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November 20, 2018

AEP-NRC-2018-66
10 CFR 50.90

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Donald C. Cook Nuclear Plant Unit 1 and Unit 2
Request for License Amendment to Technical Specification 3.4.15, "RCS Leakage Detection Instrumentation," and Application of Leak-Before-Break Methodology

References:

1. Letter from Q. Lies, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC), "Donald C. Cook Nuclear Plant Unit 1 Request for Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping," March 7, 2018, (ADAMS Accession No. ML18072A012).

2. Letter from John F. Stang, NRC, to Robert P. Powers, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Review of Leak-Before-Break for the Pressurizer Surge Line Piping as Provided by 10 CFR Part 50, Appendix A, GDC 4" (TAC Nos. MA7834 and MA7835)," dated November 8, 2000, (ADAMS Accession Number ML003767675).

Dear Sir or Madam:

Pursuant to Title 10 Code of Federal Regulations (CFR) 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, proposes to amend the Appendix A Technical Specifications (TS) to Facility Operating Licenses DPR-58 and DPR-74.

In accordance with the provisions of General Design Criterion (GDC) 4 of 10 CFR Part 50, Appendix A, I&M requests Nuclear Regulatory Commission (NRC) approval to apply Leak Before Break (LBB) methodology to piping for the Accumulator, Residual Heat Removal (RHR), and Safety Injection (SI) systems at CNP Unit 2. GDC 4 provides for the exclusion of the dynamic effects due to postulated pipe ruptures from the design basis, provided the NRC reviews and approves analysis demonstrating that the probability of fluid system piping rupture is extremely low under conditions consistent with the piping design basis. This request to apply LBB methodology is consistent with the request submitted as Reference 1, which requested application of LBB methodology to corresponding piping for CNP Unit 1.

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The proposed amendment would modify Unit 2 TS 3.4.13, "RCS Operational LEAKAGE," to change the limits for unidentified leakage from less than or equal to 1 gallon per minute (gpm) to less than or equal to 0.8 gpm as required by Reference 2. Unit 2 TS 3.4.15, "RCS Leakage Detection Instrumentation," requirements for frequency of containment air grab samples is also changed as required by Reference 2 for application of LBB methodology to RCS piping.

In addition, I&M proposes to change CNP Unit 1 and Unit 2 TS 3.4.15, "RCS Leakage Detection Instrumentation," to delete the containment humidity monitor from the Limiting Condition of Operation (LCO). This change is not directly related to the request to apply LBB methodology to Unit 2 Accumulator, RHR, and SI piping, but is included in this submittal due to the overlapping impacts to TS 3.4.15.

Enclosure 1 to this letter provides an affirmation statement. Enclosure 2 provides an evaluation of the proposed application of proprietary LBB methodology to CNP Unit 2 Accumulator, RHR, and SI piping.

Enclosure 3 contains WCAP-18295-P "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology." This report is an LBB analysis performed in accordance with 10 CFR 50, Appendix A, GDC-4 and NUREG-0800, Standard Review Plan 3.6.3. The analysis performs an evaluation of CNP Unit 1 and Unit 2 Accumulator piping, but this request is only asking for approval for Unit 2 Accumulator piping.

Enclosure 4 contains WCAP-18302-P "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology." This report is an LBB analysis performed in accordance with 10 CFR 50, Appendix A, GDC-4 and NUREG-0800, Standard Review Plan 3.6.3. The analysis performs an evaluation of CNP Unit 1 and Unit 2 RHR piping, but this request is only asking for approval for Unit 2 RHR piping.

Enclosure 5 contains WCAP-18309-P "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology." This report is an LBB analysis performed in accordance with 10 CFR 50, Appendix A, GDC-4 and NUREG-0800, Standard Review Plan 3.6.3. The analysis performs an evaluation of CNP Unit 1 and Unit 2 SI piping, but this request is only asking for approval for Unit 2 SI piping.

Enclosure 6 contains WCAP-18394-P "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break." This report contains fatigue crack growth evaluations performed in support of the LBB analyses contained in Enclosures 3, 4, and 5. The evaluations perform a fatigue crack growth assessment of CNP Unit 1 and Unit 2 Accumulator, RHR, and SI piping, but this request is only asking for approval for the associated Unit 2 piping.

Enclosure 7 contains LTR-SDA-II-18-41-P "Responses to NRC Questions on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2." This letter contains additional information supporting the analyses contained in Enclosures 3, 4, and 5.

Enclosure 8 contains affidavits from the Westinghouse Electric Company for withholding the proprietary information contained in Enclosures 3, 4, 5, 6, and 7. Each affidavit sets forth the basis for which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in 10 CFR 2.390(b)(4). Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390.

Enclosures 9, 10, 11, 12, and 13 contain non-proprietary versions of Enclosures 3, 4, 5, 6, and 7 respectively. The non-proprietary reports are being provided based on the NRC's expectation that the submitter of the proprietary information should provide, if possible, a non-proprietary version of the document with brackets showing where the proprietary information has been deleted.

Enclosure 14 provides an evaluation of the proposed changes to Unit 1 and Unit 2 TS 3.4.15 to delete the containment humidity monitor from the LCO. Enclosure 15 contains an evaluation of all proposed changes in accordance with 10 CFR 50.92(c) regarding significant hazards consideration.

Enclosures 16 and 17 provide Unit 1 and Unit 2 TS pages, respectively, marked to show the proposed changes. New clean Unit 1 and Unit 2 TS pages with proposed changes incorporated will be provided to the NRC Licensing Project Manager when requested. Enclosures 18 and 19 provide Unit 1 and Unit 2 TS Bases pages, respectively, marked to show the proposed changes. Bases changes are included for information only. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the Technical Specifications Bases Control Program.

I&M requests approval of the proposed changes commensurate with the NRC's normal review and approval schedule. Once approved, the amendment will be implemented within 90 days.

Copies of this letter and its enclosures are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

There are no new regulatory commitments made in this letter. Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Director, at (269) 466-2649.

Sincerely,

Q. Shane Lies
Site Vice President

BMC/mll

Enclosures:

1. Affirmation
2. Evaluation of the Proposed Application of LBB Methodology to Donald C. Cook Nuclear Plant Unit 2 Accumulator, RHR, and SI piping
3. WCAP-18295-P, Revision 0 "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)
4. WCAP-18302-P, Revision 0 "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)
5. WCAP-18309-P, Revision 0 "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)
6. WCAP-18394-P, Revision 1 "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Proprietary)
7. LTR-SDA-II-18-41-P, Revision 1, "Responses to NRC Questions on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Proprietary)
8. Affidavits of Withholding Pursuant to 10 CFR 2.390, Westinghouse Electric Company
9. WCAP-18295-NP, Revision 0 "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Non-Proprietary)
10. WCAP-18302-NP, Revision 0 "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Non-Proprietary)
11. WCAP-18309-NP, Revision 0 "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Non-Proprietary)
12. WCAP-18394-NP, Revision 1 "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Non-Proprietary)
13. LTR-SDA-II-18-41-NP, Revision 1 "Responses to NRC Questions on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Non-Proprietary)
14. Proposed License Amendment Request Regarding Technical Specification 3.4.15, "RCS Leakage Detection Instrumentation"
15. No Significant Hazards Consideration Determination
16. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Pages Marked To Show Proposed Changes
17. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages Marked To Show Proposed Changes
18. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)

19. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)

c: R. J. Ancona – MPSC, w/o enclosures 8 -13
R. F. Kuntz, NRC Washington, D.C., w/o enclosures 8 -13
MDEQ – RMD/RPS, w/o enclosures 8 -13
NRC Resident Inspector, w/o enclosures 8 -13
K. S. West, NRC Region, III w/o enclosures 8 -13
A. J. Williamson – AEP Ft. Wayne, w/o enclosures

Enclosure 8 to AEP-NRC-2018-66

Affidavits of Withholding Pursuant to 10 CFR 2.390, Westinghouse Electric Company

Westinghouse Application for Withholding Proprietary Information from Public Disclosure, CAW-18-4697, WCAP-18295-P, Revision 0 "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

Westinghouse Application for Withholding Proprietary Information from Public Disclosure, CAW-18-4698, WCAP-18302-P, Revision 0 "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

Westinghouse Application for Withholding Proprietary Information from Public Disclosure, CAW-18-4699, WCAP-18309-P, Revision 0 "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

Westinghouse Application for Withholding Proprietary Information from Public Disclosure, CAW-18-4806, WCAP-18394-P, Revision 1 "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Proprietary)

Westinghouse Application for Withholding Proprietary Information from Public Disclosure, CAW-18-4807, LTR-SDA-II-18-41-P, Revision 1 "Responses to NRC Questions on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Proprietary)

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CAW-18-4697

January 16, 2018

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: WCAP-18295-P, Revision 0, "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

The Application for Withholding Proprietary Information from Public Disclosure is submitted by Westinghouse Electric Company LLC ("Westinghouse"), pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-18-4697 signed by the owner of the proprietary information, Westinghouse. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Indiana Michigan Power Company.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-18-4697 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 259, Cranberry Township, Pennsylvania 16066.

James A. Gresham, Manager
Regulatory Compliance

CAW-18-4697

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, James A. Gresham, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse") and declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Executed on: 1/18/18

James A. Gresham, Manager
Regulatory Compliance

(1) I am Manager, Regulatory Compliance, Westinghouse Electric Company LLC ("Westinghouse"), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WCAP-18295-P, Revision 0, "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary), dated January 2018, for submittal to the Commission, being transmitted by Indiana Michigan Power Company letter. The proprietary information as submitted by Westinghouse is that associated with Westinghouse's request for NRC approval of WCAP-18295-P, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to provide a technical justification for eliminating accumulator line rupture as the design basis for D.C. Cook Units 1 and 2.

(b) Further, this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of similar information to its customers for the purpose of performing Leak-Before-Break evaluations of the technical justification for eliminating accumulator line rupture as the design basis.

(ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and non-proprietary versions of a document, furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC Document Control Desk:

Enclosed are:

1. WCAP-18295-P, "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

2. WCAP-18295-NP, "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Non-Proprietary)

Also enclosed are the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-18-4697, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-18-4697 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 259, Cranberry Township, Pennsylvania 16066.

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CAW-18-4698

January 16, 2018

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: WCAP-18302-P, Revision 0, "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

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The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-18-4698 signed by the owner of the proprietary information, Westinghouse. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

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James A. Gresham, Manager
Regulatory Compliance

CAW-18-4698

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

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COUNTY OF BUTLER:

I, James A. Gresham, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse") and declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Executed on: 1/16/18

James A. Gresham, Manager
Regulatory Compliance

(1) I am Manager, Regulatory Compliance, Westinghouse Electric Company LLC ("Westinghouse"), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

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Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

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(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

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(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WCAP-18302-P, Revision 0, "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary), dated January 2018, for submittal to the Commission, being transmitted by Indiana Michigan Power Company letter. The proprietary information as submitted by Westinghouse is that associated with Westinghouse's request for NRC approval of WCAP-18302-P, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to provide a technical justification for eliminating residual heat removal line rupture as the design basis for D.C. Cook Units 1 and 2.

(b) Further, this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of similar information to its customers for the purpose of performing Leak-Before-Break evaluations of the technical justification for eliminating residual heat removal line rupture as the design basis.

(ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and non-proprietary versions of a document, furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC Document Control Desk:

Enclosed are:

1. WCAP-18302-P, "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

2. WCAP-18302-NP, "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Non-Proprietary)

Also enclosed are the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-18-4698, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-18-4698 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 259, Cranberry Township, Pennsylvania 16066.

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Direct tel: (412) 374-4643
Direct fax: (724) 940-8542
e-mail: greshaja@westinghouse.com

CAW-18-4699

January 17, 2018

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: WCAP-18309-P, Revision 0, "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

The Application for Withholding Proprietary Information from Public Disclosure is submitted by Westinghouse Electric Company LLC ("Westinghouse"), pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-18-4699 signed by the owner of the proprietary information, Westinghouse. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Indiana Michigan Power Company.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-18-4699 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 259, Cranberry Township, Pennsylvania 16066.

James A. Gresham, Manager
Regulatory Compliance

CAW-18-4699

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, James A. Gresham, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse") and declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Executed on: 1/17/18

James A. Gresham, Manager
Regulatory Compliance

(1) I am Manager, Regulatory Compliance, Westinghouse Electric Company LLC ("Westinghouse"), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WCAP-18309-P, Revision 0, "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary), dated January 2018, for submittal to the Commission, being transmitted by Indiana Michigan Power Company letter. The proprietary information as submitted by Westinghouse is that associated with Westinghouse's request for NRC approval of WCAP-18309-P, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to provide a technical justification for eliminating safety injection line rupture as the design basis for D.C. Cook Units 1 and 2.

(b) Further, this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of similar information to its customers for the purpose of performing Leak-Before-Break evaluations of the technical justification for eliminating safety injection line rupture as the design basis.

(ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

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In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC Document Control Desk:

Enclosed are:

1. WCAP-18309-P, "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Proprietary)

2. WCAP-18309-NP, "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology" (Non-Proprietary)

Also enclosed are the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-18-4699, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-18-4699 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 259, Cranberry Township, Pennsylvania 16066.

