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May 7, 2004

AEP:NRC:4034-01
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 No. 50-315 and 50-316
License Renewal Application – Response to Requests for Additional Information on Scoping and Screening Results
(TAC Nos. MC 1202 and MC 1203)

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.

In the course of the Nuclear Regulatory Commission (NRC) review process, the NRC staff transmitted a number of draft requests for additional information (RAIs) to I&M. In a public meeting held on April 13, 2004, the Staff instructed I&M to consider these draft RAIs final, and provide responses as required to support NRC review of the license renewal application (LRA). This letter provides I&M's responses to LRA Section 2 RAIs received prior to April 1, 2004.

The enclosure to this letter provides an affirmation pertaining to the statements made in this letter. Attachment 1 provides I&M's responses to RAIs; Attachment 2 provides a copy of the nuclear sampling system flow diagrams, as required to facilitate the review of the response to RAI 2.3.3.3-5. 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,

M. K. Nazar
Senior Vice President and Chief Nuclear Officer

NH/rdw

A 104

Enclosure: Affirmation

Attachments:
1. Response to Requests for Additional Information for the Donald C. Cook Nuclear Plant License Renewal Application - Scoping and Screening Results

2. Flow Diagrams for the Donald C. Cook Nuclear Plant, Units 1 and 2, Nuclear Sampling System (OP-1-5141B-44, OP-1-5141G-2, and OP-2-5141G-2)

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

Enclosure to AEP:NRC:4034-01

AFFIRMATION

I, Mano K. Nazar, being duly sworn, state that I am Senior Vice President and Chief Nuclear Officer of American Electric Power Service Corporation and 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.

American Electric Power Service Corporation

M. K. Nazar
Senior Vice President and Chief Nuclear Officer

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 7th DAY OF May, 2004

Notary Public

My Commission Expires 6/10/2007

BRIDGET TAYLOR
Notary Public, Berrien County, MI
My Commission Expires Jun. 10, 2007

Response to Requests for Additional Information for the
Donald C. Cook Nuclear Plant License Renewal Application - Scoping and Screening Results

This attachment provides Indiana Michigan Power Company's (I&M's) responses to the Donald C. Cook Nuclear Plant (CNP) License Renewal Application (LRA) Section 2 Requests for Additional Information (RAIs) received prior to April 1, 2004.

RAI 2.1-1:

10 CFR 54(a)(1)(iii) requires, in part, that the applicant consider within the scope of license renewal those systems, structures, and components [SSCs] that ensure the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in §50.34(a)(1), §50.67(b)(2), or §100.11. In discussions with the D.C. Cook license renewal project team, the NRC staff noted that the applicant has submitted a license amendment application to allow use of the alternate source term (AST) methodology for control room habitability and offsite dose analyses. The staff has approved use of the alternate source term for control room habitability dose evaluations, but use of the alternate source term methodology for offsite dose evaluations has not yet been approved. The staff requests that the applicant describe how the use of the alternate source term method was factored into their scoping evaluations and to specifically identify the impact of the alternate source methodology on the scoping of safety-related SSCs pursuant to 10 CFR 54.4(a)(1). Additionally, with regard to the portion of the AST methodology currently under review by the staff, the applicant should describe their plans for evaluating the license renewal scoping impact should the staff approve use of the AST for offsite dose consequences evaluations.

I&M Response to RAI 2.1-1:

The license amendment request to allow the use of the AST methodology for control room dose calculations was approved in two separate license amendments. The first license amendment, License Amendments 258 (Unit 1) and 241 (Unit 2), Reference 1, accepted the use of the AST for the fuel handling accident aspects of the control room dose calculations. The second license amendment, License Amendments 271 (Unit 1) and 252 (Unit 2), Reference 2, accepted the use of the AST for the remainder of the control room dose calculations. The use of the AST method, as approved in these license amendments, does not impact the scoping of safety-related SSCs pursuant to 10 CFR 54.4(a)(1). The use of the AST methodology affected operating limits and analysis input parameters, which in turn affected some equipment performance requirements. However, the AST methodology established no new equipment functional requirements (i.e., no new or different equipment was credited for the revised control room dose analyses, and no new or different operational modes were required of equipment already credited in the analyses).

The question indicated that I&M has submitted a license amendment application to allow use of the AST methodology for offsite dose analyses. I&M's only licensing action with respect to adoption of the AST methodology is the license amendment pertaining to the control room dose analyses. I&M has no current plans to request a license amendment to credit the AST for the offsite dose analyses. Should I&M pursue this activity in the future, any changes to equipment functional requirements that would result from the new analyses will be evaluated in accordance with established design control processes. If a license amendment regarding AST should occur prior to issuance of the renewed operating license, the resultant changes to the current licensing basis (CLB) will be evaluated to determine if they materially affect the contents of the LRA, and if so, addressed in accordance with the requirements of 10 CFR 54.21(b).

References for RAI 2.1-1

1. Letter from J. F. Stang, NRC, to R. P. Powers, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Issuance of Amendments (TAC Nos. MA9394 and MA9395)," dated November 13, 2001 (License Amendments 258 and 241)
2. Letter from J. F. Stang, NRC, to A. C. Bakken III, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Issuance of Amendments (TAC Nos. MB5318 and MB5319)," dated November 14, 2002 (License Amendments 271and 252)

RAI 2.1-2:

10 CFR 54.4(a)(1)(iii) requires, in part, that the applicant consider within the scope of license renewal those systems, structures, and components that ensure the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in § 50.34(a)(1), § 50.67(b)(2), or § 100.11. In Section 2.1.1.1, "Application of Safety-Related Scoping Criteria," of the LRA, the applicant stated that, because of plant-unique considerations or preferences, some components classified as safety-related in the facility database did not perform any of the safety-related intended functions of 10 CFR 54.4(a)(1). The applicant stated that these components may have been considered outside the scope of 10 CFR 54.4(a)(1). During the audit, the applicant described the process used to evaluate components classified as safety-related that did not perform a safety-related intended function. As part of the process, the applicant stated that the safety-classification of many safety-related components was re-evaluated in order to reconcile differences between scoping determinations and facility database information. The staff requests a description of the process used during license renewal scoping activities to disposition components classified as safety-related that do not perform a safety-related intended function. In particular, the staff requires the following information:

a. *A description of any components or structures classified as safety-related in the facility safety-classification database that were not included within the scope of license renewal under the 10 CFR 54.4(a)(1) criteria. This description should include the basis for determining that these components do not perform a safety related intended function. The response should also indicate if these components were included within the scope of license renewal under a different scoping criteria (e.g. § 54.4(a)(2) or (a)(3)).*

b. *Describe how components originally classified as safety-related in the component cooling water miscellaneous header were addressed during scoping evaluations.*

c. *Describe the process used to reconcile the facility database safety classification information with scoping intended function determinations. In particular, the staff requests a description of the process including the scope of the review used to re-evaluate the safety classification of SSCs to reconcile disparities with intended function determinations.*

I&M Response to RAI 2.1-2:

a. The basis for identifying components that perform a safety-related intended function, consistent with NEI 95-10, was initiated by developing a list of plant systems commonly referred to in the CNP CLB, as defined in 10 CFR 54.3, and other information sources. The key information sources that form the CLB include the Updated Final Safety Analysis Report (UFSAR), Technical Specifications, and docketed licensing correspondence. The systems and structures list was developed from these CLB documents and other information sources, including the Facility Database (FDB). The FDB was generally not consulted for safety classification of electrical components because of the bounding approach used as described in LRA Section 2.5. Likewise, the FDB was generally not consulted for safety classification of structural components because they often have no unique identifiers such as those given to mechanical components, as described in LRA Section 2.1.2.2.1.

   Functions for mechanical systems were then identified based on reviews of CLB documentation and other information sources, including the Maintenance Rule Program Database, and the Expanded System Readiness Review Reports. Mechanical system evaluation boundaries were established to include components that support system intended functions as required by the criteria of 10 CFR 54.4(a)(1).

   Within the system evaluation boundary, long-lived passive components that perform or support an intended function without moving parts or a change in configuration or properties were subject to aging management review. LRA drawings were then created by marking mechanical flow diagrams to indicate only those components within the system evaluation boundaries that require an aging management review. However, components that are within the scope of license renewal based solely on the criterion of 10 CFR 54.4(a)(2) are not generally indicated on the drawings but are described in LRA Section 2.3 and listed in LRA Table 3.3.2-11.

This process identified some passive, long-lived mechanical components (mostly small valves) classified in the FDB as "QAN" (safety-related) that did not appear to perform a safety-related support function. Condition reports were written to track safety classification determinations (SCDs) and the FDB updates.

A comprehensive comparison of the mechanical components classified as safety-related in the FDB to the mechanical components not subject to aging management review was also performed during February 2003 after the aging management review reports were completed. This comparison confirmed that the vast majority of the passive, long-lived mechanical components classified as QAN in the FDB that were not subject to aging management review were under evaluation in accordance with the SCD process and were being tracked by condition reports. The comparison also identified a small number of additional components (thermowells, valves, and conoseals) that required aging management review. These additional components were subsequently included in the aging management review reports. This comparison provided re-assurance that all components with a safety function had been included in the scope of license renewal. Note that the FDB was not used as the primary basis for inclusion of components subject to aging management, but rather was used as a tool to confirm that all components with a safety-related function were properly and correctly subjected to aging management review.

A follow-up comparison was performed in January 2004 using similar criteria noted in the comparison discussed above. This comparison identified a few passive, long-lived mechanical components associated with the component cooling water (CCW) system seal water and letdown heat exchangers that had not been reclassified from safety-related to nonsafety-related by the tracking condition reports listed in the February 2003 comparison. These CCW system components are subject to aging management review for 10 CFR 54.4(a)(2) considerations only, and were not highlighted on the associated LRA drawings. This review also identified a temporary instrument connection isolation valve that was in scope and was included in the applicable aging management review. However, this valve, 1-RC-131, the pressurizer vent to the pressurizer relief tank vent valve, was not highlighted on drawing LRA-1-5128A at location K7, but should have been.

This comparison identified a small number of system components (typically valves, flex hoses, and dampers) in several systems that do not perform an intended function as defined in 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), or 10 CFR 54.4(a)(3). Currently, these components are conservatively classified as safety-related in the FDB, and may be considered for future re-classification. The components are characterized below:

1. Spare components that are not currently installed in the plant.
2. Test point identifiers that have an FDB number for ease of identification only.
3. Control air manual emergency vent valves. These valves are located on air lines that do not have a pressure boundary intended function.

4. Heating, ventilation, and air-conditioning (HVAC) damper compressed air flow control valves. These valves are located on compressed air lines that do not have a pressure boundary intended function.
5. Compressed air flex hoses. The flex hoses are located on air lines that do not have a pressure boundary intended function.
6. A compressed air system ring header shutoff valve. This valve is located on a compressed air line that does not have a pressure boundary intended function.
7. A future storage heater inlet shutoff valve.
8. Waste gas compressor check and shutoff valves. These valves are located on waste gas oxygen analyzer lines (1/2-inch) that do not have a pressure boundary intended function.
9. A purge exhaust vent backdraft damper. This damper is located on a duct that does not have a pressure boundary intended function.

This comparison also identified a small number of system components (typically valves and thermowells) in several systems that do not perform an intended function as defined in 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3), but are in scope for license renewal because they have a 10 CFR 54.4(a)(2) spatial interaction intended function. Currently, these components are conservatively classified as safety-related in the FDB, and may be considered for future safety classification downgrades. The components are characterized below:

1. Demineralized water system manual makeup isolation valves to the CCW surge tank. These valves are upstream of the CCW system license renewal pressure boundary.
2. The CCW system radiation detector sample isolation shutoff valve. This valve is outside of the CCW system license renewal pressure boundary.
3. Main steam trip and throttle valve condensate drain valves. The valves are not within the main steam system license renewal pressure boundary.
4. Pressurizer relief tank drain shutoff valves. These are drain valves for the pressurizer relief tank, which does not have an intended function.
5. Thermowells. The thermowells are downstream of the pressurizer safety valves, which form the license renewal boundary for 10 CFR 54.4(a)(1).
6. Reactor coolant tank drain shutoff valves. These valves are located on a line that does not have a pressure boundary intended function.
7. The monitor tank transfer pump discharge to circulating water (CW) discharge tunnel drain valve. This valve is located on a line that does not have a pressure boundary intended function.
8. A secondary sampling shutoff valve. This valve is located on a line that does not have a pressure boundary intended function.

In conclusion, all long-lived, passive mechanical components that perform a 10 CFR 54.4(a)(1) intended function were found to be subject to aging management review. No exceptions were noted.

b. Components originally classified as safety-related (including those in the CCW miscellaneous header) that were subsequently re-classified to nonsafety-related were addressed/evaluated using the SCD process. The process for judging if components have a safety-related function is described in response "a" above, while the SCD process is briefly summarized below from the CNP procedure.

   The SCD evaluator/preparer identifies and reviews the design output documents (e.g., system descriptions, ISI/IST lists, the Environmental Qualification Equipment List, flow diagrams, electrical elementary diagrams, wiring diagrams, one-line drawings) that describe the functions and the safety classification of the component. The system safety functions and component safety functions are listed on a SCD form along with a discussion of the basis for the safety classification. The discussion documents the justification for the safety classification, including a failure evaluation, if appropriate. Review and approval of the SCD are in accordance with the procedure. The FDB is updated as required following approval of the SCD.

c. A list of safety-related mechanical components was derived from the FDB. This FDB list was compared to a list of passive, long-lived mechanical components that were determined to be subject to aging management review, based on the scoping intended function determination. A listing of the component types subject to aging management review is provided in the LRA Section 2 tables, with a more detailed list provided in each of the mechanical aging management reports.

   Reconciliation was performed in February 2003, and again in January 2004. Details of these reviews are described further in the response to Part "a" of this question. Both reconciliations determined that the long-lived, passive mechanical components that perform a 10 CFR 54.4(a)(1) intended function were subject to aging management review. No exceptions were noted.

   Note that the FDB was not used as the primary basis for inclusion of components subject to aging management review, but rather was used as a tool to confirm that all components with a safety-related function were properly and correctly subjected to aging management review.

RAI 2.1-3:

By letters dated December 3, 2001, and March 15, 2002, the Nuclear Regulatory Commission (NRC) issued a staff position to the Nuclear Energy Institute (NEI) which described areas to be considered and options it expects licensees to use to determine what systems, structures, or components (SSCs) meet the 10 CFR 54.4(a)(2) criterion (i.e., all nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any safety-related functions identified in paragraphs (a)(1)(i), (ii), (iii) of this section).

The December 3rd letter provided specific examples of operating experience which identified pipe failure events (summarized in Information Notice (IN) 2001-09, "Main Feedwater System Degradation in Safety Related ASME Code Class 2 Piping Inside the Containment of a Pressurized Water Reactor") and the approaches that the NRC considers acceptable to determine which piping systems should be included in scope based on the 54.4(a)(2) criterion.

The March 15th letter further described the staff's expectations for the evaluation of non-piping SSCs to determine which additional nonsafety related SSCs are within scope. The position states that applicants should not consider hypothetical failures, but rather should base their evaluation on the plant's current licensing basis (CLB), engineering judgment and analyses, and relevant operating experience. The letter further describes operating experience as all documented plant specific and industry wide experience which can be used to determine the plausibility of a failure. Operating experience documentation sources would include NRC generic communications and event reports, plant specific condition reports, industry reports such as SOERs, and engineering evaluations.

