Entergy
Operations

Entergy Operations, Inc.

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U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Comparati.. Analysis of the
Reactor Coolant Pumps

Gentlemen:

During the current Arkansas Nuclear One, Unit 1 (ANO-1) refueling outage (1R10), the "D" reactor coolant pump (RCP) was disassembled. This disassembly was to inspect the RCP for damage due to potential motor thrust bearing failure. This disassembly was not a planned outage evolution.

In letter dated March 26, 1992 (1CAN039211), information was submitted to the NRC to revise an Entergy Operations commitment to perform single-wall radiography of the pump casing and instead conduct RCP casing structural integrity examinations and evaluations using the methodology contained in ASME Code Case N-481. In the March 26, 1992, letter, Entergy Operations committed to submit a report of the Code Case defined evaluation by June 5, 1992.

During a March 30, 1992, telephone conference call, the NRC requested the results of the VT-1 and VT-3 examination of the "D" RCP. Also requested was a comparative analysis between the Code Case postulated flaw evaluation and the "A" and "B" RCP previous fracture mechanics and stress analysis evaluations. The purpose of this submittal is to provide the requested information.

Results of the Nondestructive Examinations

The VT-1 exterior surface examination of the "D" RCP casing welds, upper and lower scroll (horizontal) welds and torus (vertical) welds has been performed and there were no indications identified. The VT-3 examination of the interior surface of the casing also identified no indications. Scratches were found during the VT-3 examination on the wear ring; however, this is not a concern since the wear ring does not function as a

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pressure boundary. Enhanced UT examinations of the areas of interest on the "A" and "B" RCPs have been performed. No new indications were identified and the previously identified flaws have not grown. In fact, due to better technology, the previously identified flaw in the "B" RCP has been sized smaller than was previously identified.

Comparative Analysis

The four RCPs ("A", "B", "C", and "D") at ANO-1 were all manufactured by Byron Jackson. All four pump casings were fabricated from ASTM A351-69, Grade CF8M. The pumps have identical design. Figure 1 is a drawing of the pumps.

The four (4) RCPs at ANO have experienced essentially the same operating history since the cold legs are not isolable from the reactor vessel or the steam generators. There have been short periods (on the order of 2 to 3 months) of three (3) pump operation. These events involved the "C" and "D" pumps and would have caused the temperatures through the respective cold legs to be somewhat elevated but within the operating envelope. ANO is licensed for three (3) pump operation. All other plant transients would have affected all the pumps and all the cold legs equally.

Attached is a scoping evaluation for the ANO-1 RCPs. This evaluation reviews prior inspection results performed in 1986 and 1988 and associated fracture mechanics evaluations to determine if the safety and serviceability requirements of Code Case N-481 as it relates to the pump casing will be satisfied.

Based on the 1986 and 1988 fracture mechanics and stress analysis evaluations and the information provided in this submittal, Entergy Operations believes that the current evaluation will demonstrate the integrity of the pump casing under postulated flawed conditions. If however, the current evaluation does not demonstrate the integrity of the casing under the Code Case postulated flow condition, Entergy Operations will disassemble the "D" RCP in the next refueling outage (1R11) and will perform single-wall radiography of the pump casing.

Should you have any questions regarding this issue, please contact me.

Very truly yours,

James J. Fisicaro

James J. Fisicaro
Director, Licensing

JJF/RWC/sjf
Attachments

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