Westinghouse Electric Company
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Direct fax: (724) 940-8542
e-mail: mercieej@westinghouse.com

CAW-18-4806

September 14, 2018

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: WCAP-18394-P, Revision 1, "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Proprietary)

The Application for Withholding Proprietary Information from Public Disclosure is submitted by Westinghouse Electric Company LLC ("Westinghouse"), pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-18-4806 signed by the owner of the proprietary information, Westinghouse. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Indiana Michigan Power Company.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-18-4806 and should be addressed to Edmond J. Mercier, Manager, Fuels Licensing and Regulatory Support, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 256, Cranberry Township, PA 16066.

Edmond J. Mercier, Manager
Fuels Licensing and Regulatory Support

CAW-18-4806

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, Edmond J. Mercier, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse") and declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Executed on: 9/14/2018

Edmond J. Mercier, Manager
Fuels Licensing and Regulatory Support

(1) I am Manager, Fuels Licensing and Regulatory Support, Westinghouse Electric Company LLC ("Westinghouse"), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WCAP-18394-P, Revision 1, "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Proprietary), dated August 2018, for submittal to the Commission, being transmitted by Indiana Michigan Power Company letter. The proprietary information as submitted by Westinghouse is that associated with responses to NRC question on the expanded scope Leak-Before-Break evaluations for D.C. Cook Units 1 and 2, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to provide a technical justification for eliminating accumulator, residual heat removal, and safety injection line ruptures as the design basis for D.C. Cook Units 1 and 2.

(b) Further, this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of similar information to its customers for the purpose of performing Leak-Before-Break evaluations of the technical justification for eliminating accumulator, residual heat removal, and safety injection line ruptures as the design basis.

(ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and non-proprietary versions of a document, furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC Document Control Desk:

Enclosed are:

1. WCAP-18394-P, Revision 1, "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Proprietary)

2. WCAP-18394-NP, Revision 1, "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break" (Non-Proprietary)

Also enclosed are the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-18-4806, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-18-4806 and should be addressed to Edmond J. Mercier, Manager, Fuels Licensing and Regulatory Support, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2, Suite 256, Cranberry Township, PA 16066.

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Direct fax: (724) 940-8542
e-mail: mercieej@westinghouse.com

CAW-18-4807

September 14, 2018

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: LTR-SDA-II-18-41-P, Revision 1, "Responses to NRC Question on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Proprietary)

The Application for Withholding Proprietary Information from Public Disclosure is submitted by Westinghouse Electric Company LLC ("Westinghouse"), pursuant to the provisions of paragraph (b)(1) of Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-18-4807 signed by the owner of the proprietary information, Westinghouse. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Indiana Michigan Power Company.

Correspondence with respect to the proprietary aspects of the Application for Withholding or the Westinghouse Affidavit should reference CAW-184807, and should be addressed to Edmond J. Mercier, Manager, Fuels Licensing and Regulatory Support, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2 Suite 256, Cranberry Township, Pennsylvania 16066.

Edmond J. Mercier, Manager
Fuels Licensing and Regulatory Support

CAW-18-4807

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, Edmond J. Mercier, am authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse") and declare that the averments of fact set forth in this Affidavit are true and correct to the best of my knowledge, information, and belief.

Executed on: 9/14/2018

Edmond J. Mercier, Manager
Fuels Licensing and Regulatory Support

(1) I am Manager, Fuels Licensing and Regulatory Support, Westinghouse Electric Company LLC ("Westinghouse"), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Nuclear Regulatory Commission's ("Commission's") regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage (e.g., by optimization or improved marketability).

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in LTR-SDA-II-18-41-P, Revision 1, "Responses to NRC Question on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Proprietary), for submittal to the Commission, being transmitted by Indiana Michigan Power Company letter. The proprietary information as submitted by Westinghouse is that associated with responses to NRC question on the expanded scope Leak-Before-Break evaluations for D.C. Cook Units 1 and 2, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to provide a technical justification for eliminating accumulator, residual heat removal, and safety injection line ruptures as the design basis for D.C. Cook Units 1 and 2.

(b) Further, this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of similar information to its customers for the purpose of performing Leak-Before-Break evaluations of the technical justification for eliminating accumulator, residual heat removal, and safety injection line ruptures as the design basis.

(ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and non-proprietary versions of a document, furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

Indiana Michigan Power Company

Letter for Transmittal to the NRC

The following paragraphs should be included in your letter to the NRC Document Control Desk:

Enclosed are:

1. LTR-SDA-II-18-41-P, Revision 1, "Responses to NRC Question on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Proprietary)

2. LTR-SDA-II-18-41-NP, Revision 1, "Responses to NRC Question on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2" (Non-Proprietary)

Also enclosed are the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-18-4807, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Item 1 contains information proprietary to Westinghouse Electric Company LLC ("Westinghouse"), it is supported by an Affidavit signed by Westinghouse, the owner of the information. The Affidavit sets forth the basis on which the information may be withheld from public disclosure by the Nuclear Regulatory Commission ("Commission") and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse Affidavit should reference CAW-18-4807 and should be addressed to Edmond J. Mercier, Manager, Fuels Licensing and Regulatory Support, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 2 Suite 256, Cranberry Township, Pennsylvania 16066.

Enclosure 1 to AEP-NRC-2018-66

AFFIRMATION

I, Q. Shane Lies, being duly sworn, state that I am the Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the U. S. Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Q. Shane Lies
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 20 DAY OF November, 2018

Notary Public

My Commission Expires 01/21/2025

Enclosure 2 to AEP-NRC-2018-66

Evaluation of Proposed Application of LBB Methodology to Donald C. Cook Nuclear Plant Unit 2 Accumulator, RHR, and SI piping

1.0 SUMMARY DESCRIPTION

Pursuant to Title 10 Code of Federal Regulations (CFR) 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, proposes an amendment to Renewed Facility Operating License No. DPR-74 for CNP Unit 2. This license amendment request (LAR) requests approval for application of leak-before-break (LBB) methodology to piping for the Accumulator, Residual Heat Removal (RHR), and Safety Injection (SI) systems at CNP Unit 2.

The proposed amendment would also modify CNP Unit 2 Technical Specifications (TS) Section 3.4.13, "RCS Operational LEAKAGE," to change the limits for unidentified leakage from less than or equal to 1 gallon per minute (gpm) to less than or equal to 0.8 gpm.

In this application, I&M is requesting approval to apply LBB methodology to Accumulator, RHR, and SI piping in Unit 2. The analysis provided in Enclosures 3, 4, and 5 includes evaluation of portions of the Accumulator piping, RHR piping, and the SI piping, respectively. Enclosure 6 contains fatigue crack growth evaluations for the Accumulator piping, RHR piping, and SI piping. Enclosure 7 contains additional information supporting the evaluations in Enclosures 3, 4, and 5.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The Accumulator lines are attached to each of the four primary reactor coolant loop (RCL) cold leg piping segments. The Accumulator lines allow for injection from the Accumulator tanks into the reactor vessel, via the cold leg piping, to provide emergency core cooling. Each of the Accumulator lines are 10-inch, Schedule 140 and the portion of piping evaluated for LBB extends from the cold leg pipe through two check valves and ends at an isolation valve near the Accumulator tanks. Layout figures of the relevant Accumulator piping are provided in Figure 3-1 and Figures 3-6 through 3-9 of Enclosure 3 to this letter.

The RHR lines evaluated for LBB are separated into the RHR suction line and RHR return lines. The RHR lines draw coolant from the RCL, pass it through a heat exchanger to remove residual heat, and return the coolant back to the RCL. The RHR suction line is attached to one of the four RCL hot leg piping segments. The RHR suction line evaluated for LBB is 14-inch, Schedule 160 extending from the hot leg pipe through an isolation valve and ending at a second isolation valve.

The RHR return lines are attached to the Accumulator line piping for two of the four reactor coolant loops. The RHR return line evaluated for LBB is 8-inch, Schedule 140 at the connection to the Accumulator line and ending at the first check valve. Layout figures of the RHR suction and return lines are provided in Figures 5-3 and 5-4 of Enclosure 4 to this letter, respectively.

The SI lines evaluated for LBB are associated with both the RCL hot leg piping and cold leg piping. Hot leg SI lines are directly attached to each of the four RCL hot leg piping segments. The hot leg SI lines evaluated for LBB are 6-inch, Schedule 160 extending from the hot leg pipe through a check valve before transitioning to 8-inch, Schedule 140 piping and ending at an isolation valve.

Cold leg SI lines are attached to the Accumulator line piping and provide injection to the RCL cold leg through the Accumulator line. The cold leg SI lines evaluated for LBB are 10-inch, Schedule 140 at the connection to the Accumulator line transitioning to 6-inch, Schedule 160 piping and ending at a check valve. Layout figures of the relevant SI piping are provided in Figure 3-1 and Figures 3-5 through 3-7 of Enclosure 5 to this letter.

Operating pressure and temperature considered for the LBB evaluation of each of these piping systems are provided in Table 1, below.

Table 1
LBB Evaluation Input Parameters for Operating Conditions

Accumulator Lines:	
Operating Temperature, Fahrenheit (°F)	
From cold leg to shortly beyond first check valve	549
From shortly beyond first check valve to isolation valve	120
Operating Pressure, Pounds Per Square Inch Gauge (psig)	
From cold leg to first check valve	2345
From first check valve to second check valve	2235
From second check valve to isolation valve	644
RHR Lines:	
Operating Temperature, °F	
Suction line, from hot leg to first isolation valve	617
Suction line, from first isolation valve to second isolation valve	120
Return line, from Accumulator line to first check valve	120
Operating Pressure, psig	
Suction line, from hot leg to first isolation valve	2235
Suction line, from first isolation valve to second isolation valve	450
Return line, from Accumulator line to first check valve	2235
SI Lines:	
Operating Temperature, °F	
Hot leg SI, from hot leg to first check valve	618
Hot leg SI, from first check valve to isolation valve	120
Cold leg SI, from Accumulator line to first check valve	120
Operating Pressure, psig	
Hot leg SI, from hot leg to isolation valve	2235
Cold leg SI, from Accumulator line to first check valve	2235

Thermal stratification occurs when operating conditions permit hot and cold layers of water to exist simultaneously in a horizontal pipe. This can result in significant thermal loadings due to the high fluid temperature differentials. Changes in the stratification state result in thermal cycling, which can cause fatigue damage. In response to Nuclear Regulatory Commission (NRC) Bulletin 88-08, Supplement 3 (Reference 1), the potential for thermal stratification was examined

for CNP in 1989. WCAP-12143, including Supplement 1 (Reference 2), identifies auxiliary piping systems at CNP which may be susceptible to thermal stratification. The piping of the Accumulator lines, RHR lines, and SI lines are not identified as piping systems which are susceptible to thermal stratification.

2.2 Current Technical Specifications Requirements

A reliable leak detection system is required for application of the LBB methodology. This reliability is necessary to monitor initiation of a leak in the reactor coolant pressure boundary so that appropriate actions can be taken to place the plant in a safe condition.

At CNP, the TS for Unit 2 requires that the reactor coolant leakage detection system be operable in operating Modes 1 through 4. Per the current Unit 2 TS Bases, the particulate and gaseous radioactivity monitors are considered operable when capable of detecting a 1 gpm increase in unidentified leakage within 4 hours, given an RCS activity equivalent to that assumed in the design calculations for the monitors.

The CNP reactor coolant leakage detection system is consistent with the intent of the regulatory position in Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," (Reference 3) in that it is capable of detecting a 1 gpm leak in 1 hour. This exceeds the criterion of 1.0 gpm detection within 4 hours, stated in Generic Letter 84-04 (Reference 4) and NUREG-1061, Volume 3, Section 5.7(b) (Reference 5) as being acceptable for applying the LBB methodology.

Furthermore, the application of LBB has been previously evaluated for the pressurizer surge line at CNP Unit 1 and Unit 2. The basis for the surge line LBB evaluation considered a leak detection rate of 0.8 gpm, below the 1.0 gpm leak detection capability criterion (References 3, 4, and 5). The NRC approval for implementation of the surge line LBB was predicated on demonstration that the CNP leakage detection systems are capable of reliably detecting 0.8 gpm of primary coolant leakage. The Safety Evaluation Report for the surge line LBB (Reference 6) documents that the 0.8 gpm leakage detection capability was adequately justified. A CNP leakage detection capability calculation demonstrates the capability to detect a 0.8 gpm RCS leak within one hour is valid for leaks in the Accumulator, RHR, and SI piping. As such, the capability to detect a 0.8 gpm RCS leak within one hour is the basis for LBB evaluation. The technical evaluations of LBB for the Accumulator, RHR, and SI lines are not dependent on the specific response times of the credited leak detection systems.

2.3 Reason for the Proposed Change

I&M is requesting this approval because, without the requirement to design against a double guillotine break, there would be additional margin in future piping analysis. The margin associated with the approval of this request could eliminate future needs for additional pipe restraints or supports whose installation and maintenance could require personnel radiation exposure as well as resource expenditures to engineer, install, and maintain. It would also allow I&M to realize significant cost savings by simplifying the update process for calculations impacted by the recent Unit 2 reactor upflow modification, completed in the spring of 2018.