Based on a review of the license renewal application (LRA), the applicant's scoping and screening implementation procedures, and discussions with the applicant, the staff determined that additional information is required with respect to certain aspects of the applicant's evaluation of the 10 CFR 54.4(a)(2) scoping criteria. Please address the following issues:

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.

b: Section 2.1.1.2.2, "Spatial Failures of Nonsafety-Related SSCs," of the LRA states that nonsafety-related systems and nonsafety-related portions of safety-related systems containing steam or liquid that are near safety-related equipment are considered within the scope of license renewal per 10 CFR 54.4(a)(2). However, this section of the LRA

also states that long-term exposure to conditions resulting from a failed nonsafety-related SSC (such as leakage or spray) is not considered credible. The staff requests that the applicant clarify its position and methodology relative to the consideration of spray and wetting of safety-related SSCs due to the failure of nonsafety-related equipment. Specifically, the applicant should address the following:

1. *Clarify how the determination that long-term exposure to conditions resulting from a failed nonsafety-related SSC was not considered credible was applied during scoping evaluations. Specifically address if nonsafety-related SSCs were excluded from the scope of license renewal based on this determination.*

2. *Describe how the effects of short-term wetting and spray on passive and active safety-related SSCs were considered during 10 CFR 54.4(a)(2) scoping. During the methodology audit, the applicant indicated that the methodology for evaluating spatial interactions assumed that safety-related SSCs were capable of withstanding short-term duration spray and wetting without loss of intended function. The applicant should clarify how the effects of short term spray and wetting were considered during scoping. Furthermore, if it was assumed that safety-related SSCs could withstand short-term spray or wetting without loss of intended function, the applicant should describe the basis for this assumption.*

3. *Identify if the walkdown aging management program described in Section B.1.38, "System Walkdown," of the LRA was used as the sole aging management program for any nonsafety-related structures or components that could potentially spatially interact with safety-related SSCs. If the effects of aging for any nonsafety-related SSC are managed solely by the system walkdown aging management program, the applicant should describe how the effects of short term spray and wetting were considered during scoping and aging management review evaluations.*

In addressing each of the above issues, if your review indicates that use of the scoping methodology screened out potential nonsafety-related SSCs that could spatially interact with safety-related SSCs, describe any additional scoping evaluations performed to address the 10 CFR 54.4(a)(2) criteria. As part of your response, list any additional SSCs included within scope as a result of your efforts, and list those SCs for which aging management reviews were conducted, and for each SC describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

I&M Response to RAI 2.1-3:

a. For nonsafety-related piping connected to safety-related piping, the piping and supports up to the first equivalent anchor beyond the safety/nonsafety interface are within the scope of license renewal and subject to aging management review. The safety/nonsafety interface is shown on the LRA drawings. However, the exact location of the equivalent anchor is not shown on these drawings. To assure that all material and environmental combinations were included in the LRA aging management review summary tables, a review of Group 1 systems was performed. As defined in LRA Section 2.3.3.11, Group 1 systems are those within the scope of license renewal for 10 CFR 54.4(a)(1) or 10 CFR 54.4a(3), as well as 10 CFR 54.4a(2). Piping classifications beyond the license renewal boundary indicated on the drawings for these systems were reviewed to ensure that no new material and environmental combinations exist. Piping was traced from the license renewal boundary back to an obvious anchor point (e.g., a larger line, a larger component such as a pump, heat exchanger, etc.) to identify piping classification changes. This approach assured that the piping reviewed would include the first equivalent anchor. If a piping material or environmental change was identified, it was compared with the aging management review results for that system or a connected system to validate that the material and environmental combination was addressed.

   The essential service water (ESW) and CCW systems did not require a drawing review. As indicated in the aging management review results tables, LRA Tables 3.3.2-2 and 3.3.2-3, all possible material (carbon steel, stainless steel, and copper alloy) and environmental combinations for these two systems have been addressed, since the CNP piping specifications allow only these materials.

   Review of the Group 1 systems confirmed that all applicable material and environmental combinations up to and including the first equivalent anchor were included in LRA Section 3.0, Aging Management Review Results.

b. Clarification of the methodology relative to the consideration of spray and wetting of safety-related SSCs due to the failure of nonsafety-related equipment is provided in the following paragraphs.

   1. LRA Section 2.1.1.2.2, under the heading *Leakage, Spray, or Flooding*, states that "Long-term exposure to conditions resulting from a failed nonsafety-related SSC (such as leakage or spray) is not considered credible." This conclusion was not applied during scoping evaluations. If a steam or liquid-filled nonsafety-related system (or nonsafety-related portion of a safety-related system) was in a safety-related building, then that system was considered in scope for 10 CFR 54.4(a)(2) regardless of potential exposure duration. Nonsafety-related SSCs were not excluded from the scope of license renewal based on the consideration that long-term exposure to conditions resulting from a failed nonsafety-related SSC was not credible.

2. The potential for wetting or spray on passive and active safety-related components was considered in scoping evaluations. Nonsafety-related systems containing steam or liquid that are near safety-related equipment are considered in scope for 10 CFR 54.4(a)(2) regardless of potential exposure duration. An assumption that safety-related SSCs could withstand short-term spray or wetting without loss of intended function was not applied during scoping or screening.

3. As indicated in LRA Table 3.3.2-11, the System Walkdown Program is credited as the sole aging management program for some nonsafety-related components that could spatially interact with safety-related SSCs. As stated above, the duration of potential spray or wetting was not a consideration during scoping. The System Walkdown Program, as described in LRA Appendix B.1.38, is considered adequate since it requires periodic walkdowns that will detect and correct failures caused by long-term exposure to spray or wetting. Short-term exposure is not a concern for passive components such as valve bodies and piping. Active safety-related component failures due to short-term exposure would be detected in the course of normal operation or through monitoring required by the Maintenance Rule and appropriate corrective actions would be taken. This is consistent with the Statement of Considerations (SOC) that states,

> "On the basis of consideration of the effectiveness of existing programs which monitor the performance and condition of systems, structures, and components that perform active functions, the Commission concludes that structures and components associated only with active functions can be generically excluded from a license renewal aging management review. Functional degradation resulting from the effects of aging on active functions is more readily determinable, and existing programs and requirements are expected to directly detect the effects of aging."

RAI 2.1-4:

LRA Section 2.1.2.4.1, Packing, Gaskets, Component Seals, and O-rings, states that "These types of consumables are considered subcomponents of the identified components and, therefore are not subject to their own condition or performance monitoring where it can be demonstrated that one of the following conditions exist:

- *The sealing materials are short-lived because they are replaced on a fixed frequency or have a qualified life established (e.g., for EQ purposes), or*
- *The sealing materials are not relied on in the CLB to maintain either:*
  - *Leakage below established limits, or*
  - *System pressure sufficiently high to deliver specified flow rates."*

Discuss how it was demonstrated that the types of consumables discussed in this section were not subject to their own condition or performance monitoring.

I&M Response to RAI 2.1-4:

During aging management reviews, consumable subcomponents, such as packing, gaskets, seals, and o-rings, were determined not to be subject to aging management review. The two criteria discussed in LRA Section 2.1.2.4.1 are (a) sealing materials that are short-lived because they are replaced on a fixed frequency or have a qualified life and (b) sealing materials not relied on to maintain leakage below limits and not relied on to maintain system pressure high enough to deliver required flows. The following paragraphs provide a summary of the results of the application of these two criteria.

(a) Sealing materials that are considered short-lived include:

- electrical component sealing materials with a qualified environmental qualification (EQ) life;
- reactor vessel o-rings that are periodically replaced; and
- reactor coolant pump (RCP) seals that are periodically monitored and replaced as needed consistent with the criteria in WCAP-14575-A, *Aging Management Evaluation for Class 1 Piping and Associated Pressure Boundary Components*, Section 3.1.7. The RCP seals are a highly visible and closely monitored element of the reactor coolant system. I&M maintains site-specific procedures specifying performance monitoring and inspection activities of these seals and subsequent seal replacement based on the results of these activities. Additionally, RCP seal leakage is closely monitored as controlled leakage in the CNP technical specifications. These performance and condition monitoring activities have proven effective in identifying conditions indicative of RCP seal degradation; thereby allowing I&M to replace these components prior to failure.

(b) Sealing materials that are not required to maintain pressure boundary integrity include:

- pressurizer manway gaskets, which do not require aging management review, as evaluated in WCAP-14574-A, *License Renewal Evaluation: Aging Management Evaluation for Pressurizers*, Section 2.2; and
- other packing, gaskets, component seals, and o-rings that are not considered pressure boundaries per ASME Section III.

Structural sealants required to maintain positive or negative pressure for a space or used to provide flood and fire barriers are subject to aging management review and are included in the LRA in Sections 2.4.5, 3.5.2.1.1, and 3.5.2.1.5; and in Tables 2.4-1, 2.4-5, 3.5.1 (item 3.5.1-6), 3.5.2-1, and 3.5.2-5.

The review summarized above demonstrates that sealing materials were adequately evaluated to provide reasonable assurance that either the materials are not subject to aging management review or the aging effects on these materials will be effectively managed during the period of extended operation.

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).

I&M Response to RAI 2.1-5:

In some internal plant locations, piping insulation serves the intended function of limiting heat loss in order to reduce area heat loads during an accident. Insulation that functions only to maintain the environment (temperature) during normal operation does not perform an intended function as described in 10 CFR 54.4. An example of such insulation is that which is installed on hot piping in containment. Degradation of this insulation could result in local concrete temperature exceeding the temperature assumed for the environment in the aging management review. However, maintaining the environment assumed for the aging management review is not an intended function, as described in 10 CFR 54.4. NUREG-1801, *Generic Aging Lessons Learned (GALL) Report*, recommends further evaluation for concrete exposed to elevated temperatures; however, NUREG-1800, *Standard Review Plan for Review of License Renewal Applications of Nuclear Power Plants*, Section 3.5.3.2.2.1, states that further evaluation of concrete at elevated temperature is necessary only if the concrete is not covered by the structures

monitoring program. Concrete is included in the CNP Structures Monitoring Program, which provides assurance that aging effects, including those due to high temperature that could be caused by insulation degradation, will not compromise the ability of the concrete to perform its intended functions. Therefore, in accordance with the guidance specified in NUREG-1800, further evaluation of this concrete is unnecessary, and the subject piping insulation is not subject to aging management review.

Insulation that performs an intended function is indoors and hence is protected from the weather. A review of CNP operating experience verified that the plant has not experienced aging-related degradation of piping insulation in dry indoor environments. Therefore, based on operating experience, there are no aging effects requiring management for indoor insulation at CNP. 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 and 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 2.1-6:

The audit team evaluated the quality attributes of the applicant's Aging Management Program (AMP) activities described in Appendix B, "Aging Management Programs and Activities," of the LRA. Guidance for the staff review of this area is contained in NUREG-1800, Section A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)." As described in Branch Technical Position IQMB-1, the AMP quality attributes for safety-related components and structures are adequately addressed by the Quality Assurance requirements of 10 CFR 50, Appendix B. For nonsafety-related structures and components subject to an AMR, the applicant has the option to expand the scope of its 10 CFR Part 50 Appendix B program to include nonsafety-related structures and components to address corrective actions, the confirmation process, and administrative controls for aging management during the period of extended operation. Based on the staff's evaluation, the quality attributes (corrective action, confirmation process, and administrative controls) described in Section B.0.3, "CNP Corrective Actions, Confirmation Process, and Administrative Control," are consistent with Branch Technical Position IQMB-1. However, the team determined that the applicant has not described the AMP quality attributes in Appendix A, "Updated Final Safety Analysis Report Supplement." Consistent with Branch Technical Position IQMB-1, applicant should either document a commitment to expand the scope of its 10 CFR Part 50 Appendix B program to include nonsafety-related structures and components subject to an AMP to address the AMP quality attributes during the period of extended operation or propose an alternative means to address this issue. The staff requests that the applicant clarify their commitments related to addressing the quality attributes of AMPs applicable to nonsafety-related structures and components subject to aging management. The description in Appendix A should provide sufficient information for the staff to determine if the quality attributes for the Appendix A.1 aging management programs are consistent with the review acceptance criteria contained in NUREG-1800, Section A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)."

I&M Response to RAI 2.1-6:

The "Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants" includes Branch Technical Position RLSB-1 Aging Management Review – Generic. RLSB-1, Section A.1.2.3, "Aging Management Program Elements," Subsection A.1.2.3.8, "Confirmation Process," states, "The confirmation process should be described. The confirmation process should ensure that preventive actions are adequate and that appropriate corrective actions have been completed and are effective."

The CNP Corrective Action Program is an existing program for identifying, evaluating, and correcting deficiencies and is implemented in accordance with the requirements of 10 CFR 50, Appendix B and CNP's Quality Assurance Program Description (QAPD). Under the guidance of the CNP QAPD, administrative procedures for corrective actions require that any deficiency documented by an individual shall be evaluated, dispositioned, and either corrected or declared

acceptable in accordance with the deficiency disposition. These procedures and instructions provide guidance on documentation, evaluation, completion, and confirmation actions, including follow-up of corrective actions. Accordingly, the confirmation process is part of the corrective action program and the CNP Quality Assurance Program.

Therefore, deficiencies identified during the performance of inspections or activities associated with any of the aging management programs or time-limited aging analyses will be entered into the appropriate corrective action program and actions, including confirmation activities, performed accordingly.

The CNP UFSAR Supplement (LRA Appendix A, Section A.2.1) will be revised as indicated by the underlined paragraph below: (Note: This change is consistent with same change accepted by the NRC for inclusion into the R. E. Ginna Nuclear Power Plant UFSAR for license renewal programs.)

A.2.1 AGING MANAGEMENT PROGRAMS AND ACTIVITIES

The integrated plant assessment and the time-limited aging analyses for license renewal identified existing and new aging management programs necessary to provide reasonable assurance that structures and components within the scope of license renewal will continue to perform their intended functions consistent with the CLB for the period of extended operation. This section describes the aging management programs and activities that will be required during the period of extended operation. Existing aging management programs, including those requiring license renewal enhancements, are described in the present tense; whereas new aging management programs that are developed for license renewal are presented in the future tense.

The CNP Quality Assurance Program Description implements the requirements of 10 CFR 50, Appendix B, and is consistent with the summary in Section A.2 of NUREG-1800, Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants, published July 2001. The Quality Assurance Program Description includes the elements of corrective action, confirmation process, and administrative controls, and is applicable to the safety-related and non-safety-related structures, systems, and components that are within the scope of license renewal.

RAI 2.2-3:

In a comparison of the D. C. Cook units, the staff's review finds that, in general, the CNP LRA does not identify design differences in the systems and components for D. C. Cook Unit 1 compared to Unit 2. D. C. Cook Units 1 and 2 were licensed approximately three years apart and have a 5% difference in rated thermal power.

Provide a general description of the major design differences between the systems and components of the two units. Explain how these differences have been addressed in the scoping and screening review process for the corresponding systems of the two units.

I&M Response to RAI 2.2-3:

The CNP units are essentially the same, and any design differences were reviewed in accordance with the established process for scoping and screening. A general description of the noteworthy design differences is provided below. These differences have already been addressed, as required, in LRA Section 2 (Scoping and Screening), and Section 3 (Aging Management Results).

(1) Turbine Generators

The Unit 1 turbine-generator was manufactured by the General Electric Company with an electro-hydraulic type turbine control system. The Unit 2 turbine-generator was manufactured by Brown, Boveri and Company with a mechanical-hydraulic turbine control system. Both control systems are functionally similar. As described in LRA Section 2.3.4.5, the capability to trip the main turbine is a function required in support of the anticipated transient without scram (ATWS) and station blackout events. This is the only intended function of the mechanical components of the main turbine and is within the scope of license renewal based on the criterion of 10 CFR 54.4(a)(3). Tripping the main turbine requires releasing hydraulic oil from the main turbine control system. If hydraulic control oil pressure is lost, the trip function is completed. Mechanical pressure boundary integrity is not required for this function to be met. Therefore, no passive mechanical components of the main turbine require aging management review.

(2) Steam Generators

The Unit 2 steam generators (SGs) were replaced in 1988, and the Unit 1 SGs were replaced in 2000. The Unit 1 SG replacement included installation of a new lower assembly (including tube bundle), new steam drum internals, and a new feedwater distribution system. The steam drum internals were installed in the refurbished, original steam drum shell. The Unit 2 SG replacement included installation of a new lower assembly (including tube bundle) and refurbishment of the upper assembly (steam drum) and associated internals. Design differences in SG components and/or materials are further detailed in LRA Tables 2.3.1-5 and 3.1.2-5.

(3) Refueling Water Storage Tank

The Unit 1 refueling water storage tank is heated by means of heat tracing circuits. The Unit 2 refueling water storage tank is heated by means of a pump that recirculates tank water through two electric heaters. Both tanks are insulated with 2-inch thick fiberglass insulation.

The passive components for the Unit 2 heater circulation loop are included for aging management, and are listed in LRA Tables 2.3.2-1 and 3.2.2-1.

(4) Reactor Fuel

The Unit 1 reactor core incorporates a 15 x 15 fuel assembly design, whereas the Unit 2 reactor core is comprised of an array of 17 x 17 fuel assemblies. LRA Section 2.3.3.12 notes that the primary safety intended function of the fuel is to provide a barrier for fission products. However, the fuel is not subject to aging management review because it is periodically replaced.

RAI 2.2-4:

Section 1.4 of the CNP UFSAR notes that the design of Unit 1 preceded the adoption of the 10 CFR 50 Appendix A, General Design Criteria, and therefore, the D. C. Cook plant was designed and constructed to meet the intent of the Proposed General Design Criteria, published July 11, 1967. Use of the preliminary version of the plant-specific design criteria may have resulted in significant differences in the licensing bases for CNP Units 1 and 2 from later PWRs of a similar design.

