inside the NFPA 805 defined power block include office areas and do not affect risk significant fire scenarios. The use of non-plenum cables does not impact any NSCA PB evaluations. Fire Zone 43 contains Variance from Deterministic Requirements (VFDRs) defined in the current license basis and a detailed evaluation is provided below.
- Exposed, nonplenum-rated electrical wiring located above suspended ceilings is minimal, is sufficiently dispersed, and adds limited combustible loading. CNP complies [...] to NFPA 805, Section 3.3.5.3, Electrical Cable Flame Propagation Limits. Although this is recognized as not equivalent to plenum rated cable, it does reflect that most non-plenum cables have some fire resistive capability.
- The NFPA 805 requirement to require plenum cable exceeds National Electrical Code (NEC) (NFPA 70) requirements for cables not in plenum spaces. Original fire protection installation criteria did not mandate plenum cables in suspended ceiling spaces as required by NFPA 805 (2001). Non-plenum spaces have stagnant air versus flowing air in

plenum areas in which smoke filled air can travel through to other locations of the plant. The SMO (Fire Zone 126), Turbine office (Fire Zone 129), on line Lab (Fire Zone 129), AEO Break Room (Fire Zone 129) and Make up Plant (Fire Zone 87) locations do not contain plenum spaces.

- Based on walk downs and a review of CNP Technical Evaluations, no fixed ignition sources, per NUREG/CR-6850, were identified in the area above the suspended ceilings.
- CNP modification procedures ensure that future cable installations above suspended ceilings will meet the requirements of NFPA 805 Section 3.3.5.1.
- Fire barriers prevent propagation of fires to adjacent fire areas. Areas above suspended ceilings do not cross established fire barriers.
- CNP procedures have been updated to specifically restrict the storage of combustible material, including extension cords above suspended ceilings.
- For areas located within Fire Zone 129, areas above suspended ceilings are not used as plenum spaces and do not contain any NSCA related equipment.
- There are no automatic suppression or detection systems within the suspended ceiling space for these locations. An automatic suppression system protects the exterior of the Makeup Water Plant Office (it is an enclosure within Fire Zone 87). Ionization smoke detectors are installed below the ceilings in the AEO Break Room, the SMO and TSC, and TRPAC (Fire Zone 129, Fire Zone 43, and Fire Zone 126). Fire barriers bound the Fire Areas comprising these zones. Hose streams are available throughout these Zones. These fire protection features, in combination with persons who routinely occupy these areas along with the dedicated fire brigade, are expected to detect and suppress fires prior to fire expanding and effecting cables/equipment in additional Fire Zones.

The licensee stated that Fire Zone 43, TRPAC, has some NSCA considerations that were evaluated further. The licensee provided a supplemental evaluation of the fire protection features and impacts on the NSCA. This included a description of the automatic fire detection system, fire doors, internal walls, and HVAC system. The licensee also described the detailed fire modeling that was performed for Fire Zone 43, which determined that the risk, safety margin, and DID met the acceptance criteria of NFPA 804 Section 4.2.4. The licensee stated, "There is no impact to this analysis due to the potential for minimal amounts of non-plenum exposed cables in the suspended ceiling."

The licensee stated that, in general, the presence of nonplenum-rated cables above suspended ceilings in the identified locations does not adversely affect nuclear safety capability, and that the wiring above the suspended ceilings is kept to a minimum. The licensee further stated that the low-voltage communications and data network cables are not prone to heat-generating

overload faults, and that in the unlikely event of a fire occurring in the area above the suspended ceiling, there will be no impact on the ability of CNP to achieve and maintain the NSPC of NFPA 805.

The licensee stated that the location of nonplenum-rated wiring above suspended ceilings has no impact on the radioactive release performance criteria and that the radioactive release review was performed based on the potential location of radiological concerns and is independent of the type of wiring and locations of suspended ceilings. The licensee further stated that radioactive release performance criteria are satisfied based on the determination of limiting radioactive release, which is not affected by the cables above suspended ceilings that do not comply with the requirements specified in Section 3.3.5.1 of NFPA 805.

