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Sent: Thursday, October 27, 2011 10:20 AM
To: 'hletheridge@aep.com'; mkscarpello@aep.com; 'jrwaters@aep.com'
Cc: Tsao, John
Subject: D. C. Cook Units 1 and 2 - Draft RAI on the Alloy 600 Aging Management Program (TAC ME6882 and ME6883)

Joe:

By letter dated August 17, 2011, Indiana Michigan Power Company (I&M) submitted for NRC review and approval the Alloy 600 aging management program (AMP) for Donald C. Cook (Accession No. ML11238A069). I&M submitted the Alloy 600 AMP to satisfy one of the commitments in its license renewal application. The NRC staff reviewed the proposed AMP in accordance with XI.M11B, *Cracking of Nickel-alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion in Reactor Coolant Pressure Boundary Components (PWRs Only)* in NUREG-1801, Revision 2, *Generic Aging Lessons Learned (GALL) Report*. **To complete its review, the NRC staff needs the additional information described in this draft RAI. You may choose to accept this e-mail conveying the draft RAI as formal RAI and respond within 45 days of receipt, or you may request to discuss the draft RAI and target response date in a conference call with the NRC staff.**

Draft RAI

- (1) To manage Alloy 600 components, the Program Description section of XI.M11B in NUREG-1801, Revision 2, references American Society of Mechanical Engineers (ASME) Code Case N-729, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1," which is part of the requirements in Title 10, Code of Federal Regulations, Paragraph 50.55a (10 CFR 50.55a). However, Section 1.7 of the proposed Alloy 600 AMP does not reference this code case. Although the licensee has replaced the Units 1 and 2 reactor vessel head with Alloy 690/52/152 material, 10 CFR 50.55a(g)(6)(ii)(D) still applies and thus should be referenced. (a) The licensee needs to cite this code case and 10 CFR 50.55a(g)(6)(ii)(D) or justify why it is not referenced in Section 1.7. (b) Section 1.7 identifies ASME Code Cases N-722-1 and N-770-1. The NRC has imposed conditions on both code cases in 10 CFR 50.55a(g)(6)(ii)(E) and 10 CFR 50.55a(g)(6)(ii)(F), respectively. Section 1.7 also needs to include the reference to these two NRC regulations. As a general rule, whenever these three ASME code cases are mentioned in a regulatory document, they should be followed with a reference to the NRC regulations in 10 CFR 50.55a(g)(6)(ii)(D), (E), or (F) as applicable.
- (2) Attribute Item 1 of XI.M11B in NUREG-1801, Revision 2, provides the generic scope of an Alloy 600 AMP. Section 3.5.4 of the proposed AMP states that "...[d]etermine appropriate sample locations, inspection techniques, and acceptance standards in accordance with industry guidelines..." (a) In addition to industry guidelines, Section 3.5.4 of the proposed AMP needs to state that the sample locations, inspection techniques and acceptance standards are also determined in accordance with 10 CFR 50.55a and relevant NRC generic communications or justify why NRC regulations are not included. (b) Discuss the inspection samples for the components identified in

Attachment 2 (e.g., how many welds and/or components will be inspected) during each inspection. (c) Attachment 1 does not include the following components: reactor coolant pump nozzle welds, and reactor coolant piping branch lines. Attachment 2 does not include the following components: the steam generator shell cladding in Unit 1; the hot and cold leg nozzles, pressurizer nozzle (1-PRZ-23) to safe-end weld, steam generator primary manway diaphragm, steam generator primary nozzle-to-safe-end weld in Unit 2. Discuss why these components are not covered under the scope of the proposed Alloy 600 AMP.

