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Docket No: 50-316

Donald C. Cook Nuclear Plant Unit 2
UNIT 2, CYCLE 16 REACTOR PRESSURE VESSEL UPPER AND LOWER HEAD INSPECTION

References:
1. Nuclear Regulatory Commission (NRC) Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," dated August 21, 2003.
2. NRC Revised Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," Accession Number ML040220181, dated February 20, 2004.
3. Letter from William H. Ruland, NRC, to Mano K. Nazar, Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Unit 2 – Relaxation of the Requirements of First Revised Order (EA-03-009) Regarding Reactor Pressure Vessel Head Inspections Dated February 20, 2004 (TAC No. MC3074)," Accession Number ML042510444, dated September 27, 2004.

During the Unit 2, Cycle 16 refueling outage that ended May 6, 2006, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, performed a bare-metal visual inspection of the CNP Unit 2 reactor pressure vessel (RPV) bottom-mounted instrumentation (BMI) nozzle penetrations, and bare-metal and volumetric examinations of the RPV upper head.

The BMI inspection was completed in accordance with I&M's commitment made in response to Nuclear Regulatory Commission (NRC) Bulletin 2003-02 (Reference 1), which addressed a concern about reactor coolant leakage from BMI penetrations. The Bulletin requested licensees to submit descriptions of their RPV head penetration inspection programs and the results of the bare-metal inspection performed during the next refueling outage. In response to the Bulletin, I&M committed

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to perform bare-metal visual inspections of the Unit 2 RPV lower head and penetrations each refueling outage.

The bare-metal visual and volumetric examinations of the RPV upper head were performed in accordance with NRC Revised Order EA-03-009 (Reference 2), which required licensees to assess the susceptibility of their plant's RPV upper head to primary water stress corrosion cracking (PWSCC), and to perform inspections on a schedule commensurate with the PWSCC susceptibility. The results of both the upper and lower head inspections are provided below.

The BMI inspection was conducted by contractor and I&M personnel, and included personnel qualified as American Society of Mechanical Engineers Code, Section XI, Level II examiners. The bottom two sections of insulation were lowered to allow unobstructed access to all penetrations and the membrane areas of the lower reactor vessel. A pole-mounted camera was used to perform a VT-2 examination to VT-3 examination criteria for distance and lighting on all 58 Unit 2 RPV BMI nozzle penetrations, including 360 degrees around each BMI penetration. No boric acid deposits were found at any RPV BMI nozzle penetration or anywhere on the RPV bottom-head surface area. No boric acid residue sampling or analysis was required or performed. The as-found condition of the Unit 2 RPV bottom head was identical to the as-left condition following the bottom cleaning and re-inspection performed during the Unit 2, Cycle 15 refueling outage. No indications of through-wall leakage were found during the Unit 2, Cycle 16 RPV BMI inspection. The inspection results were digitally recorded, and copies of the video files were saved to computer drives as video clips.

The RPV upper head inspection activities included a calculation of Effective Degradation Years (EDY) that was completed in accordance with Reference 2, Section IV.A at the completion of Unit 2 Fuel Cycle 15, March 23, 2006. The EDY value at the beginning of the Unit 2, Cycle 16 refueling outage was 14.40, which places the Unit 2 RPV upper head into a high susceptibility category when evaluated in accordance with Reference 2, Section IV.B. The high susceptibility categorization requires the performance of both bare-metal visual and volumetric examinations during each refueling outage.

Both the bare-metal visual and volumetric examinations of the CNP Unit 2 RPV upper head were conducted during the refueling outage that ended May 6, 2006. These inspections were required by Reference 2, Section IV.C(1).

A 100 percent bare-metal visual examination of the Unit 2 RPV upper head showed no evidence of pressure boundary leakage. However, evidence of above-head leakage from an external source was discovered near Penetration Number 42. To ensure that the source of residue was not the result of pressure-boundary leakage, the following were performed.

- A chemical sample analysis, which determined the residue to be 1.3 to 1.6 years old, was performed.

- Extensive visual examinations of Penetration 42 (prior to and after residue sampling and cleaning) were performed. The examination indicated that the origin of the residue was not from the annular gap between the vessel head and the penetration tube. Evidence of previous above-head leakage, including pooling and dripping, was observed on the insulation panel seam in the vicinity above Penetration 42.
- A volumetric examination, including ultrasonic/eddy current of the inside diameter of the penetration tube, was performed. No rejectable indications were found and no evidence of leakage in the shrink-fit region was observed in the J-groove weld inspection data.
- Supplemental eddy current examinations of the J-groove weld and penetration tube outside diameter surfaces were conducted. No rejectable indications were observed in the J-groove weld inspection data.
- A manual surface examination using liquid penetrant was performed on the Penetration 42 nozzle immediately above the reactor vessel closure head. No indications were observed.

A 100 percent volumetric examination of the 78 control rod drive mechanism penetrations and the single vent penetration in the Unit 2 RPV head was completed in accordance with Section IV.C(5)(b)(iii) utilizing an approved relaxation of the requirements obtained in accordance with Section IV.F (Reference 3). No unacceptable indications were found.

No repairs of any head penetrations were needed or performed.

This letter contains no new commitments. Should you have any questions, please contact Ms. Susan D. Simpson, Regulatory Affairs Manager, at (269) 466-2428.

Sincerely,

Joseph N. Jensen
Site Support Services Vice President

RGV/rdw

c: J. L. Caldwell – NRC Region III
K. D. Curry – AEP Ft. Wayne
Director, Office of Nuclear Reactor Regulation
J. T. King – MPSC, w/o attachment
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AFFIRMATION

I, Joseph N. Jensen, being duly sworn, state that I am Site Support Services Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this information with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Joseph N. Jensen
Site Support Services Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 28th DAY OF June, 2006

Notary Public

My Commission Expires 6/10/2007