

August 22, 2019

AEP-NRC-2019-32
10 CFR 50.90

Docket No.: 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
Response to Request for Additional Information Regarding Unit 2 Leak-Before-Break Analysis
and Deletion of Containment Humidity Monitors for Unit 1 and Unit 2

References:

1. Letter from Q. S. Lies, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC), "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," dated November 20, 2018, Agencywide Documents Access and Management System Accession (ADAMS) No. ML18334A267.
2. E-mail from R. F. Kuntz, NRC, to H. L. Levendosky, I&M, "D.C. Cook Nuclear Plant Unit Nos. 1 and 2 - Request for Additional Information related to Unit 2 Leak Before Break Analysis and Deletion of Containment Humidity Monitors for Unit Nos. 1 and 2 (EPID: L-2018-LLA-0726)," dated July 23, 2019, ADAMS No. ML19204A096.

This letter provides Indiana Michigan Power Company's (I&M), licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, response to the Request for Additional Information (RAI) by the U. S. Nuclear Regulatory Commission (NRC) regarding a license amendment request (LAR) to apply proprietary Leak-Before-Break (LBB) methodology to CNP Unit 2 Reactor Coolant System (RCS) small-diameter piping and delete humidity monitors from CNP Unit 1 and Unit 2 Technical Specification (TS) 3.4.15, "RCS Leakage Detection Instrumentation."


By Reference 1, I&M submitted a request to amend CNP Unit 1 and Unit 2 TS 3.4.15, "RCS Leakage Detection Instrumentation." Included in this LAR is a request to apply proprietary LBB methodology to CNP Unit 2 RCS small diameter piping. By Reference 2, the NRC submitted an RAI concerning the LAR submitted by I&M as Reference 1.

Enclosure 1 to this letter provides an affirmation statement. I&M is providing Enclosure 2 to this letter as its response to the NRC's RAI from Reference 2.

ADD
NRR

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/ml

Enclosures:

1. Affirmation
 2. Response to Request for Additional Information Regarding Unit 2 Leak-Before-Break Analysis and Deletion of Containment Humidity Monitors for Unit 1 and Unit 2
- c: R. J. Ancona – MPSC
R. F. Kuntz – NRC Washington D.C.
EGLE – RMD/RPS
NRC Resident Inspector
D. J. Roberts – NRC Region III
A. J. Williamson – AEP Ft. Wayne, w/o enclosures

Enclosure 1 to AEP-NRC-2019-32

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.

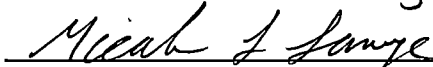
Indiana Michigan Power Company



Q. Shane Lies
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 22 DAY OF August, 2019



Notary Public

My Commission Expires 02/20/25



Enclosure 2 to AEP-NRC-2019-32

Response to Request for Additional Information Regarding Unit 2 Leak-Before-Break Analysis and Deletion of Containment Humidity Monitors for Unit 1 and Unit 2

By letter dated November 20, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18334A267), Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1 and Unit 2, submitted an amendment request to apply proprietary Leak-Before-Break (LBB) methodology to CNP Unit 2 Reactor Coolant System (RCS) small-diameter piping and delete the humidity monitors from CNP Unit 1 and Unit 2 Technical Specification (TS) 3.4.15, "RCS Leakage Detection Instrumentation" (Reference 1).

The U. S. Nuclear Regulatory Commission (NRC) staff is currently reviewing the submittal and has determined that additional information is needed in order to complete the review. The request for additional information (RAI) and I&M's response are provided below.

RAI-1.a

The license amendment request provided by letter dated November 20, 2018 requested, in part, application of LBB methodology for CNP, Unit 2. As noted in the November 20, 2018 amendment request, I&M had requested application LBB methodology for CNP, Unit 1 by letter dated March 7, 2018. Subsequent to the November 20, 2018 amendment request, the CNP, Unit 1, LBB methodology was supplemented by letters dated November 27, 2018, and May 6, 2019, to revise the LBB analysis.

