



August 11, 2004

AEP:NRC:4034-11
· 10 CFR 54

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUBJECT: Donald C. Cook Nuclear Plant, Units 1 and 2
Docket Nos. 50-315 and 50-316
License Renewal Application – Supplemental Responses to
Requests for Additional Information
(TAC Nos. MC1202 and MC1203)

Dear Sir or Madam:

By letter dated October 31, 2003, Indiana Michigan Power Company (I&M) submitted an application to renew the operating licenses for Donald C. Cook Nuclear Plant (CNP), Units 1 and 2 (Reference 1). This letter provides supplemental responses to requests for additional information (RAIs) for the CNP license renewal application (LRA).

During the conduct of its review, the Nuclear Regulatory Commission (NRC) Staff identified areas where additional information was needed to complete its review of the LRA. By letter dated May 7, 2004 (Reference 2), I&M responded to Staff RAIs pertaining to the scoping and screening methodology in LRA Section 2.1 and the scoping and screening results for structures and structural commodities in LRA Section 2.4. Subsequently, on May 17 and 21, 2004, the NRC Staff held telephone conference calls with I&M's license renewal project personnel to discuss the responses to the LRA Sections 2.1 and 2.4 RAIs (Reference 3). As a result of these discussions, I&M is providing supplemental responses to the following RAIs:

- RAI 2.1-3 - 10 CFR 54.4(a)(2) scoping criteria – equivalent anchors
- RAI 2.1-5 - Scoping of thermal piping insulation – intended functions
- RAI 2.4-2 - Scoping of thermal piping insulation – effect on structures
- RAI 2.4-3 - Scoping of structures associated with the ultimate heat sink
- RAI 2.4-4 - Passive crane subcomponents meeting 10 CFR 54.21(a)(1)(i)
- RAI 2.4-5 - Cable feed-through assembly pressure boundary intended function

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In addition to supplementing the RAI responses discussed above, this letter also provides a revised response to RAI 4.2.1-1, which supersedes I&M's original response to RAI 4.2.1-1, as provided in I&M's letter dated June 16, 2004 (Reference 4). The original response provided concurrence with the NRC Staff reviewer's assertion that the upper-shelf energy (USE) reduction reported in LRA Section 4.2.1 was incorrect. Subsequent to submitting the original RAI 4.2.1-1 response, I&M determined that the LRA did not clearly reflect the method for determining the USE reduction value for Unit 2 beltline welds, but the calculated USE reduction value presented in the LRA is indeed correct. The revised RAI response is provided in the attachment to this letter.

The enclosure to this letter provides an affirmation pertaining to the statements made in this letter. The attachment to this letter provides the supplemental RAI responses. There are no new commitments contained in this submittal.

Should you have any questions, please contact Mr. Richard J. Grumbir, Project Manager, License Renewal, at (269) 697-5141.

Sincerely,



Joseph N. Jensen
Site Vice President

NH/rdw

Enclosure: Affirmation

Attachment: Supplemental Responses to Requests for Additional Information
for the Donald C. Cook Nuclear Plant License Renewal Application

References:

1. Letter from M. K. Nazar, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2, Application for Renewed Operating Licenses," AEP:NRC:3034, dated October 31, 2003 [Accession No. ML033070177].
2. Letter from M. K. Nazar, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant, Units 1 and 2, License Renewal Application – Response to Requests for Additional Information on Scoping and Screening Results (TAC Nos. MC1202 and MC1203)," AEP:NRC:4034-01, dated May 7, 2004 [Accession No. ML041390360].
3. NRC Record of Conference Call, "Summary of Telephone Conference Calls Held on May 17 and 21, 2004, Between the U.S. Nuclear Regulatory Commission (NRC) and Indiana Michigan Power Company (I&M) Representatives Concerning Responses to Request for Additional Information on Donald C. Cook Nuclear Plant, Units 1 and 2, License Renewal Application (TAC Nos. MC1202 and MC1203)," dated July 27, 2004 [Accession No. ML042110275].
4. Letter from M. K. Nazar, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant, Units 1 and 2, License Renewal Application - Response to Requests for Additional Information on Time-Limited Aging Analyses," AEP:NRC:3054-08, dated June 16, 2004 [Accession No. ML041750561].

c: J. L. Caldwell, NRC Region III
K. D. Curry, AEP Ft. Wayne, w/o attachment
J. T. King, MPSC, w/o attachment
J. G. Lamb, NRC Washington DC
MDEQ – WHMD/HWRPS, w/o attachment
NRC Resident Inspector
J. G. Rowley, NRC Washington DC