2.4 Description of the Proposed Change

I&M requests NRC approval to apply LBB methodology to piping for the Accumulator, RHR, and SI systems at CNP, Unit 2.

The proposed amendment would modify TS 3.4.13, "RCS Operational LEAKAGE," to change the limits for unidentified leakage from less than or equal to 1 gpm to less than or equal to 0.8 gpm. The proposed amendment would also modify TS 3.4.15, "RCS Leakage Detection Instrumentation." The change to TS 3.4.15 to reflect application of LBB to Unit 2 is described in Enclosure 14 to this letter along with a separate change also affecting TS 3.4.15. Enclosure 17 to this letter provides existing Unit 2 TS pages, marked up to show the proposed changes. Enclosure 19 to this letter provides Unit 2 TS Bases pages, marked up to reflect the TS change. The TS Bases pages are provided for information purposes only. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the Technical Specifications Bases Control Program. Clean Unit 2 TS pages with proposed changes incorporated will be provided to the NRC Licensing Project Manager when requested.

Background

In a nuclear power plant, structures, systems, and components important to safety require protection from accidents, including pipe breaks. A pipe break creates dynamic forces due to fluid discharge and pipe whip as a reaction to the jet created at the break location. The magnitude of the dynamic forces generated by a pipe break depends on the size of the break. One method to determine the size of the break is to assume an instantaneous formation of an arbitrary break and separation across the pipe diameter. This deterministic postulation is non-mechanistic and provides the severest condition requiring a complex protection system to counteract the dynamic forces created by the pipe break.

In reality, a pipe break occurs through the formation of a tiny crack in the line that, if unstable, develops into a full size crack over time. A second method for estimating a break makes use of this fact by examining the potential for, and the duration of the crack formation. Through this analysis, it is possible to predict whether a crack will form and, in the event of its formation, whether sufficient warning will be available to safely shut down the plant. This complex analysis requires reliable engineering data of the pipe material, its configuration, and plant operating experience. However, a successful implementation of this methodology reduces the complexity of systems required to protect the plant against pipe breaks. The application of this methodology, referred to as LBB methodology, reduces radiation exposure and maintenance costs while maintaining plant safety.

10 CFR 50, Appendix A, General Design Criteria (GDC) 4 allows the use of LBB analyses, when reviewed and approved by the NRC, to eliminate from the design basis the dynamic effects of the pipe ruptures postulated in NUREG-0800, Section 3.6.3 (Reference 7). An NRC staff-approved LBB analysis permits licensees to remove protective hardware such as pipe whip restraints and jet impingement barriers, redesign pipe connected components, their supports and their internals, and perform other related changes in operating plants.

On February 1, 1984, the NRC issued Reference 4 to all operating Pressurized-Water Reactor (PWR) licenses on the subject of "Safety Evaluation of Westinghouse Topical Reports

Dealing With Elimination of Postulated Pipe Breaks in PWR Primary Main Loops." The NRC completed their review of I&Ms response to Reference 4 and issued a Safety Evaluation and License Amendment No. 76 to CNP Unit 2 (Reference 8) to delete license condition 2.C.(3)(a) on "Analysis of Reactor Vessel Supports and Internals."

The NRC also approved application of LBB methodology for the CNP Unit 1 and Unit 2, pressurizer surge line rupture. An LBB analysis was performed by Westinghouse consistent with the criteria in NUREG-1061, Volume 3, and GDC-4 of Appendix A to 10 CFR 50. The analysis concluded that the probability of large pipe breaks occurring in the pressurizer surge line is sufficiently low such that dynamic effects associated with the postulated pipe breaks need not be included in the design basis. The LBB analysis was submitted for NRC review, and was approved as documented in an NRC Safety Evaluation Report (Reference 6).

3.0 TECHNICAL EVALUATION

3.1 Basis for the Approval of Request

The proposed update of the I&M Unit 2 LBB evaluation is provided in three separate enclosures (Enclosures 3, 4, and 5 to this letter), as described below. In addition, fatigue crack growth evaluations for the affected piping are provided in Enclosure 6 to this letter as described below. The evaluation of fatigue crack growth is not required by the Standard Review Plan 3.6.3 as part of the demonstration of LBB, but has been included in this submittal based on precedence set by previous submittals. Enclosure 7 to this letter provides additional information supporting the LBB evaluation, provided as a response to an NRC request for additional information (RAI) received regarding the amendment request in Reference 9. While the request in Reference 9 is specific to CNP Unit 1, the responses to the RAI are also applicable to Unit 2.

Enclosure 3 to this letter contains WCAP-18295-P "Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology." This report is an LBB analysis performed in accordance with 10 CFR 50, Appendix A, GDC-4 and NUREG-0800, Standard Review Plan 3.6.3. The analysis performs an evaluation of CNP Unit 1 and Unit 2 Accumulator piping, but this request is only asking for approval for Unit 2 Accumulator piping. Enclosure 9 contains a non-proprietary version of WCAP-18295-P.

Enclosure 4 to this letter contains WCAP-18302-P "Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology." This report is an LBB analysis performed in accordance with 10 CFR 50, Appendix A, GDC-4 and NUREG-0800, Standard Review Plan 3.6.3. The analysis performs an evaluation of CNP Unit 1 and Unit 2 RHR piping, but this request is only asking for approval for Unit 2 RHR piping. Enclosure 10 contains a non-proprietary version of WCAP-18302-P.

Enclosure 5 to this letter contains WCAP-18309-P "Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology." This report is an LBB analysis performed in accordance with 10 CFR 50, Appendix A, GDC-4 and NUREG-0800, Standard Review Plan 3.6.3. The analysis

performs an evaluation of CNP Unit 1 and Unit 2 SI piping, but this request is only asking for approval for Unit 2 SI piping. Enclosure 11 contains a non-proprietary version of WCAP-18309-P.

Enclosure 6 to this letter contains WCAP-18394-P "Fatigue Crack Growth Evaluations of D.C. Cook Units 1 and 2 RHR, Accumulator, and Safety Injection Lines Supporting Expanded Scope Leak-Before-Break." This report contains fatigue crack growth evaluations performed in support of the LBB analyses contained in Enclosures 3, 4, and 5. The evaluations perform a fatigue crack growth assessment of CNP Unit 1 and Unit 2 Accumulator, RHR, and SI piping, but this request is only asking for approval for the associated Unit 2 piping. Enclosure 12 contains a non-proprietary version of WCAP-18394-P.

Enclosure 7 to this letter contains LTR-SDA-II-18-41-P, "Responses to NRC Questions on the Expanded Scope Leak-Before-Break Evaluations for D.C. Cook Units 1 and 2." This letter addresses an NRC RAI submitted in response to the amendment request in Reference 9, but is also relevant to this amendment request due to the information provided in support of the analyses in Enclosures 3, 4, and 5. Enclosure 13 contains a non-proprietary version of LTR-SDA-II-18-41-P.

Enclosure 8 to this letter contains affidavits from the Westinghouse Electric Company for withholding the proprietary information contained in Enclosures 3, 4, 5, 6, and 7. Each affidavit sets forth the basis for which the information may be withheld from public disclosure by the Commission and addresses, with specificity, the considerations listed in 10 CFR 2.390(b)(4). Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390.

3.2 Evaluation Approach

For application of the LBB methodology, Westinghouse performed a review of PWR operating history to validate that the probability of crack development due to primary water stress corrosion cracking, water hammer, cyclic fatigue, thermal stratification, creep, erosion, erosion-corrosion, and brittle fracture is remote. This review has been provided through review of the operating history of the plant, including, but not limited to vendor operating history, piping design bases, water quality control, and the Updated Final Safety Analysis Report.

A review of the materials and their properties was also performed. The material type of the seamless pipes (A376 TP316) and fittings (A403 WP316) were found to be resistant to stress corrosion cracking and other potential degradation mechanisms.

The final step in the evaluation is the determination of the margins against leakage and unstable flaw propagation. This evaluation is initiated through the calculation of applied loads. For the leak rate evaluations, loading contributions from dead-weight, thermal expansion, and pressure are considered. For flaw stability evaluations, loading contributions from dead-weight, thermal expansion, pressure, and faulted seismic events are considered. The piping systems are analyzed using these load combinations to determine the limiting locations. The leakage and the critical flaw sizes at the limiting locations were calculated to determine the margin. Loads used in the analysis take into account the effects due to the implementation of the measurement uncertainty recapture power uprate amendment issued in Reference 10.

The highlights of this evaluation are summarized as follows:

1. The forces and moments associated with normal operation (e.g., pressure, dead-weight, and thermal expansion) and faulted seismic events (Design Basis Earthquake) have been considered in the piping analyses.

2. Analysis locations are categorized by piping geometry, operating conditions (pressure and temperature), material properties, and welding process. The critical analysis location is determined by the maximum faulted stress of any location in each distinct category.

3. Through-wall flaws, under normal operation loading, have been postulated at the critical analysis locations. The predicted flaw size at each critical analysis location is large enough to ensure detection with a margin of at least ten over the plant leak detections capability under normal operating conditions.

4. Using the fracture mechanics analytical model, flaw stability evaluations were performed to determine the critical flaw sizes, at each critical analysis location, under faulted operation loading. The ratio of critical flaw sizes to the respective leakage flaw sizes at each critical analysis location is shown to meet the required margin of two or greater.

5. A review of CNP operating experience has been performed to evaluate whether the pipe will experience stress corrosion cracking, fatigue, or water hammer. The review included system operational procedures, system modification history, water chemistry parameters, limits and controls, resistance of piping material to various forms of stress corrosion, and performance of the pipe under cyclic loading.

6. The piping materials have been examined for susceptibility to thermal aging and potential for creep or brittle cleavage-type failure over the range of operating temperatures.

Westinghouse also performed fatigue crack growth evaluations of the Accumulator lines, the RHR lines, and the SI lines to determine degradation related to cyclic fatigue, and to evaluate stability of a through-wall flaw in support of the application of LBB methodology.

3.3 Evaluation Findings

The results of this evaluation indicate that a factor of ten or more exists for leak detection and a factor of two or more exists between the leakage flaw size and the critical flaw size for CNP Unit 2. The faulted loads have been combined by the absolute summation method and therefore the recommended margin on loads is satisfied. All other conditions relative to the operating history are also satisfied. The results of the evaluation are summarized below:

1. The result of analyses using the normal (pressure, dead-weight, and thermal expansion) and faulted loads identified seven critical analysis locations for the Accumulator lines, six critical analysis locations for the RHR lines, and nine critical analysis locations for the SI lines. Each critical location represents the highest stress

for each categorization based on piping geometry, operating conditions (pressure and temperature), material properties, and welding process.

2. The leakage flaw sizes are calculated for 8 gpm and therefore, the margin of ten on leak rate is satisfied with respect to the 0.8 gpm leak detection capability at CNP. The faulted loads have been summed absolutely; a margin exceeding one exists for the load conditions. The minimum margin between the leakage flaw size and the critical flaw size is two.

3. The CNP operating history indicated that there is reasonable assurance that the pipe will not be affected by water hammer, stress corrosion cracking, and fatigue. Additionally, CNP Unit 2 Inservice Inspection (ISI) examination records for the associated piping were reviewed and none of the examinations reported recordable indications.

4. Fatigue crack growth evaluations for the Accumulator piping, RHR piping, and SI piping show that small surface flaws would not develop to through-wall flaws, and that the growth of a flaw would be very slow. These results support the justification that flaw growth would be insignificant in between the time when leakage reaches 8 gpm and the time that the plant would be shut down.

5. Sixty-year fatigue crack growth results for each piping system show that the fatigue crack growth evaluations bound the transient projections for the 60-year period of extended operation.

It is, therefore, concluded that the LBB methodology is applicable to the CNP Unit 2 Accumulator lines, RHR lines, and SI lines.

3.4 Evaluation of Changes to Technical Specifications

The change to TS 3.4.13, "RCS Operational LEAKAGE," will bound the application of LBB to RHR, SI, Accumulator, and Pressurizer Surge Line piping by reducing the allowed RCS Operational LEAKAGE for unidentified LEAKAGE from 1 gpm to 0.8 gpm. This change maintains the validity of the NRC Safety Evaluation Report (Reference 6) which approves LBB application to the Pressurizer Surge Line piping. This change also brings Unit 2 allowed RCS Operational LEAKAGE for unidentified LEAKAGE into alignment with Unit 1 TS 3.4.13, pending the amendment requested via Reference 9.

The NRC Safety Evaluation Report regarding LBB application to the Pressurizer Surge Line Piping also required that containment atmosphere grab samples be taken every 12 hours if containment particulate monitor channels became inoperable. Changes to TS 3.4.15, "RCS Leakage Detection Instrumentation," are evaluated in Enclosure 14 to this letter.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Regulatory Requirements

The applicable regulatory requirement for submitting the LBB evaluation to exclude the dynamic effects associated with postulated pipe ruptures from the design basis is specified in 10 CFR 50, Appendix A, GDC 4. This LAR is submitted in accordance with 10 CFR 50.90.