Request:

- a. *Revise the LBB analysis for CNP, Unit 2, as necessary, to address the supplements to the CNP, Unit 1 LBB analysis.*

I&M Response to RAI-1.a

The request in Reference 1 to apply LBB methodology at CNP Unit 2 is consistent with the LAR submitted by I&M on March 7, 2018, (Reference 2), as supplemented by Reference 3 and Reference 4, which requested application of LBB methodology to corresponding piping for CNP Unit 1. Based on discussions with NRC staff, I&M submitted an additional supplement to Reference 2 on May 6, 2019, revising the scope of requested piping at CNP Unit 1 (Reference 5) and responding to two additional RAIs (RAI-8 and RAI-9). Following the revision in scope and RAI responses, the amendment requested in Reference 2, as supplemented by References 3, 4, and 5, was approved by the NRC and issued on August 1, 2019, via Reference 6.

The RAI responses provided by I&M in Reference 5 were written to address NRC questions regarding the Unit 1 LBB analysis included in Reference 2. The responses to those RAIs, however, are also applicable to the Unit 2 LBB analysis, with two exceptions.

- The response to RAI-8.d states that "the existing DC Cook license basis requires the capability to detect 0.8 gpm of RCS leakage within one hour." The existing license basis for Unit 2 requires the capability to detect 1.0 gpm of RCS leakage within four hours. The response to RAI-8.d also discusses the Required Action for CNP Unit 1 if the containment particulate channel is

inoperable. The existing Required Actions at CNP Unit 2 are different from those at Unit 1. The changes proposed in Enclosure 14 of Reference 1 revise the CNP Unit 2 TS 3.4.15 to require 0.8 gpm RCS leakage detection within one hour and revise the structure of the CNP Unit 2 TS 3.4.15 to be consistent with the Unit 1 TS 3.4.15.

- The response to RAI-9.b.1 provides, as an example, the required surveillance frequency for Surveillance Requirement 3.4.13.1 in the event of the inoperability of the RCS leakage detection instruments, based on CNP Unit 1 TS 3.4.15, "RCS Leakage Detection Instrumentation." The existing Required Actions for TS 3.4.15 at CNP Unit 2 are different from those at Unit 1. The changes proposed in Enclosure 14 of Reference 1 will revise the structure of the CNP Unit 2 TS 3.4.15 to be consistent with the Unit 1 TS 3.4.15.

Based on the precedent established in Reference 6, I&M is supplementing the request to apply LBB methodology at CNP Unit 2 (Reference 1), revising the scope of the request to be consistent with that requested for Unit 1 in Reference 2, as supplemented by Reference 5. The supplement to Reference 1, which addresses the scoping changes for the Residual Heat Removal (RHR), Accumulator, and Safety Injection (SI) lines, individually, is below.

RHR Piping:

Per WCAP-18302-P, the scope of the LBB analysis is from the Cold Legs on Loops 2 and 3 to the second RHR check valves, 2-RH-133 and 2-RH-134, and from the Hot Leg on loop 2 to valve 2-ICM-129. However, per the current licensing basis for CNP Unit 2, for systems not normally operating, only the piping attached to the RCS up to and including the first isolation valve (i.e. check valve or normally closed block valve) is considered high energy. Therefore the scope of the LBB LAR will be limited as follows:

- 1) I&M is including RHR piping starting at the Loop 2 Cold Leg up to, and including, check valve 2-SI-170-L2.
- 2) I&M is including RHR piping starting at the Loop 3 Cold Leg up to, and including, check valve 2-SI-170-L3.
- 3) I&M is including RHR piping starting at the Loop 2 Hot Leg up to, and including isolation valve 2-IMO-128.