To facilitate the staff's review, provide a summary description of the impact of these differences on the CNP design, including the technical areas where these differences may impact the scoping and screening results for the two units.

I&M Response to RAI-2.2-4:

The CNP Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the CNP design. The PSDC discussed in Section 4 of the UFSAR applied I&M's "understanding of the intent" of the General Design Criteria (GDC) proposed by the Atomic Energy Commission (AEC) in July 1967. The CNP PSDC, as presented in the Preliminary Safety Analysis Report, were approved by reference when the construction permits were issued by the AEC.

The application for the operating license, including the Final Safety Analysis Report, was submitted on February 1, 1971, prior to the May 21, 1971, effective date of 10 CFR 50, Appendix A. The AEC review ensured that, at a minimum, the CNP design met the PSDC by evaluating the design against the more recent proposed GDC. This review was documented in Section 3.1 of the September 10, 1973, operating license Safety Evaluation Report (SER), which acknowledged that CNP was not designed to, and I&M was not committed to, the "current General Design Criteria," although the design meets these criteria:

> "The Cook plant was designed and constructed to meet the intent of the Proposed General Design Criteria, published July 11, 1967. The Final Safety Analysis Report had been filed with the Commission when revisions of the General Design Criteria were published in February 1971 and July 7, 1971. We reviewed the plant design against the current General Design Criteria and we believe that the design meets these criteria."

The license renewal integrated plant assessment (IPA) was performed in accordance with the requirements of 10 CFR 54, and is consistent with the guidance provided by NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR 54 – License Renewal." This review did not include a detailed comparison of the CNP design to the 10 CFR 50, Appendix A GDC, but rather assessed the existing plant design, as described in the CLB, to ensure that the structures and components requiring aging management are identified and that the effects of aging are effectively managed to maintain the CLB.

As discussed in UFSAR Section 1.4.10, a number of specific aspects of the 10 CFR 50, Appendix A GDC have become obligations or commitments applicable to the CNP design. If these aspects were determined to be pertinent to the license renewal IPA, they were discussed or referenced in the LRA. For example, LRA Section 2.3.3.6 (page 2.3-65) states that maintaining dose to control room operators less than GDC-19 is a safety-intended function of the control room ventilation system. Also, LRA Section 4.7.1.2 (page 4.7-3) discusses the leak-before-break (LBB) analysis of the pressurizer surge line. This analysis credits provisions of GDC-4, "Environmental and Dynamic Effects Design Basis," to exclude from the plant's design basis the dynamic effects associated with postulated pipe rupture if analysis is approved by the NRC demonstrating that the probability of pipe rupture is extremely low. NRC approval of the LBB analysis is provided in LRA reference 4.7-3.

In summary, the CNP design, as approved by the NRC in the September 10, 1973, operating license SER, was determined to meet the GDC that were current at the time of issuance of the operating license (i.e., GDC published in 10 CFR 50, Appendix A). I&M did not perform a detailed comparison of the plant design to the GDC, but instead considered the plant design, as described in the CLB, as the basis for the license renewal evaluations in the IPA. Specific cases where I&M has committed to aspects of the 10 CFR 50, Appendix A GDC are discussed in UFSAR Section 1.4.10, and the LRA, where appropriate.

RAI 2.2-5:

Many LRA Section 2 tables (for example, Tables 2.3.3-2, 2.3.3-3, and 2.3.4-3) list "fittings" as a component type subject to an AMR having the intended function of a pressure boundary. Fittings normally include the piping system components such as elbows, tees, unions, reducers, caps, etc. However, the corresponding LRA tables for the other auxiliary systems and steam and power conversion systems (for example, Tables 2.3.3-5, 2.3.3-6, 2.3.3-11, 2.3.4-1, 2.3.4-2, and 2.3.4-4) do not include the component type fittings, even though fittings are an integral part of these systems. Identify components that are considered in the LRA tables as part of the component group fittings, and explain why the component type "fittings" is not included in some of the LRA Section 2 tables.

I&M Response to RAI 2.2-5:

Piping system components such as elbows, tees, unions, reducers, and caps were included in component type "Fittings." In some of the LRA Section 2 (and Section 3) tables, these piping system components were included in component type "Piping." Fittings were included separately in those LRA tables where a fittings listing was not identical to piping or manifold (piping) listings in the table (i.e., differences exist between the materials or environments applicable to the piping/manifold and those applicable to the fittings). Where the material/environment combinations applicable to the fittings were the same as the piping listings in a table, a separate listing was not necessary. Regardless of which component type was used for fittings that are an integral part of a system, all material and environmental combinations present in passive, long-lived components that perform or support an intended function within the system were reviewed and appropriately included for aging management.

RAI 2.2-6:

License renewal drawings for the essential service water system for D.C. Cook, Unit 1 and Unit 2, LRA-1-5113 and LRA-2-5113, show radiation monitoring alarms, at locations M3 and M6 on the drawings. Similarly, radiation monitoring alarms are shown on the Unit 1 and Unit 2 license renewal drawings of the component cooling water system LRA-1-5135 and LRA-2-5135, at locations J6 and J7. Clarify whether these alarms penetrate the pressure boundary of the system piping. If they do, as recommended in Table 2.1-5 of NUREG-1800 and Appendix B of NEI 95-10, Revision 3, identify the radiation monitoring alarms for the auxiliary systems that support the intended function of maintaining the pressure boundary and thus are within the scope of license renewal and subject to an AMR in accordance with the requirements of 10 CFR 54.4(a)(1)(ii) and 10 CFR 54.21(a)(1).

I&M Response to RAI 2.2-6:

The pressure boundary passive mechanical component for these radiation detectors is included in review of the ESW and CCW systems under the component type identified as "Detector well" in LRA Tables 3.3.2-2 and 3.3.2-3.

RAI 2.3.3.1-1:

Section 2.3.3.1, "Spent Fuel Pool" (SFP) of the LRA states that "The primary safety intended function of the spent fuel pool system is to maintain adequate water inventory for shielding and to prevent criticality of the stored fuel." In a letter dated February 4, 1992, in response to the staff's request for additional information on a license amendment request for D. C. Cook, Units 1 and 2, the Indiana Michigan Power Company stated the following:

> *Make-up water to the [spent fuel] pool can be obtained from several reliable, permanently installed sources, including the [chemical and volume control system] hold-up tank recirculation pump, demineralized water supply, and [reactor water storage tank]. . . With these diverse sources, make-up water will be readily available in the event of loss of spent fuel pool cooling.*

In the safety evaluation issued pursuant to the above amendments (Amendment Nos. 169 and 152 to licenses DPR-58 and DPR-74 for D. C. Cook, Units 1 and 2) dated January 14, 1993, the staff stated the following:

> *In the safety evaluation issued pursuant to Amendment No. 32 to Facility Operating License No. DPR-58 and Amendment No. 13 to Facility Operating License No. DPR-74 for D. C. Cook, Units 1 and 2, respectively, state that the spent fuel pool meets the design criteria of Regulatory Guide 1.13 which requires a diversity of make up water sources to the spent fuel pool. The SE states that in a previous SE for Amendment No. 32 and 13 to licenses DPR-58 and DPR-74, the staff accepted the chemical and volume control system hold-up tanks as the Seismic Category I source of make up water to the SFP. The hold-up tank recirculation pump, which is rated at 500 gpm, can be used to pump water from the hold up tank to the SFP.*

However, the license renewal drawing of the SFP, LRA-12-5136, does not show the source of make-up water from the chemical and volume control system (CVCS) hold-up tanks to the SFP as being subject to an AMR. Justify the exclusion of the piping and components linking the make-up water source from the CVCS hold-up tanks, and at least one other make-up water source to the SFP from being subject to an AMR in accordance with the requirements of 10 CFR 54.4(a)(1)(iii) and 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.1-1:

The make-up water piping from the CVCS hold-up tanks to the SFP is not currently classified as Seismic Class I, nor has it ever been classified as Seismic Class I. Consequently, these piping and components are not subject to aging management review in accordance with the requirements of 10 CFR 54.4(a)(1)(iii).

Drawing LRA-12-5136 is highlighted to indicate those mechanical components subject to aging management review that perform a 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3) function. The piping and components from the CVCS hold-up tanks (or other sources) to the SFP are not highlighted, because they are not safety-related (i.e., non-seismic Class I) and are not relied upon to demonstrate compliance with the regulated events of 10 CFR 54.4(a)(3). The seismic classification of the CVCS hold-up tanks and make-up water piping to the SFP as presented in this response is in agreement with I&M responses to the NRC staff's request for additional information in support of SFP storage capacity expansion in 1979 (Amendment Nos. 32 and 13 for CNP, Units 1 and 2) and SFP reracking in 1992 (Amendment Nos. 74 and 58 for CNP, Units 1 and 2) (References 1 and 2, respectively). The safety evaluations for these license amendments erroneously identified these piping and components as Seismic Class I.

References for RAI 2.3.3.1-1

1. Letter from G. P. Maloney, I&M, to H. R. Denton, NRC, "Spent Fuel Storage Capacity Expansion Program," AEP:NRC:0213B, dated September 26, 1979

2. Letter from E. E. Fitzpatrick, I&M, to NRC Document Control Desk, "Spent Fuel Pool Reracking Response to Request for Additional Information," AEP:NRC:1146B, dated February 4, 1992

RAI 2.3.3.2-1:

LRA Table 2.3.3-2 lists tubing in the essential service water system (ESW) as subject to an AMR. However, tubing is not identified on the ESW license renewal drawings. Identify the ESW tubing that is in scope and subject to an AMR.

I&M Response to RAI 2.3.3.2-1:

The LRA drawings highlight entire instrument lines between the main process piping up to the instrument as subject to aging management review. Instrument lines typically include tubing as a part of the routing to the instrument, even though it is not specifically identified as tubing on the drawing. However, this same instrument line may also include piping. The "Tubing" entry in LRA Table 2.3.3-2 represents instrument tubing and the "Piping" entry in the table represents process and/or instrument piping. Both component types are listed to describe the complete passive mechanical pressure boundary up to the instruments. Aging management review results for the tubing are provided in LRA Table 3.3.2-2.

RAI 2.3.3.2-2:

License renewal drawings of ESW for D. C. Cook Unit 1 and Unit 2, LRA-1-5113A and LRA-2-5113A identify "Auto Vent VA" components T-131-5, T-131-6, T-131-7, and T-131-8 shown at locations D9, C7, D4, and C2 of the drawings to be within the scope of license renewal and subject to an AMR. Similarly, license renewal drawings LRA-1-5113 for Unit 1 and LRA-2-5113 for Unit 2 identify components T-131-1, T-131-2, T-131-3, and T-131-4 shown at locations B3, and B7 of the drawings as within scope and subject to an AMR. However, an Auto Vent VA component group is not listed in Table 2.3.3.2 as being subject to an AMR. Include the Auto Vent VA component group in Table 2.2.3.2 or justify the exclusion of this group from the table.

I&M Response to RAI 2.3.3.2-2:

These auto vent components are included under the component type "Valve" and were included in the aging management review of the ESW System.

RAI 2.3.3.2-3:

LRA Section 2.3.3.2 states that the license renewal drawings do not indicate components that are within the scope of license renewal in accordance with the requirements 10 CFR 54.4(a)(2) only. This section also states that "nonsafety-related component types in the ESW system that require aging management review for 10 CFR 54.4(a)(2) are in the auxiliary building and screen house and consist of bolting, valves, tubing and piping."

Clarify whether all the bolting, valves, tubing and piping in the auxiliary building and screen house are in-scope and subject to an AMR in accordance with 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1). If not, identify which components are in-scope and subject to an AMR.

I&M Response to RAI 2.3.3.2-3:

All ESW system bolting, valves, tubing, and piping located in the auxiliary building and screenhouse that is highlighted on the LRA drawings specified in LRA Section 2.3.3.2 is within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3), and is subject to aging management review. As described in LRA Section 2.3.3.11, ESW is a Group 1 system; therefore, portions of the system are subject to aging management review based on meeting the criteria of 10 CFR 54.4(a)(2).

The 10 CFR 54.4(a)(2) identification process, as described in response to RAI 2.3.3.11-2, identified nonsafety-related systems and components with the potential for spray or leakage that could prevent safety-related systems and components from performing their required safety function. Conservatively, all nonsafety-related components containing liquid or steam located in the auxiliary building and screenhouse were determined to be subject to aging management review unless no safety-related equipment was in the area. For the ESW system, the 10 CFR 54.4(a)(2) identification review confirmed that all water-carrying ESW system bolting, valves, tubing, and piping in the auxiliary building is located in areas containing safety-related equipment, and is therefore subject to aging management review. In the screenhouse, all water-carrying ESW system bolting, valves, tubing, and piping is subject to aging management review, with the exception of inaccessible portions of the duplex strainer backwash outlet and auto-vent drains and the ESW discharge header, which are encased in concrete beneath the screenhouse slab. Because they are encased in concrete beneath the screenhouse, failure of this piping would not result in leakage or spray that could prevent the ability of any safety-related components to perform their safety function.

RAI 2.3.3.3-1:

The following items are shown on the license renewal drawings as within the scope of license renewal and subject to an AMR. However they are not listed in Table 2.3.3-3, "Component Cooling Water (CCW) System Components Subject to Aging management Review." Explain why these components are not listed in Table 2.3.3-3 as components subject to an AMR.

a. Upper and lower bearing oil coolers shown on the license renewal drawings LRA-1-5135D and LRA-2-5135D, at locations E2, H2, K2, and L2
b. External pipe coils shown on the license renewal drawings LRA-1-5135E and LRA-2-5135E at locations B2, B5, J2, and J5.

I&M Response to RAI 2.3.3.3-1:

a. Upper bearing oil coolers shown on LRA drawings LRA-1-5135D and LRA-2-5135D are included in LRA Table 2.3.3-3 under the component types "Heat exchanger (shell)" and "Heat exchanger (tubes)." Lower bearing oil coolers shown on drawings LRA-1-5135D and

LRA-2-5135D are included in LRA Table 2.3.3-3 under the component type "Heat exchanger." The lower bearing oil coolers are not shell and tube heat exchangers; they are stainless steel coils in the lower oil reservoirs.

b. External pipe coils shown on drawings LRA-1-5135E and LRA-2-5135E are included in LRA Table 2.3.3-3 under the component type "Heat exchanger."

RAI 2.3.3.3-2:

LRA Table 2.3.3-3 lists the following items as components that are subject to an AMR. However, the staff is not able to identify them on the license renewal drawings as components subject to an AMR.

a. Tubing is listed in Table 2.3.3-3 and identified in LRA Section 2.3.3.3 as a nonsafety- related component type that requires an AMR for 10 CFR 54.4(a)(2). Although tubing was found in the CCW license renewal drawings, none of it was designated as being subject to an AMR. Identify CCW system tubing that are subject to an AMR.

b. LRA Tables 2.3.3-3 and 3.3.2-3 list strainer-tee and expansion joint as components subject to an AMR. However, these components are not shown on the CCW system license renewal drawings. Clarify if all the component cooling water system strainer-tees and expansion joints are within the scope of license renewal and subject to an AMR. If not, identify those that are subject to an AMR and provide justification for those that are not subject to an AMR.

I&M Response to RAI 2.3.3.3-2:

a. CCW system instrument tubing subject to aging management review based on the criteria of 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3) is highlighted on drawings LRA-1-5135, LRA-1-5135A, LRA-1-5135B, LRA-1-5135D, LRA-1-5135E, LRA-2-5135, LRA-2-5135A, LRA-2-5135B, LRA-2-5135D and LRA-2-5135E. These drawings highlight the entire line up to each instrument, including tubing between the process piping and the instrument. Component types "Tubing" and "Piping" listed in LRA Table 2.3.3-3 represent the complete passive mechanical pressure boundary up to the instruments.

Nonsafety-related CCW system instrument tubing is also subject to aging management review based solely on the 10 CFR 54.4(a)(2) criterion, as discussed in I&M's response to RAI 2.3.3.3-5. The environment and materials are the same in safety-related and nonsafety-related portions of the system. The aging management review results in LRA Table 3.3.2-3 also apply to the portions of the CCW system requiring aging management review for 10 CFR 54.4(a)(2).

b. CCW strainer-tees subject to aging management review are highlighted on drawings LRA-1-5135 at locations E4, E6 and E7 and LRA-2-5135 at locations E6 and E7. Components numbered 12-STN-39, 1-STN-39E, 1-STN-39W, 2-STN-39E and 2-STN-39W are CCW pump suction tee-type strainers with internals removed. These strainer-tees are an integral part of the system piping; however, since they have specific component numbers on the drawings, they were not included with the component type "Piping" or "Fittings" in LRA Tables 2.3.3-3 and 3.3.2-3. These CCW system strainer-tees are subject to aging management review.