AFFIRMATION

I, Joseph N. Jensen, being duly sworn, state that I am Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the 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



Joseph N. Jensen
Site Vice President

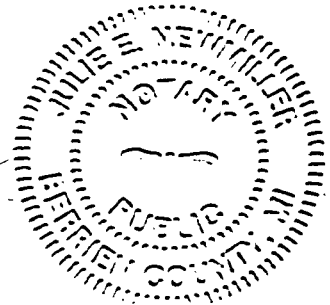
SWORN TO AND SUBSCRIBED BEFORE ME

THIS 11th DAY OF August, 2004

Julie E. Newmiller
Notary Public

My Commission Expires 8-22-2004

JULIE E. NEWMILLER
Notary Public, Berrien County, MI
My Commission Expires Aug 22, 2004



**Supplemental Responses to Requests for Additional Information for the
Donald C. Cook Nuclear Plant License Renewal Application**

By letter dated May 7, 2004 (Reference 1), Indiana Michigan Power Company (I&M) responded to Nuclear Regulatory Commission (NRC) Staff requests for additional information (RAIs) pertaining to the scoping and screening methodology in License Renewal Application (LRA) Section 2.1 and the scoping and screening results for structures and structural commodities in LRA Section 2.4. Subsequently, on May 17 and 21, 2004, the NRC Staff held telephone conference calls with I&M's license renewal project personnel to discuss the responses to the LRA Sections 2.1 and 2.4 RAIs (Reference 2). This attachment provides I&M's supplemental responses to the following RAIs:

- RAI 2.1-3 - 10 CFR 54.4(a)(2) scoping criteria
- RAI 2.1-5 - Scoping of thermal piping insulation – intended functions
- RAI 2.4-2 - Scoping of thermal piping insulation – effect on structures
- RAI 2.4-3 - Scoping of structures associated with the ultimate heat sink
- RAI 2.4-4 - Passive crane subcomponents meeting 10 CFR 54.21(a)(1)(i)
- RAI 2.4-5 - Cable feed-through assembly pressure boundary intended function

In addition to supplementing the RAI responses discussed above, this attachment also provides a revised response to RAI 4.2.1-1, which supersedes I&M's original response to RAI 4.2.1-1, as provided in I&M's letter dated June 16, 2004 (Reference 3).

RAI 2.1-3, Part a.:

a: For nonsafety-related piping attached to safety related piping, the applicant stated in LRA Section 2.1.1.2.2, "Spatial Failures of Nonsafety-Related SSCs," that the nonsafety-related piping and supports up to and including the first equivalent anchor beyond the safety/nonsafety interface were within the scope of license renewal and subject to aging management review. However, during the audit, the applicant stated that the location of the first equivalent anchor point has not been physically located in the as-built plant. Therefore, the staff requires additional information regarding the process used by the applicant to ensure that all nonsafety-components and structures between the safety/nonsafety interface and the first equivalent anchor point were adequately considered during scoping. In particular, the applicant should describe the method used to ensure that all material/environment combinations between the safety/nonsafety interface and the first equivalent anchor were considered during aging management review.

Clarification Requested by NRC Staff in May 17 and 21, 2004, Telephone Conference Calls:

The applicant was requested to address for Part A: (a) a clear definition of what constitutes an equivalent anchor, (b) clarification and definition of "major component" if used as an equivalent anchor, (c) linkage of the equivalent anchor definitions to the current licensing basis, and (d) does the license renewal boundary for nonsafety-related piping attached to safety-related terminate at a major component. The staff indicated that there will be internal discussion to come to a consensus on I&M's approach to its answer to Part B. I&M indicated the likelihood of submitting its revised response in a supplemental letter.

I&M's Supplemental Response to RAI 2.1-3, Part a:

I&M's original response to Part a. of RAI 2.1-3, provided in the May 7, 2004, RAI response letter (Reference 1), identified the process used to determine that all applicable material and environment combinations up to and including the first equivalent anchor were included in LRA Section 3.0, Aging Management Review Results. This supplemental response defines equivalent anchors and identifies major components that serve as part of equivalent anchors, thereby providing the clarification requested by the Staff in the May 17 and 21, 2004, telephone conference calls (Reference 2).

