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Director of Nuclear Reactor Regulation  
ATTN: Mr. J. F. Stolz, Chief  
Operating Reactors Branch #4  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

SUBJECT: Arkansas Nuclear One - Unit 1  
Docket No. 50-313  
License No. DPR-51  
Acoustic Emission Testing as an  
Alternative Volumetric Inspection  
Method to Ultrasonic Testing of  
ANO-1 Reactor Coolant Pump Flywheels

Gentlemen.

In preparation for our August 24, 1982, formal presentation to NRC on Acoustic Emission Testing, the following serves to introduce this technique as an alternative methodology to meet AP&L's proposed change to the Arkansas Nuclear One - Unit One (ANO-1) Technical Specification 4.2.6 which was previously submitted by our letter dated February 22, 1979 (1CAN027909). The overall basis for the subject alternative testing method is discussed below; however, the enclosed report provides greater detail.

The ANO-1 Reactor Coolant Pump Motors (RCPM) are an early model Allis-Chalmers design in which the flywheels were "shrunk-to-fit" on a splined hub. It is significant that these flywheels were not designed to be removable; in fact, the manufacturer has strongly recommended that the flywheels not be removed from their shafts. However, without their physical removal, it would be impossible to explicitly meet the apparently noncompromising wording of the present technical specification which calls for a "complete surface and volumetric examination". We have interpreted the intent of this language to include the keyways and inside diameters of the flywheels which adjoin their respective shafts.

By means of our February 22, 1979, letter from W. Cavanaugh, III, to W. R. Reid, we proposed "...to do a complete ultrasonic volumetric examination and a surface examination of all exposed surfaces accessible

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through the access ports...", in lieu of a complete surface examination of the flywheel. In our February 22, 1979, letter we included RCPM drawings showing the flywheels and access ports.

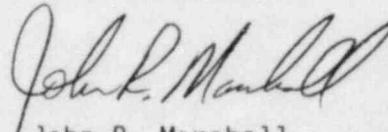
Now upon further evaluation, we are concerned that some areas of the flywheels may not be totally amenable to, in addition to not being wholly accessible for, optimum ultrasonic inspection methods. The basis for our concern centers upon whether or not the "shrink-fit" forces in the flywheel, when stationary, could tend to "close" any minute surface generated cracks and thus render such defects somewhat opaque to ultrasonic testing.

10CFR50.55a(i) and (ii) endorses the application of generally recognized Codes and Standards, and ASME Section XI "Rules for Inservice Inspection of Nuclear Power Plant Components" states in IWA 2240, in part, that "Alternative examination methods, a combination of methods or newly developed techniques may be substituted...". It is therefore requested that the volumetric method of acoustic emission inspection of ANO-1 RCP flywheels be considered as a suitable alternative method of inspection.

The enclosed report, "Acoustic Emission Testing as an Alternative Volumetric Inspection Method to Ultrasonic Testing of a Reactor Coolant Pump Flywheel," details the manner in which high stress positions in the flywheel geometry were identified. The preliminary report also sets down the method by which acoustic emission inspection is applied to the critical areas of the flywheel while under local thermal stresses which approximate to 90 percent yield or ~ 30 percent above service stresses.

As this letter only presents an alternative methodology by which we propose to accomplish the required surface and volumetric examination of the RCPM flywheels, it does not alter the proposed change to Technical Specification 4.2.6 which was submitted in our February 22, 1979, letter and yet to be approved by NRC. Thus, no fee is remitted with this letter.

Very truly yours,



John R. Marshall  
Manager, Licensing

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Enclosure