### 3.2.1 Safety Margins/Defense-in-Depth

The licensee stated that power, control, and instrumentation cables are already in use in the plenum space above the Unit 1 and Unit 2 Main Control Room and complies with NFPA 805, Section 3.3.5.3, Electrical Cable Flame Propagation Limits. The licensee further stated that its fire probabilistic risk assessment (FPRA) uses historical fires and fire tests as the basis for many inputs, and, therefore, the inherent safety margin present in the FPRA methods is acceptable because NRC accepted methods are used to perform the FPRA. The licensee further stated that deviations are evaluated against the methods and criteria for the overall internal events of probabilistic risk assessment (PRA) and FPRA model development for consistency, or confirmation of bounding treatment, to confirm that the safety margin inherent in the PRA model is unaffected.

The licensee stated that the limited amount of low voltage communications/data cable above suspended ceilings is not susceptible to shorts that would result in a fire and thus, their presence above suspended ceilings has no impact on the analytical methods used in the FPRA to evaluate potential fire scenarios. Therefore, the inherent safety margin in these methods remains unchanged.

The licensee provided a discussion of the three elements of DID, which are: 1) prevent fires from starting, 2) rapidly detect, control and extinguish fires that do occur, thereby limiting damage, and 3) provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed.

With regard to preventing fires from starting, the licensee stated that the use of non-listed communication/data cables routed above the suspended ceilings does not impact the fire protection DID and that the cables do not pose an ignition hazard. The licensee further stated that its fire analysis supports the loss of all cables and equipment in the affected areas with no impact to the ability to meet the NFPA 805 performance goals.

With regard to detecting, controlling, and extinguishing fires, the licensee stated that the cables above suspended ceilings will have no effect on the performance of area suppression or detection, and that areas without automatic features are provided with manual suppression and fire brigade response. The licensee further stated that fire analysis has been performed to demonstrate any fire that does occur will be small and contained within the fire analysis area.

With regard to providing an adequate level of fire protection so that a fire will not prevent essential safety functions from being performed, the licensee stated that there are no essential safety functions impacted by a fire in any of the affected fire zones. The only exception is Fire



Zone 43, which was modeled as whole room burnout with no loss in the ability to achieve or maintain the NFPA 805 Performance Goals.

### 3.2.2 NRC 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 limited amounts of unverified cabling installed in the areas identified above consist primarily of non-NSCA, low-voltage data and communication cables installed in non-plenum spaces. In areas where NSCA cables are collocated with unverified cables in an area above a ceiling (i.e., Fire Zone 43), the licensee has performed additional analysis that demonstrates the ability to achieve and maintain the NSPC of NFPA 805.

The NRC staff determined that the proposed change has no impact on any of the DID echelons because the limited amounts of unverified cabling installed in the areas identified above consist primarily of non-NSCA, low-voltage data and communication cables installed in non-plenum spaces, which do not represent an increase in the inherent combustible loading or ignition sources. In addition, the limited amounts of unverified cables do not exceed the hazards for which the installed fire protection features were designed, installed, and maintained to handle. For Fire Zone 43, the licensee performed additional fire modeling analysis to demonstrate that the limited amounts of unverified cables do not represent an increase in hazard beyond what the CNP fire hazards analysis already assumed. As such, the licensee's ability to prevent, detect, and suppress fires in the subject fire zones, as well as the licensee's ability to achieve and maintain safe shutdown, is unaffected by the presence of the limited amounts of unverified cables.

The NRC staff also determined that the proposed change continues to maintain adequate safety margins because the change does not impact any codes and standards, or their alternatives accepted for use by the NRC, and the change does not impact any safety analysis acceptance criteria used in the licensing basis.

### 3.2.3 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 as described by the licensee in its request to use non-plenum listed cable above suspended ceilings, is an acceptable alternative to the corresponding NFPA 805, Section 3.3.5.1 requirement. The proposed PB method is acceptable 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).

### 3.3 Use of Electric Metallic Tubing and Embedded/Buried Polyvinyl Chloride Conduit

The licensee stated that it has used EMT extensively throughout the CNP power block and that per its specification for cables, all exposed rigid metal conduit 2" or smaller inside the plant (excluding Containment) is EMT, except as noted on drawings. The licensee further stated that other sizes of EMT are not prohibited and that EMT is used for power, instrumentation, and control cables. The licensee further stated that, per its specification for cables, some conduit used in structural slabs is polyvinyl chloride, which is a plastic and is nonmetallic.

