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Docket No. 50-364



Energy to Serve Your WorldSM
NEL-02-0197

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

Joseph M. Farley Nuclear Plant – Unit 2
Supplemental Response to NRC Bulletin 2002-02
Reactor Pressure Vessel Head Degradation and
Vessel Head Penetration Nozzle Inspection Programs

Ladies and Gentlemen:

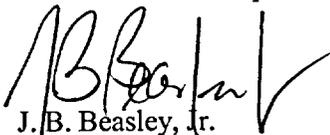
In accordance with 10 CFR 50.54(f) and pursuant to the requirements of Nuclear Regulatory Commission (NRC) Bulletin 2002-02, "Reactor Pressure Vessel Head Degradation and Vessel Head Penetration Nozzle Inspection Programs," dated August 9, 2002, Southern Nuclear Operating Company (SNC) hereby submits the enclosed information which serves as a supplement to our 30-day response to provide information regarding SNC's inspection program for the Farley Nuclear Plant (FNP) Unit 2 reactor vessel head and penetration nozzles. This information was requested by NRC staff via phone on September 27, 2002.

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

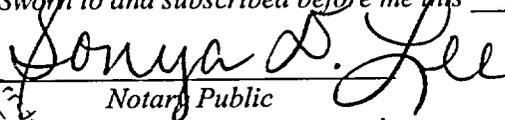
Mr. J. B. Beasley, Jr. states he is a Vice President of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

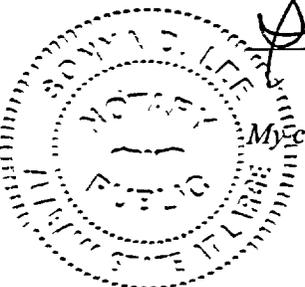
Southern Nuclear Operating Company


J. B. Beasley, Jr.

Sworn to and subscribed before me this 4th day of October, 2002.


Sonya D. Lee
Notary Public

My commission expires: 7/1/2006



A096

JBB/DWD/sdl: BL 2002-02 supplemental response.doc

Attachment

cc: Southern Nuclear Operating Company
Mr. D. E. Grissette, Nuclear Plant General Manager - Farley

U. S. Nuclear Regulatory Commission, Washington, D. C.
Mr. F. Rinaldi, NRR Project Manager - Farley

U. S. Nuclear Regulatory Commission, Region II
Mr. L. A. Reyes, Regional Administrator
Mr. T. P. Johnson, Senior Resident Inspector - Farley

Attachment

Joseph M. Farley Nuclear Plant – Unit 2
Supplemental Response to NRC Bulletin 2002-02
Reactor Pressure Vessel Head Degradation and
Vessel Head Penetration Nozzle Inspection Programs

Joseph M. Farley Nuclear Plant – Unit 2
Supplemental Response to NRC Bulletin 2002-02
Reactor Pressure Vessel Head Degradation and
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Provided below for Farley Nuclear Plant (FNP) Unit 2 is the Southern Nuclear Operating Company (SNC) supplemental response to the information request contained in Nuclear Regulatory Commission (NRC) Bulletin 2002-02 (dated August 9, 2002) and technical staff questions based on recent inspections at North Anna (telephone call with NRC staff on September 27, 2002 at 3:00 p.m. CDT). The supplemental request is repeated in bold text below.

As a result of inspection findings at North Anna, the NRC has two concerns about the combination and scope of inspection methods used during RPV head and VHP nozzle inspections. One concern is that cracks in the weld can lead to conditions to create circumferential cracks above the weld with no visual indications. The other concern is that cracks may develop in repaired nozzles within an inspection interval.

