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November 30, 2006

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

SUBJECT: 60-Day Report for ANO-2 Reactor Pressure Vessel Head Inspection for Refueling Outage 2R18
Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

REFERENCES:

1. NRC letter dated February 20, 2004, *Issuance of First Revised Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors, EA-03-009* (0CNA020404)

2. NRC letter to Entergy dated May 17, 2006, Arkansas Nuclear One, Unit 2 (ANO-2) - *Relaxation Request from Nuclear Regulatory Commission (NRC) Order EA-03-009 for the Control Element Drive Mechanism (CEDM) Nozzles*

3. NRC letter dated August 26, 2006, *Request for Relaxation from First Revised Nuclear Regulatory Commission Order EA-03-009, Dated February 20, 2004, Examination Requirement for Reactor Pressure Vessel Head* (2CNA080606)

Dear Sir or Madam:

On February 20, 2004, the Nuclear Regulatory Commission (NRC) issued the revised Order addressing inspection requirements for reactor pressure vessel (RPV) heads at pressurized water reactors (Reference 1). Section IV.E of the Order requires licensees to submit a report detailing the inspection results within sixty (60) days after returning the plant to operation.

Entergy sought and was granted two relaxations from the Order for the fall 2006 2R18 refueling outage. The first relaxation allows for augmented examinations at the blind zones on the lower portion of the Control Element Drive Mechanism (CEDM) nozzles (Reference 2). The second was with regard to only performing a limited bare metal visual (BMV) inspection of the RPV head (Reference 3).

Arkansas Nuclear One, Unit 2 (ANO-2) resumed operation on October 28, 2006 from the 2R18 refueling outage. As a result of the inspections performed, Entergy did not identify any boric acid leakage or primary water stress corrosion cracking associated with the RPV head

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inspections. Additionally, as discussed in our response to NRC Bulletin 2004-01, *Inspection of Alloy 82/182/600 Materials used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors*, Entergy replaced the ANO-2 pressurizer during this outage with a pressurizer that does not contain Alloy 600 materials. The results of the RPV head inspections are summarized in the attachment to this letter.

This letter does not contain any NRC commitments. If you have any questions or require additional information, please contact Steve Bennett at 479-858-4626.

Sincerely,

DEJ/sab

Attachment: 60-Day Report for Reactor Vessel Head Inspection for ANO-2 Refueling Outage 2R18

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Attachment to

2CAN110601

60-Day Report for Reactor Vessel Head Inspection for ANO-2 Refueling Outage 2R18

60-Day RV Head Inspection for ANO-2 Refueling Outage 2R18

Arkansas Nuclear One, Unit 2 (ANO-2) is a CE designed unit with Alloy 600 reactor pressure vessel (RPV) head penetrations which is subject to NRC Order EA-03-009. For ANO refueling outage 2R18, Entergy either complied with the Order or was granted relaxation in accordance with the Order where necessary. In accordance with Section IV.E of the Order, licensees are required to submit a report detailing the inspection results within sixty (60) days after returning the plant to operation. The following provides the results of the 2R18 inspections performed on ANO-2.

Inspection Area	Inspection Method (Letter Reference)	Extent of Inspection	2R18 Findings
Visual Inspection of RPV Head	BMV of ICI Nozzles (Ref. 1)	Perform a 360° bare metal visual inspection around the ICI nozzles from inside the cooling shroud.	A BMV inspection of the 8 ICI nozzles at the annulus was conducted. No evidence of boric acid leakage was observed.
	Visual Inspection Inside the Cooling Shroud (Ref. 3)	Inspect the outermost CEDM nozzles and vent line to the extent practical for boric acid deposits above and around the insulation.	A visual inspection of the accessible CEDM nozzles and vent line was conducted through the access doors on the shroud. No evidence of boric acid leakage was observed.
	Visual Inspection of RPV Head Flange (Ref. 1)	Inspect the peripheral portion of the head and flange external to the cooling shroud.	A visual inspection of the external surface of the RPV head flange was conducted. No evidence of boric acid leakage was observed.
	Pressure Retaining Components (Ref. 1)	Perform visual inspections of the pressure retaining components above the RPVH to identify potential boric acid deposits.	A visual inspection was performed to assess leakage from pressure retaining components above the head. No evidence of leakage was observed.

Inspection Area	Inspection Method (Letter Reference)	Extent of Inspection	2R18 Findings
NDE of CEDM Penetrations (81)	UT of Nozzle Wall including Triple Point Augmented Exam (Ref. 1 and 3)	Inspect 2" above the J-weld to the blind zone of the CEDM nozzle.	The 81 CEDMs were scanned and analyzed from the ID using Westinghouse UT probes. No indications of PWSCC were identified.
	Augmented NDE of Nozzle Blind Zone (Ref. 2)	Perform augmented ECT inspection of the blind zone region on 57 of 81 CEDM nozzles.	A manual ECT exam was conducted on the exterior surface of the nozzle by various delivery techniques. No indications of PWSCC were identified.
	Low Frequency ECT of Nozzle Annulus (Ref. 3)	CEDM nozzle annulus from the leak path region to surface of RPV head.	The Low Frequency ECT was conducted on each of the CEDM nozzles using the open housing probe. The exam did not reveal any loss of carbon steel indicative of wastage.
	UT of Nozzle Annulus (Leak Path) (Ref. 1)	Review interference fit in the nozzle annulus above the J-weld for leakage path.	The open housing probe examination did not reveal any leak path present in the annulus region of the CEDM nozzles.
NDE of ICI Penetrations (8)	UT of Nozzle Wall (Ref. 1)	Inspect 2" above the J-weld to the blind zone of the ICI nozzle.	The open housing probe UT examination did not reveal any PWSCC indications in the 8 ICI nozzles.
	ECT/UT of Nozzle Face (Ref. 1)	Perform ECT and UT of ICI nozzle face to cover blind zone region of ID UT scan	An automated ECT/UT on the face of the ICI nozzles was performed. No flaws were detected.
	UT of Nozzle Annulus (Leak Path) (Ref. 1)	Review interference fit in nozzle annulus above the J-weld for leakage path.	The open housing probe examination did not reveal any leak path present in the annulus region of the ICI nozzles.

Inspection Area	Inspection Method (Letter Reference)	Extent of Inspection	2R18 Findings
NDE of Vent Line Penetration (1)	ECT of Wetted Surface Area (Ref. 1)	Perform ECT of wetted surface of vent line nozzle and J-weld.	The ECT examination did not reveal any indications of PWSCC on the weld or nozzle.
	Low Frequency ECT of Nozzle Annulus (Ref. 3)	Vent line nozzle annulus from J-weld to surface of RPV head.	The Low Frequency ECT did not reveal any leak path or loss of carbon steel indicative of wastage.

Legend:

BMV = Bare Metal Visual

CEDM = Control Element Drive Mechanism

ECT = Eddy Current Testing

ICI = Incore Instrument

LF ECT = Low Frequency Eddy Current Testing

NDE = Non-Destructive Examination

PT = Dye Penetrant Testing

PWSCC = Primary Water Stress Corrosion Cracking

UT = Ultrasonic Testing

ID = Inside diameter