- (3) Attribute Item 3 in XI.M11B in NUREG-1801, Revision 2, of the GALL report specifies parameters that are to be monitored or inspected. (a) Discuss the parameters that will be monitored and inspected under the proposed Alloy 600 AMP. (b) Attachment 2 specifies "Visual" as the inspection method for various steam generator components such as divider plate, tubesheet cladding, manway diaphragm, nozzle dam rings and shell cladding. Discuss whether the visual inspection is equivalent to ASME Code, Section XI, IWA-2210, visual examination category VT-1, VT-2, or VT-3. If not, explain what the visual inspection is (e.g., what is being examined and what are acceptance criteria). (c) Attachment 2 cited ASME Code Cases N-770-1, N-729-1, and N-722-1 for the required inspection frequency without citing 10 CFR 50.55a(g)(6)(ii)(D), 10 CFR 50.55a(g)(6)(ii)(E), and 10 CFR 50.55a(g)(6)(ii)(F) which impose conditions on these code cases. Include these regulations in Attachment 2 or justify why these NRC regulations are not referenced in Attachment 2.
- (4) Attribute Item 4 in NUREG-1801, Revision 2, Detection of Aging Effects, states that "...Reactor coolant pressure boundary leakage can be monitored through the use of radiation air monitoring and other general area radiation monitoring, and technical specifications for reactor coolant pressure boundary leakage..." Discuss the capability of the RCS leakage detection systems in Units 1 and 2 with respect to Regulatory Guide 1.45, Revision 1, "Guidance on Monitoring and Responding to Reactor Coolant System Leakage."
- (5) Attribute Item 5 in NUREG-1801, Revision 2, Monitoring and Trending, states that reactor coolant pressure boundary leakage is calculated and trended on a routine basis in accordance with technical specification to detect changes in the leakage rates. Explain why this attribute is not included in the proposed AMP.
- (6) Attribute Item 6 in NUREG-1801, Revision 2, specifies the acceptance criteria for all indications of cracking and loss of material due to boric acid-induced corrosion. Section 4.7.1 of the proposed AMP states that "...[i]nspection results that do not meet the acceptance criteria are documented via PMP-7030-CAP-001, Action Initiation..." The acceptance criteria are not clearly defined in the proposed AMP. The proposed AMP needs to include a section on acceptance criteria for the inspection results. The acceptance criteria section should include the individual criterion for the inspected components as defined in Attachment 2.
- (7) Attribute Item 7 of XI.M11B in NUREG-1801, Revision 2, *Corrective Actions*, specifies that relevant flaw indications of susceptible components found to be unacceptable for further services are corrected through implementation of appropriate repair or replacement as dictated by 10 CFR 50.55a and industry guidelines (e.g., MRP-139). In addition, detection of leakage or evidence of cracking in susceptible components require scope expansion of current inspection and increased inspection frequencies of some

components, as required by 10 CFR 50.55a and industry guidelines (e.g., MRP-139). Section 4.7.5 of the proposed AMP states that "...based on the initial inspection results, the need for additional inspections are determined. This information is used to develop future inspection scope and associated inspection intervals. Subsequent inspections may include inspections of the additional locations..." If the initial inspection discovers degradation in Alloy 600 components, discuss the scope and intervals of the additional inspection with respect to the ASME Code, Section XI requirements.

- (8) Attribute Item 8 of XI.M11B in NUREG-1801, Revision 2, *Confirmation Process*, and Attribute Item 9, *Administrative Controls*, references 10 CFR Part 50, Appendix B. Section 4.7.2 of the proposed AMP states that "...WHEN the test acceptance criteria are not met, THEN an Engineering Evaluation is performed in accordance with 10 CFR Part 50, Appendix B, and documented in accordance with PMP-7030-CAP-002, Condition Evaluation, Action, and Closure, in order to verify that the intended functions of the in-scope components can be maintained consistent with the current licensing basis. [Ref. 5.2.1a]..." (a) Clarify why 10 CFR Part 50, Appendix B, is used as the basis for the engineering evaluation, in lieu of 10 CFR 50.55a which requires the use of the evaluation in the ASME Code, Section XI. Discuss the procedures that will be used to implement the requirements 10 CFR Part 50, Appendix B. (b) Discuss whether the engineering evaluation would include corrective actions.

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