   CCW expansion joints subject to aging management review are highlighted on drawings LRA-1-5135 at locations E4, E6, E7, G4, G6 and G7 and LRA-2-5135 at locations E6, E7, G6 and G7. Components numbered 12-XJ-20, 12-XJ-21, 1-XJ-20E, 1-XJ-20W, 1-XJ-21E, 1-XJ-21W, 2-XJ-20E, 2-XJ-20W, 2-XJ-21E and 2-XJ-21W are CCW pump suction and discharge expansion joints. These expansion joints are an integral part of the system piping; however, since they have specific component numbers on the drawings, they were not included with the component type "Piping" or "Fittings" in LRA Tables 2.3.3-3 and 3.3.2-3. These CCW system expansion joints are subject to aging management review.

RAI 2.3.3.3-3:

Eductors are listed in LRA Section 2.3.3.3 as non-safety-related components in the auxiliary building that require an AMR for 10 CFR 54.4(a)(2). However, eductors are not shown on the license renewal drawing for the CCW system, nor are they listed in LRA Table 2.3.3-3 as components subject to an AMR. Identify the eductors in the CCW system and explain why they are not listed in LRA Table 2.3.3-3 as components being subject to an AMR.

I&M Response to RAI 2.3.3.3-3:

The CCW chemical mixing tank eductor, component QC-2231, shown on drawing LRA-1-5135 at location G2, requires aging management review for 10 CFR 54.4 (a)(2) only, as indicated in LRA Section 2.3.3.3. As noted in LRA Section 2.1.2.1.2, components that are within the scope of license renewal based solely on the criterion of 10 CFR 54.4(a)(2) are not indicated on LRA drawings. LRA Table 2.3.3-3 only includes components that are subject to aging management review for 10 CFR 54.4 (a)(1) or 10 CFR 54.4 (a)(3). As described in LRA Section 2.3.3.11, the CCW system is a Group 1 system. For systems in Group 1, the material and environments are the same in the portion of the system meeting the criteria of 10 CFR 54.4(a)(2) as for those portions meeting the criteria of 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3). Aging management programs for the environmental and material combinations identified in LRA Table 3.3.2-3 will manage aging for the eductor.

RAI 2.3.3.3-4:

License renewal drawings LRA-1-5135C and LRA-2-5135C show portions of the CCW system piping between the license renewal boundary flags at locations F5 to H5 (to and from the seal water heat exchangers) and K5 to M5 (to and from the let down heat exchangers), including the heat exchangers tubes and shells, as not subject to an AMR. However, parts of the seal water heat exchanger and letdown heat exchangers (heat exchanger channel, tubesheet, and tube side nozzles) that are within the chemical volume control system license renewal boundary are shown as subject to an AMR. Explain why the above mentioned portions of the CCW system are excluded from being subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.3-4:

The CVCS seal water and letdown heat exchangers contain reactor coolant on the tube side and CCW on the shell side. One CVCS intended function is to maintain the system pressure boundary in order to contain reactor coolant fluid. Consequently, the tube side of these heat exchangers requires aging management. Heat transfer is not a 10 CFR 54.21(a)(1) intended function for these heat exchangers. Consequently, CCW supply to the seal water and letdown heat exchangers is not required per 10 CFR 54.21(a)(1). Additional discussions that support the basis for the CCW system scope boundaries with regard to CCW inventory loss are provided in the response to RAI 2.3.3.3-5.

In conclusion, the seal water and letdown heat exchangers are required for the CVCS pressure boundary intended function only. The CCW side of the heat exchangers does not perform a 10 CFR 54.21(a)(1) intended function and consequently is not marked on the LRA drawings.

RAI 2.3.3.3-5:

The boundary of the portion of the CCW system that is subject to an AMR ends at 2" or larger valves (e.g., 10" valve on LRA-1-5135C and LRA-2-5135C at locations B6 and D6) that are shown as normally open. There are also numerous boundaries of the portion of the CCW system that are subject to an AMR that end at valves that are normally open to 2 inches or less diameter piping. Failure of the downstream piping may affect the pressure boundary intended function. However, Section 2.3.3.3 of the LRA does not discuss why this approach is acceptable. Provide additional information to support the basis for this determination. For example, discuss the steps in the procedures for identifying the locations of breaks, for closing the valves, the amount of time required to complete these steps, and the consequences on system inventory if the valves are not closed.

I&M Response to RAI 2.3.3.3-5:

The CCW system is an intermediate closed-loop system between heat sources and the ultimate heat sink. The CCW system consists of two redundant safeguards trains and a miscellaneous services train that may be supported by either safeguards train. Portions of the system that do not serve a safety function must maintain mechanical and structural integrity so that nearby safety-related equipment is not adversely affected. The CCW system also provides cooling to 10 CFR 50, Appendix R safe shutdown equipment. Consequently, the CCW system is within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), and10 CFR 54.4(a)(3).

The normally-open valves in question are associated with the CCW miscellaneous services header. Selection of normally-open manual valves as the isolation boundary is acceptable based on safety significance, system functional requirements, and postulated failure modes. The CCW boundaries are correctly shown on the LRA drawings as discussed in LRA Section 2.3.3.3. Those portions of the miscellaneous services header that have a safety function or a regulated event function are highlighted on the CCW system drawings as subject to aging management review.

The only safety-related loads on the CCW miscellaneous services header are the containment air recirculation fan motor coolers in the containment equalization/hydrogen skimmer (CEQ) system. The CCW cooling supplied to these components is for cooling incoming air to the motor windings and insulation, providing an extended service and qualification life of these fan motors. The cooling water supply is not required for immediate or short-term function of these motors. The cooling function is for the long-term environmental qualification of the motor windings/insulation, assuming accident conditions inside containment. An analysis has conservatively established that these fans can operate under accident conditions without cooling water for at least 2-1/2 days. This analysis also demonstrated that the primary safety-related functions of the CEQ fans are accomplished within 24 hours of a loss-of-coolant accident (LOCA); therefore, isolation of cooling water to these components coincident with a LOCA would be of negligible safety significance.

The CCW system is equipped with diverse detection and annunciation instrumentation devices to alert control room operators of changes in key system parameters. For example, the CCW surge tanks are equipped with safety-related low-level alarms. Control room alarm response manuals direct operator actions upon receipt of a CCW system leakage alarm. Within a matter of minutes after detection of CCW system leakage, shutting the motor-operated header isolation valves from the control room, as directed by plant procedures, would isolate the miscellaneous services header. Therefore, failure of non-safety related piping downstream of the normally-open miscellaneous services header isolation valves would result in isolation of the entire miscellaneous services header until the specific leak location is identified and isolated from the rest of the system.

Nevertheless, due to the potential impact on the safety-related portion of the system, failure of piping downstream of these normally-open valves constitutes a 10 CFR 54.4(a)(2) functional failure, as described in LRA Section 2.1.1.2. LRA Section 2.3.3.3 lists the CCW nonsafety-related component types that require aging management review for 10 CFR 54.4(a)(2). Also, since the failure of this downstream piping is a functional failure as opposed to a spatial interaction 10 CFR 54.4(a)(2) concern, clarification of the CCW miscellaneous services header components that are within the scope of license renewal and subject to aging management review is warranted. Specifically, all CCW system components depicted on drawings LRA-1-5135B, LRA-2-5135B, LRA-1-5135C, LRA-2-5135C, LRA-1-5135D, LRA-2-5135D, LRA-1-5135E, LRA-2-5135E, LRA-1-5135F, LRA-2-5135F, LRA-1-5135G, and LRA-2-5135G are considered in scope for license renewal, with the following exceptions:

- safety valve discharge piping to drains or atmosphere
- atmospheric vent piping downstream of closed vent valves
- drain piping downstream of a closed drain valve
- floor drains
- piping that does not form part of the CCW system pressure boundary (i.e., piping that forms the flowpaths for the system being cooled by CCW)

In addition, the CCW supply and return lines to the nuclear sample coolers shown on drawings OP-1-5141G and OP-2-5141G (Attachment 2 to this letter) at locations D2, F2, H2, and K2, as well as the CCW side of the coolers, are in scope for CCW system 10 CFR 54.4(a)(2) functional considerations. Also, the CCW supply and return lines to the sample chiller condenser shown on drawing OP-1-5141B (Attachment 2 to this letter) at location H6, as well as the CCW side of the coolers, are in scope for CCW system 10 CFR 54.4(a)(2) functional considerations. As indicated in LRA Table 3.3.2-3, aging of these passive, long-lived components will be managed in accordance with the System Walkdown Program (LRA Section B.1.38), and the Water Chemistry Control Program (LRA Section B.1.40.2).

Additional clarification of the current plant design and licensing basis with regard to 10 CFR 54.4(a)(1) is provided below:

1. Catastrophic failure of CCW miscellaneous services header components and piping need not be considered coincident with a LOCA or other design basis event. This CNP licensing basis is consistent with NRC guidance and industry standards with respect to application of passive single failure in fluid systems during the long-term recirculation mode following a LOCA.

2. Operator actions to isolate an affected CCW header, and any particular set of branch isolation valves are creditable based on location, procedures, component configuration, and habitability.

   Since the CCW system is a closed-loop cooling system, changes in CCW inventory would result in surge tank level fluctuations. Control room annunciators, such as low surge tank

level, low CCW pump discharge pressure, and high cooling water temperature to the RCP thermal barriers, alert operators of changes that are indicative of CCW system malfunctions. Should any of these alarms come in, an annunciator response procedure for malfunction of the CCW system would be immediately entered.

The alarm response procedure associated with malfunctions of the CCW system provides the control room staff with the sequential actions necessary to analyze faults, and if caused by a leak, to detect and isolate the source. If a leak in the miscellaneous services header is detected, the entire header is isolated, until the specific leak location can be identified and isolated. In accordance with the alarm response procedure, isolation of the miscellaneous services header from the control room would be accomplished in a matter of minutes after receipt of the annunciator. Once these valves have been closed, the safety significance of having this header isolated for up to 2-1/2 days is negligible, as the primary safety-related functions credited to the CEQ system are accomplished within the first 24 hours following a postulated design basis event. Plant operating protocol, however, directs that a failure of this type would be immediately investigated and repaired, with appropriate actions taken to prevent recurrence.

The miscellaneous services header branch loads all have isolation valves that are located within the auxiliary building, and are accessible to operators within a reasonable amount of time. The auxiliary building remains accessible for all modes of operation, except during post-accident conditions, when design-basis radiation levels exist (a catastrophic leak need not be postulated concurrent with a design basis accident (DBA)). Should a DBA scenario be occurring at the time of a small leak in these branch loads, the Plant Evaluation Team would be consulted and would prescribe appropriate actions for the operations staff, well within the 2-1/2 day period during which the CEQ fans could operate without cooling water.

3. The current nonsafety-related classification of the miscellaneous branch cooling loops does not introduce any new failure modes to the system or increase the consequences of failures when compared to original plant licensing and design basis, as the cooling functions associated with these branch loops have always been classified nonsafety-related.

4. Loss of the CCW miscellaneous services header, should it occur, is not a contributor to core damage frequency or large early release frequency and consequently is not modeled under CNP's Probabilistic Risk Assessment process.

5. Selection of normally-open manual valves as the isolation boundary is acceptable based on safety significance, system functional requirements, and postulated failure modes.

6. The inherent quality attributes applied to design, installation, maintenance, testing, and monitoring of the CCW miscellaneous header train provides reasonable assurance that current assumptions with respect to failure modes and potential consequences remain valid.

7. The CCW system miscellaneous services header is in operation during normal plant operation. The system parameters, such as temperature and pressure, are similar with respect to those during and following a DBA. The potential for catastrophic failure of these branch loops remains low since this is a low-energy system. A search of industry and plant-specific operating experience identified no catastrophic failures in CCW systems in over 20 years of nuclear industry operations.

In conclusion, the motor-operated main header isolation valves provide the primary isolation boundaries for the CCW system miscellaneous services header. By considering the CCW miscellaneous header within the scope of license renewal and aging management of the components, I&M will adequately manage aging effects. In the unlikely event of a leak in a nonsafety-related branch load, the main header isolation valves would be closed from the control room to isolate the leak, then the source of the leakage would be identified, and the manual isolation valves for that individual cooling loop closed, thereby providing the capability to restore flow to the CEQ fans motor coolers.

RAI 2.3.3.4-1:

Clarify if the following components are included in Table 2.3.3-4 as being subject to an AMR. If not, justify the exclusion of these components from being subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1):

a. *License renewal drawings show pressure regulators as within the scope of license renewal and subject to an AMR: LRA-1-5120R and LRA-2-5120R at locations E7, F8, and F9 and LRA-1-5120S and LRA-2-5120S at locations A8, B8, A9, and B9. However, housings of these regulators, which are passive and long-lived, are not specifically listed as components subject to an AMR in Table 2.3.3-4.*

b. *License renewal drawings LRA-1-5120R, LRA-2-5120R, LRA-1-5120S, and LRA-2-5120S show components MRV-223-VB1, MRV-223-VB2, MRV-233-VB1, MRV-233-VB2, MRV-213-VB1, MRV-213-VB2, MRV-243-VB1, and MRV-243-VB2 as within the scope of license renewal and subject to an AMR. Also, identify these components because they are not identified either on the standard symbol drawings (LRA-12-5103 and LRA-12-5104) or the control air system standard symbol drawing (LRA-12-5120G).*

c. *License renewal drawing LRA-12-5118B shows an electronic pneumatic transducer (2-GRV354) at location J5 as within the scope of license renewal and subject to an AMR. However, the pressure retaining boundary of this component, which is passive and long-lived, is not specifically listed as a component subject to an AMR in Table 2.3.3-4.*

I&M Response to RAI 2.3.3.4-1:

a. Pressure retaining portions of pressure regulators (or pressure control valves) shown as subject to aging management review on drawings LRA-1-5120R, LRA-2-5120R, LRA-1-5120S and LRA-2-5120S are included in component type "Valve" listed in LRA Table 2.3.3-4.

b. Components MRV-223-VB1, MRV-223-VB2, MRV-233-VB1, MRV-233-VB2, MRV-213-VB1, MRV-213-VB2, MRV-243-VB1, and MRV-243-VB2 are steam generator power operated relief valve (PORV) upper and lower pneumatic volume boosters used for manual local operation of the steam generator PORVs. Pressure retaining portions of these components are included in component type "Valve" listed in LRA Table 2.3.3-4.

c. Pressure retaining portions of electronic pneumatic transducers 2-GRV-354, at location J5 on drawing LRA-12-5118B, and 1-GRV-354, at location A5 on the same drawing, are included in component type "Valve" listed in LRA Table 2.3.3-4.

RAI 2.3.3.4-2:

On license renewal drawings LRA-1-5120R and LRA-2-5120R at locations E7, F8, and F9 and LRA-1-5120S and LRA-2-5120S at locations A8, B8, A9, and B9, components marked as MRV-223, MRV-233, MRV-213, and MRV-243 are shown as excluded from being subject to an AMR. However, it appears that these components have pressure boundary intended function. These components are not identified either on the standard symbol drawings LRA-12-5103 and LRA-12-5104 or control air system standard symbol drawing LRA-12-5120G. Identify these components and clarify whether they are passive and long-lived components. If so, explain why these components are not shown on the drawings and listed in Table 2.3.3-4 as being subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.4-2:

Components MRV-223, MRV-233, MRV-213, and MRV-243 are the steam generator PORVs. The valves were reviewed in the main steam system, are shown at locations C3, C7, K3, and K7 on drawings LRA-1-5105D and LRA-2-5105D as subject to aging management review, and are included in the component type "Valve" listing in LRA Table 2.3.4-2 in accordance with the requirements of 10 CFR 54.21(a)(1). However, the operators for these valves shown on drawings LRA-1-5120R, LRA-2-5120R, LRA-1-5120S, and LRA-2-5120S are active components and are therefore not subject to aging management review.

RAI 2.3.3.7-1:

The license renewal boundary drawings referenced in Section 2.3.3.7 did not identify the following fire protection (FP) systems and components as being within the scope of license renewal and subject to an aging management review (AMR). The staff believes that the FP systems and components described below are passive, long-lived, and perform a function that demonstrates compliance with 10 CFR 50.48 for fire protection. Provide basis for excluding the following FP systems and components from the scope of license renewal and subject to an AMR:

(1) LRA Drawing LRA-12-5152D-0 - Fire Protection Water - Aux. and Containment Buildings
A note at location D-6 states details on a deluge valve are found on DWG. 5152M, which was not included in the LRA and should be subject to an AMR. Clarify whether the deluge valve should be in scope or justify its exclusion.