- (a) An equivalent anchor is a point or points encompassing restraints in the three orthogonal directions.
- (b) A major component is plant equipment that is anchored to a structure such that all six degrees of freedom of a piping system are restrained.
- (c) An equivalent anchor is defined in Updated Final Safety Analysis Report (UFSAR) Section 2.9.3, which states, "The piping model may be structurally decoupled, to suit the higher class piping, at an anchor or at a point (or points) encompassing restraints in the 3 orthogonal directions."
- (d) For cases where the nonsafety-related piping connected to safety-related piping does not have an equivalent anchor prior to termination at a major component, that component provides the nonsafety-related anchorage. In these cases, aging of the major components providing the nonsafety-related anchorage will be managed in accordance with the aging management program described in LRA Section B.1.32, Structures Monitoring Program. The major components included in this category are shown in the following table.

| <u>Component Number¹</u> | <u>Component Description</u> |
|--|---|
| TK-49 | Steam generator startup blowdown flash tanks |
| TK-99 | Steam generator normal blowdown flash tanks |
| HE-80-1, HE-80-2, HE-80-3, and HE-80-4 | Steam generator sampling conditioning skid rough coolers |
| QC-501-6, QC-501-7, QC-501-8, and QC-501-9 | Steam generator blowdown sample radiation detector sample heat exchangers |
| TK-9 | Charging system chemical mixing tanks |
| 12-TK-16-2, 12-TK-16-4, and 12-TK-16-6 | Chemical and volume control system holdup tanks |
| QC-12 | Boric acid filters |
| 12-TK-17 | Boric acid evaporators concentrates holding tank |
| 1-TK-12N, 12-TK-12M, and 2-TK-12S | Boric acid storage tanks |
| 12-PP-68S | Boric acid evaporators concentrates holding tank transfer pump |
| 12-TK-13 | Boric acid batching tank |
| 2-TK-150 | Main steam leads condensation drain tank |
| 1-TK-200 | Main steam leads condensation drain tank |
| 2-OME-76 | High pressure turbine |
| TK-1 | Reactor coolant drain tanks |
| OME-5 | Pressurizer relief tanks |
| HE-6A and HE-6B | Feedwater heaters |

¹ Both units, unless indicated as unit-specific ("1" or "2" prefix) or common ("12" prefix).

RAI 2.1-5:

During the audit, the applicant was unable to adequately describe the evaluation that was performed to determine if any insulation installed in the plant was required to support any system intended functions identified during the scoping process. As a result the staff requests that the applicant describe any intended functions performed by insulation or the basis for determining that insulation (e.g. piping insulation) did not meet the scoping criteria described in 10 CFR 54.4(a)(1), (a)(2) or (a)(3).

Clarification Requested by NRC Staff in May 17 and 21, 2004, Telephone Conference Calls:

The applicant stated that they would provide a clarification on the scoping of thermal insulation from a generic point of view for this question.

I&M's Supplemental Response to RAI 2.1-5:

I&M's original response to RAI 2.1-5, provided in the May 7, 2004, RAI response letter (Reference 1), identified the overall screening results for thermal insulation on piping. This supplemental response replaces the original RAI 2.1-5 response in its entirety by addressing piping thermal insulation scoping and aging management review, thereby providing the clarification requested by the NRC Staff in the May 17 and May 21, 2004, telephone conference calls (Reference 2).

In some internal plant locations, piping insulation performs the function of limiting heat loss in order to reduce area heat loads that could affect operation of safety-related equipment during an accident. This includes portions of piping in the engineered safety features (ESF) systems (emergency core cooling system (ECCS)) and the steam and power conversion systems (auxiliary feedwater (AFW) system). Such piping insulation was determined to serve an intended function, and is in scope for license renewal in accordance with 10 CFR 54.4.

The insulation that limits the heat losses into an area and supports a system function is indoors and hence is protected from the weather. This type of insulation, used on the system piping, is calcium silicate and has an intended function of heat conservation. A review of Donald C. Cook Nuclear Plant (CNP) operating experience verified that the plant has not experienced aging-related degradation of piping insulation in indoor environments. Additionally, insulation serving an intended function is encapsulated with aluminum jacketing, thereby limiting the potential for degradation.

Therefore, based upon the material, environment, and operating experience, piping thermal insulation is not expected to degrade, and aging management is not required. This is consistent with NUREG-1705, *Safety Evaluation Report Related to the License Renewal of Calvert Cliffs Nuclear Power Plant Units 1 and 2*, which states: "The staff concludes that, even if the CVCS [chemical volume control system] relied on the insulation to perform any accident

mitigation functions, there are no plausible aging effects for the insulation that would warrant an aging management program.”

