Jeffrey T. Gasser
Vice President

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.7721
Fax 205.992.0403

SOUTHERN COMPANY
Energy to Serve Your World℠

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Docket No.: 50-424

NL-03-2394

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

Vogtle Electric Generating Plant
Results of Reactor Pressure Vessel Head Inspections
Required by NRC Bulletin 2003-02

Ladies and Gentlemen:

During the recent fall 2003 refueling outage (1R11) at Unit 1 of the Vogtle Electric Generating Plant (VEGP-1), Southern Nuclear Operating Company (SNC) completed a bare metal visual examination of the Alloy 600 nozzles penetrating the bottom head of the reactor pressure vessel (RPV) and a general inspection of the bottom head area. Pursuant to the requirements of NRC Bulletin 2003-02, "Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," issued to SNC on August 21, 2003, SNC hereby submits the enclosed report which constitutes the required 60-day response for VEGP-1.

Mr. J. T. Gasser 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

Jeffrey T. Gasser

Sworn to and subscribed before me this 19th *day of* December, *2003.*

Notary Public

My commission expires: 11/10/06

A109

JTG/DRG

Enclosure: Vogtle Electric Generating Plant Unit 1 60-day Response to NRC Bulletin 2003-02 "Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity"

cc: Southern Nuclear Operating Company
Mr. J. D. Woodard, Executive Vice President
Mr. W. F. Kitchens, General Manager – Plant Vogtle
Mr. M. Sheibani, Engineering Supervisor – Plant Vogtle
Document Services RTYPE: CVC7000

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. S. D. Bloom, NRR Project Manager – Vogtle
Mr. J. Zeiler, Senior Resident Inspector – Vogtle

Enclosure

Vogtle Electric Generating Plant Unit 1
60-day Response to NRC Bulletin 2003-02
"Leakage From Reactor Pressure Vessel Lower
Head Penetrations and Reactor Coolant Pressure Boundary Integrity"

Enclosure

Vogtle Electric Generating Plant Unit 1
60-day Response to NRC Bulletin 2003-02
"Leakage From Reactor Pressure Vessel Lower
Head Penetrations and Reactor Coolant Pressure Boundary Integrity"

During the recent fall 2003 refueling outage (1R11) at Unit 1 of the Vogtle Electric Generating Plant (VEGP-1), Southern Nuclear Operating Company (SNC) completed a bare metal visual examination of the Alloy 600 nozzles penetrating the bottom head of the reactor pressure vessel (RPV) and a general inspection of the bottom head area. Pursuant to NRC Bulletin 2003-02, "Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," issued to the SNC on August 21, 2003, SNC hereby responds to the 60-day inspection summary request set forth in NRC Request 2 of the Bulletin with respect to VEGP-1.

VEGP-1 returned to on-line service on October 22, 2003.

NRC Request: Within 60 days of plant restart following the next inspection of the RPV lower head penetrations, the subject PWR addressees should submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found:

SNC Response:

Examination:

A remote visual examination was performed on the outer surface of the RPV bottom closure head during the recent fall refueling outage (RFO-1R11) at VEGP-1 with a resolution capability at least equivalent to that obtained by direct visual observation. These inspections included a bare metal visual examination of all the Alloy 600 nozzles penetrating the bottom head of the vessel and a general inspection of the bottom head area for indications of wastage or significant corrosion of the low alloy steel vessel. The entire circumference of the interface of each nozzle with the vessel was evaluated for the presence of any deposits that might indicate leakage from the annulus between the nozzle and the head. These inspections were performed as recommended in Materials Reliability Program (MRP) letter MRP 2003-017 dated June 23, 2003.

Results:

No evidence of head material wastage or of leaking or cracked bottom mounted instrumentation (BMI) nozzles was found by bare metal visual examination of the RPV bottom head. However, a V-shaped rust stain was identified during inspection of the BMI Penetrations. The rust stain was oriented below the Loop 3 Cold Leg (CL) and extended from the bottom of the RPV up the side approximately 10 feet. To identify the cause of the rust, an inspection and sampling plan was developed. The plan included inspections and sampling around the Loop 3 CL and the bottom of the RPV. To inspect the Loop 3 CL, the sheet metal insulation was loosened and the insulation blankets were inspected. No boron residue or rust was visible on the bare metal at the nozzle transition region. Wet swipe samples were collected from the Loop 3 CL nozzle area. The bottom of the RPV was also inspected, areas around the bottom mounted instrumentation tubes in the rusted area were sampled with a wet swipe, and loose particles were removed with a scotch brite pad. Isotopic analysis of the samples (wet swipes and loose particles) determined that the

rust contained particulate with a nuclide signature similar to Refueling Water Storage Tank water from 5.7 and 6.9 years ago. Refuelings 1R6 and 1R7 occurred during this time period. The samples were also analyzed for boron and lithium. This analysis identified low levels of boron, but the results for lithium were below detectable limits. The sample analysis supports the conclusion that the rust was caused by a water leak from the refueling cavity during outage activities and not by Reactor Coolant System leakage.

Cause:

The size and location of the rust stain indicates that the rust was caused by water flowing down the reactor vessel. Due to the high temperature of the reactor vessel during power operations, this could only occur during refueling conditions. Located directly above each RPV loop nozzle is a ventilation port that is sealed during refueling to allow reactor cavity flooding. Based on sample analysis and review of applicable design drawings, it was concluded that one of these ventilation ports was leaking which resulted in water spraying onto the reactor vessel insulation and eventually flowing down the side of the reactor pressure vessel resulting in surface rusting of the RPV.

Corrective Actions:

Since the rust posed no threat to RPV integrity, only minor hand cleaning in the area of the BMI tubes was performed to facilitate future inspections.

Safety Significance:

The rust was determined to be minor surface rust that had no impact to reactor pressure vessel integrity.

Documentation:

The examination performed was documented by a written report supplemented by video and photographic images supporting the examination findings. This report also provides a baseline for future examinations.

Additional Inspection:

In addition to the bare metal visual examination of the RPV bottom head, a bare metal visual examination of > 99% of the RPV top head surface including 360° around each RPV head penetration nozzle was performed. 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 not 100% of the head surface because of the small area (<1%) of the head made inaccessible by the shroud support structure and insulation. However, a modification to the insulation was performed prior to the examination in order to make accessible a larger portion of the RPV top head. The examination was documented by a written report supplemented by video

and photographic images supporting the examination findings. This report also provides an updated baseline for future examinations.