(2) LRA Drawing LRA-12-5152D-0 - Fire Protection Water - Aux. and Containment Buildings
Control circuit instrumentation at location H-5 is connected to the fire protection system via a one inch water line and a normally open valve. Clarify whether these items should be in scope or justify their exclusion.

(3) LRA Drawing LRA-12-5152E-0 - Fire Protection Water - Charcoal Filters
Charcoal filters at locations C-6, E-8, J-8, and L-6 (shown in Details "B-3", "E-3", "J-3", and "M-3") have suppression components not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(4) LRA Drawing LRA-1-5152J-0 - Fire Protection Water - Turbine Bldg. & Screen House Unit 1
Details D-6, D-9, K-3, K-6, and K-9 show what appear to be dry pipe sprinkler systems with the air accumulator tanks (compressors) not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Details K-3 and K-6 also show valves and supply piping which are not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(5) LRA Drawing LRA-2-5152K-0 - Fire Protection Water - Turbine Bldg. & Screen House Unit 2
Details C-6, H-6, L-6, D-9, and L-9 show what appear to be dry pipe sprinkler systems with the air accumulator tanks (compressors) not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Detail L-6 also shows valves and supply piping to the diesel fire pump room which are not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(6) LRA Drawing LRA-12-5152L-0 - Fire Protection Water - Turbine Bldg. & Service Bldg.
Detail G-4 shows what appears to be a dry pipe sprinkler system with the air accumulator tank (compressors) not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Details G-7 and G-9 show the license renewal boundary established at a normally open valve. Clarify whether these items should be in scope or justify their exclusion.

(7) LRA Drawing LRA-12-5152N-0 - Fire Protection Water - Yard Piping Aux. Building
Detail G-3 shows what appears to be a dry pipe sprinkler system with the air accumulator tank (compressors) and drain not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Detail E-7 shows a valve and sprinkler supply for the Aux. Bldg. Drumming Room and Rad. Waste Material Handling Building not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(8) LRA Drawing LRA-12-5152R-0 - Fire Protection Water - Misc. Details
Detail L-3 shows a valve and sprinkler supply for the Containment Access Building not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(9) LRA Drawing LRA-12-5152R-0 - Fire Protection Water - Storage Tanks
Locations C-2 and D-6 show the Lake Township water supply not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(10) LRA Drawing LRA-12-5152T-0 - Fire Protection Water - Piping in Pump House
Locations H-9 shows the fire pump test header not highlighted as portions of the flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion.

(11) LRA Drawing LRA-12-5153-0 - Fire Protection CO_2 - 17 Ton System
Locations F-6 and G-6 show the suppression system supply from normally open valves to the Computer Rooms not highlighted as portions of flow diagram within the scope of license renewal and subject to an AMR. Clarify whether these items should be in scope or justify their exclusion. Verify operator actions are in the procedures to close these valves when needed.

(12) LRA Drawing LRA-2-5153G-0 - Fire Protection CO_2 - Lower 4KV Areas
The Battery Room at location E-8 does not appear to have CO_2 protection. Verify some form of protection has been provided in this area or justify the exclusion of fire suppression.

I&M Response to RAI 2.3.3.7-1:

(1) The deluge valves addressed in the note at location D6 on drawing LRA-12-5152D are preaction sprinkler system deluge valves for the reactor coolant pump area. These valves are not subject to aging management review because they do not serve a license renewal function. The manual fire suppression capability provided by these valves is not required for compliance with 10 CFR 50.48, as discussed in Fire Zone 67 specific analysis in the Fire Hazards Analysis and in UFSAR Section 9.8.1, Design Bases, Item (d).

(2) The 1-inch line leading to SD-166 at location H5 on drawing LRA-12-5152D constitutes Station Drain 166. Valve 12-ZSO-60 is normally open to ensure that there is no accumulation of water in the dry pipe header. Upon actuation of the fire suppression system in this area, solenoid-operated valve 12-ZSO-60 automatically closes to isolate the drain. The drain line downstream of valve ZSO-60 is not part of the required flow path and does not affect the function of the fire protection system; therefore, it is not subject to aging management review.

(3) The charcoal filters at locations C6, E8, J8, and L6 of drawing LRA-12-5152E serve the containment pressure relief system (1-HV-CPR-1 and 2-HV-CPR-1) and the containment instrument room ventilation system (1-HV-CIPX-1 and 2-HV-CIPX-1). These HVAC filters do not have a license renewal intended function. The manual fire suppression capability provided by these fire water lines is not required for 10 CFR 50.48 and thus these components are not subject to aging management review.

(4) The ZRC-series components at Details D-6, D-9, K-3, K-6, and K-9 of drawing LRA-1-5152J are the retard chambers associated with the alarm check valves for several wet-pipe sprinklers. The retard chambers provide an alarm function and are active components that are not subject to aging management review. Components 1-ZFP-185 and 1-ZFP-358 at Details K-6 and K-3 are alarm check valves for the wet-pipe sprinklers serving the north end of the turbine building and the abandoned diesel fire pump room in the screenhouse, which are areas requiring fire protection per 10 CFR 50.48. Therefore, these valves are subject to aging management review. The material and environment for the valves and downstream piping are the same as those for valves and piping that are already included in LRA Table 3.3.2-7. Component 1-TK-236 at Detail K-9 is the air receiver for the dry-pipe sprinkler serving the main turbine lagging area. Loss of the air receiver would not prevent the function of the dry-pipe sprinkler; therefore, this component is not subject to aging management review.

(5) The ZRC-series components at Details C-6, H-6, L-6, D-9, and L-9 of drawing LRA-2-5152K are the retard chambers associated with the alarm check valves for the wet-pipe sprinklers. The retard chambers provide an alarm function and are active components; therefore, they are not subject to aging management review. Components 2-ZFP-185 and 2-ZFP-358 at Details H-6 and L-6 are alarm check valves for the wet-pipe

sprinklers serving the south end of the turbine building and the abandoned diesel fire pump room in the screenhouse, which are areas requiring fire protection per 10 CFR 50.48. Therefore, these valves are subject to aging management review. The material and environment for the valves and downstream piping are the same as those for valves and piping that are already included in LRA Table 3.3.2-7. Component 2-TK-237 at Detail D-9 is the air receiver for the dry-pipe sprinkler serving the main turbine lagging area. Loss of the air receiver would not prevent the function of the dry-pipe sprinkler; therefore, this component is not subject to aging management review.

(6) The ZRC-series components at Detail G-4 of drawing LRA-12-5152L are the retard chambers associated with the alarm check valves for two wet-pipe sprinklers. The retard chambers provide an alarm function and are active components; therefore, they are not subject to aging management review. Components 12-ZFP-360, 12-ZFP-361, and 12-ZFP-169 at Details G-7 and G-9 are the alarm check valves for areas requiring fire protection per 10 CFR 50.48. Therefore, these valves are subject to aging management review. The material and environment for the valves and downstream piping are the same as those for valves and piping that are already included in LRA Table 3.3.2-7. The other alarm check valves at Detail G-9 are for areas that do not require fire protection per 10 CFR 50.48; therefore, they are not subject to aging management review. In the event of a failure of any components in this normally-pressurized water suppression fire protection header, station personnel will take appropriate actions to assure system intended functions are maintained.

(7) The components at Detail G-3 of drawing LRA-12-5152N are the air compressor and receiver for a dry-pipe sprinkler. Loss of the air receiver would not prevent the function of a dry-pipe sprinkler; therefore, this component is not subject to aging management review. Component 12-ZFP-264 at Detail E-7 is the alarm check valve for the Auxiliary Building Drumming Room, the Radioactive Waste Material Handling Building, and the Unit 2 personnel passageway. The Auxiliary Building Drumming Room/Personnel Passageway is an area requiring fire protection per 10 CFR 50.48; therefore, this valve is subject to aging management review. The material and environment for the valves and downstream piping are the same as those for valves and piping that are already included in LRA Table 3.3.2-7. The Radioactive Waste Material Handling Building does not require fire protection per 10 CFR 50.48, thus the associated water sprinkler piping is not subject to aging management review. In the event of a failure of any components in this normally-pressurized water suppression fire protection system header, station personnel will take appropriate actions to assure system intended functions are maintained.

(8) The components at Detail L-3 of drawing LRA-12-5152R are the fire protection (water) supply components for the containment access building. This building houses the offices for the Radiation Protection Department and serves as the primary entry/exit point for the radiologically restricted area. It is not connected to seismic structures, houses no

safety-related equipment, and does not require fire protection per 10 CFR 50.48. Therefore, these fire protection components are not subject to aging management review.

(9) The Lake Township water supply piping connections shown on drawing LRA-12-5152S are not credited for response to a fire per 10 CFR 50.48. The contained volume in the fire water storage tanks is sufficient to extinguish the 10 CFR 50.48 design basis fire without make-up from offsite sources.

(10) The fire pump test header and associated components shown on drawing LRA-12-5152T are normally isolated from the fire water header and do not provide a 10 CFR 50.48 fire protection function, thus they are not subject to aging management review.

(11) The original fire protection carbon dioxide suppression supply components for the computer rooms have been abandoned in place and are no longer functional. As shown on drawing LRA-12-5153 at locations F-6 and G-6, blanking flanges are installed downstream of valves 1-FCO-171 and 2-FCO-172.

(12) Automatic fire suppression is not provided for the Unit 2 AB Battery Room (Fire Zone 46D). This zone is equipped with early warning ionization detection throughout the zone. This system will alert the control room operators of a fire condition, allowing fire brigade personnel to be dispatched to the zone. Manual fire suppression is provided by portable fire extinguishers and water hose reels.

RAI 2.3.3.7-2:

Design Basis Table 5.1 of the Fire Protection Program Manual (FPPM) did not identify the following fire protection systems and components as being part of the design basis. The staff believes that the FP systems and components described below are required to perform a function that demonstrates compliance with Requirement of Branch Technical Position 9.5-1, Appendix A (1977). Provide basis for excluding the following FP systems and components from the scope of the design basis:

(1) FPPM Page 96 of 526 - Design Basis Table - Section E.2.b
The fire pump installation is said to be in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection. No pressure maintenance pump was found on any LRA Drawings submitted. Verify a pressure maintenance pump is present and diagram it on the drawings. Clarify if it is within the scope of license renewal and subject to an AMR.

(2) FPPM Page 105 of 526 - Design Basis Table - Section E.3.f
The manually operated foam suppression systems are discussed. No foam systems were found on any LRA Drawings submitted. Verify the location of any foam suppression systems and diagram

them on the drawings. Clarify if they are within the scope of license renewal and subject to an AMR.

(3) FPPM Page 106 of 526 - Design Basis Table - Section E.4
Halon systems are discussed in this section. No halon systems were found on any LRA Drawings submitted. Verify the location of any halon fire suppression systems and diagram them on the drawings. Clarify if they are within the scope of license renewal and subject to an AMR.

I&M Response to RAI 2.3.3.7-2:

(1) The fire protection pegging pump (12-PP-146) shown at location G5 on drawing LRA-12-5152T, is the system pressure maintenance pump. The pump is within the scope of license renewal and subject to aging management review. It is included in the component type "Pump casing" listing in LRA Tables 2.3.3-7 and 3.3.2-7.

(2) Manually-operated foam suppression racks are provided in various locations in the turbine building and screenhouse. Five-gallon cans of foam are monitored and sampled in accordance with plant procedures. They are considered consumables, analogous to fire extinguishers, and as such, are not shown on LRA drawings and do not require aging management review.

(3) The halon tanks (1-TK-274A,B,C,E,F,G and 2-TK-275A,B,C,E,F,G) are shown at locations J6 to M6 and J9 to M9 on drawing LRA-12-5154A. Distribution components and piping to the control room cable vaults are shown on this drawing with some continued at locations G2 and G6 on drawing LRA-12-5153L. These components are within the scope of license renewal and subject to aging management review. The tanks and internal cylinder valves exposed to an internal halon environment are included in component type "Tank," listed in LRA Tables 2.3.3-7 and 3.3.2-7. Other components and piping exposed to an internal air environment are included in the component types "Flex hose," "Piping," "Spray nozzles," and "Valve" listed in these tables.

RAI 2.3.3.8-1:

The following components are shown as subject to an AMR on the emergency diesel generator (EDG) license renewal drawings. However, they are not listed in LRA Table 2.3.3-8 for EDG components subject to an AMR. These components are passive and long-lived, and serve a pressure boundary function. Justify the exclusion of the following components from Table 2.3.3-8:

a. On license renewal drawings LRA-1-5151B, LRA-2-5151B, LRA-1-5151D, and LRA-2-5151D:

- *Intake manifold coolers with cooling coils, HE-47-ABS/CDS and HE-47-ABN/CDN at location H7 and J7*

- *Air receivers at locations A4 and B4*
- *Air distributors at locations D3 and E3*
- *Turbocharger housing at location G8*

b. *¾" fuel drips on drawings LRA-1-5151A, LRA-2-5151A, LRA-1-5151C, and LRA-2-5151C, at location N8.*

I&M Response to RAI 2.3.3.8-1:

a. As shown on drawings LRA-1-5151B, LRA-2-5151B, LRA-1-5151D, and LRA-2-5151D:

- Intake manifold aftercoolers, HE-47-ABN, HE-47-ABS, HE-47-CDN, and HE-47-CDS are subject to aging management review and are included in component types "Heat exchanger (shell)" and "Heat exchanger (tubes)" listed in LRA Table 2.3.3-8.

- Starting air receivers, QT-141-AB1, QT-141-AB2, QT-141-CD1, and QT-141-CD2 are subject to aging management review and are included in component type "Tank" listed in LRA Table 2.3.3-8.

- Air distributor housings are subject to aging management review, but were omitted from LRA Tables 2.3.3-8 and 3.3.2-8. The carbon steel housing and copper alloy air distributor ring have the intended function of pressure boundary and are exposed to air internally and externally. The aging effect requiring management for internal carbon steel surfaces exposed to air is loss of material which will be managed by the Preventive Maintenance Program. The aging effect requiring management for the external carbon steel surfaces exposed to air is loss of material which will be managed by the System Walkdown Program. There are no aging effects requiring management for copper alloy exposed to air.

- Turbocharger housings QT-502-AB and QT-502-CD are subject to aging management review and are included in component type "Compressor" listed in LRA Table 2.3.3-8.

b. Drip lines are not subject to aging management review. Refer to the response to RAI 2.3.3.8-3.

RAI 2.3.3.8-2:

LRA Table 2.3.3-8 lists heater housing as a component type subject to an AMR. However, by-pass lube oil filter electric heater housings (QT-501-AB/CD) shown on the license renewal drawings LRA-1-5151A, LRA-2-5151A, and LRA-1-5151C, at location A9, are shown as excluded from being subject to an AMR. Clarify whether these heaters penetrate the pressure

boundary of the system by-pass oil filters, and if the parts of these heaters that support the intended function of maintaining the pressure boundary are within the scope of license renewal and subject to an AMR in accordance with the requirements of 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.8-2:

Electric heaters QT-501-AB/CD penetrate the pressure boundary of the by-pass oil filters and are bolted to the bypass lube oil filter housings. These heater housings are considered part of the by-pass lube oil filter housings; the filter housings are evaluated with the component type "Filter housing" in LRA Tables 2.3.3-8 and 3.3.2-8. The portion of the electric heaters that form the by-pass lube oil filter pressure boundary should have been highlighted on drawings LRA-1-5151A, LRA-2-5151A, and LRA-1-5151C, as was done on drawing LRA-2-5151C at location A9. The parts of these heaters that support the intended function of maintaining the pressure boundary of the filter housings are subject to aging management review and are included with component type "Filter housing" in LRA Tables 2.3.3-8 and 3.3.2-8. The component type "Heater housing" in LRA Table 2.3.3-8 refers to the lube oil heaters (QT-116-AB/CD), shown on drawings LRA-1-5151A, LRA-1-5151C, LRA-2-5151A, and LRA-2-5151C at location F9.