RAI 2.4-2:

Based on its review of LRA Sections 2.1, 2.2, 2.3, 2.4, and 2.5, the staff identified the following three (3) issues related to scoping and screening:

- a. It is not clear to the staff if the applicant has addressed thermal insulation on piping and structures in its scoping and screening evaluation.*
- b. LRA Section 2.4.1 (Page 2.4-2) states that: “Seals are provided on the boundary of the lower and upper compartments and on the hatches in the operating deck to limit steam bypassing the ice condenser.” However, LRA Table 2.4-1 does not appear to include these seals.*
- c. LRA Section 2.4.1 identifies the equipment hatch as part of the containment structure evaluation boundary. However, LRA Table 2.4-1 does not appear to include the equipment hatch.*

For each issue above, the applicant is requested to (1) identify if it is within the scope of license renewal; (2) if not within the scope of license renewal, provide the technical basis for that determination; (3) if within the scope of license renewal, identify the specific table and row in LRA Section 2.3 or 2.4 that includes the item; and (4) if within the scope of license renewal, identify the location in LRA Section 3 that addresses the AMR for the item.

Clarification Requested by NRC Staff in May 17 and 21, 2004, Telephone Conference Calls:

The staff indicated that the thermal insulation scoping issue needs to be more specific. The applicant stated that this question was very similar to RAI 2.1-5 and that they would provide a clarification on the scoping of thermal insulation along similar lines but from a structures approach for Part A of this question. For Part B, the staff demonstrated that the “consumables” SRP was not applicable to the seals in question. I&M indicated the likelihood of submitting its revised response in a supplemental letter.

I&M’s Supplemental Response to RAI 2.4-2:

I&M’s original response to RAI 2.4-2 was provided in the May 7, 2004, RAI response letter (Reference 1). In the original response to Part a. of RAI 2.4-2, I&M addressed structural thermal insulation considerations only. This supplemental response addresses piping thermal insulation considerations, thereby providing the clarification requested by the NRC Staff in the May 17 and 21, 2004, telephone conference calls (Reference 2). In the original response to Part b., I&M identified that divider barrier hatch seals and divider barrier seals are in-scope for license renewal, but are not subject to aging management review because they are short-lived, whereas

the penetration seals were in-scope and subject to aging management review. This supplemental response also provides the bases for scoping and screening of seals associated with the divider barrier, thereby providing the clarification requested by the NRC Staff in the May 17 and 21, 2004, telephone conference calls (Reference 2).

a. Thermal insulation is addressed in two categories – thermal insulation on piping and thermal insulation on structures. The original RAI response provided the requested information pertaining to thermal insulation on structures, so this supplemental response only addresses thermal insulation on piping.

- (1) In applications where piping insulation is required to maintain post-accident temperature in areas housing safety-related equipment, the insulation is in scope and subject to aging management review.
- (2) Except as noted in paragraph a(1) above, piping insulation is not in scope and not subject to aging management review. Typically, piping insulation is installed to improve plant efficiency and provide personnel protection. For example, reactor coolant system (RCS) piping insulation is not credited in accident analyses since an RCS piping break would allow hot RCS fluid to bypass the insulation. Maintaining normal operating environment is not a 10 CFR 54.4 intended function for insulation. During normal operation, insulation supports the air conditioning and ventilation systems to maintain the environments assumed in the aging management reviews. If left uncorrected, long-term degradation might impact the ability of surrounding components or structures to accomplish required safety functions. However, in accordance with the plant's current licensing basis, normal operating practices are relied upon to maintain the material condition of the plant, including design features that are credited for maintaining analyzed operating environments.
- (3) LRA Section 2 does not list insulation in the components subject to aging management review tables. However, in some internal plant locations, piping insulation performs the function of limiting heat loss in order to reduce area heat loads that could affect operation of safety-related equipment during an accident. This includes portions of piping in the ESF systems (ECCS) and the steam and power conversion systems (AFW system). Such piping insulation was determined to serve an intended function, and is in scope for license renewal in accordance with 10 CFR 54.4.

The insulation that limits the heat losses into an area (pump rooms) is indoors and hence is protected from the weather. This type of insulation, used on the system piping, is calcium silicate and has an intended function of heat conservation. A review of CNP operating experience verified that the plant has not experienced aging-related degradation of piping insulation in indoor environments. Additionally, insulation serving an intended function is encapsulated with aluminum jacketing, thereby limiting the potential for degradation.