I&M is excluding the previously requested scope of piping downstream of the first isolation valves up to the second isolation valves, and the piping downstream of the second isolation valves, as the fluid in this piping is not representative of the RCS during normal operations.

Accumulator Piping:

Per WCAP-18295-P, the scope of the LBB analysis is from the Cold Legs for each loop to the Accumulator isolation valves 2-IMO-110, 2-IMO-120, 2-IMO-130, and 2-IMO-140. However, per the current licensing basis for CNP Unit 2, for systems not normally operating, only the piping attached to the RCS up to and including the first isolation valve (i.e. check valve or normally closed block valve) is considered high energy. Therefore the scope of the LBB LAR will be limited as follows:

- 1) I&M is including SI piping starting at the Loop 1 Cold Leg up to, and including, SI check valve 2-SI-170-L1.
- 2) I&M is including SI piping starting at the Loop 2 Cold Leg up to, and including, SI check valve 2-SI-170-L2.

- 3) I&M is including SI piping starting at the Loop 3 Cold Leg up to, and including, SI check valve 2-SI-170-L3.
- 4) I&M is including SI piping starting at the Loop 4 Cold Leg up to, and including, SI check valve 2-SI-170-L4.

I&M is excluding the previously requested scope of piping downstream of the first isolation valves up to the second isolation valves, and the piping downstream of the second isolation valves, as the fluid in this piping is not representative of the RCS during normal operations.

Safety Injection Piping:

Per WCAP-18309-P, the scope of the LBB analysis is from the Cold Legs for each loop to the second SI check valves 2-SI-161-L1, 2-SI-161-L2, 2-SI-161-L3, and 2-SI-161-L4. Also, per WCAP-18309-P, the scope of the LBB analysis is from the Hot Legs for each loop to the second SI isolation valves 2-IMO-315 and 2-IMO-325. However, per the current licensing basis for CNP Unit 2, for systems not normally operating, only the piping attached to the RCS up to and including the first isolation valve (i.e. check valve or normally closed block valve) is considered high energy. Therefore the scope of the LBB LAR will be limited as follows:

- 1) I&M is including SI piping starting at the Loop 1 Cold Leg up to, and including, SI check valve 2-SI-170-L1.
- 2) I&M is including SI piping starting at the Loop 2 Cold Leg up to, and including, SI check valve 2-SI-170-L2.
- 3) I&M is including SI piping starting at the Loop 3 Cold Leg up to, and including, SI check valve 2-SI-170-L3.
- 4) I&M is including SI piping starting at the Loop 4 Cold Leg up to, and including, SI check valve 2-SI-170-L4.
- 5) I&M is including SI piping starting at the Loop 1 Hot Leg up to, and including, SI check valve 2-SI-158-L1.
- 6) I&M is including SI piping starting at the Loop 2 Hot Leg up to, and including, SI check valve 2-SI-158-L2.
- 7) I&M is including SI piping starting at the Loop 3 Hot Leg up to, and including, SI check valve 2-SI-158-L3.
- 8) I&M is including SI piping starting at the Loop 4 Hot Leg up to, and including, SI check valve 2-SI-158-L4.

I&M is excluding the previously requested scope of piping downstream of the first isolation valves up to the second isolation valves, and the piping downstream of the second isolation valves, as the fluid in this piping is not representative of the RCS during normal operations.

RAI-1.b

- b. *Table 7-1 of the WCAP-18295 and WCAP-18309 reports addresses the critical locations of CNP, Unit 2 in the elastic-plastic fracture mechanics (EPFM) analysis. Given that the scope of the LBB analysis may be revised, please clarify whether the EPFM analysis is still used in the CNP, Unit 2, LBB analysis. If so, describe the method used to calculate the applied J-integral values in the fracture mechanics analysis (e.g., how the applied J-integral values are derived from the applied loads and associated plastic deformation). Alternatively, provide*

relevant references. In addition, clarify whether the applied tearing modulus values are also calculated and used in the analysis.

