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Dale E. James  
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1CAN120404

December 20, 2004

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

SUBJECT: Report of Reactor Building Tendon Surveillance and Concrete Inspection  
Arkansas Nuclear One, Unit 1  
Docket No. 50-313  
License No. DPR-51

Dear Sir or Madam:

Entergy completed the Arkansas Nuclear One, Unit 1, (ANO-1) 30-year tendon surveillance and concrete inspection on October 12, 2004. Pursuant to the requirements of ASME Section XI, IWL-3300 and ANO-1 Technical Specification (TS) 5.6.6, an engineering report was prepared to document the evaluation of examinations that did not meet the acceptance standards of ASME IWL-3100 or IWL-3200. No indications were found that challenged the structural integrity of the reactor building. In accordance with TS 5.6.6, the results of this engineering evaluation are to be submitted to the NRC within 30 days of the completion of the engineering evaluation. The results of the engineering evaluations were completed on December 7, 2004 and a summary of these results are provided in the attachment to this letter.

Based on the results of the engineering evaluation of the ANO-1 30-year tendon surveillance and concrete inspection, Entergy has concluded that the ANO-1 reactor building is capable of performing its design function. This report includes no new commitments.

If you have any questions or require additional information, please contact Steve Bennett at 479-858-4626.

Sincerely,

A handwritten signature in black ink, appearing to read "Dale E. James".

DEJ/sab

Attachment: Results of Engineering Evaluation for the ANO-1 30-Year Reactor Building  
Tendon Surveillance and Concrete Inspection

A047

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**Attachment**

**1CAN120404**

**Results of Engineering Evaluation for the ANO-1 30-Year Reactor Building  
Tendon Surveillance and Concrete Inspection**

## Results of Engineering Evaluation for the ANO-1 30-Year Reactor Building Tendon Surveillance and Concrete Inspection

Entergy completed the Arkansas Nuclear One, Unit 1, (ANO-1) 30-year tendon surveillance and concrete inspection on October 12, 2004. Pursuant to the requirements of ASME Section XI, IWL-3300 and ANO-1 Technical Specification (TS) 5.6.6, an engineering report was prepared to document the evaluation of examinations that did not meet the acceptance standards of ASME IWL-3100 or IWL-3200. While no indications were found that challenge current structural integrity or leak tightness of the reactor building, several indications were found that did not meet the acceptance criteria of IWL-3000. These indications and the results of the engineering evaluation are as follows:

1. Low Reserve Alkalinity – Grease samples from three tendons had low reserve alkalinity. These tendons are 2D218, 21H-52, and 32H-18. The alkalinity of the grease did not meet the acceptance criteria of IWL-3221.4. Additional testing of the grease showed that it would provide adequate corrosion protection for the tendons and the grease was accepted by evaluation in accordance with IWL-3222.

Cause of Condition - IWL-3310(a): This condition is caused by a mixture of tendon sheathing filler greases being used over the life of the plant. Entergy design calculation (CALC-87-E-0052-05) confirms that ANO-1 uses a mixture of 2040P and 2040P4 grease. This mixture includes the 2040P grease that has a normal reserve alkalinity approaching zero. 2040P grease was used early in plant life and was considered to be acceptable as long as the Acid Number (ASTM D-974) was less than 1.

Applicability to the Other Unit: This condition is acceptable and does not have the potential to adversely impact ANO-2 containment.

Acceptability of Reactor Building - IWL-3310(b): The grease is considered to provide adequate corrosion protection for the tendon as long as the Acid Number is less than 1. Testing has shown that all of the grease samples had an Acid Number of less than 1. As a result, the ability of the tendons to perform their intended reactor building function is not compromised by this condition and the reactor building is acceptable for continued service without replacement of the grease.

Requirements for Repair or Replacement - IWL-3310(c): As noted above, this condition does not require repair or replacement of the associated grease.