Regarding the use of EMT, the licensee stated that the use of EMT was not prohibited by original Fire Protection Design Guidelines, is impact resistant, and has been a basic conduit type for the life of plant at CNP. The licensee stated that, based on a review of Corrective Action Program requests, its presence has not adversely affected NSPC, radiological release performance criteria, safety margin, or DID. Additionally, the licensee stated that the CNP cable installation specification provides installation criteria to prevent damage to cables, and limits installation of EMT in close proximity to equipment that may induce damage due to equipment vibration.

The licensee stated:

The NEC allows the use of EMT for both "exposed" and "concealed" work but the area must "not be subject to severe physical damage." Per the NFPA Report on Proposals for Revision to NFPA 805-2001, Section 3.3.5.2 of NFPA 805 was revised for consistency with the NEC (NFPA 70) to remove the requirement prohibiting thin-wall EMT. The current edition of NFPA 805 (2015), retains this change. Although the current edition of NFPA 805 is not within the CNP licensing bases, the change to NFPA 805 was made by the NFPA Technical Committee on Fire Protection for Nuclear Facilities, which is made up of experts representing varied viewpoints and interests concerning nuclear facility fire protection, through a consensus standards development process.

The licensee stated that the CNP cable installation specification has been revised to prohibit future installation of EMT. Pending NRC approval of the LAR, I&M plans to revise the cable installation specification to allow the use of EMT in areas that are not subject to severe physical damage to reflect the intent of the current NFPA 805 standard and to provide DID.

Regarding the use of plastic conduit, the licensee stated that the CNP cable installation specification requires that all concrete encased nonmetallic conduit be plastic, and that metallic conduit be used to extend plastic conduit runs out of the floor slabs, with the plastic not extending past the concrete surface. The nonmetallic conduit provides physical protection and separation for the conduit. The plastic conduit embedded in concrete is not subject to direct flame/heat impingement from an external source. The licensee stated that the NEC (NFPA 70), allows use of rigid nonmetallic conduit for underground and embedded applications, and that no PB evaluations (i.e., use of fire modeling) were performed on VFDRs associated with embedded conduits during CNP's NFPA 805 transition on embedded conduit.

The licensee stated that the use of EMT does not affect NFPA 805 credited success paths, as conduit type is not credited to withstand the effects of fire, and, therefore, there is no impact on the NSPC.

The licensee stated that the use of nonmetallic conduit for raceways embedded in concrete is allowed by NFPA 70, NEC, and provides adequate physical and electrical protection for cables. The licensee further stated that the use of PVC conduit in embedded/buried locations does not affect nuclear safety, as the material in which conduits are run within an embedded location are not subject to the failure mechanisms that could potentially result in circuit damage or resultant damage to external targets and, therefore, there is no impact on the NSPC.

The licensee stated that the use of nonmetallic conduit in embedded/buried installations and EMT does not have any impact on the radiological release performance criteria, and that the radiological release review was performed based on the manual fire suppression capabilities in areas containing, or potentially containing, radioactive materials and is not dependent on the type of conduit material. The licensee further stated that the conduit material does not change the radiological release evaluation which concludes that potentially contaminated water is contained and smoke is monitored, and the conduits do not add additional radiological materials to the area or challenge system boundaries.

### 3.3.1 Safety Margins/DID

The licensee stated that EMT is noncombustible and that self-ignited cable fires contained within conduit are not postulated to spread beyond the conduit. The licensee further stated that precautions and limitations on use and installation ensure that these materials do not impact the analysis of the fire event, and, therefore, the inherent safety margin and conservatism in these analysis methods remain unchanged.

The licensee stated that embedded nonmetallic conduit is protected from mechanical damage and from damage resulting from either an exposure fire or from a fire within the conduit impacting other targets. The licensee further stated that the areas with plastic conduit have been analyzed in their current configuration and that precautions and limitations on use ensure that these materials do not impact the analysis of the fire event, and, therefore, the inherent safety margin and conservatism in these analysis methods remain unchanged.

The licensee provided a discussion of the use of EMT on the three elements of DID. With regard to preventing fires from starting, the licensee stated that the use of EMT and embedded/buried plastic conduit does not create ignition sources and does not impact fire prevention. The licensee further stated that EMT and embedded plastic conduit have been in use since original plant construction, are allowed by the NEC, and do not increase the potential for a fire to start.