10 CFR 50, Appendix A, GDC CRITERION 4 Environmental and dynamic effects design bases, states:

> *Structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.*

As described in Updated Final Safety Analysis Report, Section 1.4, the Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the CNP design. The following PSDC are relevant to the proposed amendment:

PSDC CRITERION 33 Reactor Coolant Pressure Boundary Capability

> *The reactor coolant pressure boundary shall be capable of accommodating without rupture the static and dynamic loads imposed on any boundary component as a result of an inadvertent and sudden release of energy to the coolant. As a design reference, this sudden release shall be taken as that which would result from a sudden reactivity insertion such as rod ejection (unless prevented by positive mechanical means), rod dropout, or cold water addition.*

PSDC CRITERION 34 Reactor Coolant Pressure Boundary Rapid Propagation Failure Prevention

> *The reactor coolant pressure boundary shall be designed and operated to reduce to an acceptable level the probability of rapidly propagating type failure. Consideration is given (a) to the provisions for control over service temperature and irradiation effects which may require operational restrictions, (b) to the design and construction of the reactor pressure vessel in accordance with applicable codes, including those which establish requirements for absorption of energy within the elastic strain energy range and for absorption of energy*

by plastic deformation and (c) to the design and construction of reactor coolant pressure boundary piping and equipment in accordance with applicable codes.

NUREG-1061, Volume 3 (Reference 5) provides a methodology that the NRC accepts for LBB submittals. The LBB approach described applies the fracture mechanics technology to demonstrate that high energy fluid piping is very unlikely to experience double-ended ruptures or their equivalent in longitudinal or diagonal splits. The NUREG also provides a step by step approach to performing LBB analysis. I&M has followed the guidance of NUREG-1061, Volume 3, in performing the enclosed analyses.

NUREG-0800, Section 3.6.3 (Reference 7) provides guidance to NRC reviewers on the specific areas to review and acceptance criteria for LBB applications. The LBB methodology is reviewed for key parameters to ensure that acceptance criteria are satisfied.

The proposed changes are consistent with the above regulatory requirements and criteria. Therefore, the proposed changes will assure safe operation by continuing to meet applicable regulations and requirements.

4.2 Precedent

The NRC has approved similar LARs to allow for the acceptance of LBB methodology analysis as listed in Precedents 1 and 2. A similar amendment request was submitted for Unit 1 and is under NRC review at the time of this submittal, as listed in Precedent 3.

Previously, I&M has received approval from the NRC for the use of LBB methodology on CNP Unit 1 and Unit 2 Pressurizer Surge Line piping and RCS piping. These approvals were received outside of the LAR process, as listed in Precedents 4 and 5.

1. Letter from Thomas J. Wengert, NRC, to Mark A. Schimmel (Northern States Power Company – Minnesota), "Prairie Island Nuclear Generating Plant, Units 1 and 2 - Issuance of Amendments Re: Request to Exclude the Dynamic Effects Associated with Certain Postulated Pipe Ruptures from the Licensing Basis Based Upon Application of Leak-Before-Break Methodology. (TAC Nos. ME2976 and ME2977)," dated October 27, 2011, (ADAMS Accession Number ML112200856).

2. Letter from Patrick D. Milano, NRC, to Mary [*sic*] G. Korsnick (R. E. Ginna Nuclear Power Plant, LLC), "R. E. Ginna Nuclear Power Plant – Amendment Re: "Application of Leak-Before-Break Methodology For Pressurizer Surge Line and Accumulator Lines" (TAC No. MC4929)," dated September 22, 2005, (ADAMS Accession Number ML052430343).

3. Letter from Q. Lies, I&M, to U.S. NRC, "Donald C. Cook Nuclear Plant Unit 1 Request for Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping," March 7, 2018 (ADAMS Accession No. ML18072A012).

4. Letter from John F. Stang, NRC, to Robert P. Powers, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Review of Leak-Before-Break for the Pressurizer Surge Line Piping as Provided by 10 CFR Part 50, Appendix A, GDC 4" (TAC Nos. MA7834 and MA7835)," dated November 8, 2000, (ADAMS Accession Number ML003767675).

5. Letter from Steven A. Varga, NRC, to John Dolan, I&M, Issuance of Amendment No. 76 to Donald C. Cook Unit 2 to delete license condition on analysis of reactor vessel supports and internals, dated November 22, 1985, (ADAMS Accession Number ML021010521).

4.3 No Significant Hazards Consideration

See Enclosure 15 to this letter.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

5.0 ENVIRONMENTAL CONSIDERATION

I&M has evaluated the proposed amendments for environmental considerations. The review has resulted in the determination that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20. However, the proposed amendments do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendments meet the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendments.

6.0 REFERENCES

1. Nuclear Regulatory Commission (NRC) Bulletin 88-08, Supplement 3, "Thermal Stresses in Piping Connected to Reactor Coolant Systems," April 11, 1989.

2. WCAP-12143, Revision 0 and Supplement 1, "Report on Evaluation of Auxiliary Piping attached to the Reactor Coolant System per NRC Bulletin 88-08 for American Electric Power Service Corporation D. C. Cook Units 1 and 2," April 1989.

3. Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," Revision 0, May 1973.

4. NRC, Generic Letter 84-04, "Safety Evaluation of Westinghouse Topical Reports Dealing with Elimination of Postulated Pipe Breaks in PWR Primary Main Loops," February 1, 1984.

5. NUREG-1061, Volume 3, "Report of the U.S. Nuclear Regulatory Commission Piping Review Committee, Evaluation of Potential for Pipe Breaks," November 1984.

6. Letter from John F. Stang, NRC to Robert P. Powers, Indiana Michigan Power Company(I&M), "Donald C. Cook Nuclear Plant, Units 1 and 2 – Review of Leak-Before-Break for the Pressurizer Surge Line Piping as Provided by 10 CFR Part 50, Appendix A, GDC 4" (TAC Nos. MA7834 and MA7835)," dated November 8, 2000, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML003767675).

7. NUREG-0800, Revision 1, Standard Review Plan: 3.6.3 Leak-Before-Break Evaluation Procedures, March 2007.

8. Letter from Steven A. Varga (NRC) to John Dolan (Indiana and Michigan Electric Company), Issuance of Amendment No. 76 to Donald C. Cook Unit 2 to delete license condition on analysis of reactor vessel supports and internals, dated November 22, 1985, (ADAMS Accession Number ML021010521).

9. Letter from Q. Lies, I&M, to U. S. NRC, "Donald C. Cook Nuclear Plant Unit 1 Request for Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping," March 7, 2018, (ADAMS Accession No. ML18072A012).

10. Letter from John F. Stang, NRC to A. Christopher Bakken, I&M, "Donald C. Cook Nuclear Plant, Unit 2 – Issuance of Amendment Regarding Measurement Uncertainty Power Uprate (TAC No. MB6751)," May 2, 2003, (ADAMS Accession No. ML030990094).

Enclosure 14 to AEP-NRC-2018-66

Proposed License Amendment Request Regarding
Technical Specification 3.4.15, "RCS Leakage Detection Instrumentation"

1.0 SUMMARY DESCRIPTION

Pursuant to Title 10 Code of Federal Regulations (CFR) 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, proposes to amend the Appendix A Technical Specifications (TS) to Facility Operating Licenses DPR-58 and DPR-74. I&M proposes to change TS 3.4.15, "RCS Leakage Detection Instrumentation," to delete the containment humidity monitor from the Limiting Condition of Operation (LCO) statement. Additionally, I&M proposes to revise the structure of the Unit 2 TS 3.4.15 to be consistent with the Unit 1 TS 3.4.15, and to reflect the requirements for 0.8 gpm Reactor Coolant System (RCS) leakage detection capability that is required for a change evaluated in Enclosure 2 to this letter.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The RCS leakage detection system and operation is described in the CNP Updated Final Safety Analysis Report (UFSAR), and CNP design documents, as follows:

Currently CNP Unit 1 and Unit 2 RCS leakage into containment is detected by the following methods:

- The containment atmosphere particulate radioactivity monitor, which is the most sensitive.
- The containment atmosphere gaseous radioactivity monitor, which is less sensitive than the particulate radioactivity monitor.
- The containment humidity monitor, which is less sensitive than the particulate and gaseous radioactivity monitors, provides a backup means of detecting RCS leakage.
- An increase in the amount of coolant make-up water, which is required to maintain normal level in the pressurizer, or an increase in containment sump level.

Containment Atmosphere Particulate Radioactivity Monitor

The containment atmosphere particulate radioactivity monitor is the most sensitive instrument of those available for detection of RCS leakage into containment. This instrument is capable of detecting particulate radioactivity in concentrations as low as 10^{-9} microcurie/cubic centimeter (μCi/cc) of containment air. The sensitivity of the particulate radioactivity monitor to an increase in reactor coolant leak rate is dependent upon the magnitude of the normal baseline leakage into containment. The sensitivity is greatest where baseline leakage is low. Where containment atmosphere particulate activity is below the threshold of detectability, operation of the monitor with stationary filter paper would increase leak sensitivity to a few cc/minute. Assuming a low background of particulate radioactivity, a reactor coolant corrosion product radioactivity of 0.2 μCi/cc (a value consistent with little or no fuel cladding leakage), and complete dispersion of the leaking radioactive solids into the containment atmosphere, the particulate radioactivity monitor is capable of detecting leaks as small as approximately 0.0013 gpm (5 cc/minute) within thirty minutes after they occur. If only ten percent of the particulate activity is actually dispersed in the air, the threshold of detectable leakage is raised to approximately 0.013 gpm (50 cc/minute). For cases where baseline reactor coolant leakage falls within the

detectable limits of the particulate radioactivity monitor, the instrument can be adjusted to alarm on leakage increases from two to five times the baseline value. The containment atmosphere particulate radioactivity monitor provides indication, record, and alarm function in the Control Room, but no control function. The system is not safety-related, has no safety or accident mitigation functions and no non-safety related/diverse actuation functions.

Containment Atmosphere Gaseous Radioactivity Monitor

The containment atmosphere gaseous radioactivity monitor is less sensitive (threshold at 10^{-6} µCi/cc) than the containment atmosphere particulate radioactivity monitor, and would function only in the event that significant reactor coolant gaseous activity exists due to fuel cladding defects. Assuming a reactor coolant gaseous activity of 0.3 µCi/cc, the occurrence of a leak of 2 to 4 gpm would double the background activity (predominantly argon-41) in less than one hour. In these circumstances this instrument is a useful backup to the particulate radioactivity monitor. The containment atmosphere gaseous radioactivity monitor provides indication, record, and alarm function in the Control Room, but no control function. The system is not safety-related, has no safety or accident mitigation functions and no non-safety related/diverse actuation functions.

Containment Humidity Monitor

The containment humidity monitor provides an indirect indication of leakage into containment. This instrumentation does not have the sensitivity of the particulate or gaseous radioactivity monitors, but detects vapor originating from all sources: the reactor coolant, the steam, and the feedwater systems. Plots of containment air dew point variations above a baseline maximum should be sensitive to incremental leakage equivalent to 0.2 to 1.0 gpm. The Containment Humidity Detection System components are not safety-related and provide indication and record functions only. No control or alarm functions are provided. The system has no safety or accident mitigation functions and no non-safety related/diverse actuation functions.

Liquid Inventory in the Process Systems and in the Containment Sump

An increase in the amount of coolant make-up water, which is required to maintain normal level in the pressurizer, will be indicated by an increase in charging flow or change in volume control tank level. Gross RCS leakage will be indicated by a rise in normal containment sump level and periodic operation of containment sump pumps. A run time meter is provided to monitor the frequency of operation and running time of each containment sump pump.

2.2 Current Technical Specifications Requirements

The current Unit 1 TS LCO 3.4.15 is as follows:

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor in each sump;

b. One containment atmosphere particulate radioactivity monitor; and

c. One containment humidity or containment atmosphere gaseous radioactivity monitor.

The current Unit 1 TS 3.4.15 Actions are as follows:

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment sump monitor(s) inoperable.	A.1	----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	A.2	Restore containment sump monitor(s) to OPERABLE status.	30 days
B. Containment atmosphere particulate radioactivity monitor inoperable.	B.1.1	Analyze grab samples of the containment atmosphere.	Once per 12 hours
	OR		
	B.1.2	----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 12 hours
	AND		
	B.2	Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required containment humidity or containment atmosphere gaseous radioactivity monitor inoperable.	C.1 Analyze grab samples of the containment atmosphere. OR C.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 24 hours Once per 24 hours
---------- NOTE ---------- Only applicable when the containment atmosphere gaseous radiation monitor is the only OPERABLE monitor. ---------- D. Containment sump monitor inoperable. AND Containment atmosphere particulate radioactivity monitor inoperable.	D.1 Analyze grab samples of the containment atmosphere. AND D.2.1 Restore containment sump monitor to OPERABLE status. OR D.2.2 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.	Once per 12 hours 7 days 7 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Containment atmosphere particulate radioactivity monitor inoperable. AND Required containment humidity or containment atmosphere gaseous radioactivity monitor inoperable.	E.1 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status. OR E.2 Restore required containment humidity or containment atmosphere gaseous radioactivity monitor to OPERABLE status.	30 days 30 days
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours
G. LCO 3.4.15.a, b, and c not met.	G.1 Enter LCO 3.0.3.	Immediately

The current Unit 1 TS Surveillance Requirement (SR) 3.4.15.5 is as follows:

SURVEILLANCE		FREQUENCY
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the containment humidity monitor.	In accordance with the Surveillance Frequency Control Program

The current Unit 1 TS 3.4.15 differs from the Unit 2 TS 3.4.15. This difference is due to the application of leak-before-break (LBB) methodology to the Unit 1 pressurizer surge line as approved by Reference 1.