Concern 1:

As of September 26, 2002, North Anna 2 has identified circumferential cracks in 4 of the 9 nozzles examined with UT, and they have identified indications on the weld of 63 of 65 penetrations. The licensee considers these indications to be unacceptable and has plans to repair them. The identification of the circumferential cracks, above the weld, when coupled with the numerous weld indications raises NRC's concerns about the adequacy of RPV head and VHP nozzle inspections. According to North Anna, there was no visual indication on the surface of the RPV head of through wall cracks, and it is postulated moisture entered the annulus region through cracks in the welds. This finding, if true, indicates that cracks in the weld can lead to conditions that will create circumferential cracks above the weld with no visual indications on the surface of the RPV head. Part of the justification by licensees that do not plan to directly examine the J-groove welds included:

- **Improvements in visual inspection techniques;**
- **Prior to turning circumferential, axial cracks would develop and go through wall thus providing observable leakage;**
- **No leaks (i.e., circ cracks) have been identified without visual indication on the surface of the RPV head,**
- **Environment need for PWSCC in the annulus would not be created until through weld or wall crack occurred.**

Licensees that have excluded direct examination of the J-groove welds from their RPV head and VHP nozzle inspection programs should be asked to supplement their Bulletin 2002-02 responses with a discussion of whether the findings at North Anna 2 alters their justification for continued reliance on visual examines and their decision not to directly examination the J-groove welds.

Joseph M. Farley Nuclear Plant – Unit 2
Supplemental Response to NRC Bulletin 2002-02
Reactor Pressure Vessel Head Degradation and
Vessel Head Penetration Nozzle Inspection Programs

SNC Response to NRC Concern 1:

SNC has considered the cited North Anna 2 reactor pressure vessel head (RPV) and vessel head penetration (VHP) nozzle inspection findings and has concluded that the inspection methods employed during the current FNP Unit 2 outage remain adequate to address the pertinent safety issues (nozzle ejection and head metal wastage), including the concern that circumferential cracks could develop above the nozzle attachment welds (J-groove welds) without any visual indication of leakage on the head surface. The recent FNP Unit 2 head inspection did not rely on visual examination alone. In addition to the bare metal visual (BMV) exam performed on top of the head on all the nozzles, an ultrasonic testing (UT) volumetric exam was performed from under the head on all the nozzles. As described in SNC's September 9, 2002 letter responding to Bulletin 2002-02, this UT exam was capable of detecting both axial and circumferential indications initiating from the ID or OD surface of the nozzle tube material. An additional feature of the UT exam was leak path verification, a technique whereby the UT data for the interference fit region above each J-groove weld was examined for evidence of any leakage path. No indications of leakage or cracking were found by any of these examinations, making followup dye penetrant testing (PT) of the J-groove welds unnecessary.

There are several factors which help distinguish FNP from North Anna 2 with respect to RPV head condition. FNP Unit 2 has accumulated approximately 4 effective degradation years (EDY) less than North Anna 2 and has a history of a clean head with no flaw indications. Also, the FNP Unit 2 head was fabricated by Combustion Engineering while the North Anna 2 head was fabricated by Rotterdam Dockyard. Additionally, FNP uses zinc injection, which has been demonstrated to inhibit pressurized water stress corrosion cracking (PWSCC) in Alloy 600.

SNC is reviewing the underlying basis for its future inspection plans considering the findings at North Anna 2. SNC will outline plans for Unit 1 and future inspections in a separate response following conclusion of the Unit 2 outage this fall as previously committed. SNC will work with EPRI MRP and the NRC, as well as consider the findings from North Anna 2, in determining the scope and frequency of future inspections.

Concern 2:

As of September 26, 2002, North Anna 2 has identified indications using UT in two nozzles that were repaired less than 9 months ago following their visual inspections in response to Bulletin 01-01. Some licensees in their Bulletin 2002-02 inspections excluded repaired nozzles from their inspection scope with little or no justification. It may be advisable to include repaired nozzles in subsequent inspections.

Licensees that have excluded repaired nozzles from the scope of their current/next RPV head and VHP nozzle inspections should be asked to supplement their Bulletin 2002-02 response with a strong discussion as to why it's acceptable to exempt their repaired penetrations from examination.

SNC Response to NRC Concern 2:

FNP has no repaired nozzles.