I&M Response to RAI-1.b

With the scope of the request to apply LBB methodology reduced, as described in I&M's response to RAI-1 a., the EPFM analysis is not used for any of the critical weld locations remaining within the revised scope.

RAI-2

From the license amendment request letter dated November 20, 2018, Enclosure 14 (page 3), it states:

Liquid Inventory in the Process Systems and in the Containment Sump

For CNP Units 1 and 2, 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.

From the license amendment request letter dated November 20, 2018, Enclosures 18 (TS B 3.4.15 for Unit 1, Unit 2 TS B 3.4.15 is identical), it states:

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 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 [gallon per minute]. 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.

NRC Guidance:

NUREG-0800, Standard Review Plan, Section 5.2.5, "Reactor Coolant Pressure Boundary Leakage Detection," Revision 2 – March 2007, ADAMS Accession No. ML070610277.

Regulatory Guide (RG) 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973 – Revision 0, ADAMS Accession No. ML003740113.

Request:

Provide additional details related to the 'Liquid Inventory in the Process Systems and in the Containment Sump' monitors available in the main control room, such that their reliance would be just as or more effective than the containment humidity monitors. For example, charging flow and volume control tank level indication, record, and alarm functions; containment sump pump flow and/or containment sump

level indication, timers, record, and alarm function, for three total sumps. Similar detail was provided in the LAR letter for other TS 3.4.15 monitors.

I&M Response to RAI-2

The liquid inventory equipment (charging and letdown flow, as well as volume control tank level) provide control, indication, record, and alarm functions in the control rooms. The containment sump consists of three sumps – the lower containment sump, the reactor cavity sump, and the pipe tunnel sump. The three sumps provide high sump level alarm function only in the control rooms. Each of the three sumps contain two sump pumps. The monitor for the containment sump detects the operating frequency of the installed sump pumps via pump run time meters located on the containment auxiliaries subpanel in the auxiliary building. Operators monitor the six containment sump pump run time meters once per 12-hour shift.

A more in-depth discussion of the containment sump instrumentation and its ability to detect RCS leakage is included in the RAI responses provided by I&M in Reference 5, which was written to address NRC questions regarding the Unit 1 LBB analysis included in Reference 2. The responses provided in Reference 5, as they relate to the containment sump, are also applicable to Unit 2. The containment water level monitoring system is safety-related, has safety/accident mitigation functions and non-safety related/diverse actuation functions.

References:

1. Letter from Q. S. Lies, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC), "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," dated November 20, 2018, Agencywide Documents Access and Management System Accession (ADAMS) No. ML18334A267.
2. Letter from Q. S. Lies, I&M, to 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," dated March 7, 2018, ADAMS No. ML18072A012.
3. Letter from Q. S. Lies, I&M, to NRC, "Donald C. Cook Nuclear Plant, Unit 1, Response to Request for Additional Information Regarding License Amendment Request for Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping," dated September 27, 2018, ADAMS No. ML18274A093.
4. Letter from Q. S. Lies, I&M, to NRC, "Donald C. Cook Nuclear Plant, Unit 1, Supplement to Response to Request for Additional Information Regarding License Amendment Request for Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping," dated November 27, 2018, ADAMS No. ML18333A032.
5. Letter from Q. S. Lies, I&M, to NRC, "Donald C. Cook Nuclear Plant, Unit 1, Response to Request for Additional Information Regarding License Amendment Request for Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping," dated May 6, 2019, ADAMS No. ML19129A126.

6. Letter from R. S. Haskell, NRC, to J. P. Gebbie, I&M, "Donald C. Cook Nuclear Plant, Unit No. 1 - Issuance of Amendment No. 346 Re: "Approval of Application of Proprietary Leak-Before-Break Methodology for Reactor Coolant System Small Diameter Piping" (EPID L-2018-LLA-0054)," dated August 1, 2019, ADAMS No. ML19170A362.