Therefore, based upon the material, environment, and operating experience, piping thermal insulation is not expected to degrade, and aging management is not required. This is consistent with NUREG-1705, *Safety Evaluation Report Related to the License Renewal of Calvert Cliffs Nuclear Power Plant Units 1 and 2*, which states: "The staff concludes that, even if the CVCS relied on the insulation to perform any accident mitigation functions, there are no plausible aging effects for the insulation that would warrant an aging management program."

- (4) LRA Section 3 aging management review results tables do not list insulation because, as discussed in paragraph a(3) above, this component type was not originally identified in the LRA Section 2 tables as a component subject to aging management review. Piping thermal insulation does not have an aging effect requiring management and, therefore, does not require an aging management program.
- b. Paragraphs b(2) and b(3) of I&M's original response to RAI 2.4-2 are revised to relocate screening information in the original paragraph b(3) to paragraph b(2) with additional clarification. Paragraphs b(2) and b(3) are revised to read as follows (clarification is included in *italics*):

- (2) *While these seals are in the scope of license renewal, not all are subject to aging management review.*

The first two types of seals, divider barrier seals and divider barrier hatch seals, are not listed in LRA Table 2.4-1 as subject to aging management review. *These two seal types were considered in the scoping and screening process, but were screened out because they are periodically inspected and replaced as needed.*

Divider barrier seals are *periodically* inspected and are replaced based on their condition in accordance with CNP Technical Specifications Surveillance Requirement 4.6.5.9. The divider barrier hatch seals are *periodically* inspected and are replaced as needed per CNP Technical Specification Surveillance Requirement 4.6.5.5.2. *The Technical Specification surveillance requirements for the divider barrier seals and divider barrier hatch seals provide reasonable assurance that the intended function of these components will be maintained in the period of extended operation.*

The divider barrier penetration seals are subject to aging management review.

- (3) The divider barrier penetration seals are listed as "Divider barrier penetration seals" in LRA Table 2.4-5 on page 2.4-22.

RAI 2.4-3:

The staff has reviewed the following information submitted by the applicant, in order to identify all of the structures and components that are essential to ensure access to the ultimate heat sink (Lake Michigan), for safe shutdown following a design basis event:

*LRA Section 2.3.3.2 (Essential Service Water),
LRA Section 2.3.3.11 (Screen Wash System),
LRA Section 2.4.3 (Turbine Building and Screenhouse);
UFSAR Section 9.8.3 (Service Water Systems),
UFSAR Section 10.6 (Circulating Water System);
UFSAR Figure 1.3-1 (Plot Plan),
UFSAR Figure 10.6-1 (Circulating Water System)*

As a result of this review, additional information are needed before the staff can reach a conclusion that all essential elements have been included in the LR scope and have been subject to aging management review.

LRA Section 2.4.3, under "Evaluation Boundaries", lists the structural elements that are evaluated for the turbine building and screenhouse. The following elements in the list appear to directly relate to the availability of cooling water for safe shutdown:

- Screenhouse superstructure, which houses the ESW and CW (circulating water) pumps, as well as the traveling screens, stop logs, and bar grills*
- Structural components and commodities from, and including, the intake cribs up to but not including the CW pump intake piping*
- Structural components and commodities from, and including, the intake cribs up to but not including the ESW pump intake piping*
- Structural components and commodities from, and including, the discharge tunnels up to, and including, the discharge jets*
- Structural components and commodities that support CW pumps and intake piping*
- Structural components and commodities that support ESW pumps and intake piping*
- Structural components and commodities associated with the following:*

Intake cribs; Discharge piping; Forebay; Traveling screens; Trash baskets; Trash collection; Sluice gates; De-icing tunnels; Discharge tunnels; Screenhouse; Piping supports, pump supports, baseplates, and anchors contained within the screenhouse.

However, many of the elements listed above are not specifically identified in LRA Table 2.4-3, "Turbine Building And Screenhouse Components Subject to Aging Management Review", and only two (2) items in the table specify an intended function "SCW" (provide source of cooling water for plant shutdown). These are intake corrugated steel piping and intake crib steel framing and plate. LRA Table 2.4-5, "Structural Commodities Components Subject to Aging Management Review", does not list any components specifically related to the availability of cooling water for safe shutdown.