RAI 2.3.3.8-3:

The ¾" contaminated drip lines to the engine room sump are shown on license renewal drawings LRA-1-5151A, LRA-2-5151A, LRA-1-5151C, and LRA-2-5151C as being subject to an AMR. These lines continue on P&ID drawings 5180 and 12-5180, which are not included in the license renewal drawing index. Therefore, the staff is unable to determine whether all the contaminated drip line components that meet the criteria of 10 CFR 54.4(a)(2) have been identified as being subject to an AMR and are listed as component types in LRA Table 2.3.3-8. In order for the staff to make this determination, provide the above mentioned drawings or text information which identifies the EDG fuel oil drip line components that are subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.8-3:

The drip lines to the engine room sump shown on drawings LRA-1-5151A, LRA-2-5151A, LRA-1-5151C, and LRA-2-5151C were highlighted in error. The contaminated drip lines are open-ended lines used for draining fuel oil leakage to the engine room sump during engine operation. These drip lines do not have an intended function that meets the criteria of 10 CFR 54.4(a)(1), 10 CFR 54.4(a)(2), or 10 CFR 54.4(a)(3). Consequently, it would not be appropriate to highlight these lines on drawing 12-5180 (which is a layout drawing of the station drainage piping in the fill and slab diesel generator area, not a flow diagram). The supports for the drains lines required to provide structural support (including Seismic II/I interaction) are

included in the scope of license renewal and are subject to aging management review. The supports are included in the commodity type "Piping supports" in LRA Tables 2.4-5 and 3.5.2-5, on pages 2.4-21 and 3.5-60, respectively.

RAI 2.3.3.8-4:

Lube oil coolers are shown, at location H6, on the license renewal drawings LRA-1-5151A, LRA-2-5151A, LRA-1-5151C, and LRA-2-5151C; and jacket water coolers are shown at location E9, on the license renewal drawings LRA-1-5151B, LRA-2-5151B, LRA-1-5151D, and LRA2-5151D as within the scope of license renewal and subject to an AMR. Table 2.3.3-8 does not list "heat exchanger channels" and "tubesheets," although "heat exchanger shell" with an intended function of pressure boundary and "heat exchanger tubes" with an intended function of heat transfer are listed in this table as components subject to an AMR. Explain why the heat exchanger channels and tubesheets are not included in Table 2.3.3-8.

I&M Response to RAI 2.3.3.8-4:

The channels and tubesheets of the emergency diesel generator lube oil coolers QT-110-AB/CD, and jacket water coolers QT-131-AB/CD, are subject to aging management review, but were inadvertently omitted from LRA Table 3.3.2-8. The tubesheets of the lube oil and jacket water coolers are made of carbon steel and are exposed to fresh raw water on one side and either lube oil or treated jacket water on the other. The cooler channels are cast iron and are exposed to fresh raw water internally and air externally. The following aging management review results apply to these components.

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program
Heat exchanger (channel)	Pressure boundary	Cast iron	Raw water (fresh) (internal)	Loss of material	Service Water System Reliability
			Air (external)	Loss of Material	System Walkdown
Heat exchanger (tubesheet)	Pressure boundary	Carbon steel	Raw water (fresh) (internal)	Loss of material	Service Water System Reliability
			Lube oil (internal)	Loss of material	Oil Analysis
			Treated water (internal)	Loss of material	Water Chemistry Control

RAI 2.3.3.9-1:

A vent is shown on license renewal drawing LRA-12-5150B at location D5 as subject to an AMR. However, the vent component group is not listed in LRA Table 2.3.3-9. Clarify if vents are considered to be part of the component group "piping" in Table 2.3.3-9. If not, justify the exclusion of this component from being subject to an AMR in accordance with the requirements of 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.9-1:

The fuel oil tank vent piping shown on drawing LRA-12-5150B is subject to aging management review and is included in the component type "Piping" listing in LRA Table 2.3.3-9.

RAI 2.3.3.9-2:

Clarify whether the components of the security diesel generator (SS-701) shown on license renewal drawing LRA-12-5150B, at location N4, is treated in the D.C. Cook LRA as a complex assembly. Regarding complex assemblies, Table 2.1-2 of NUREG-1800 states that "Some structures and components, when combined, are considered a complex assembly.... An applicant should establish the boundaries for each assembly by identifying each structure and component that makes up the complex assembly and determining whether or not each structure and component is subject to an AMR." If the security diesel is treated as a complex assembly, identify the boundaries of the security diesel generator so that the staff may determine whether its subcomponents are subject to an AMR in accordance with the requirements of 10 CFR 54.4(a)(3) and 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.3.9-2:

The security diesel generator is considered a complex assembly for the CNP LRA. The mechanical subsystems of the security diesel generator subject to aging management review include the fuel oil subsystem, lube oil subsystem, jacket water subsystem, intake air subsystem, and engine exhaust gas subsystem. The cooling water supply to the security diesel was evaluated with the fire protection system, which supplies the cooling water. Security diesel generator components subject to aging management review are identified in LRA Table 2.3.3-9. The diesel generator engine itself is an active component.

RAI 2.3.3.9-3:

License renewal drawing LRA-12-5150B shows two jacket water coolers at locations K8 and K9 as being within the scope of license renewal and subject to an AMR. Clarify if these jacket water

coolers are listed in LRA Table 2.3.3-9 as part of the heat exchanger component type subject to an AMR. If not, justify the exclusion of these components from Table 2.3.3-9.

I&M Response to RAI 2.3.3.9-3:

Jacket water coolers 12-HE-68-1 and 12-HE-68-2 are subject to aging management review and are included in the component types "Heat exchanger (shell)" and "Heat exchanger (tubes)" listings in LRA Table 2.3.3-9.

RAI-2.3.3.11-1:

Section 2.3.3.11 of the LRA describes 17 systems within the scope of license renewal and subject to an AMR based on the criterion of 10 CFR 54.4(a)(2), i.e., these systems contain nonsafety-related components whose failure could potentially result in the failure of safety-related equipment to perform its intended function. However, it is not explained how failure of these systems or components within these systems may effect the safety-related components/systems intended functions. Provide additional information which describes how failure of these nonsafety-related systems results in the failure of a safety-related system or component to perform its intended function.

I&M Response to RAI-2.3.3.11-1:

LRA Section 2.1.1.2 discusses the application of criterion for nonsafety-related SSCs whose failure could prevent the accomplishment of safety functions. Systems and structures that meet these criteria are included in the scope of license renewal, and are evaluated to determine if they include passive, long-lived components that are subject to aging management review.

The application of the criterion for nonsafety-related SSCs whose failure could prevent the accomplishment of safety functions were considered as either functional or spatial. In a functional failure, the failure of a nonsafety-related SSC to perform its normal function impacts a safety function. In a spatial failure, the loss of structural or mechanical integrity of a nonsafety-related SSC in physical proximity to a safety-related component impacts a safety function of the safety-related component.

The CCW system has the potential to be impacted by a functional 10 CFR 54.4(a)(2) type failure. Pressure boundary failure of nonsafety-related piping and mechanical components that branch from the CCW miscellaneous header could impact the ability of the CCW system to perform its safety function.

The specific spatial failure mechanism (i.e., physical impact, pipe whip, jet impingement, harsh environment from a pipe rupture, damage due to leakage, spray, or flooding) of each 10 CFR 54.4(a)(2) component was not determined, since a "spaces approach" was taken for the majority of components, especially those included for leakage, spray, or flooding. This approach

identifies occurrences in which the spatial interaction between safety-related and nonsafety-related components could result in impairment of a safety function during the period of extended operation. This provides a conservative basis for including all steam- or liquid-containing components in a particular space that may interact with any safety-related component.

As discussed with the NRC Staff in a public meeting conducted on March 31, 2004, two tables are included in this response to facilitate the staff's review. These tables identify by system and building location the nonsafety-related component types whose failure could impact safety-related SSCs. Table 2.3.3.11-1A includes liquid and steam systems in scope for 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3) and 10 CFR 54.4(a)(2) and Table 2.3.3.11-1B includes liquid and steam systems in scope for 10 CFR 54.4(a)(2) only.

In addition, three drawings (OP-1-5141G, OP-2-5141G, and OP-1-5141B) are provided in Attachment 2 to this letter to facilitate the staff's review of the CCW system with regard to 10 CFR 54.4(a)(2) functional considerations. Additional discussion of these drawings is included in the attached table.

Table 2.3.3.11-1A Liquid and Steam Systems in Scope for 10 CFR 54.4(a)(1) or (a)(3) and (a)(2)[3]									
SYSTEM[1, 2]	BD	CCW[4]	CVCS	ESW	FW	MS	RCS	VENT	CNTMT
10 CFR 54.4(a)(2) BASIS Spatial (SP), Functional (F)[5]	SP	SP / F	SP	SP	SP	SP	SP	SP	SP
BUILDING	A	A,C	A,C	A,S	A	A,T	A,C	A	A,C
COMPONENT TYPE									
Bolting	X	X	X	X	X	X	X	X	
Condenser shell			X					X	
Eductor		X	X						
Evaporator housing			X						
Flow indicator							X		
Filter housing			X						
Heat exchanger (shell)	X		X				X		
Ion exchanger			X						
Level gauge			X				X	X	
Manifold	X	X	X		X		X		
Orifice	X		X		X		X		
Piping	X	X	X	X	X	X	X	X	X
Pump	X		X			X	X	X	X
Silencer						X			
Strainer						X		X	
Tanks	X	X	X			X	X	X	
Thermowell	X		X		X		X		
Trap						X			
Tubing	X	X	X	X	X	X	X	X	X
Valve	X	X	X	X	X	X	X	X	X
Ventilation unit housing								X	

Table Notes on next page; a list of abbreviations used in this table is provided after the Table 2.3.3.11-1B notes.

Notes for Table 2.3.3.11-1A

Note 1. Systems BD, CCW, CVCS, ESW, FW, MS, and RCS are identified in LRA Section 2.3.3.11 as Group 1 Systems.

Note 2. Systems VENT and CNTMT are discussed in LRA Section 2.3.3.11 under the Group 2 Systems heading.

Note 3. FP system components that require aging management review for 10 CFR 54.4(a)(2) are liquid-filled components in the containment, auxiliary building, screenhouse, and the portion of the turbine building that contains the auxiliary feedwater (AFW) pumps. Because these portions of the system are also within the scope of license renewal for 10 CFR 54.4(a)(3), no additional evaluation of FP system components is required for 10 CFR 54.4(a)(2).

Note 4. All piping and passive components associated with drawings LRA-1-5135B, LRA-2-5135B, LRA-1-5135C, LRA-2-5135C, LRA-1-5135D, LRA-2-5135D, LRA-1-5135E, LRA-2-5135E, LRA-1-5135F, LRA-2-5135F, LRA-1-5135G, and LRA-2-5135G are considered to be in scope and subject to aging management review for CCW system 10 CFR 54.4(a)(2) functional considerations with the following exceptions:

- safety valve relief piping to drains or atmosphere
- vent piping from a closed vent valve to atmosphere
- all drains and drain piping from a closed drain valve to a drain
- piping to heat exchangers from a system other than the CCW system

In addition, the CCW supply to the nuclear sample coolers shown on drawings OP-1-5141G and OP-2-5141G (Attachment 2 to this letter) at locations D2, F2, H2, and K2, as well as the CCW side of the coolers, are considered to be in scope for CCW system 10 CFR 54.4(a)(2) functional considerations. Also, the CCW supply to the sample chiller condenser shown on drawing OP-1-5141B (Attachment 2 to this letter) at location H6, as well as the CCW side of the coolers, are considered to be in scope for CCW system 10 CFR 54.4(a)(2) functional considerations.

Active components (such as those identified in NEI 95-10, Appendix B), which include items such as instrumentation, motors and valve operators, and short lived components, are screened out and not subject to aging management review.

Note 5. Spatial failure (SP) - the loss of structural or mechanical integrity of a nonsafety-related structure or component in physical proximity to a safety-related component, which impacts the safety function of the safety-related component.
Functional failure (F) - the failure of a nonsafety-related SSC to perform its normal function which impacts a safety function.

Table 2.3.3.11-1B Liquid and Steam Systems in Scope for 10 CFR 54.4(a)(2) Only [2]

SYSTEM [1]	AS	CF	DEMIN	DRAIN	ICE	LTW	NESW	NS	PASS	PW	RWD	SD	SFP	RMS
10 CFR 54.4(a)(2) BASIS Spatial (S), Functional (F) [3]	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
BUILDING	A	A	A,C,T	A	A,C,T	A	A,C,T	A,C,T	A,C	A,C,T	A,T	A,C	A,C	A
COMPONENT TYPE														
Bolting	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Condenser shell					X									
Evaporator housing					X									
Filter housing											X			
Flex hose												X		
Heat exchanger (shell)								X	X					
Heater coil	X													
Heater housing					X					X				
Level glass gauge		X		X							X			
Manifold (piping)					X		X		X	X	X	X	X	
Orifice				X	X		X		X	X				
Piping	X	X	X	X	X	X	X			X	X	X	X	X
Pump casing		X		X	X				X	X	X	X		X
Sample cooler (HX)														
Strainer housing	X	X			X				X		X			
Tank		X		X					X	X	X	X		
Thermowell			X		X		X			X	X			
Trap	X													
Tubing	X	X	X	X	X		X	X	X	X	X	X	X	
Valve	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table Notes on next page; a list of abbreviations used in this table is provided after the Table 2.3.3.11-1B notes.

Notes for Table 2.3.3.11-1B

Note 1. Systems AS, CF, DEMIN, DRAIN, ICE, LTW, NESW, NS, PASS, PW, RWD, SD, SFP, and RMS are discussed in LRA section 2.3.3.11 for Group 2 Systems.

Note 2. The intended function of the SCRN system is to provide a flow path to and from the ultimate heat sink and the ESW system via the intake and discharge tunnels. Failure of this function, performed by nonsafety-related equipment, could affect a safety function. For license renewal, this equipment is evaluated with the screenhouse structure (LRA Section 2.4.3). Therefore, no components in the SCRN system are evaluated in this section. The SCRN system does not have the potential for spatial interaction with safety-related equipment.

Note 3. Spatial failure (SP) - the loss of structural or mechanical integrity of a nonsafety-related structure or component in physical proximity to a safety-related component, which impacts the safety function of the safety-related component.
Functional failure (F) - the failure of a nonsafety-related SSC to perform its normal function which impacts a safety function.

Abbreviations for Tables 2.3.3.11-1A and 2.3.3.11-1B

Systems

AS	Auxiliary Steam
BD	Blowdown System
CCW	Component Cooling Water
CF	Chemical Feed
CNTMT	Containment
CVCS	Chemical Volume and Control System
DEMIN	Demineralized Water
DRAIN	Process Drains
ESW	Essential Service Water
FP	Fire Protection
FW	Feedwater
ICE	Ice Condenser
LTW	Lake Township Water
MS	Main Steam
NESW	Non Essential Service Water
NS	Nuclear Sampling
PASS	Post Accident Sampling
PW	Primary Water
RCS	Reactor Coolant System
RWD	Radioactive Waste Disposal
SD	Station Drainage
SFP	Spent Fuel Pool
RMS	Radiation Monitoring System
VENT	Ventilation Systems (Auxiliary Building, Containment and Miscellaneous)

Buildings

A	Auxiliary Building
C	Containment
S	Screenhouse
T	Turbine Building

RAI 2.3.3.11-2:

LRA Table 2.3.3-11 identifies component types and intended functions as a group for these 17 systems. The staff is unable to identify which component types and intended functions in the table correlate to which of the 17 systems described in LRA Section 2.3.3.11. License renewal drawings have not been provided for these systems; nor does the UFSAR provide sufficient descriptive information. Therefore, the staff is unable to conclude, with reasonable assurance, that the applicant has identified the mechanical system components for these systems that are within the scope of license renewal and subject to an AMR in accordance with the requirements of 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1). In order for the staff to make this determination, provide drawings or text information which identifies the components by system that are subject to an AMR because they meet the intended function of 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1). If any of these components are not included in LRA Table 2.3.3-11, revise the table.

I&M Response to RAI 2.3.3.11-2:

LRA Section 2.1.1.2 describes the application of the 10 CFR 54.4(a)(2) criterion at CNP. The category in this section that results in the greatest amount of equipment subject to aging management review and included in LRA Table 2.3.3-11 is that of nonsafety-related components included as a result of their potential for leakage and spray. Highlighted flow diagrams that indicate 10 CFR 54.4(a)(2) components would be of limited value to a reviewer since flow diagrams do not provide equipment location information. Without location information, it cannot be determined if nonsafety-related equipment has a potential for spatial interaction such as leakage or spray onto safety-related equipment.

Nonsafety-related systems and components with the potential for spray or leakage that could prevent safety-related systems and components from performing their required safety function are considered in the scope of license renewal and subject to the requirements of 10 CFR 54.21(a)(1). The concern for these systems is a pressure boundary failure that could result in the nonsafety-related piping spraying or leaking on safety-related equipment.

To identify systems that would be in scope for 10 CFR 54.4(a)(2) as a result of the potential for leaking or spraying on safety-related equipment, the following conservative approach was utilized.