The current Unit 2 TS LCO 3.4.15 is as follows:

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor in each sump;

b. One containment atmosphere radioactivity monitor (gaseous or particulate); and

c. One containment humidity monitor.

The current Unit 2 TS 3.4.15 Actions are as follows:

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment sump monitor(s) inoperable.	A.1	----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	A.2	Restore containment sump monitor(s) to OPERABLE status.	30 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere. OR B.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1. AND B.2 Restore required containment atmosphere radioactivity monitor to OPERABLE status.	Once per 24 hours Once per 24 hours 30 days
C. Containment humidity monitor inoperable.	C.1 Analyze grab samples of the containment atmosphere. OR C.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 24 hours Once per 24 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
---------- NOTE ---------- Only applicable when the containment atmosphere gaseous radiation monitor is the only OPERABLE monitor. ---------- D. Containment sump monitor(s) inoperable. AND Containment humidity monitor inoperable.	D.1 Analyze grab samples of the containment atmosphere. AND D.2.1 Restore containment sump monitor(s) to OPERABLE status. OR D.2.2 Restore containment humidity monitor to OPERABLE status.	Once per 12 hours 7 days 7 days
E. Required containment atmosphere radioactivity monitor inoperable. AND Containment humidity monitor inoperable.	E.1 Restore required containment atmosphere radioactivity monitor to OPERABLE status. OR E.2 Restore containment humidity monitor to OPERABLE status.	30 days 30 days
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours
G. LCO 3.4.15.a, b, and c not met.	G.1 Enter LCO 3.0.3.	Immediately

The current Unit 2 TS Surveillance Requirement (SR) 3.4.15.5 is as follows:

SURVEILLANCE		FREQUENCY
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the containment humidity monitor.	In accordance with the Surveillance Frequency Control Program

The Unit 1 and Unit 2 LCOs for TS 3.4.15 require instruments of diverse monitoring principles to be operable to provide confidence that small amounts of unidentified leakage are detected in time to allow actions to place the unit in a safe condition, when RCS leakage indicates possible reactor coolant pressure boundary degradation. Both Unit 1 and Unit 2 LCOs require three instruments to be operable.

2.3 Reason for the Proposed Change

The Unit 1 and Unit 2 containment humidity monitors are obsolete and I&M desires to remove and or abandon the instrumentation. Significant resources are needed to maintain this equipment, and each instance of maintenance causes dose to be received because the instruments are located in lower containment. As discussed further in Section 3.1 of this enclosure, the humidity monitors are considered an indirect indication of leakage to containment, but have been shown to have limited value in identifying RCS leakage.

The Unit 2 TS 3.4.15 is changed to reflect the requirements for 0.8 gpm RCS leakage detection capability required for application of LBB methodology to RCS piping. This change was previously approved by Reference 1 and will be implemented upon approval of this LAR.

2.4 Description of the Proposed Change

The containment humidity monitor and the associated "or" logic are removed from Unit 1 TS LCO 3.4.15 c., such that just the gaseous radioactivity monitor remains in LCO 3.4.15 c.

The gaseous radioactivity monitor is removed from Unit 2 TS LCO 3.4.15 b. along with the "or" logic, such that just the particulate radioactivity monitor remains in TS LCO 3.4.15 b. The containment humidity monitor is removed from Unit 2 TS LCO 3.4.15 c. and is replaced with the gaseous radioactivity monitor, such that just the gaseous radioactivity monitor remains in TS LCO 3.4.15 c.

The proposed Unit 1 and Unit 2 TS LCO 3.4.15 is as follows:

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor in each sump;

b. One containment atmosphere particulate radioactivity monitor; and

c. One containment atmosphere gaseous radioactivity monitor.

With the removal of the containment humidity monitor from the TS LCO 3.4.15 statement, Actions, for both Unit 1 and Unit 2 TS 3.4.15, were changed to reflect removal of the containment humidity monitor and to reflect the removal of the "or" logic from Unit 1 TS LCO 3.4.15 c. and Unit 2 TS LCO 3.4.15 b. In addition, Action G was reworded to align with the wording used in NUREG-1431, Revision 2 (Reference 2).

The change for Unit 1 TS 3.4.15 Actions is as follows:

- Action C – "Required containment humidity or" was deleted from the Condition.
- Action D – The Note was deleted from the Condition.
- Action E – Action was deleted in its entirety.
- Action F – Renumbered to reflect the deleted Action E and deleted "E" from the Condition.
- Action G – Renumbered to reflect the deleted Action E. Rephrased the Condition from "LCO 3.4.15.a, b, and c not met" to "All required monitors inoperable."

The Change for Unit 2 TS 3.4.15 Actions is as follows:

- Action B – Added "particulate" to the Condition and changed "24 hours" to "12 hours" in the Completion Time.
- Action C – Deleted "humidity" from the Condition and replaced with "atmosphere gaseous radioactivity." Added an AND to the Required Action to restore containment atmosphere gaseous radioactivity monitor to OPERABLE status with a Completion Time of 30 days.
- Action D – Deleted the Note from the Condition. Deleted "humidity" from the Condition and replaced with "atmosphere particulate radioactivity." Deleted "humidity" from the Required Action D.2.2 and replaced with "atmosphere particulate radioactivity."
- Action E – Action was deleted in its entirety.
- Action F – Renumbered to reflect the deleted Action E and deleted "E" from the Condition.
- Action G – Renumbered to reflect the deleted Action E. Rephrased the Condition from "LCO 3.4.15.a, b, and c not met" to "All required monitors inoperable."

The proposed Unit 1 and Unit 2 TS 3.4.15 Actions are as follows:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment sump monitor(s) inoperable.	A.1 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 24 hours
	AND	
	A.2 Restore containment sump monitor(s) to OPERABLE status.	30 days
B. Containment atmosphere particulate radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere.	Once per 12 hours
	OR	
	B.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1.	Once per 12 hours
	AND	
	B.2 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.	30 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Containment atmosphere gaseous radioactivity monitor inoperable.	C.1.1 Analyze grab samples of the containment atmosphere. OR C.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1. AND C.2 Restore containment atmosphere gaseous radioactivity monitor to OPERABLE status	Once per 24 hours Once per 24 hours 30 days
D. Containment sump monitor(s) inoperable. AND Containment atmosphere particulate radioactivity monitor inoperable.	D.1 Analyze grab samples of the containment atmosphere. AND D.2.1 Restore containment sump monitor(s) to OPERABLE status. OR D.2.2 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.	Once per 12 hours 7 days 7 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, C, or D not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours
F. All required monitors inoperable.	F.1 Enter LCO 3.0.3.	Immediately

With the removal of the containment humidity monitor from the Unit 1 and Unit 2 TS LCO 3.4.15 statement, TS SR 3.4.15.5, for both Unit 1 and Unit 2 TS 3.4.15, is deleted to reflect removal of the containment humidity monitor from Unit 1 TS LCO 3.4.15 c. and Unit 2 TS LCO 3.4.15 b.

Enclosures 16 and 17 to this letter provide the Unit 1 and Unit 2 TS pages, respectively, marked to show proposed changes. Removed text on the pages of Enclosure 16 and 17 is lined through and new text on these pages is marked with a single-line border. New clean Unit 1 and Unit 2 TS pages with proposed changes incorporated will be provided to the Nuclear Regulatory Commission (NRC) Licensing Project Manager when requested. Also provided as Enclosures 18 and 19 to this letter, for information purposes only, are the Unit 1 and Unit 2 TS Bases pages, respectively, marked to show proposed changes. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the Technical Specifications Bases Control Program.

3.0 TECHNICAL EVALUATION

3.1 Evaluation of Deletion of the Containment Humidity Monitor from TS LCO 3.4.15

The containment humidity monitor is removed from Unit 1 TS LCO 3.4.15 c. along with the "or" logic, such that just the gaseous radioactivity monitor remains in LCO 3.4.15 c.

The gaseous radioactivity monitor is removed from Unit 2 TS LCO 3.4.15 b. along with the "or" logic, such that just the particulate radioactivity monitor remains in TS LCO 3.4.15 b. The containment humidity monitor is removed from Unit 2 TS LCO 3.4.15 c. and is replaced with the gaseous radioactivity monitor, such that just the gaseous radioactivity monitor remains in TS LCO 3.4.15 c.

Regulatory Guide (RG) 1.45, Reactor Coolant Pressure Boundary Leakage Detection Systems, (Reference 3) states:

"At least three separate detection methods should be employed and two of these methods should be (1) sump level and flow monitoring and (2) airborne particulate radioactivity monitoring. The third method may be selected from the following:

a. Monitoring of condensate flow rate from air coolers,
b. Monitoring of airborne gaseous radioactivity

Humidity, temperature or pressure monitoring of the containment atmosphere should be considered as alarms or indirect indication of leakage to the containment."

I&M would continue to maintain three required methods, as discussed in Regulatory Guide (RG) 1.45. The three methods are containment sump monitoring, containment airborne particulate radioactivity monitoring, and containment airborne gaseous radioactivity monitoring. As described in RG 1.45, monitoring of humidity in the containment atmosphere is considered an indirect indication of leakage into containment. With the removal of the containment humidity monitor, the control room operators would continue to have containment temperature and pressure monitoring instrumentation for use as indirect indication of leakage into containment.

A historical review was conducted of actual plant data for the currently installed containment humidity monitoring instrumentation's ability to detect less than TS allowable RCS leakage. Two instances were identified in which RCS leakage into containment was identified by other monitored parameters, but was not detected by the containment humidity monitoring instrumentation. There were no instances where humidity monitors were the only means to detect an RCS leak. In 2004, the Unit 1 pressurizer manway experienced leakage which was identified by the containment atmosphere particulate radioactivity monitor. The recorded leakage was a maximum of 0.27 gpm. In 2015, a Unit 1 reactor coolant pump seal experienced elevated leakage. This leakage was indicated on both Unit 1 containment atmosphere particulate radioactivity monitors. There was not a corresponding increase indicated on the containment humidity monitor. These instances demonstrate that the remaining RCS leakage detection instrumentation is sufficient to detect significant leakage from the reactor coolant pressure boundary.

3.2 Evaluation of Change to TS 3.4.15 Actions

By Reference 1, the NRC approved the application of LBB methodology to the pressurizer surge line for both CNP Unit 1 and Unit 2. As allowed by Reference 1, the methodology was only applied to Unit 1, and administrative controls, required by Reference 1, were established for Unit 1 RCS leakage detection. These administrative controls established an increase in the frequency of containment air grab samples from every 24 hours to every 12 hours when there were no containment atmosphere particulate radioactivity monitoring channels operable.

By Reference 4, the NRC approved the conversion of CNP TS to Improved Technical Specifications (ITS) consistent with Reference 2 (NUREG-1431, Revision 2). When the administrative controls, required by Reference 1, were added to Unit 1 TS 3.4.15 upon conversion to ITS, it resulted in Unit 1 TS 3.4.15 being structured differently than Unit 2 TS 3.4.15. Prior to conversion to ITS the CNP Unit 1 and Unit 2 TS for RCS leakage detection instrumentation were identical.

By Reference 5, the NRC approved the CNP adoption of Reference 6 (TSTF-513), which addressed a generic non-conservatism in RCS leakage detection TS described in Reference 7 (Information Notice 2005-24). CNP adopted Reference 6 for both Unit 1 and Unit 2. Both TS logic structures result in the same level of conservatism in RCS leakage detection, with the Unit 1 TS 3.4.15 supporting the application of LBB methodology to the Unit 1 pressurizer surge line. Therefore, restructuring the Unit 2 TS 3.4.15 to be consistent with the Unit 1 TS 3.4.15 would continue to meet the licensing basis requirements established by Reference 1 and be consistent with Reference 6. The discussion that follows provides a detailed evaluation of each change.

Evaluation of the change to Unit 1 and Unit 2 TS 3.4.15 LCO statement to remove the containment humidity monitor is discussed above.

The evaluation of change for Unit 1 TS 3.4.15 Actions is as follows:

- Action C – "Required containment humidity" was deleted from the Condition. Added an AND to the Required Action to restore containment atmosphere gaseous radioactivity monitor to OPERABLE status with a Completion Time of 30 days. Removing the containment humidity monitor from Action C is consistent with the removal of the containment humidity monitor from the LCO statement, discussed in Section 3.1 above. Adding a 30-day required restoration time brings this Action into line with Actions A and B, and ensures a timely return to maintaining three separate detection methods.
- Action D – The Note was deleted from the Condition. The Note is redundant once the containment humidity monitor is removed from the LCO statement.
- Action E – Action was deleted in its entirety. The Required Actions contained in Action E are redundant to existing Required Action B.2 and Required Action C.2, which is added by this amendment request.
- Action F – Renumbered to reflect the deleted Action E and deleted "E" from the Condition.
- Action G – Renumbered to reflect the deleted Action E. Rephrased the Condition from "LCO 3.4.15.a, b, and c not met" to "All required monitors inoperable." The Condition was rephrased to match the wording used in Reference 2 (NUREG-1431, Revision 2). The revised wording does not change the intent of the Action, and eliminates the need to refer back to the LCO statement.