Additional Examination Requirements - IWL-3310(d): Since the reported values for grease base numbers and acid numbers are acceptable as is and do not indicate a major change or deterioration of the grease from the time of installation; no additional examinations are required as a result of this condition.

2. **Void in Tendon Grease on Tendon 2D218** – The difference between the amount of grease removed for tendon inspection and the amount of grease required to refill tendon 2D218 exceeded 10% of the net tendon duct volume indicating the previous presence of a void in the tendon grease. Examination of a tendon wire showed that no degradation of the tendon had occurred and the tendon was refilled, removing the void.

**Cause of Condition - IWL-3310(a)**: The cause of this condition is believed to be leakage past the tendon grease can gaskets.

**Applicability to the Other Unit**: This condition is believed to be caused by leaking grease cans. The ANO-2 tendon grease cans have a larger bearing area on the gasket material and are less susceptible to leakage past the gasket than ANO-1 grease cans; however, ANO-2 grease cans are still potentially subject to gasket leakage. The existing containment inservice inspection program monitors for grease leakage in accordance with the IWL requirements and is an adequate means of detecting gasket leaks on ANO-2.

**Acceptability of Reactor Building - IWL-3310(b)**: The purpose of the tendon grease is to prevent corrosion of the tendon. Since there was no damage to the tendon wires and the corrosion protection medium (grease) has been restored; the reactor building remains acceptable for service.

**Requirements for Repair or Replacement - IWL-3310(c)**: Replacement of the tendon grease has been performed. Tendon grease can gasket leakage is addressed as detailed in item 3 below.

**Additional Examination Requirements - IWL-3310(d)**: No additional examinations of 2D218 are required. Examinations as a result of tendon grease can gasket leakage are addressed as detailed in item 3 below.

3. **Grease Leaks from Tendon Grease Cans** – A grease leak exceeding the acceptance criteria of IWL-3111 was detected on ANO-1 tendon V-40. Additionally grease leaks were detected on several other tendon cans but were determined to be acceptable per IWL. Repair of the leak on tendon V-40 will be performed as discussed below.

**Cause of Condition - IWL-3310(a)**: The cause of this condition is believed to be leakage past the tendon grease can gaskets.

**Applicability to the Other Unit**: The ANO-2 tendon grease cans have a larger bearing area on the gasket material and are less susceptible to leakage past the gasket than ANO-1 grease cans; however, ANO-2 grease cans are still potentially subject to gasket leakage. The existing Containment Building Inservice Inspection Program monitors for grease leakage in accordance with the IWL requirements and is an adequate means of detecting gasket leaks on ANO-2.

**Acceptability of Reactor Building - IWL-3310(b)**: Entergy design calculation (CALC-11406-014 sheet 13) shows that the ANO-1 reactor building design allowed for one tendon of each group to be detensioned for tendon surveillance and wire removal. As a result, the reactor building remains functional even if one of the vertical tendons is completely detensioned. Since no issues with the acceptability of the vertical tendons other than the leakage from tendon V-40 were noted in the surveillance, the reactor building retains its ability to perform its design function. Even though the acceptability of the reactor building does not rely on the acceptability of any single vertical tendon,

additional corrective actions are being taken to ensure that tendon V-40 is acceptable or repaired and to ensure that adequate corrosion protection is restored for the tendon.

Requirements for Repair or Replacement - IWL-3310(c): The seals for the lower tendon grease can for tendon V-40 will be replaced and the tendon refilled with grease as necessary. This action is scheduled to be performed during the 1R19 refueling outage in the fall of 2005.

Additionally, the top tendon grease can anchor head for tendon V-40 will be inspected for corrosion and proper grease coverage.

Additional Examination Requirements - IWL-3310(d): The top tendon grease can anchor head for tendon V-40 will be inspected for corrosion and proper grease coverage.

The above actions are being performed in support of final resolution of the ANO-1 30-year tendon inspection. However, these actions are not being identified as regulatory commitments, but will be tracked through the Entergy Corrective Action Program.