- First, the safety-related structures at CNP were identified using the civil/structural aging management review reports. These structures are the containment buildings, auxiliary building, screenhouse and the portion of the turbine building that contains the AFW pumps. These areas contain the relevant targets, i.e., safety-related SSCs, with the potential to be affected by failure of nonsafety-related components.
- The systems in these structures containing liquid or steam were then identified. This was done with plant layout drawings and CNP FDB information that identifies the location of

components. Only systems with nonsafety-related components in the safety-related structures specified above were included in scope for 10 CFR 54.4(a)(2).

- Individual components in these systems were evaluated using equipment location information in the CNP FDB and equipment layout drawings. Conservatively, all nonsafety-related components containing liquid or steam located in the containment building, auxiliary building, screenhouse and the portion of the turbine building that contains the AFW pumps were determined to be subject to aging management review unless no safety-related equipment was in the area. This process resulted in many nonsafety-related components being included even though they likely cannot impact safety-related equipment. In limited cases, additional reviews were performed to exclude specific nonsafety-related components where design features, such as panels or enclosures, would protect safety-related equipment from leakage or spray.

The approach for scoping and screening of nonsafety-related components for 10 CFR 54.4(a)(2) assures that components within the scope of license renewal and subject to an aging management review in accordance with the requirements of 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) have all been identified and included in LRA Tables 2.3.3-11 and 3.3.2-11. To facilitate the staff's review, tables identifying component types that are subject to aging management review in accordance with the requirements of 10 CFR 54.4(a)(2) have been provided in I&M's response to RAI 2.3.3.11-1.

RAI 2.3.3.11-3:

Page 2.3-82 of the LRA implies that the spent fuel pool cooling system does not perform an intended function as defined in 10 CFR 54.4. In addition, license renewal drawings LRA-1-5135B and LRA-2-5135B show portions of the CCW system piping between the license renewal boundary flags at locations J3 and L4 (to and from the spent fuel pit heat exchangers) as excluded from being subject to an AMR. However, UFSAR Section 9.4.1, Page 35 states that "Any spent fuel pool off-loading scenario, including a full core off-load of two units, which meets the 180°F peak bulk pool temperature with one train of cooling and 5.8 hours to boil criteria is acceptable."

From this statement, it is not clear that water in the spent fuel pool can maintain sufficient shielding and prevent the release of radioactive gases with the 180°F peak bulk pool temperature and 5.8 hours to boil criteria without activation of at least one cooling train. Justify why at least one train of spent fuel pool cooling is not within the scope of license renewal in accordance with the requirements of 10 CFR 54.4(a).

I&M Response to RAI 2.3.3.11-3:

The SER for CNP Units 1 and 2 License Amendments 260 and 243 (Reference 1) provides the bases for the UFSAR statement cited above. The SER evaluated conditions related to the

approval of a change to shorter starts of core offload dependent on maximum ultimate heat sink temperatures during two periods in a year.

Section 2.2.3 of the SER provides the SFP cooling system evaluation of cases as follows:

- Case 1a - planned full-core offload after 148 hours of decay time, 85°F ultimate heat sink temperature, and one SFP cooling train fails. This case results in a peak pool bulk temperature of 179.9°F.
- Case 1b - planned full-core offload after 100 hours of decay time, 77.8°F ultimate heat sink temperature, and one SFP cooling train fails. This case results in a peak pool bulk temperature of 180.0°F.
- Case 2 - unplanned full-core offload after 100 hours of decay time and 30 days after previously discharged refueling load, 85°F ultimate heat sink temperature; no failure until peak SFP temperature is reached - then both SFP cooling trains are lost, leading to boiling in the SFP. This case results in a 5.8 hour time-to-boil.

Section 2.2.4 of the SER provides the following conclusions.

> "For planned refueling conditions with both cooling trains in service, SFP water temperature will stay below 142.3°F, which is below the long term SFP design temperature of 150°F. In the event that one SFP cooling train fails, the remaining SFP cooling train will maintain SFP temperature below the SFP design temperature of 180°F ..."
>
> "In the unlikely event of a sustained loss of both SFP cooling trains, the available makeup capacity exceeds the maximum potential rate of evaporative losses, and these makeup sources can be aligned within the time available prior to the onset of boiling. Therefore, the staff concludes that the reliability and capacity of SFP cooling and makeup systems are adequate to deal with the increased heat load, resulting from the proposed reduction in decay time ..."

Reference to the 180°F peak bulk pool temperature in the cited UFSAR statement reflects the evaluation of Cases 1a and 1b (loss of one train of SFP cooling) and reference to 5.8 hours to boil reflects the evaluation of Case 2 (loss of all SFP cooling).

Sufficient shielding is maintained by compliance with Technical Specification 3/4.9.11, which specifies that at least 23 feet of water shall be maintained over the top of irradiated fuel assemblies in the storage racks. The minimum water level is consistent with the assumptions in the accident analyses. As indicated in UFSAR Section 2.9.2, the SFP cooling system is a Seismic Class II system; the SFP itself is a Seismic Class I structure.
Based on the availability and capability of other reliable sources of makeup to maintain shielding at the maximum potential rate of evaporative losses, as evaluated in the Reference 1 SER, and the SFP cooling system seismic design classification, as indicated in the CNP UFSAR, the SFP

cooling system was determined to not have an intended function and was not included in the scope of license renewal in accordance with 10 CFR 54.4(a).

Reference for RAI 2.3.3.11-3

1. Letter from J. F. Stang, NRC, to R. P. Powers, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 - Issuance of Amendments (TAC Nos. MB1975 and MB1976)," dated November 30, 2001 [Accession No. ML012910720]

RAI 2.3.4.1-1:

LRA Section 2.3.4.1 states that "The main feedwater system is also included in the scope of license renewal due to the potential for spatial interactions with safety-related equipment. The main feedwater system non-safety-related components requiring an aging management review for 10 CFR 54.4(a)(2) are in the auxiliary building."

License renewal drawings LRA-1-5105D and LRA-2-5105D (the only drawings referenced in Section 2.3.4.1) show the safety-related portion of the main feedwater system only, which is from the steam generators to the main feedwater check valves. This portion of the system is within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(1). The remainder of the feedwater system, upstream of the check valves (which includes the aforementioned non- safety-related components within the scope of license renewal in accordance with 10 CFR 54.4(a)(2), is continued on drawings 1-5106 and 2-5106, which are not included in the LRA drawing index. Therefore, the staff is unable to determine whether the main feedwater system components that meet 10 CFR 54.4(a)(2) criteria (nonsafety-related components whose failure prevent satisfactory accomplishment of a safety-related component intended function) are identified as component types subject to an AMR in LRA Table 2.3.4-1. Provide drawings or text information which identifies the main feedwater system components within the scope of license renewal because they meet the criteria of 10 CFR 54.4(a)(2) as described. If any of these components which are passive and long-lived are not included as a component type in LRA Table 2.3.4-1, revise this table.

I&M Response to RAI 2.3.4.1-1:

The nonsafety-related component types in the feedwater system that require aging management review for 10 CFR 54.4(a)(2) are located in the auxiliary building and consist of the component types of bolting, orifices, thermowells, valves, manifolds, tubing, and piping. As described in LRA Section 2.3.3.11, the feedwater system is a Group 1 system. For systems in Group 1, the material and environments are the same in the portion of the system meeting the criteria of 10 CFR 54.4(a)(2) as for those portions meeting the criteria of 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3). Aging management programs for the environment and material

combinations identified in LRA Table 3.4.2-1 will manage aging for the component types listed above.

RAI 2.3.4.2-1:

LRA Section 2.3.4.2 states that "The main steam system is also included in the scope of license renewal due to the potential for spatial interactions with safety-related equipment. The nonsafety-related components in the main steam system that require aging management review for 10 CFR 54.4(a)(2) are in the auxiliary building and the turbine building in the auxiliary feedwater pump rooms." According to LRA Section 2.1.2.1.2, "Components that are within the scope of license renewal based solely on the criterion of 10 CFR 54.4(a)(2) are not generally indicated on the drawings but are described in Section 2.3 and listed in Table 3.3.2-11."

License renewal drawings LRA-1-5105D, LRA-2-5105D, LRA-1-5141A, and LRA-2-5141A (the only drawings referenced in Section 2.3.4.2) show the safety-related portion of the main steam system only from the steam generators to the main steam isolation valves. This portion of the system is within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(1). The remainder of the system, downstream of the isolation valves up to the high-pressure turbine (which would include the aforementioned non-safety-related components within the scope of license renewal in accordance with 10 CFR 54.4(a)(2)), is shown on the license renewal drawing LRA-1-5105. However, no components belonging to the main steam system are highlighted on this drawing. Additionally, LRA Table 3.3.2-11 lists component types under the general heading of "Miscellaneous Systems in Scope for 10 CFR 54.4(a)(2)" rather than associating them with specific systems. As a result, by using this table and the LRA drawings provided, the staff is unable to verify that all main steam system components within the scope of license renewal and subject to an AMR have been properly identified.

Clarify whether all the non-safety-related components of the main steam system are within the scope of license renewal, because of a potential spatial interaction with safety-related equipment, subject to an AMR in accordance with 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1). If not, identify which components are in-scope and subject to an AMR.

I&M Response to RAI 2.3.4.2-1:

The nonsafety-related component types in the main steam system that require aging management review for 10 CFR 54.4(a)(2) are located in the auxiliary building and inside the AFW pump rooms in the turbine building. They consist of bolting, tanks, strainers, traps, valves, tubing, and piping. As described in LRA Section 2.3.3.11, the main steam system is a Group 1 system. For systems in Group 1, the material and environments are the same in the portion of the system meeting the criteria of 10 CFR 54.4(a)(2) as for those portions meeting the criteria of 10 CFR 54.4(a)(1) or 10 CFR 54.4(a)(3). Aging management programs for the environment and

material combinations identified in LRA Table 3.4.2-2 will manage aging for all the component types listed above.

RAI 2.3.4.2-2:

The four main steam isolation valves and their actuators are shown on license renewal drawings LRA-1-5105D and LRA-2-5105D at locations B3, B7, L3, and L7. UFSAR Section 10.2.2 describes the design of these actuators. The drawings show the actuator cylindrical housings as being within the scope of license renewal and subject to an AMR. However, these housings are not specifically listed in LRA Table 2.3.4-2 as a component type subject to an AMR. These housings are passive, long lived components and meet the requirements of 10 CFR 4.21(a)(1) for being subject to an AMR. Clarify whether these housings are included in one of component types listed in LRA Table 2.3.4-2. If not, justify the exclusion of these housings from being subject to an AMR.

I&M Response to RAI 2.3.4.2-2:

The steam cylinders for the steam generator stop valves MRV-210, 220, 230, and 240 form part of the main steam pressure boundary and are an integral part of the valve bodies. The steam cylinders and other portions of the valve body are highlighted on drawings LRA-1-5105D and LRA-2-5105D and are included in the aging management review in the main steam system. Since the steam cylinders are an integral part of the valve body, they are included in the component type "Valve."

RAI 2.3.4.3-1:

With regard to the condensate storage tank, LRA Section 2.3.4.3 states that "The floating head seal and associated support posts are included in the aging management review because the failure of the seal could cause flow blockage." License renewal drawings LRA-1-5106A and LRA-2-5106A show the condensate storage tanks for Units 1 and 2 as being subject to an AMR. However, the floating head seal is shown to be excluded from being subject to an AMR in both of these drawings and, furthermore, is not listed in LRA Table 2.3.4-3 as a component type subject to an AMR. Explain why the floating head seal on the condensate storage tank, although stated earlier to be subject to an AMR, is not highlighted on the abovementioned drawings nor listed in Table 2.3.4-3 as a component type subject to an AMR.

I&M Response to RAI 2.3.4.3-1:

As stated in LRA Section 2.3.4.3, the floating head seal and associated support posts are included in the aging management review because the failure of the seal could cause flow blockage. Since the seal does not have a unique component number in the database, it was

included in the component type "Tank" in LRA Table 2.3.4-3. As listed in LRA Table 3.4.2-3 under the component type "Tank", elastomer tank components may experience change in material properties or cracking. It is an administrative oversight that the seals are not highlighted on drawings LRA-1-5106A and LRA-2-5106A to show that they are subject to aging management review.

RAI 2.3.4.3-2:

License renewal drawings LRA-1-5106A and LRA-2-5106A show strainers upstream of the three auxiliary feedwater pumps at locations E9, H9, and K9. LRA Table 2.3.4-3 includes strainer housings as a component type subject to an AMR, however, strainer internals have not been listed in this table. Failure of the strainer internals could prevent the strainer from performing its intended function (in this case preventing debris from entering the pump suction), or possibly cause a flow blockage. Clarify whether these strainer internals are long-lived and passive. If so, justify why strainer internals are not included in Table 2.3.4-3 as being subject to an AMR in accordance with 10 CFR 54.21(a)(1).

I&M Response to RAI 2.3.4.3-2:

Strainers upstream of the AFW pumps have a component intended function of filtration. They are long-lived and passive and, therefore, are subject to aging management review. The strainer internals were inadvertently omitted from LRA Tables 2.3.4-3 and 3.4.2-3 in error.

The stainless steel strainer internals are submerged in treated water in AFW pump suction piping, which is the same environment as the stainless steel AFW suction piping. The aging effect requiring management is loss of material, which is managed by the Primary and Secondary Water Chemistry Control Program. The aging management review results are consistent with those for the internal surfaces of the stainless steel piping in LRA Table 3.4.2-3. LRA Table 3.4.2-3 should include the following entry for completeness (LRA Table 2.3.4-3 should also include the first two columns in the entry):

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs
Strainer internals	Filtration	Stainless steel	Treated water (internal)	Loss of material	Water Chemistry Control

RAI 2.3.4.3-3:

License renewal drawing LRA-1-5106A shows turbine oil cooler HE-70 and governor oil cooler HE-71, at locations L3 and M2, as being in scope and subject to an AMR. LRA Table 2.3.4-3

lists the heat exchanger subcomponents "shell" and "tubes" as separate component types subject to an AMR. However, other subcomponents of the lube oil coolers, such as tubesheets and channel heads (which perform a pressure boundary intended function), are not explicitly listed in LRA Table 2.3.4-3, as are the shell and the tubes. Furthermore, the cooling water system used to cool the lube oil has not been identified on the license renewal drawing LRA-1-5106A. Identify the coolers cooling water system, and justify why other heat exchanger internal subcomponents such as tubesheets and channel heads are not considered to be subject to an AMR, or else revise Table 2.3.4-3 to include these items.

I&M Response to RAI 2.3.4.3-3:

The turbine oil cooler and governor oil cooler use water from the AFW system itself for cooling. As can be seen in sketch "L-4 "on drawing LRA-1-5106A, water from the turbine-driven AFW (TDAFW) pump discharge is diverted to flow through the turbine oil cooler and governor oil cooler, then is returned to the suction of the TDAFW pump.

Subcomponents of the lube oil coolers, such as tubesheets and channel heads are subject to aging management review but are not explicitly listed in LRA Table 2.3.4-3. The programs that manage aging effects on the shell and tubes also manage aging effects on subcomponents. Therefore, the subcomponents are included in the component types "Heat exchanger (shell)" and "Heat exchanger (tubes)" in LRA Table 2.3.4-3.

RAI 2.3.4.4-1:

UFSAR Section 10.11.2 states that the steam generator blowdown is monitored for radioactivity prior to reaching either the startup or normal blowdown flash tanks. It is further stated that these radiation monitors close the steam generator blowdown system isolation valves upon detection of high radioactivity. However, the staff has examined the license renewal drawings for Units 1 and 2 referenced in LRA Section 2.3.4.4 and is unable to locate radiation monitors upstream of the flash tanks. In effecting closure of the isolation valves, these monitors support the intended function of containment isolation and, therefore, the passive, pressure boundary retaining housings for these monitors should be within the scope of license renewal and subject to an AMR. Provide information to locate the aforementioned radiation monitors and verify whether pressure boundary retaining housings for these components are subject to an AMR. If not, justify the exclusion of these radiation monitors from being subject to an AMR, or else revise Table 2.3.4-4 to include these items.

I&M Response to RAI 2.3.3.4-1:

Radiation monitoring upstream of the steam generator blowdown (SGBD) flash tanks is provided in each unit by monitor DRA-300 (R-19), which is depicted in Unit 1 at location D7 on drawing LRA-1-5141A and in Unit 2 at location D7 on drawing LRA-2-5141A. As shown on drawing

LRA-1-5105 at location B5 and on drawing LRA-2-5105B at locations C2 and C3, the individual steam generator sample points DSR-301, DSR-302, DSR-303, and DSR-304 tap off upstream of the SGBD isolation valves DCR-310, DCR-320, DCR-330, and DCR-340, and are thus upstream of the flash tanks. The SG samples pass through steam generator sample isolation valves DCR-301, DCR-302, DCR-303, and DCR-304 before reaching monitor DRA-300.