The evaluation of change for Unit 2 TS 3.4.15 Actions is as follows:

- Action B – Removed "Required" and added "particulate" to the Condition and changed "24 hours" to "12 hours" in the Completion Time. Action B is modified to address only the particulate radioactivity monitor, consistent with the changes to Unit 2 LCO 3.4.15 b. discussed above. The change in Completion Time is required due to the implementation of LBB methodology for Unit 2, discussed in Enclosure 2 to this letter, and is consistent with changes approved by the NRC in Reference 1.
- Action C – Deleted "humidity" from the Condition and replaced with "atmosphere gaseous radioactivity." Added an AND to the Required Action to restore containment atmosphere gaseous radioactivity monitor to OPERABLE status with a Completion Time of 30 days. The modification to the scope of Action C is consistent with the changes to Unit 2 LCO 3.4.15 c. discussed above. Adding a 30-day required restoration time brings this

Action into line with Actions A and B, and ensures a timely return to maintaining three separate detection methods.

- Action D – Deleted the Note from the Condition. Deleted "humidity" from the Condition and replaced with "atmosphere particulate radioactivity." Deleted "humidity" from the Required Action D.2.2 and replaced with "atmosphere particulate radioactivity." The Note is made redundant by the other changes to Action D and by the removal of the containment humidity monitor from the LCO 3.4.15 statement. Replacing the humidity monitor with the particulate radioactivity monitor is consistent with the intent of the Condition for Action D, which is that the gaseous radioactivity monitor is the only OPERABLE monitor, with the Required Action to restore one other method of detection within the Completion Time of 7 days.
- Action E – Action was deleted in its entirety. The Required Actions contained in Action E are redundant to existing Required Action B.2 and Required Action C.2, which is added by this amendment request.
- Action F – Renumbered to reflect the deleted Action E and deleted "E" from the Condition.
- Action G – Renumbered to reflect the deleted Action E. Rephrased the Condition from "LCO 3.4.15.a, b, and c not met" to "All required monitors inoperable." The Condition was rephrased to match the wording used in Reference 2 (NUREG-1431, Revision 2). The revised wording does not change the intent of the Action, and eliminates the need to refer back to the LCO statement.

3.3 Evaluation of Deletion of TS SR 3.4.15.5

With the removal of the containment humidity monitor from the Unit 1 and Unit 2 TS LCO 3.4.15 statements, Unit 1 and Unit 2 TS SR 3.4.15.5 is deleted to reflect removal of the containment humidity monitor from Unit 1 TS LCO 3.4.15 c. and Unit 2 TS LCO 3.4.15 c.

Enclosures 16 and 17 to this letter provide the Unit 1 and Unit 2 TS pages, respectively, marked to show proposed changes. Removed text on the pages of Enclosures 16 and 17 is lined through and new text on these pages is marked with a single-line border. New clean Unit 1 and Unit 2 TS pages with proposed changes incorporated will be provided to the NRC Licensing Project Manager when requested.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical specifications" states:

> (c) Technical specifications will include items in the following categories:
>
> (2) *Limiting conditions for operation.* (i) Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met...

(ii) A technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:

(A) *Criterion 1.* Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

(B) *Criterion 2.* A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(C) *Criterion 3.* A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(D) *Criterion 4.* A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The proposed change will modify Unit 1 and Unit 2 TS 3.4.15, "RCS Leakage Detection Instrumentation." This change allows for removal of an instrument that is not required in order to indicate a significant abnormal degradation of the reactor coolant pressure boundary. Criteria 2, 3, and 4 are not applicable to the containment humidity monitors. Therefore, the requirements of 10 CFR 50.36 continue to be met with the changes proposed in this license amendment request for Unit 1 and Unit 2 TS 3.4.15.

NUREG-0737, "Clarification of TMI Action Plan Requirements" (Reference 7) established requirements for additional accident-monitoring instrumentation, including containment radiation monitoring and containment water level monitoring, but has no requirements regarding the monitoring of containment humidity. Containment humidity is not a factor in determining CNP Unit 1 and Unit 2 Emergency Action Levels.

General Design Criteria

The construction permits for CNP were issued and the majority of construction was completed prior to issuance of 10 CFR 50, Appendix A, General Design Criteria (GDC), in 1971 by the Atomic Energy Commission (AEC). CNP was designed and constructed to comply with the AEC GDC as proposed on July 10, 1967. The application of the AEC proposed General Design Criteria to the CNP is contained in the UFSAR as the Plant Specific Design Criteria (PSDC). Appendix A of 10 CFR Part 50 GDC differs both in numbering and content from the PSDC for CNP.

The impact of the LCO changes proposed in this submittal on the PSDC applicable to this license amendment request are discussed below:

PSDC 16 Monitoring Reactor Coolant Leakage

"Means shall be provided to detect significant uncontrolled leakage from the reactor coolant pressure boundary."

This change allows for removal of an instrument that is not required in order to detect significant uncontrolled leakage from the reactor coolant pressure boundary. Therefore, the requirements of the CNP UFSAR PSDC 16 continue to be met with the changes proposed in this license amendment request for Unit 1 and Unit 2 TS 3.4.15.

4.2 No Significant Hazards Consideration Determination

See Enclosure 15 to this letter.

4.3 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

5.0 ENVIRONMENTAL CONSIDERATION

I&M has evaluated this license amendment request (LAR) against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. I&M has determined that this LAR meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR Part 50 that 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, or that changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria:

(i) The amendment involves no significant hazards consideration.
As demonstrated in Enclosure 15 to this letter, the proposed TS change does not involve a significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.
This LAR will not change the types or amounts of any effluents that may be released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.
This LAR will not increase the individual or cumulative occupational radiation exposure.

6.0 REFERENCES

1. Letter from John F. Stang Nuclear Regulatory Commission (NRC) to Robert P. Powers Indian Michigan Power Company (I&M), "Donald C. Cook Nuclear Plant, Units 1 and 2 – Review of Leak-Before-Break for the Pressurizer Surge Line Piping as Provided by 10 CFR Part 50, Appendix A, GDC 4" dated November 8, 2000, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML003767675).

2. NUREG-1431, Revision 2, "Standard Technical Specifications Westinghouse Plants," June 2001.

3. Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," Revision 0, May 1973.

4. Letter from Jack Donohew, NRC to Mano K. Nazar, I&M, "D.C. Cook Nuclear Plant, Units 1 and 2 – Issuance of Amendments for the Conversion to the Improved Technical Specifications with Beyond Scope Issues" dated June 1, 2005, (ADAMS Accession Number ML050620034).

5. Letter from Peter S. Tam, NRC to Lawrence J. Weber I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Issuance of Amendments RE: Time Limit to Restore Inoperable Reactor Coolant System Leakage Detection Instrumentation" dated November 1, 2011, (ADAMS Accession Number ML11249A090).

6. TSTF-513-A, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation," January 3, 2011.

7. NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980.

8. NRC, Information Notice 2005-24, "Nonconservatism in Leakage Detection Sensitivity," August 3, 2005 (ADAMS Accession Number ML051780073).

Enclosure 15 to AEP-NRC-2018-66

No Significant Hazards Consideration Determination

In accordance with Title 10 Code of Federal Regulations (CFR) 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, Renewed Facility Operating Licenses DPR-58 and DPR-74, proposes to be allowed to exclude the dynamic effects (Leak Before Break (LBB)) associated with postulated pipe ruptures from the licensing basis for piping attached to the Reactor Coolant System (RCS). Specifically, this includes portions of the Safety Injection, Residual Heat Removal, and Accumulator systems attached to the RCS. Additionally, a change will be made to the Technical Specification (TS) for the RCS leakage detection making the TS more restrictive. This TS change is to reflect the required leakage detection capabilities in order to apply LBB. I&M also proposes a change to TS 3.4.15, "RCS Leakage Detection Instrumentation," to remove the Containment Humidity Monitor instrumentation from the Limiting Condition of Operation.

I&M has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92(c), "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   Overall protection system performance will remain within the bounds of the previously performed accident analyses. The design of the protection systems will be unaffected. The reactor protection system and engineered safety feature actuation system will continue to function in a manner consistent with the plant design basis. All design, material and construction standards that were applicable prior to the request are maintained.

   For CNP, Unit 2, the bounding accident for pipe breaks is a Large Break Loss of Coolant Accident (LBLOCA). Since the application of the LBB analysis verifies the integrity of the piping attached to the reactor coolant system, the probability of a previously evaluated accident is not increased. The consequences of a LBLOCA have been previously evaluated and found to be acceptable. The application of the LBB analysis will cause no change in the dose analysis associated with a LBLOCA, and therefore, does not affect the consequences of an accident.

   The proposed amendment will not alter any assumptions or change any mitigation actions in the radiological consequence evaluations in the Updated Final Safety Analysis Report (UFSAR).

   The proposed change to TS 3.4.15 removes the requirement for containment humidity monitor instrumentation. The occurrence of RCS leakage will continue to be monitored by the remaining required instrumentation, the atmosphere radioactive particulate and gaseous monitors and containment sump monitors. The monitoring of RCS leakage is not a precursor to any accident previously evaluated. The monitoring of RCS leakage is not used to mitigate the consequences of any accident previously evaluated.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any previously evaluated?

Response: No.

No new accident scenarios, failure mechanisms, or single failures are introduced as a result of the proposed change. All systems, structures, and components previously required for the mitigation of an event remain capable of fulfilling their intended design function. The proposed change has no adverse effects on any safety-related systems or components and does not challenge the performance or integrity of any safety-related system. Further, there are no changes in the method by which any safety-related plant system performs its safety function.

The proposed change to TS 3.4.15 allows for the removal of the containment humidity monitor as a RCS leakage detection instrument, which does involve a physical alteration of the plant, but no new or different type of equipment will be installed as a replacement. This change does not involve a change in the methods governing normal plant operation. The proposed change maintains sufficient continuity and diversity of leak detection capability that the probability of piping evaluated and approved for LBB progressing to pipe rupture remains extremely low.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

Margin of safety is related to the ability of the fission product barriers to perform their design functions during and following accident conditions. These barriers include the fuel cladding, the reactor coolant system, and the containment. The proposed amendment request does not involve a change to any of these barriers.

The proposed change does not involve a significant reduction in a margin of safety because adoption of LBB methodology does not reduce the margin of safety that exists in the present CNP TS or UFSAR. The operability requirements of the TS are consistent with the initial condition assumptions of the safety analyses.

This proposed amendment uses LBB technology combined with leakage monitoring to show that it is acceptable to exclude the dynamic effects associated with postulated pipe ruptures from the licensing basis for the systems evaluated that are attached to the RCS. The CNP analysis demonstrates that the LBB margins discussed in NUREG-1061, Volume 3 are satisfied.

The proposed change to TS 3.4.15 removes the containment humidity monitor instrument from the operability requirements for the RCS leakage detection instrumentation. Although one less instrument is available as a method of RCS leakage detection, there are a sufficient number and types of other RCS leakage detection instruments that would detect leakage at a lower threshold. Additionally, alternate instrumentation for containment pressure and temperature is available for backup indication of RCS leakage. Therefore, RCS leakage will continue to be detected with a similar level of sensitivity before a gross failure would occur in the RCS pressure boundary.

