

October 2, 1996

Mr. C. Randy Hutchinson  
Vice President, Operations AND  
Entergy Operations, Inc.  
1448 S. R. 333  
Russellville, AR 72801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING ENTERGY OPERATIONS,  
INC.'S TECHNICAL SPECIFICATIONS CHANGE REQUEST TO DELETE REACTOR  
COOLANT PUMP FLYWHEEL INSPECTIONS - ARKANSAS NUCLEAR ONE, UNITS 1  
AND 2 (TAC NO. M92062)

Dear Mr. Hutchinson:

By letter dated April 4, 1995, Entergy Operations, Inc. submitted the  
subject request. The NRC staff has determined that additional information is  
needed to complete its review. Please respond to the enclosed request for  
additional information within 60 days from receipt of this letter.

Sincerely,

ORIGINAL SIGNED BY:

Thomas W. Alexion, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-313 and 50-368

Enclosure: Request for Additional Information

cc w/encl: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script that reads "Thomas W. Alexion".

Thomas W. Alexion, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

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Mr. C. Randy Hutchinson  
Entergy Operations, Inc.

Arkansas Nuclear One, Units 1 & 2

cc:

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County Judge of Pope County  
Pope County Courthouse  
Russellville, AR 72801

## REQUEST FOR ADDITIONAL INFORMATION

### DELETION OF REACTOR COOLANT PUMP FLYWHEEL INSPECTIONS

Questions Related To SIR-94-080, Rev. 1, "Relaxation of Reactor Coolant Pump Flywheel Inspection Requirements," March 1995

1. Section 3.0, Previous Inspection Results for RCP [Reactor Coolant Pump] Flywheels, Pgs. 3-1 to 3-12: Provide additional information if the ultrasonic (UT) examinations at the Combustion Engineering Owners Group (CEOG) member plants were qualified relative to inspection of RCP flywheels. Regardless whether a formal qualification was performed, please include in your response the following:
  - a. Any information supporting qualification of the examinations of RCP flywheels.
  - b. Any information supporting qualification of the personnel performing the examinations of RCP flywheels.
  - c. Any information regarding the degree of uncertainty in UT measurements based on the procedures and personnel qualification basis.
2. Section 3.0, Previous Inspection Results for RCP Flywheels, Pgs. 3-1 to 3-12: The fatigue analysis is dependent on the premise that UT equipment used for examinations of RCP flywheels at these facilities is capable of accurately detecting and sizing a 0.25-inch long near-surface flaw. Provide your basis supporting the probability of detection (POD) for the examinations performed. Provide details on how the POD values were determined, qualified, and used in concluding the assumed size of the initial flaw. Also, provide a demonstration of the CEOG member plants' UT detection capability in not missing a flaw size of 0.25 inch.
3. Section 6.1.1, Centrifugal Stresses, Pg. 6-1: It was stated in curve-fitting the stress distribution that a radial distance of 2 inches from the keyway was considered in order to obtain an accurate fit. Did you only consider the stress distribution within this 2-range in the fracture mechanics analysis or did you exclude this part of stress distribution in your analysis?
4. Section 6.1.1, Centrifugal Stresses, Pg. 6-1: The finite element method (FEM) was employed in the stress analyses, but not in the fracture mechanics analyses. Support your fracture mechanics results by modifying the FEM model to include the postulated crack and then input the crack face pressure using the complete tangential stress distributions for the critical keyway regions in Figures 5-28 through 5-33 or demonstrate that the simplified models used are conservative.

ENCLOSURE

5. Section 6.3, Allowable Flaw Size Determination, Pg. 6-6: It was stated that the stress intensity distribution for the centrifugal and the shrink-fit stresses are compared separately with the allowable fracture toughness to determine the allowable flaw sizes. Under normal operating conditions, the staff believes that contributions from both centrifugal and shrink-fit stresses to the applied stress intensity factors are comparable and should be combined. Figures 6-3 through 6-8 indicate that when the combined effect is considered the ASME Code criteria may not be met even for the initial crack size of 0.25 inch. Clarify this. Also, provide a revised copy of Figures 6-3 and 6-14 by adding the stress intensity due to shrink fit at the proper speed to the stress intensity due to centrifugal load.
6. Provide information on the remaining shrink fit for accident conditions for all flywheels.
7. Provide past RCP flywheel maintenance records in terms of maintenance frequency and level of disassembly involved.
8. Discuss the test results from the initial examination on Arkansas Nuclear One, Unit 1's RCP flywheels in terms of detection and sizing capability of the acoustic emission methodology used and the future inspection plan for these flywheels.