Therefore, the applicant is requested to:

- 1. List all structures and components depicted in UFSAR Figure 10.6-1 (Circulating Water System), and any additional structures and components, that are essential to ensure the availability of cooling water for safe shutdown, up to (but not including) the ESW pumps;*
- 2. Correlate the list developed in response to (a) above with the structures and components identified in LRA Section 2.4.3 "Evaluation Boundaries";*
- 3. For each listed structure and component, identify the applicable line item in LRA Table 2.4-3 or LRA Table 2.4-5;*
- 4. If it is not included in either of these tables, identify where it is addressed in the LRA;*
- 5. Identify the applicable AMR reference for each structure and component.*

Clarification Requested by NRC Staff in May 17 and 21, 2004, Telephone Conference Calls:

The staff indicated that according to USFAR 10.6-2, the gates should be in scope. The staff was directed to see Figure 1.3-6, Page A.8 for clarification. The applicant stated that it would provide this information for clarification in a supplemental letter.

I&M's Supplemental Response to RAI 2.4-3:

I&M's original response to RAI 2.4-3, provided in the May 7, 2004, RAI response letter (Reference 1), identified the structures and components depicted in UFSAR Figure 10.6-1 (Circulating Water System) that are and are not essential to ensure availability of cooling water for safe shutdown. This supplemental response provides clarification to the original RAI 2.4-3 response by revising and expanding the first paragraph of the original RAI 2.4-3 response to provide the basis for determining the structures and components essential for the flowpath relied upon for safe shutdown. Additionally, the original RAI 2.4-3 response provided a table to correlate the items listed in LRA Section 2.4.3, Evaluation Boundaries, to line items in LRA Tables 2.4-3 and 3.5.2-3. This supplemental response clarifies the correlation for the traveling screen structural supports, which were not specifically addressed in the table in the original RAI response.

The flow path relied on for safe shutdown to ensure the availability of cooling water to the ESW pumps is through the intake pipes to the forebay and screenhouse and then to the ESW pump. The structures and components that are essential for this flow path are the forebay, intake cribs, intake pipes, screenhouse, and traveling screens. The de-icing tunnel and the discharge tunnels are not part of the required flow path but are considered subject to aging management review because they are structurally integral to the screenhouse foundation. These structures and components are depicted in UFSAR Figure 10.6-1. The structures and components that are not essential to ensure availability of cooling water for safe shutdown include the sluice gates, roller gates, stop log guides, discharge elbows, and discharge corrugated piping terminating at the discharge elbows.

The discharge elbows and the discharge corrugated piping terminating at the discharge elbows shown on UFSAR Figure 10.6-1 are not relied on to ensure the availability of cooling water to

the ESW pumps. Sluice gates and roller gates can be aligned to supply water to the ESW pumps from the lake through the discharge piping; however, as discussed in UFSAR Section 9.8.3.2, damage from barge or ship accidents or even natural phenomena that could totally isolate these three pipes is not credible. As the maximum demand for the ESW system is a small fraction (approximately one percent) of the total circulating water system demand during normal operation, and the intake pipes would not be totally isolated by a postulated accident or natural phenomenon, the alternative intake flowpath through the discharge piping using the roller gates and sluice gates is not required to ensure the availability of water to the ESW pumps.

The sluice gates and roller gates also provide de-icing capability to the intake cribs. De-icing is accomplished by closing the motor-operated sluice gate to shut off flow to the screenhouse from the middle intake pipe and sending a portion of "warm" discharge water from either the Unit 1 or Unit 2 discharge tunnel back through (via the de-icing tunnel) the middle pipe to the lake. The heated water will recirculate to the other two intake pipes thus keeping the intakes free of ice. De-icing supports normal plant operation and is not credited for emergency operation since warm circulating water flow would not be available with a loss of offsite power. Therefore, sluice gates and roller gates do not perform a license renewal intended function.

The stop log guides are not safety-related and do not perform a license renewal intended function. The purpose of the stop log guides is to hold temporary stop logs in place to allow inspections or maintenance.

As provided in the original RAI 2.4-3 response, the entry in LRA Section 2.4.3, Evaluation Boundaries, applicable to the traveling screens is, "Structural components and commodities from, and including, the intake cribs up to but not including the CW pump intake piping and those associated with the traveling screens." The original response correctly noted that the screens are active components and are not subject to aging management review. This supplemental response clarifies that the structural supports for the screens are part of the screenhouse structure, which is in scope for license renewal and subject to aging management review.

RAI 2.4-4:

It is not clear to the staff about the scope of load handling systems included in the D.C. Cook license renewal scope. LRA Section 2.3.3.12, "Material/Equipment Handling" and "Refueling", identify specific cranes that are in the scope of license renewal, and refer to LRA Section 2.4 for the evaluation. LRA Sections 2.4.1, 2.4.2, 2.4.3, and 2.4.5 all identify load handling systems under "Evaluation Boundaries" and/or in the associated Table 2.4-x. However, there is not a one-to-one correspondence between all of the cranes listed in LRA Section 2.3.3.12 and the information in LRA Section 2.4. Also, it is not clear if there are additional load handling systems in the LR scope and covered by LRA Section 2.4.