Therefore, it is concluded that the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, I&M concludes that the proposed amendments do not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

Enclosure 16 to AEP-NRC-2018-66

Donald C. Cook Nuclear Plant Unit 1 Technical Specification Pages
Marked To Show Proposed Changes

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor in each sump;

b. One containment atmosphere particulate radioactivity monitor; and

c. One ~~containment humidity or~~ containment atmosphere gaseous radioactivity monitor.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment sump monitor(s) inoperable.	A.1	----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	A.2	Restore containment sump monitor(s) to OPERABLE status.	30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Containment atmosphere particulate radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere. OR B.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1. AND B.2 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.	Once per 12 hours Once per 12 hours 30 days
C. ~~Required containment humidity or~~ cContainment atmosphere gaseous radioactivity monitor inoperable.	C.1.1 Analyze grab samples of the containment atmosphere. OR C.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1. AND C.2 Restore containment atmosphere gaseous radioactivity monitor to OPERABLE status.	Once per 24 hours Once per 24 hours 30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~NOTE~~ ~~Only applicable when the containment atmosphere gaseous radiation monitor is the only OPERABLE monitor.~~ D. Containment sump monitor(s) inoperable. AND Containment atmosphere particulate radioactivity monitor inoperable.	D.1 Analyze grab samples of the containment atmosphere. AND D.2.1 Restore containment sump monitor to OPERABLE status. OR D.2.2 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.	Once per 12 hours 7 days 7 days
~~E. Containment atmosphere particulate radioactivity monitor inoperable.~~ ~~AND~~ ~~Required containment humidity or containment atmosphere gaseous radioactivity monitor inoperable.~~	~~E.1 Restore containment atmosphere particulate radioactivity monitor to OPERABLE status.~~ ~~OR~~ ~~E.2 Restore required containment humidity or containment atmosphere gaseous radioactivity monitor to OPERABLE status.~~	~~30 days~~ ~~30 days~~
~~F~~E. Required Action and associated Completion Time of Condition A, B, C, or D~~, or E~~ not met.	~~F~~E.1 Be in MODE 3. AND ~~F~~E.2 Be in MODE 5.	6 hours 36 hours
~~G. LCO 3.4.15.a, b, and c not met.~~ F. All required monitors inoperable.	~~G~~F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitors.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform COT of the required containment atmosphere radioactivity monitors.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the containment sump monitors.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitors.	In accordance with the Surveillance Frequency Control Program
~~SR 3.4.15.5~~	~~Perform CHANNEL CALIBRATION of the containment humidity monitor.~~	~~In accordance with the Surveillance Frequency Control Program~~

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Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages
Marked To Show Proposed Changes

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 RCS Operational LEAKAGE

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 0.8 ~~1~~ gpm unidentified LEAKAGE;

c. 10 gpm identified LEAKAGE; and

d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time of Condition A not met. OR Pressure boundary LEAKAGE exists. OR Primary to secondary LEAKAGE not within limit.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment sump monitor in each sump;

b. One containment atmosphere particulate radioactivity monitor ~~(gaseous or particulate)~~; and

c. One containment ~~humidity~~ atmosphere gaseous radioactivity monitor.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment sump monitor(s) inoperable.	A.1	----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ----------	
		Perform SR 3.4.13.1.	Once per 24 hours
	AND		
	A.2	Restore containment sump monitor(s) to OPERABLE status.	30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ~~Required c~~Containment atmosphere particulate radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere. OR B.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1. AND B.2 Restore ~~required~~ containment atmosphere particulate radioactivity monitor to OPERABLE status.	Once per ~~24~~12 hours Once per ~~24~~12 hours 30 days
C. Containment ~~humidity~~ atmosphere gaseous radioactivity monitor inoperable.	C.1.1 Analyze grab samples of the containment atmosphere. OR C.1.2 ----------NOTE---------- Not required until 12 hours after establishment of steady state operation. ---------- Perform SR 3.4.13.1. AND C.2 Restore containment atmosphere gaseous radioactivity monitor to OPERABLE status.	Once per 24 hours Once per 24 hours 30 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~NOTE~~ ~~Only applicable when the containment atmosphere gaseous radiation monitor is the only OPERABLE monitor.~~ D. Containment sump monitor(s) inoperable. AND Containment ~~humidity~~ atmosphere particulate radioactivity monitor inoperable.	D.1 Analyze grab samples of the containment atmosphere. AND D.2.1 Restore containment sump monitor(s) to OPERABLE status. OR D.2.2 Restore containment ~~humidity~~ atmosphere particulate radioactivity monitor to OPERABLE status.	Once per 12 hours 7 days 7 days
~~E. Required containment atmosphere radioactivity monitor inoperable.~~ ~~AND~~ ~~Containment humidity monitor inoperable.~~	~~E.1 Restore required containment atmosphere radioactivity monitor to OPERABLE status.~~ ~~OR~~ ~~E.2 Restore containment humidity monitor to OPERABLE status.~~	~~30 days~~ ~~30 days~~
~~F~~E. Required Action and associated Completion Time of Condition A, B, C, or D~~, or E~~ not met.	~~F~~E.1 Be in MODE 3. AND ~~F~~E.2 Be in MODE 5.	6 hours 36 hours
~~G. LCO 3.4.15.a, b, and c not met.~~ F. All required monitors inoperable.	~~G~~F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform COT of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the containment sump monitors.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
~~SR 3.4.15.5~~	~~Perform CHANNEL CALIBRATION of the containment humidity monitor.~~	~~In accordance with the Surveillance Frequency Control Program~~

Enclosure 18 to AEP-NRC-2018-66

Donald C. Cook Nuclear Plant Unit 1 Technical Specification Bases Pages Marked To Show Proposed Changes (For Information Only)

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

Plant Specific Design Criterion 16 (Ref. 1) requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide (RG) 1.45, Revision 0, (Ref. 2) describes acceptable methods for selecting leakage detection systems. While Cook Nuclear Plant (CNP) is not committed to RG 1.45, the requirements of RG 1.45 were followed to the extent practical. This was documented in D.C. Cook's response to Generic Letter 84-04 (Ref. 3), and accepted by the NRC as documented in the associated Safety Evaluation Report (Ref. 4).

Leakage detection systems must have the capability to detect significant reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE. In addition to meeting the OPERABILITY requirements, the monitors are typically set to provide the most sensitive response without causing an excessive number of spurious alarms.

The containment sump used to collect unidentified LEAKAGE is instrumented to detect increases above the normal flow rates.

The reactor coolant contains radioactivity that, when released to the containment, may be detected by radiation monitoring instrumentation. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE.

~~An increase in humidity of the containment atmosphere would indicate release of water vapor to the containment. Dew point temperature measurements can thus be used to monitor humidity levels of the containment atmosphere as an indicator of potential RCS LEAKAGE.~~

~~Since the humidity level is influenced by several factors, a quantitative evaluation of an indicated leakage rate by this means may be questionable and should be compared to observed increases in liquid flow into or from the containment sump. Humidity level monitoring is considered most useful as an indirect alarm or indication to alert the operator to a potential problem.~~

BASES

BACKGROUND (continued)

Air temperature and pressure monitoring methods may also be used to infer unidentified LEAKAGE to the containment. Containment temperature and pressure fluctuate slightly during unit operation, but a rise above the normally indicated range of values may indicate RCS leakage into the containment. The relevance of temperature and pressure measurements is affected by containment free volume and, for temperature, detector location. Alarm signals from these instruments can be valuable in recognizing rapid and sizable leakage to the containment. Temperature and pressure monitors are not required by this LCO.

The above-mentioned LEAKAGE detection methods or systems differ in sensitivity and response time. Some of these systems could serve as early alarm systems signaling the operators that closer examination of other detection systems is necessary to determine the extent of any corrective action that may be required.

APPLICABLE SAFETY ANALYSES

The need to evaluate the severity of an alarm or an indication is important to the operators, and the ability to compare and verify with indications from other systems is necessary.

The safety significance of RCS LEAKAGE varies widely depending on its source, rate, and duration. Therefore, detecting and monitoring RCS LEAKAGE into the containment area is necessary. Quickly separating the identified LEAKAGE from the unidentified LEAKAGE provides quantitative information to the operators, allowing them to take corrective action should a leakage occur detrimental to the safety of the unit and the public. In addition, a specific leak before break analysis was performed for the pressurizer surge line (Ref. 6) and for the small diameter piping connected to the RCS (Ref. 7, 8, and 9), which assumed the operators would be capable of identifying a leak from this location prior to propagation of the break. The containment atmosphere particulate radioactivity monitor was specifically assumed in this analysis.

RCS Leakage Detection Instrumentation satisfies Criterion 1 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide confidence that small amounts of unidentified LEAKAGE are detected in time to allow actions to place the unit in a safe condition, when RCS LEAKAGE indicates possible RCPB degradation.

The LCO requires three instruments to be OPERABLE.

The containment sump is used to collect unidentified LEAKAGE. The containment sump consists of three sumps – the lower containment sump, the reactor cavity sump, and the pipe tunnel sump. The LCO requirements apply to the total amount of unidentified LEAKAGE

BASES

LCO (continued)

collected in all three sumps. The monitor for the containment sump detects the operating frequency of a pump and is instrumented to detect when there is an increase above the normal value by 1 gpm. The identification of an increase in unidentified LEAKAGE will be delayed by the time required for the unidentified LEAKAGE to travel to the containment sump and it may take longer than four hours to detect a 1 gpm increase in unidentified LEAKAGE, depending on the origin and magnitude of the LEAKAGE. This sensitivity is acceptable for containment sump monitor OPERABILITY.

The reactor coolant contains radioactivity that, when released to the containment, can be detected by the gaseous or particulate containment atmosphere radioactivity monitor. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE, but have recognized limitations. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. If there are few fuel element cladding defects and low levels of activation products, it may not be possible for the gaseous or particulate containment atmosphere radioactivity monitors to detect a 1 gpm increase within 4 hours during normal operation. The particulate containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting a 0.8 gpm increase in unidentified LEAKAGE within 1 hour given an RCS activity equivalent to that assumed in the design calculations for the monitors. The gaseous containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting a 1 gpm increase in unidentified LEAKAGE within 4 hours given an RCS activity equivalent to that assumed in the design calculations for the monitors.

~~An increase in humidity of the containment atmosphere could indicate the release of water vapor to the containment. Containment humidity monitors are instrumented to detect when there is an increase in LEAKAGE above the normal value by 1 gpm. The time required to detect a 1 gpm increase above the normal value varies based on environmental and system conditions and may take longer than 4 hours. This sensitivity is acceptable for the containment humidity monitor OPERABILITY.~~

The LCO is satisfied when monitors of diverse measurement means are available. Thus, one containment sump monitor in each sump (lower containment, reactor cavity, and pipe tunnel), a particulate radioactivity monitor, and a ~~containment humidity or~~ containment gaseous radioactivity monitor, provide an acceptable minimum. In addition, for a containment sump monitor to be OPERABLE, its associated sump pump and integrator must also be OPERABLE.

BASES

ACTIONS (continued)

The 12 hour interval provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable unit conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

C.1 and C.2

With the ~~required containment humidity or~~ containment gaseous radioactivity monitor inoperable, alternative action is again required. Either grab samples of the containment atmosphere must be taken and analyzed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information. Provided a grab sample is taken or a water inventory balance is performed every 24 hours, reactor operation may continue while awaiting restoration of the ~~containment humidity or~~ containment gaseous radioactivity monitor to OPERABLE status.

The 24 hour interval provides periodic information that is adequate to detect RCS LEAKAGE. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable unit conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

D.1, D.2.1, and D.2.2

With the containment sump monitor and the containment atmosphere particulate radiation monitor inoperable, the only means of detecting LEAKAGE ~~are~~ is the containment gaseous radiation monitor ~~and the containment humidity monitor~~.

~~A Note clarifies that~~ This Condition is applicable when the only OPERABLE monitor is the containment atmosphere gaseous radiation monitor. The containment atmosphere gaseous radioactivity monitor typically cannot detect a 1 gpm leak within four hours when RCS activity is low. In addition, this configuration does not provide the required diverse means of leakage detection. Indirect methods of monitoring RCS leakage must be implemented. Grab samples of the containment

BASES

ACTIONS (continued)

atmosphere must be taken to provide alternate periodic information. The 12-hour interval is sufficient to detect increasing RCS leakage. The Required Action provides 7 days to restore another RCS leakage monitor to OPERABLE status to regain the intended leakage detection diversity. The 7 day Completion Time ensures that the plant will not be operated in a degraded condition for a lengthy time period.

~~E.1 and E.2~~

~~With the containment atmosphere particulate radioactivity monitor and the required containment humidity or containment atmosphere gaseous radioactivity monitor inoperable, the only means of detecting leakage is the containment sump monitor. This Condition does not provide the required diverse means of leakage detection. The Required Action is to restore either of the inoperable required monitors to OPERABLE status within 30 days to regain the intended leakage detection diversity. The 30 day Completion Time ensures that the unit will not be operated in a reduced configuration for a lengthy time period.~~

E. ~~F.1 and F.2~~

If any Required Action and associated Completion Time of Condition A, B, C, or D~~, or E~~ cannot be met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

F. ~~G.1~~

With all three types of required monitors inoperable (i.e., LCO 3.4.15.a, b, and c not met), no automatic means of monitoring leakage are available, and immediate unit shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.3, and SR 3.4.15.4~~, and SR 3.4.15.5~~

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 1.4.3.

2. Regulatory Guide 1.45, Rev. 0, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3. AEP Letter to NRC, AEP:NRC:0137D, "NRC Generic Letter 84-04; Elimination Of Postulated Pipe Breaks In Primary Main Loops Generic Issue A-2, Asymmetric Blowdown Loads On PWR Primary Systems Request For License Condition Deletion," dated September 10, 1984.

4. NRC Letter to AEP, "Generic Letter 84-04, Safety Evaluation of Westinghouse Topical Reports Dealing With Elimination of Postulated Pipe Breaks in PWR Primary Main Loops," dated November 22, 1985.

5. UFSAR, Section 4.2.7

6. WCAP-15435, Rev. 1, Technical Justification for Eliminating Pressurizer Surge Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2 Nuclear Power Plant, August 2000.

7. WCAP-18295-P, Rev. 0, Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology, January 2018.

8. WCAP-18302-P, Rev. 0, Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology, January 2018.

9. WCAP-18309-P, Rev. 0, Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology, January 2018.

Enclosure 19 to AEP-NRC-2018-66

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BASES

APPLICABLE SAFETY ANALYSES (continued)

to limit primary to secondary LEAKAGE through any one SG to less than or equal to 150 gallons per day is significantly less than the conditions assumed in the safety analysis.

