From:	Jones, Heather
To:	KUEMIN, JAMES L; GUSTAFSON, OTTO W
Cc:	Diaz-Sanabria, Yoira; Pham, Bo; Chawla, Mahesh; Tsao, John; Lupold, Timothy
Subject:	Palisades Nuclear Plant - Request for Additional Information - License Renewal Commitment - Nickel Alloy Aging Management Program
Date:	Tuesday, December 13, 2011 11:00:00 AM

By letter dated March 13, 2008 (Agencywide Document Access and Management Systems Accession No. ML080770454), Entergy (the licensee) submitted its proposed Nickel Alloy Program (Procedure No. EM-09-22) to satisfy one of the commitments in its license renewal application for the Palisades Nuclear Plant. The staff reviewed the proposed Nickel Alloy program in accordance with aging management program (AMP) 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 the Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Revision 2. Specifically, the staff compared the proposed Nickel Alloy Program against the 10 attributes of GALL AMP XI.M11B in NUREG-1801, Revision 2. To complete its review, the staff requests additional information. Please arrange a teleconference to discuss the following information:

REQUEST FOR ADDITIONAL INFORMATION (RAI)

1. GALL AMP XI.M11B, Program Description, references the following three American Society of Mechanical Engineers (ASME) Code Cases:
(a) Code Case N-729-1, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1," is incorporated with conditions in Title 10, Code of Federal Regulations, Part 50, Paragraph 50.55a(g)(6)(ii)(D).
(b) Code Case N-722, "Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Section XI, Division 1," is incorporated with conditions in 10 CFR 50.55a(g)(6)(ii)(E).
(c) Code Case N-770-1, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated With UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1," is incorporated with conditions in 10 CFR 50.55a(g)(6)(ii)(F). However, the proposed Nickel Alloy program does not reference these three code cases or corresponding paragraphs in 10 CFR 50.55a.
Discuss how these code cases and corresponding paragraphs in 10 CFR 50.55a will be implemented under the proposed Nickel Alloy Program to satisfy GALL AMP XI.M11B.

2. GALL AMP XI.M11B, Attribute Item 1, Scope of Program, states that the loss of material due to boric acid corrosion in susceptible components in the vicinity of nickel-alloy components should also be managed, which is not discussed in the proposed Nickel Alloy Program. Discuss how the proposed Nickel Alloy Program satisfies GALL AMP XI.M11B with regard to the aging management of loss of material due to boric acid corrosion or justify the adequacy of the proposed program.

3. Section 2.1.3 of the Nickel Alloy Program identifies many components in the Palisades Nuclear Plant that are made of nickel alloy. Clarify whether the weld joining the safe end and the safety injection, shutdown cooling outlet and surge line nozzles in the primary coolant piping is made of Alloy 82/182 material and if the safe end is made of Alloy 600

material. Also, clarify whether the weld joining the safe end and the pressurizer spray, surge line, and relief valve nozzles is made of Alloy 82/182 and if the safe end is made of Alloy 600 material.

4. GALL AMP XI.M11B, Attribute Item 2, Preventive Actions, provides guidance on preventive actions to mitigate primary water stress corrosion cracking. Section 5.2.3 of the proposed Nickel-Alloy Program states that the mechanical stress improvement process has been applied at several nickel alloy locations. Section 5.2.3 further states that the details of the mitigation are contained in the Palisades 10-year Interval Master Inservice Inspection Plan for Class 1, 2, 3, Risk-Informed Defense-In-Depth and Augmented Examinations. (a) If this report is submitted to the NRC, provide the date. If not, submit the report or provide a list of components that have been applied with the mechanical stress improvement process. (b) Discuss whether other mitigation methods such as weld overlay, onlay, or inlay have been applied to nickel alloy components. (c) Discuss any repairs on nickel alloy components that have been completed.

5. GALL AMP XI.M11B, Attribute Item 3, Parameter Monitored/Inspected, specifies parameters that are to be monitored or inspected. Discuss the parameters that will be monitored and inspected under the proposed Nickel-Alloy Program.

6. GALL AMP XI.M11B, Attribute Item 4, 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. (a) Discuss the capability of the plant's RCS leakage detection systems to address this attribute. (b) Section 5.2.4 of the proposed Nickel Alloy Program discusses detection of cracking through a combination bare-metal visual examination and/or non-visual examination techniques. Discuss how the proposed inspections will satisfy the requirements of 10 CFR 50.55a(g)(6)(ii)(D), (E) and (F). Discuss the inspection samples for the components identified in Section 2.1.3 of the proposed program (e.g., how many welds and/or components will be inspected) during each inspection. Discuss inspection techniques, such as, visual, surface, or volumetric examinations for each component (components may be grouped for the specific inspection method).

7. GALL AMP XI.M11B, Attribute Item 5, 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. Clarify how the proposed Nickel Alloy Program satisfies Attribute Item 5 of GALL AMP XI.M11B.

8. GALL AMP XI.M11B, Attribute Item 6, Acceptance Criteria, specifies the acceptance criteria for all indications of cracking and loss of material due to boric acid-induced corrosion.
Sections 5.3.6 and 5.3.7 of the proposed Nickel Alloy Program provide the acceptance criteria for cracking, but not for loss of material. (1) Discuss the acceptance criteria for loss of material due to boric acid corrosion in susceptible components in the vicinity of nickel-alloy components. (2) Discuss the acceptance criteria for visual examinations that will be performed under the proposed Nickel Alloy Program.

9. GALL AMP XI.M11B, Attribute Item 7, 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. 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. Repair and replacement procedures and activities must either comply with ASME Section XI, as incorporated in 10 CFR 50.55a or conform to applicable ASME Code Cases that have been endorsed in 10 CFR 50.55a by referencing the latest version of NRC Regulatory Guide 1.147. Clarify how the proposed Nickel Alloy Program satisfies Attribute Item 7 of GALL AMP XI.M11B.

10. GALL AMP XI.M11B, Attribute Item 8, Confirmation Process, states that site quality assurance procedures and review and approval processes are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. Discuss how the proposed Nickel Alloy Program satisfies Attribute Item 8 of GALL AMP XI.M11B.

11. GALL AMP XI.M11B, Attribute Item 9, Administrative Controls, references 10 CFR Part 50, Appendix B. Section 4.4 of the proposed Nickel Alloy Program discusses administrative controls without referencing 10 CFR Part 50, Appendix B. Clarify how the proposed Nickel Alloy Program satisfies Attribute Item 9 of GALL AMP XI.M11B.

12. GALL AMP XI.M11B, Attribute Item 10, Operating Experience, provides guidance on identifying, maintaining and addressing operating experience. Section 4.5 of the proposed Nickel Alloy Program discusses briefly how operating experience is identified. Discuss any industry operating experience that is applicable to Palisades. Discuss in details whether a record of operating experience has been maintained and how industry operating experience will be addressed under the proposed Nickel Alloy Program.

13. Since the time the proposed Nickel Alloy Program was submitted, several documents have been revised. For example, References 3.1.3 and 3.1.5 are cited as NUREG-1801, Revisions 0 and 1, respectively. However, NUREG-1801, Revision 2, is the latest version and should be cited in Section 3.0. Please explain how the proposed Nickel Alloy Program will be reviewed and maintained current from now to the end of the extended period of operation.