With the concerns stated above, the applicant is requested to: (1) provide a listing of all load

handling systems in the LR scope; (2) identify specific components that are subject to an AMR, for each in-scope load handling system; (3) identify the specific line item in LRA Tables 2.4-1, 2.4-2, or 2.4-5 that covers each component; and (4) identify the applicable AMR reference for each component.

Clarification Requested by NRC Staff in May 17 and 21, 2004, Telephone Conference Calls:

The staff requested clarification of what constituted the crane. The applicant stated that the crane itself was an active component. All others (i.e. rail, girders) were passive parts.

I&M's Supplemental Response to RAI 2.4-4:

I&M's original response to paragraph (2) of RAI 2.4-4, provided in the May 7, 2004, RAI response letter (Reference 1), identified some of the load handling system components that are subject to aging management review. This supplemental response provides clarification to the original RAI 2.4-4 response by revising and expanding paragraph (2) of the original RAI 2.4-4 response to clearly identify the in-scope load handling system structural components that perform a license renewal intended function:

- (2) The structural components (including crane rails, girders, bridge, trolley, monorails, and their associated supports and anchorages) of the in-scope load handling systems are subject to aging management review.

RAI 2.4-5:

Section 2.4 of the LRA does not describe the cable feed-through assembly, which is part of containment electrical penetrations. This assembly serves a pressure boundary intended function. Therefore, the applicant is requested to clarify whether the cable feed-through assembly is in scope or not. If it is in scope, identify the applicable table number and component name in LRA Section 2.4, and the applicable AMR table number and component name in LRA Section 3.5. If it is not in scope, provide the justification for its exclusion.

Clarification Requested by NRC Staff in May 17 and 21, 2004, Telephone Conference Calls:

The staff indicated to the applicant that the feed-through assemblies should be treated as structures. The applicant stated that it would review their response to determine if any changes needed to be made based on the Staff's input.

I&M's Supplemental Response to RAI 2.4-5:

I&M's original response to RAI 2.4-5, provided in the May 7, 2004, RAI response letter (Reference 1), discussed pressure testing of electrical penetrations, including cable feed-through assemblies, but did not specifically discuss 10 CFR 50, Appendix J, pressure testing of the

electrical penetration assembly resilient seals. This supplemental response provides clarification to the original RAI 2.4-5 response by superseding the last paragraph of the original RAI response with the following:

The EQ Program incorporated pressure testing of the cable feed-through assemblies in the qualification of the electrical containment penetrations. Additionally, electrical penetrations are tested in accordance with the requirements of 10 CFR 50 Appendix J. Type B testing is performed periodically on resilient seals of the electrical penetrations assemblies as required by Appendix J. This includes resilient seals associated with the cable feed-through assemblies. 10 CFR 50 Appendix J is a regulatory requirement that applies through the period of extended operation. Steel elements of the penetrations were included in the containment aging management review as "Containment penetrations (mechanical and electrical)," listed in LRA Tables 2.4-1 and 3.5.2-1, on pages 2.4-14, 3.5-28, and 3.5-29.

RAI 4.2.1-1:

LRA Section 4.2.1 states, "CNP's USE values were calculated using the methodology presented in Position 1." According to Position 1.2 (Position 1 according to the applicant's terminology) of Regulatory Guide 1.99, Revision 2, a copper composition of 0.056% and a fluence value of $1.475E+19$ n/cm² for the beltline welds at a depth one-quarter of the RPV wall thickness for the Unit 2 RPV would give an upper-shell energy reduction of about 21%, not the 12% reported in the LRA and WCAP-13517, Rev 1, "Evaluation of Pressurized Thermal Shock for D. C. Cook Unit 2." Please clarify.