Primary to secondary LEAKAGE is a factor in the dose releases outside containment resulting from a steam line break (SLB) accident To a lesser extent, primary to secondary LEAKAGE is a factor in the dose releases outside containment in other accidents or transients involving secondary steam release to the atmosphere, such as a steam generator tube rupture (SGTR). The leakage contaminates the secondary fluid.

The UFSAR (Ref. 3) analysis for SGTR assumes the contaminated secondary fluid is released via the steam generator power operated relief valves (and safety valves if their setpoint is reached) if offsite power is not available or if the condenser steam dump system fails to operate. The safety analysis for the SLB accident assumes 0.25 gpm per SG (1.0 gpm for all SGs) primary to secondary LEAKAGE as an initial condition. The dose consequences resulting from events resulting in a steam discharge to the atmosphere are within the limits defined in 10 CFR 50.67.

The RCS Operational LEAKAGE satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

RCS operational LEAKAGE shall be limited to:

a. Pressure Boundary LEAKAGE

No pressure boundary LEAKAGE is allowed, being indicative of material deterioration. LEAKAGE of this type is unacceptable as the leak itself could cause further deterioration, resulting in higher LEAKAGE. Violation of this LCO could result in continued degradation of the RCPB. LEAKAGE past seals and gaskets is not pressure boundary LEAKAGE.

b. Unidentified LEAKAGE

The 0.8 ~~One~~ gallon per minute (gpm) of unidentified LEAKAGE is allowed as a reasonable minimum detectable amount that the containment air particulate monitoring equipment can detect within a reasonable time period. The limit of 0.8 gpm is necessary to satisfy the requirements for the application of Leak-Before-Break methodology as documented in Reference 6, and approved by the NRC as documented in Reference 7. Violation of this LCO could result in continued degradation of the RCPB, if the LEAKAGE is from the pressure boundary.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 5).

REFERENCES

1. UFSAR, Section 1.4.3.
2. Regulatory Guide 1.45, May 1973.
3. UFSAR, Section 14.2.4.
4. NEI 97-06, "Steam Generator Program Guidelines."
5. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."
6. Letter from Indiana Michigan Power Company (Q. S. Lies) to the NRC dated XXXX X, 2018.
7. Letter from NRC (XXXXX X. XXXX) to Indiana Michigan Power Company (Joel P. Gebbie), dated XXXX X, 2019.

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

Plant Specific Design Criterion 16 (Ref. 1) requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide (RG) 1.45, Revision 0, (Ref. 2) describes acceptable methods for selecting leakage detection systems. While Cook Nuclear Plant (CNP) is not committed to RG 1.45, the requirements of RG 1.45 were followed to the extent practical. This was documented in D.C. Cook's response to Generic Letter 84-04 (Ref. 3), and accepted by the NRC as documented in the associated Safety Evaluation Report (Ref. 4).

Leakage detection systems must have the capability to detect significant reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE. In addition to meeting the OPERABILITY requirements, the monitors are typically set to provide the most sensitive response without causing an excessive number of spurious alarms.

The containment sump used to collect unidentified LEAKAGE is instrumented to detect increases above the normal flow rates.

The reactor coolant contains radioactivity that, when released to the containment, may be detected by radiation monitoring instrumentation. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE.

~~An increase in humidity of the containment atmosphere would indicate release of water vapor to the containment. Dew point temperature measurements can thus be used to monitor humidity levels of the containment atmosphere as an indicator of potential RCS LEAKAGE.~~

~~Since the humidity level is influenced by several factors, a quantitative evaluation of an indicated leakage rate by this means may be questionable and should be compared to observed increases in liquid flow into or from the containment sump. Humidity level monitoring is considered most useful as an indirect alarm or indication to alert the operator to a potential problem.~~

BASES

BACKGROUND (continued)

Air temperature and pressure monitoring methods may also be used to infer unidentified LEAKAGE to the containment. Containment temperature and pressure fluctuate slightly during unit operation, but a rise above the normally indicated range of values may indicate RCS leakage into the containment. The relevance of temperature and pressure measurements is affected by containment free volume and, for temperature, detector location. Alarm signals from these instruments can be valuable in recognizing rapid and sizable leakage to the containment. Temperature and pressure monitors are not required by this LCO.

The above-mentioned LEAKAGE detection methods or systems differ in sensitivity and response time. Some of these systems could serve as early alarm systems signaling the operators that closer examination of other detection systems is necessary to determine the extent of any corrective action that may be required.

APPLICABLE SAFETY ANALYSES

The need to evaluate the severity of an alarm or an indication is important to the operators, and the ability to compare and verify with indications from other systems is necessary.

The safety significance of RCS LEAKAGE varies widely depending on its source, rate, and duration. Therefore, detecting and monitoring RCS LEAKAGE into the containment area is necessary. Quickly separating the identified LEAKAGE from the unidentified LEAKAGE provides quantitative information to the operators, allowing them to take corrective action should a leakage occur detrimental to the safety of the unit and the public. In addition, specific leak before break analyses were performed for the small diameter piping connected to the RCS (Ref. 6, 7, and 8), which assumed the operators would be capable of identifying a leak from this location prior to propagation of the break. The containment atmosphere particulate radioactivity monitor was specifically assumed in this analysis.

RCS Leakage Detection Instrumentation satisfies Criterion 1 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide confidence that small amounts of unidentified LEAKAGE are detected in time to allow actions to place the unit in a safe condition, when RCS LEAKAGE indicates possible RCPB degradation.

The LCO requires three instruments to be OPERABLE.

The containment sump is used to collect unidentified LEAKAGE. The containment sump consists of three sumps – the lower containment sump, the reactor cavity sump, and the pipe tunnel sump. The LCO requirements apply to the total amount of unidentified LEAKAGE

BASES

LCO (continued) collected in all three sumps. The monitor for the containment sump detects the operating frequency of a pump and is instrumented to detect when there is an increase above the normal value by 1 gpm. The identification of an increase in unidentified LEAKAGE will be delayed by the time required for the unidentified LEAKAGE to travel to the containment sump and it may take longer than four hours to detect a 1 gpm increase in unidentified LEAKAGE, depending on the origin and magnitude of the LEAKAGE. This sensitivity is acceptable for containment sump monitor OPERABILITY.

The reactor coolant contains radioactivity that, when released to the containment, can be detected by the gaseous or particulate containment atmosphere radioactivity monitor. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE, but have recognized limitations. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. If there are few fuel element cladding defects and low levels of activation products, it may not be possible for the gaseous or particulate containment atmosphere radioactivity monitors to detect a 1 gpm increase within 4 hours during normal operation. ~~However, t~~The particulate containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting a ~~1~~0.8 gpm increase in unidentified LEAKAGE within ~~4~~ 1 hours given an RCS activity equivalent to that assumed in the design calculations for the monitors. The gaseous containment atmosphere radioactivity monitor is OPERABLE when it is capable of detecting a 1 gpm increase in unidentified LEAKAGE within 4 hours given an RCS activity equivalent to that assumed in the design calculations for the monitors.

~~An increase in humidity of the containment atmosphere could indicate the release of water vapor to the containment. Containment humidity monitors are instrumented to detect when there is an increase in LEAKAGE above the normal value by 1 gpm. The time required to detect a 1 gpm increase above the normal value varies based on environmental and system conditions and may take longer than 4 hours. This sensitivity is acceptable for the containment humidity monitor OPERABILITY.~~

The LCO is satisfied when monitors of diverse measurement means are available. Thus, one containment sump monitor in each sump (lower containment, reactor cavity, and pipe tunnel), ~~in combination with~~ a ~~gaseous or~~ particulate radioactivity monitor, and a containment ~~humidity~~ gaseous radioactivity monitor, provide an acceptable minimum. In addition, for a containment sump monitor to be OPERABLE, its associated sump pump and integrator must also be OPERABLE.

BASES

APPLICABILITY

Because of elevated RCS temperature and pressure in MODES 1, 2, 3, and 4, RCS leakage detection instrumentation is required to be OPERABLE.

In MODE 5, the temperature is to be ≤ 200°F and pressure is maintained low or at atmospheric pressure. In MODE 6 the temperature is low and the pressure is maintained low or at atmospheric pressure. Since the temperatures and pressures are far lower than those for MODES 1, 2, 3, and 4, the likelihood of leakage and crack propagation are much smaller. Therefore, the requirements of this LCO are not applicable in MODES 5 and 6.

ACTIONS

A.1 and A.2

With the containment sump monitor(s) inoperable, no other form of sampling can provide the equivalent information; however, the containment atmosphere radioactivity monitor will provide indications of changes in leakage. Together with the containment atmosphere radioactivity monitor, the periodic surveillance for RCS water inventory balance, SR 3.4.13.1, must be performed at an increased frequency of 24 hours to provide information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable unit conditions are established.

Restoration of the sump monitor(s) to OPERABLE status within a Completion Time of 30 days is required to regain the function after the failure of the monitors. This time is acceptable, considering the Frequency and adequacy of the RCS water inventory balance required by Required Action A.1.

B.1.1, B.1.2, and B.2

With the ~~required~~ containment atmosphere particulate radioactivity monitoring instrumentation channel inoperable, alternative action is required. Either grab samples of the containment atmosphere must be taken and analyzed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information.

With a sample obtained and analyzed or water inventory balance performed every ~~24~~ 12 hours, the reactor may be operated for up to 30 days to allow restoration of the required containment atmosphere particulate radioactivity monitor.

BASES

ACTIONS (continued)

The ~~24~~ 12 hour interval provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable unit conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

C.1 and C.2

With the containment ~~humidity~~ gaseous radioactivity monitor inoperable, alternative action is again required. Either grab samples of the containment atmosphere must be taken and analyzed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information. Provided a grab sample is taken or a water inventory balance is performed every 24 hours, reactor operation may continue while awaiting restoration of the containment ~~humidity~~ gaseous radioactivity monitor to OPERABLE status.

The 24 hour interval provides periodic information that is adequate to detect RCS LEAKAGE. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable unit conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

D.1, D.2.1, and D.2.2

With the containment sump monitor and the containment ~~humidity~~ particulate radioactivity monitor inoperable, the only means of detecting LEAKAGE ~~are~~ is the containment atmosphere gaseous radiation monitor~~s~~. ~~A Note clarifies that~~ This Condition is applicable when the only OPERABLE monitor is the containment atmosphere gaseous radiation monitor. The containment atmosphere gaseous radioactivity monitor typically cannot detect a 1 gpm leak within four hours when RCS activity is low. In addition, this configuration does not provide the required diverse means of leakage detection. Indirect methods of monitoring RCS leakage must be implemented. Grab samples of the containment

BASES

ACTIONS (continued)

atmosphere must be taken to provide alternate periodic information. The 12 hour interval is sufficient to detect increasing RCS leakage. The Required Action provides 7 days to restore another RCS leakage monitor to OPERABLE status to regain the intended leakage detection diversity. The 7-day Completion Time ensures that the plant will not be operated in a degraded configuration for a lengthy time period.

~~E.1 and E.2~~

~~With the required containment atmosphere radioactivity monitor and the containment humidity monitor inoperable, the only means of detecting leakage is the containment sump monitor. This Condition does not provide the required diverse means of leakage detection. The Required Action is to restore either of the inoperable required monitors to OPERABLE status within 30 days to regain the intended leakage detection diversity. The 30 day Completion Time ensures that the unit will not be operated in a reduced configuration for a lengthy time period.~~

E. ~~F.1 and F.2~~

If any Required Action and associated Completion Time of Condition A, B, C, or D~~, or E~~ cannot be met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

F. ~~G.1~~

With all three types of required monitors inoperable (i.e., LCO 3.4.15.a, b, and c not met), no automatic means of monitoring leakage are available, and immediate unit shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.3, and SR 3.4.15.4~~, and SR 3.4.15.5~~

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 1.4.3.

2. Regulatory Guide 1.45, Rev. 0, "Reactor Coolant Pressure Boundary Leakage Detection System," May 1973.

3. AEP Letter to NRC, AEP:NRC:0137D, "NRC Generic Letter 84-04; Elimination Of Postulated Pipe Breaks In Primary Main Loops Generic Issue A-2, Asymmetric Blowdown Loads On PWR Primary Systems Request For License Condition Deletion," dated September 10, 1984.

4. NRC Letter to AEP, "Generic Letter 84-04, Safety Evaluation of Westinghouse Topical Reports Dealing With Elimination of Postulated Pipe Breaks in PWR Primary Main Loops," dated November 22, 1985.

5. UFSAR, Section 4.2.7

6. WCAP-18295-P, Rev. 0, Technical Justification for Eliminating Accumulator Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology, January 2018.

7. WCAP-18302-P, Rev. 0, Technical Justification for Eliminating Residual Heat Removal Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology, January 2018.

8. WCAP-18309-P, Rev. 0, Technical Justification for Eliminating Safety Injection Line Rupture as the Structural Design Basis for D.C. Cook Units 1 and 2, Using Leak-Before-Break Methodology, January 2018.