Radiation monitors 1-DRA-300 and 2-DA-300 do not support a containment isolation function. The SGBD isolation valves are intended for equipment protection as described in UFSAR Section 5.4.1 under containment isolation system Class F piping and are not considered containment isolation valves. The closure of these valves on a high radiation signal provided by the radiation monitors isolates an effluent process flow when high steam generator radioactivity exists. Radiation monitors 1-DRA-300 and 2-DRA-300 pressure retaining boundaries are not subject to aging management since they are located downstream of the seismic I class break at air-operated fail-closed isolation valves DCR-301, DCR-302, DCR-303, and DCR-304. The radiation monitors are outside of the 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(3) pressure boundary as shown on drawings LRA-1-5141A and LRA-2-5141A. Therefore, the radiation monitors are not subject to an aging management review and are not included in LRA Table 2.3.4-4.

RAI 2.3.4.5-1:

LRA Section 2.3.4.5 states that the only intended function of the mechanical components of the main turbine system is to effect a turbine trip (via the turbine control system) in response to an anticipated transient without scram or a station blackout event. Since a pressure boundary failure of the mechanical components of the control system will automatically cause a trip (a fail-safe condition), the pressure boundary intended function of these components is not required following these events. LRA Section 2.3.4.5 also states that no passive mechanical component of the main turbine system is subject to an AMR. In accordance with the criteria of 10 CFR 54.4(a)(3), the mechanical components of the main turbine control system should be within the scope of license renewal. Since LR Section 2.3.4.5 does not reference or provide any boundary drawings which show these components, the staff is unable to determine if all components which should be subject to an AMR have been identified. Provide a drawing or a text description of the main turbine system that identifies the mechanical components of the turbine control system which are subject to an AMR.

I&M Response to RAI 2.3.4.5-1:

In accordance with LRA Section 2.3.4.5, the intended function of the mechanical components of the main turbine system is to affect a turbine trip in response to an ATWS or a station blackout. In accordance with the criteria of 10 CFR 54.4(a)(3), the turbine control system is within the scope of license renewal. The turbine control system is a hydraulic system that trips the turbine by dumping hydraulic fluid from the turbine control valve actuators. Since a pressure boundary

failure of the mechanical components of the control system will automatically cause a trip (a fail-safe condition), the pressure boundary of these components is not required to support the system intended function. Mechanical components that actually dump the hydraulic fluid are active and do not require aging management review. Since passive mechanical components have no intended function, they also require no aging management review. Therefore, no mechanical components of the turbine control system are subject to aging management review.

RAI 2.4-1:

(1) LRA Table 2.2-4 identifies structures that are not within the scope of license renewal. The note at the top of the table states "The UFSAR does not contain details of these structures." It is not obvious to the staff that all of the listed structures serve no intended function, e.g., the containment access building, gas cylinder storage building, hazardous storage building, and the loop feed enclosure. Please clarify and provide technical basis for the determination that they are not within the scope of license renewal.

(2) LRA Table 2.2-4 identifies the "Switchyard tower and pedestal for Unit 2 power delivery" as not being within the scope of license renewal. However, LRA Section 2.4.4 "Yard Structures" identifies "Tower: Unit 2 power delivery to switchyard" as within scope and subject to aging management review. Please resolve this apparent discrepancy.

(3) Please verify that seismic II over I considerations are not applicable to structures listed in LRA Table 2.2-4 (e.g., meteorological and microwave towers).

(4) Please verify that at plant site, is there any site drainage or dewatering system that is relied on to control the groundwater level. If there is such a system, please identify whether this system (or systems) is within the scope of license renewal. Also, please provide the technical basis for either including it in or excluding it from the scope of license renewal. If within the scope, identify the applicable AMR references in LRA Section 3.

I&M Response to RAI 2.4-1:

(1) The containment access building, gas cylinder storage building, and the hazardous storage building do not perform intended functions. The containment access building is located east of the auxiliary building crane bay. It houses the offices for the Radiation Protection Department and serves as the primary entry/exit point for the radiologically restricted area. The gas cylinder storage building stores miscellaneous gas cylinders and is located on grade south of the Unit 2 turbine building. The hazardous storage building is a modular building, located west of the Unit 1 turbine building, in which 55-gallon drums of chemical waste are stored.

These three structures are not connected to seismic structures and do not provide:

(a) structural support or functional support for safety-related equipment;
(b) shelter or protection for safety-related equipment;
(c) structural or functional support for non-safety related equipment whose failure could directly prevent satisfactory accomplishment of required safety-related functions;
(d) missile barriers (internally or externally generated);
(e) flood protection barriers (internal or external flooding event);
(f) rated fire barriers to confine or retard a fire from spreading to or from adjacent regulatory fire areas or regulatory fire zones; or
(g) structural or functional support for components credited for regulated events.

Note that the "Gas bottle storage tank foundation" listed in LRA Table 2.2-3, the "Gas bottle storage tank rack" listed in LRA Table 2.4-4, and the "Gas bottle storage tank rack and foundation" listed in LRA Section 2.4.4 refer to the nitrogen bulk storage tank foundation and racks, which is in scope for 10 CFR 54.4(a)(3) requirements, and not to the gas cylinder storage building discussed above.

The inclusion of the loop feed enclosure in LRA Table 2.2-4 is an error. The loop feed enclosure is in the scope of license renewal as part of the offsite power (OFPW) system (which was included based on NRC guidance pertaining to station blackout). The OFPW system provides the electrical interconnections between the offsite network and the station auxiliary buses, as well as electrical interconnections among other buildings and facilities located on the CNP site. The concrete portion of the loop feed enclosure is covered in LRA Table 2.4-4, under line item "Trench from switchyard to start-up transformers (duct bank)." The enclosure itself is covered in LRA Table 2.4-5 under line item "Electrical instrument panels and enclosures."

(2) The inclusion of "Switchyard tower and pedestal for Unit 2 power delivery" in LRA Table 2.2-4 is an administrative error. The same item is correctly identified in LRA Table 2.2-3.

(3) During the scoping process, Seismic II over I considerations were verified as not applicable to structures that were correctly listed in LRA Table 2.2-4, including meteorological and microwave towers.

(4) CNP does not have any site drainage or dewatering system that is relied on to control the groundwater level.

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.

I&M Response to RAI 2.4-2:

a. For information related to thermal insulation on piping, refer to the RAI 2.1-5 response.

   Structural thermal insulation is addressed in the scoping and screening evaluation as follows:

   (1) The thermal barriers for the ice condenser, wall duct panels, intermediate and upper deck curtains, and concrete walls are within the scope of license renewal.

   (2) Not applicable – within the scope of license renewal.

   (3) The thermal barriers for the ice condenser, wall duct panels, intermediate and upper deck curtains, and concrete walls are included in the "Ice condenser intermediate and upper deck curtains" entry in LRA Table 2.4-1 on page 2.4-16.

   (4) The "Ice condenser intermediate and upper deck curtains" entry in LRA Table 3.5.2-1 on page 3.5-40 addresses the aging management review for these items.

b. Seals that provide a boundary between the lower and upper compartments are of three types.

   - Divider barrier seals between the bottom of the ice condenser compartment slab and the containment wall and up the sides of the ice condenser end walls.
   - Divider barrier hatch seals provided on the hatches in the operating deck.
   - Divider barrier penetration seals installed around penetrations and openings through the divider barrier.

For these seals,

(1) All three types of seals described above are within the scope of license renewal. The seals are sub-components within the containment structure and are not explicitly called out. LRA Table 2.2-3 lists the containment as a structure within scope.

(2) Not applicable – within the scope of license renewal.

(3) The first two types of seals, divider barrier seals and the divider barrier hatch seals, are not listed in LRA Table 2.4-1 as subject to aging management review since they are considered short-lived. The determination that the divider barrier seals and the divider barrier hatch seals are short-lived is based on guidance in the SOC and in NUREG-1800.

SOC on "Long-Lived" SRP Section 2.1.3.2.2:

> "It is important to note, however, that the Commission has decided not to generically exclude passive structures and components that are replaced based on performance or condition from an [AMR]...such generic exclusion is not appropriate...However, the Commission does not intend to preclude a license renewal applicant from providing site-specific justification in a license renewal application that a replacement program on the basis of performance or condition for a passive structure or component provides reasonable assurance that the intended function of the passive structure or component will be maintained in the period of extended operation."

Specific Staff Guidance on "Consumables" SRP Table 2.1-3 –

> " . . . The consumables in category (c) are short-lived and periodically replaced, and can be excluded from an AMR on that basis. Likewise, the consumables that fall within category (d) are typically replaced based on performance or condition monitoring that identifies whether these components are at the end of their qualified lives and may be excluded, on a plant-specific basis, from AMR under 10 CFR 54.21(a)(1)(ii)."

The divider barrier seals are inspected and replaced based on their condition in accordance with CNP Technical Specification Surveillance Requirement 4.6.5.9. The divider barrier hatch seals are visually inspected before final closure each outage and replaced as needed and are inspected every ten years per CNP Technical Specification Surveillance Requirement 4.6.5.5.2. Therefore, these seals are short-lived and not subject to aging management review. The divider barrier penetration seals are listed in the "Divider barrier penetration seals" entry in LRA Table 2.4-5 on page 2.4-22.

(4) The "Divider barrier penetration seals" entry in LRA Table 3.5.2-5 on page 3.5-66 addresses the aging management review for divider barrier penetration seals.

c. The equipment hatch is grouped with the personnel airlocks in the component type "Air lock doors." The equipment hatch is located near the top of the fuel transfer canal. One personnel access opening is located within the equipment hatch. The other is located at the instrument room, El. 612'. The component type "Air lock doors" corresponds to items 3.5.1-4 and 3.5.1-5 "Personnel airlock and equipment hatch" in LRA Table 3.5-1 on page 3.5-17.

(1) The equipment hatch is within the scope of license renewal and is subject to aging management review.

(2) Not applicable – within the scope of license renewal.

(3) The equipment hatch is included in component type "Air lock doors" entry in LRA Table 2.4-1 on page 2.4-14.

(4) The "Air lock doors" entry in LRA Table 3.5.2-1 on page 3.5-27 addresses the aging management review for the equipment hatch.

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 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.*

I&M Response to RAI 2.4-3:

The structures and components that are essential to ensure availability of cooling water for safe shutdown and perform an intended function per 10 CFR 54.4(a) are the de-icing tunnels, discharge tunnels, forebay, intake cribs, intake pipe, screenhouse, and traveling screens. These structures and components are depicted in UFSAR Figure 10.6-1 "Circulating Water System." 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, and the discharge elbows.

Correlation of evaluation boundaries in LRA Section 2.4.3 to line items in LRA Table 2.4-3, and to structures and/or components/commodities (i.e., aging management review references) in LRA Table 3.5.2-3 is provided in the table below. All structures and components related to cooling water availability are correlated to line items in the referenced LRA Tables.

Item	Evaluation Boundaries	Line Item in LRA Tables 2.4-3 and 3.5.2-3
De-icing tunnels	Structural components and commodities that support ESW and CW pumps and intake piping and those associated with the de-icing tunnels	De-icing tunnels
Discharge tunnels	Structural components and commodities from, and including, the discharge tunnels up to, and including, the discharge jets and those associated with the discharge tunnels	Discharge tunnels and bays
Forebay	Screenhouse superstructure which houses the ESW and CW pumps, as well as the traveling screens, stop logs, and bar grilles and those associated with the forebay	Screenhouse forebay bar grille and base
Intake crib	Structural components and commodities that support ESW and CW pumps and intake piping and those associated with the intake cribs	Intake crib framing and plate
Intake crib	Structural components and commodities from, and including, the intake cribs up to but not including the ESW and CW pump intake piping and those associated with the intake cribs	Intake cribs (surrounding sacked concrete)
Intake pipe	Structural components and commodities that support ESW and CW pumps and intake piping	Intake corrugated piping
Screenhouse	Screenhouse superstructure which houses the ESW and CW pumps, as well as the traveling screens, stop logs, and bar grilles	Superstructure framing
Screenhouse	Interior and exterior masonry, including concrete walls and slabs, concrete block walls, concrete pads, and embedded equipment supports	Screenhouse below grade walls, beams, and slabs
Screenhouse	Interior and exterior masonry, including concrete walls and slabs, concrete block walls, concrete pads, and embedded equipment supports	Screenhouse exterior above grade walls

Item	Evaluation Boundaries	Line Item in LRA Tables 2.4-3 and 3.5.2-3
Screenhouse	Interior and exterior masonry, including concrete walls and slabs, concrete block walls, concrete pads, and embedded equipment supports	Table 2.4-3 – Foundation mat (turbine building and screenhouse) Table 3.5.2-5 – Foundation mat (screenhouse)
Screenhouse	Screenhouse superstructure which houses the ESW and CW pumps, as well as the traveling screens, stop logs, and bar grilles	Superstructure steel column concrete encasing
Traveling screens	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	Not applicable. The screens move in order to perform their function. Since these components are active, they are not 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.

I&M Response to RAI 2.4-4:

(1) LRA Section 2.3.3.12 provides a general description of the material handling system and provides a reference to LRA Section 2.4 for cranes that are evaluated as structural components. Load handling systems that perform an intended function for license renewal are:

- Ice condenser equipment access end wall cranes
- Ice condenser bridge cranes
- Polar cranes
- Auxiliary building cranes
- Spent fuel cranes
- Emergency diesel generator cranes
- Auxiliary building hoists:
  - Motor driven and turbine driven auxiliary feed pump room manual hoists
  - Reactor coolant filter and seal water return filter hoists
  - Concentrates, seal water injection, and ion exchange filters hoists
  - Reciprocating charging pump room hoists
  - Centrifugal charging pump room hoists
  - Safety injection pump room hoists
  - Containment spray pump room hoists
  - Residual heat removal pump room hoists
  - Main steam stop enclosure hoists
  - Recirculation valve enclosure hoists

(2) Crane rails, girders, and their associated supports and anchorages are subject to aging management review for all in-scope load handling systems.

(3) The following table provides the cross-reference to specific line items in LRA tables.

Load Handling System	LRA Table Cross Reference	Table Line Item
Ice condenser equipment access end wall cranes	Table 2.4-1 and Table 3.5.2-1	Ice condenser bridge cranes, crane rails, and supports
Ice condenser bridge cranes	Table 2.4-1 and Table 3.5.2-1	Ice condenser bridge cranes, crane rails, and supports
Polar cranes	Table 2.4-1 and Table 3.5.2-1	Polar cranes, crane rails, and supports
Auxiliary building cranes	Table 2.4-2 and Table 3.5.2-2	Cranes, rails, and supports
Spent fuel cranes	Table 2.4-2 and Table 3.5.2-2	Cranes, rails, and supports
Emergency diesel generator cranes	Table 2.4-2 and Table 3.5.2-2	Cranes, rails, and supports
Auxiliary building hoists listed in response to sub-part (1) of this question	Table 2.4-5 and Table 3.5.2-5	Cranes, rails, and girders

(4) The applicable aging management review reference in the LRA for each component is shown in the LRA Section 3 tables listed in sub-part (3) of this question.

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.

I&M Response to RAI 2.4-5:

LRA Table 2.1.1 identifies electrical portions of electrical and instrumentation and control penetration assemblies (e.g., electrical penetration assembly cables and connections) as a commodity group that serves an intended function. The cable feed-through assemblies are part of these electrical penetrations, and are therefore in scope for license renewal.

As described in LRA Section 2.1.2.3.3, all electrical penetration assemblies (including the cable feed-through assemblies) are included in the EQ Program. Under the EQ Program, cable feed-through assemblies are subject to replacement based on a qualified life and thus in accordance with 10 CFR 54.21(a)(1)(ii) are not subject to aging management review.

In addition to replacing these components based on a qualified life, the EQ Program also incorporated pressure testing of the cable feed-through assemblies in the qualification of the electrical containment penetrations. Furthermore, while not subject to aging management review, electrical penetrations are tested in accordance with the requirements of 10 CFR 50 Appendix J. 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 and 3.5-28 through 3.5-29.

Attachment 2 to AEP:NRC:4034-01

Flow Diagrams for the Donald C. Cook Nuclear Plant, Units 1 and 2, Nuclear Sampling System (OP-1-5141B-44, OP-1-5141G-2, and OP-2-5141G-2)

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