With regard to detecting, controlling, and extinguishing fires, the licensee stated that the EMT and embedded plastic conduit have no impact on the ability of the automatic suppression or detection systems to perform their functions. The licensee further stated that portable fire extinguishers and hose reel stations are available for manual firefighting activities by the site fire brigade and are unaffected by the presence of EMT and embedded/buried plastic conduit. The licensee further stated that EMT provides a similar level of cable protection during a fire as rigid conduit.

With regard to providing an adequate level of fire protection so that a fire will not prevent essential safety functions from being performed, the licensee stated that the use of EMT and embedded/buried plastic conduit does not result in compromising automatic fire suppression functions, manual fire suppression functions, or post-fire safe shutdown capability, and will not prevent essential safety functions from being performed.

### 3.3.2 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 apparent impact on the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release because (1) these criteria are independent from the type of conduit used for embedded conduit and are otherwise unaffected by the use of EMT, and (2) the conduit is inherently protected from physical fire or mechanical damage and does not contribute any additional radiological material or hazard.

The NRC staff determined that the proposed change has no apparent impact on any of the DID echelons because the use of EMT and embedded/buried PVC conduit does not represent an increase in the inherent combustible loading or ignition sources. In addition, the use of EMT and embedded/buried PVC conduit does not exceed the hazards for which the installed fire protection features were designed, installed, and maintained to handle. In addition, the type of conduit used does not impact the credited success paths for achieving and maintaining safe shutdown.

The NRC staff also determined that the proposed change continues to maintain adequate safety margins, in part, because the change does not impact any codes and standards, or their alternatives accepted for use by the NRC, and the change does not impact any safety analysis acceptance criteria used in the licensing basis.

### 3.3.3 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 as described by the licensee in its request to use electric metallic tubing and embedded/buried polyvinyl chloride conduit, is an acceptable alternative to the NFPA 805, Section 3.3.5.2, requirement. The proposed PB method is acceptable 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 October 24, 2013 (Reference 3), the NRC issued Amendment Nos. 322 and 305 which revised the existing fire protection license conditions for CNP to ones that address the transition to a R/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 CNP.

In its letter dated November 7, 2017, as supplemented by letter dated May 4, 2018, the licensee requested a license amendment to modify Fire Protection License Condition 2.C.(4) for Unit 1, and 2.C.(3)(o) for Unit 2. The licensee proposed that the license condition be revised to add the LAR submittal dates, and issuance date of this SE, to the first paragraph under 2.C.(4) and 2.C.(3)(o), respectively. 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 safety evaluation (SE), the NRC staff reviewed the information provided by the licensee and concludes that the proposed use of a PB alternative to allow the use of non-plenum rated wiring above suspended ceilings, and EMT and embedded/buried PVC conduits, is acceptable. Therefore, the NRC staff concludes that the revision of the license conditions to allow such use, by identifying the additional LAR and SE dates, is appropriate and acceptable.

As revised, the first paragraph of CNP Unit No. 1 and 2, License Condition 2.C.(4) and 2.C.(3)(o), will read as shown below:

#### Fire Protection

Indiana Michigan Power Company 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 licensee's amendment request dated July 1, 2011, as supplemented by letters dated September 2, 2011, April 27, 2012, June 29, 2012, August 9, 2012, October 15, 2012, November 9, 2012, January 14, 2013, February 1, 2013, May 1, 2013, June 21, 2013, and September 16, 2013; and the license amendment request dated November 7, 2017, as supplemented by letter dated May 4, 2018, and as approved in the Safety Evaluations dated October 24, 2013 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 Michigan State official was notified of the proposed issuance of the amendments on May 10, 2018. The State official had no comments.

#### 6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational 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 (83 FR 169). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 8.0 REFERENCES

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2. Lies, Q. Shane, Indiana Michigan Power Company, letter to U.S. Nuclear Regulatory Commission, "Donald C. Cook Nuclear Plant, Units 1 and 2, Supplement to Request for Deviation from National Fire Protection (NFPA) Standard 805 Requirements," May 4, 2018 (ADAMS Accession No. ML18128A275).
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SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REQUEST FOR DEVIATION FROM NATIONAL FIRE PROTECTION ASSOCIATION 805 REQUIREMENTS (EPID L-2017-LLA-0374) DATED JULY 6, 2018

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