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Docket No.: 50-348

*Energy to Serve Your World*SM

NL-03-1387

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant – Unit 1
Results of Reactor Pressure Vessel Head Inspections
Required by Order EA-03-009

Ladies and Gentlemen:

During the recent spring refueling outage at Unit 1 of the Farley Nuclear Plant (FNP), Southern Nuclear Operating Company (SNC) completed inspections as required by NRC Order EA-03-009, issued February 11, 2003 to establish interim inspection requirements for reactor pressure vessel (RPV) heads at pressurized water reactors. SNC hereby reports the results of those inspections as required by Paragraph E of Section IV of the Order.

The FNP Unit 1 inspections were performed in accordance with the applicable requirements of Paragraphs C and D of Section IV of the Order, as relaxed by NRC's letter of April 25, 2003 with regard to items IV.C.(1)(a) and IV.C.(1)(b)(i). These relaxations were requested in SNC's March 3, 2003 letter answering the Order, with supplemental information provided by SNC's letters of April 11 and April 18, 2003.

With an Effective Degradation Year (EDY) value at the start of the spring refueling outage of 17.5 years as calculated per Paragraph A of Section IV, FNP Unit 1 fell into the High (EDY >12) category for susceptibility to primary water stress corrosion cracking (PWSCC) established by Paragraph B, hence, the inspection requirements of Paragraph C (1) were applied.

Results:

IV.C.(1)(a):

No evidence of head material wastage or of leaking or cracked nozzles was found by bare metal visual examination of the RPV top head. Scope of this examination was relaxed from the original requirement to examine 100% of the head surface. The relaxed requirement allowed examination of the head surface to the extent possible, with 100% coverage of surface areas adjacent to the penetration nozzles.

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This relaxation was requested because of the small area (<1%) of the head made inaccessible by the shroud support structure and reflective metal insulation. Examination of the RPV top head in accordance with the relaxed requirement was achieved, with all penetration nozzles (69 – 4” OD nozzles plus 1 – 1” OD head vent nozzle) examined 360° around.

IV.C.(1)(b)(i):

No evidence of cracked nozzles or of leakage into the interference fit zone was found by ultrasonic testing (UT) of the 69 – 4” OD RPV top head penetration nozzles. Scope of this examination was relaxed for the 4” OD nozzles from the original requirement for UT coverage to extend from 2” above the J-groove weld down to the bottom of the nozzle. The relaxed requirement was for UT coverage to extend from 2” above the J-groove weld to at least 1” below the weld. This relaxation was requested because of inspection limitations imposed by the physical configuration of the 4” OD nozzle ends, which are externally threaded and internally tapered. Complete UT coverage was achieved for all 4” OD nozzles in accordance with the relaxed scope requirement, and the required assessment to determine if leakage had occurred into the interference fit zone was performed for each nozzle. In addition to the UT examination, eddy current testing (ECT) was performed on the internal surface of all 4” OD nozzles and extended beyond the reach of the UT coverage down to the taper. No indications of nozzle cracking were found by this ECT exam.

IV.C.(1)(b)(ii):

No evidence of cracking was found by ECT and dye penetrant testing (PT) of the 1” OD head vent penetration nozzle and associated J-groove weld. PT was performed on the wetted surface of the J-groove weld, while ECT was performed on the internal surface of the nozzle from 2” above the J-groove weld down to the bottom of the nozzle. In addition to the ECT examination, UT was performed on the head vent nozzle from 2” above the J-groove weld down to the limit of the inspection equipment. No indications of nozzle cracking were found by this UT exam.

IV.D:

Visual inspections were performed to identify potential boric acid leaks from pressure-retaining components above the RPV top head. The bare metal visual examination performed per item IV.C.(1)(a) noted white spots on several penetration nozzles above the penetration/RPV top head interface. Also noted was a light film of dry white material on the head surface, mirror insulation and downhill sides of penetration nozzles near the 240° azimuth shroud access opening. These deposits had been identified and documented in previous inspections. Smear samples confirmed the deposits to be dried boric acid residue. Analysis of isotopic ratios indicated that the residue was more than 5 years old. None of this residue exhibited any of the distinctive characteristics of nozzle leakage, and the thinly deposited residue did not prevent verification of the integrity of the penetrations and top head surface. Post-inspection cleaning removed most of the residue from the head.

Based on the distribution patterns and apparent age of the boric acid residue discovered, SNC attributes this residue to past leaks at Conoseal connections above the head. These and other pressure-retaining components above the RPV top head were inspected by

maintenance personnel as part of head disassembly for refueling. No evidence of current leakage was found.

Additional Inspection:

In addition to the bare metal visual examination of the RPV top head required by the Order, a best-effort visual examination was performed on the outer surface of the RPV bottom head around the 50 – 1.5" OD bottom mounted instrument (BMI) nozzles. No evidence of head material wastage or of leaking or cracked nozzles was found by this examination, but translucent white residue streams were apparent on the bottom head surface near the 0° azimuth. These streams appeared to have originated from above and run down the RPV to the lowest point, the center of the bottom head. Translucent white residue was also noted on several BMI nozzles. None of this residue exhibited any of the distinctive characteristics of nozzle leakage, and the thinly deposited residue did not prevent verification of the integrity of the penetrations and bottom head surface. No post-inspection cleaning was performed.

Mr. J. B. Beasley, Jr. states he is a Vice President of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

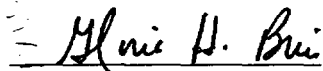
This letter contains no NRC commitments. If you have any questions, please advise.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY


J. B. Beasley, Jr.

Sworn to and subscribed before me this 30th day of June, 2003.


Notary Public

My commission expires: 6-7-05

JBB/DWD/sdl

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cc: Southern Nuclear Operating Company
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U. S. Nuclear Regulatory Commission
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