I&M Review of Original Response to RAI 4.2.1-1:

I&M's original response to RAI 4.2.1-1 was provided in the RAI response letter dated June 16, 2004 (Reference 3). The original response provided concurrence with the NRC Staff reviewer's assertion that, in accordance with the methodology presented in Regulatory Guide 1.99, Revision 2, Position 1.2 (referred to as Position 1), the upper-shelf energy (USE) reduction should have been reported as 21 percent (%), not the 12% reported in the LRA and WCAP-13517, Revision 1. Based on this determination, a condition report was generated to track and resolve the apparent inaccuracy in WCAP-13517, Revision 1. However, in the course of evaluating this condition report, it was identified that CNP's USE values for the Unit 2 beltline welds were calculated using Regulatory Guide 1.99, Revision 2, Position 2.2 (referred to as Position 2) methodology, which is used when two or more credible surveillance data sets are available for the reactor. Based on this information, it was determined that the 12% USE reduction value presented in the LRA is indeed correct.

As noted in the original RAI 4.2.1-1 response, this conclusion that the Charpy USE remains above 50 ft-lbs [foot-pounds] for all base metal (plates and forgings) and welds at 48 effective full power years (EFPY) for both units remains valid. The revised response to RAI 4.2.1-1 provided below supplements the USE reduction method discussion in LRA Section 4.2.1, and

corrects the information provided in the June 16, 2003, RAI response letter (Reference 3) by replacing the original I&M response to RAI 4.2.1-1 in its entirety.

Revised Response to RAI 4.2.1-1:

WCAP-13517, *Evaluation of Pressurized Thermal Shock for D. C. Cook Unit 2*, Revision 1, Table A-2, provides projected end-of-life (EOL) (48 EFPY) USE values for Unit 2 plates using Position 1 (i.e., Regulatory Guide 1.99, Revision 2, Figure 2), which is consistent with Note (b) in the table. The USE reduction for Unit 2 beltline welds using Regulatory Guide 1.99, Revision 2, Figure 2, (with a copper content of 0.056% and EOL fluence of $1.475E19$ n/cm²), is 21% for Position 1, which is different than the 12% reduction for beltline welds reported in WCAP-13517 Table A-2. Upon further investigation, the 12% USE reduction reported in WCAP-13517 Table A-2 is correctly based on Position 2 (i.e., modified Figure 2 of Regulatory Guide 1.99, Revision 2, as per Position 2.2), and surveillance data reported in WCAP-13515, *Analysis of Capsule U from the Indiana Michigan Power Company D. C. Cook Unit 2 Reactor Vessel Radiation Surveillance Program*, Revision 1, Table 5-10. The surveillance program credibility evaluation for Unit 2 beltline welds is discussed in WCAP-15047, *D. C. Cook WOG Reactor Vessel 60-Year Evaluation Minigroup Heatup and Cooldown Limit Curves for Normal Operation*, Revision 2, Section 4.2 and Table 4-5.

Therefore, the USE reduction of 12% and the C_v USE at T/4 ft-lbs column value for Unit 2 beltline welds reported in WCAP-13517 Table A-2 and LRA Table 4.2-2 are correct and are based on Regulatory Guide 1.99, Revision 2, Position 2, and not Position 1 as implied by Note (b) in WCAP-13517 Table A-2 and as originally reported in LRA Section 4.2.1.

In summary, all EOL USE values for Unit 1 plates and welds reported in LRA Table 4.2-1 are based on Regulatory Guide 1.99, Revision 2, Position 1. All EOL USE values for Unit 2 plates reported in LRA Table 4.2-2 are based on Regulatory Guide 1.99, Revision 2, Position 1. Only the EOL USE values for Unit 2 beltline welds reported in LRA Table 4.2-2 are based on Regulatory Guide 1.99, Revision 2, Position 2.

The conclusion that the Charpy USE remains above 50 ft-lbs for all base metal (plates and forgings) and welds at 48 EFPY for both units remains valid.

References:

1. Letter from M. K. Nazar, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant, Units 1 and 2, License Renewal Application - Response to Requests for Additional Information on Scoping and Screening Results (TAC Nos. MC1202 and MC1203)," AEP:NRC:4034-01, dated May 7, 2004 [Accession No. ML041390360].
2. NRC Record of Conference Call, "Summary of Telephone Conference Calls Held on May 17 and 21, 2004, Between the U.S. Nuclear Regulatory Commission (NRC) and Indiana Michigan Power Company (I&M) Representatives Concerning Responses to Request for Additional Information on Donald C. Cook Nuclear Plant, Units 1 and 2, License Renewal Application (TAC Nos. MC1202 and MC1203)," dated July 27, 2004 [Accession No. ML042110275].
3. Letter from M. K. Nazar, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant, Units 1 and 2, License Renewal Application - Response to Requests for Additional Information on Time-Limited Aging Analyses," AEP:NRC:3054-08, dated June 16, 2004 [Accession No. ML041750561].