

L. M. Stinson (Mike)
Vice President

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

Tel 205.992.5181
Fax 205.992.0341



Energy to Serve Your World™
NL-04-2321

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Docket Nos.: 50-348
50-364

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

Joseph M. Farley Nuclear Plant
Response to a Request for Additional Information on NRC Bulletin 2003-01
Potential Impact of Debris Blockage on Emergency Sump Recirculation
at Pressurized Water Reactors

Ladies and Gentlemen:

The U. S. Nuclear Regulatory Commission (NRC) issued NRC Bulletin 2003-01 to inform licensees of the potential for additional adverse effects due to debris blockage of flowpaths necessary for Emergency Core Cooling System (ECCS) and Containment Spray System (CSS) recirculation and containment drainage. These additional adverse effects were based on NRC-sponsored research that identified the potential susceptibility of pressurized-water reactor (PWR) recirculation sump screens to debris blockage in the event of a high energy line break (HELB) that would require ECCS and CSS operation in the recirculation mode.

In accordance with 10 CFR 50.54(f), the NRC requested a response within 60 days of the date of the NRC Bulletin to either: 1) state that the ECCS and CSS recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the NRC Bulletin and are in compliance with 10 CFR 50.46(b)(5) and all existing applicable regulatory requirements (Option 1); or 2) describe any interim compensatory measures that have been or will be implemented to reduce the risk which may be associated with the potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance has been completed (Option 2).

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SNC provided, in a letter dated August 7, 2003, the Farley Nuclear Plant response to Option 2 of the Requested Information in Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," dated June 9, 2003. SNC received a facsimile request for additional information (RAI) on August 30, 2004 and subsequently discussed the RAI with the NRC staff via telecon on September 10, 2004. SNC provided a response to the RAI in a letter dated October 29, 2004 in which SNC stated, "SNC has received the WOG operational guidance and is currently reviewing for implementation at FNP. Due to the current outage activities at FNP, the discussion of our plans to implement this new [Westinghouse Owner's Group] WOG guidance is not available at this time. SNC will provide this discussion by November 30, 2004."

The SNC response to the RAI on WOG guidance for Farley Nuclear Plant is provided in the enclosure.

Mr. L. M. Stinson, 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.

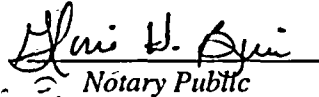
Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY



L. M. Stinson

Sworn to and subscribed before me this 30 day of November, 2004.


Notary Public

My commission expires: 6-7-05

LMS/CHM

Enclosure: Farley Nuclear Plant Response to RAI

U. S. Nuclear Regulatory Commission

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cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. L. M. Stinson, Vice President – Plant Farley
Mr. J. R. Johnson, General Manager – Plant Farley
RType: CFA04.054; LC# 14177

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. S. E. Peters, NRR Project Manager – Farley
Mr. C. A. Patterson, Senior Resident Inspector – Farley

**Joseph M. Farley Nuclear Plant
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Enclosure

Farley Nuclear Plant Response to RAI

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Enclosure

Farley Nuclear Plant Response to RAI

The following request for additional information was received from the NRC:

By letter dated August 8, 2003,¹ Southern Nuclear Operating Company (the licensee) provided the 60-day response to NRC Bulletin 2003-01 for the Joseph M. Farley Nuclear Plant - Units 1 and 2. The Bulletin requested the licensee to either (1) state that the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the Bulletin and are in compliance with all existing applicable regulatory requirements, or (2) describe any interim compensatory measures that have been implemented or that will be implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is complete. The staff has completed its preliminary review of the SNC response and has determined it needs the following additional information to complete its review:

NRC Question 1

On page 2 of Attachment 1 to your response to Bulletin 2003-01 you state that "FNP [Farley Nuclear Plant] will review WOG recommended procedural modifications when issued and determine if any FNP specific changes are required." The Westinghouse Owner's Group (WOG) has developed operational guidance in response to Bulletin 2003-01 for Westinghouse and CE type pressurized water reactors (PWRs). Please provide a discussion of your plans to consider implementing this new WOG guidance. Include a discussion of the WOG recommended compensatory measures that have been or will be implemented for your plant, and the evaluations or analyses performed to determine which of the WOG recommended changes are acceptable for your plant. Provide technical justification for those WOG recommended compensatory measures not being implemented by your plant. Also include a detailed discussion of the procedures being modified, the operator training being implemented, and your schedule for implementing these compensatory measures.

¹ Actual date of letter was August 7, 2003.

FNP Response

Candidates for Operator Action (COAs) to be implemented pending final engineering analysis and training validation:

COA 1A – Operator action to secure one containment spray pump before recirculation alignment.

Basis: By design, Unit 1 A train and Unit 2 A and B trains of Containment Spray (CS) and Residual Heat Removal (RHR) have separate, independent sumps; therefore, securing one spray pump will only stop the flow rate and the differential pressure across that sump. This evolution will have no impact on the sumps screen for the other train. Unit 1 B train CS and RHR pumps share a common sump screen. Securing the Unit 1 B train CS pump will reduce the flow rate and the differential pressure across the Unit 1 B train sump screen. Therefore SNC chooses to implement this step for the specific case of B train on Unit 1 in ECP-1.3, *Recirculation Sump Blockage*.

COA 5 – Refill of RWST

Basis: FNP has current guidance in ECP-1.1, *Loss of Emergency Coolant Recirculation*, to fill the RWST. The guidance is also planned for ECP-1.3, *Recirculation Sump Blockage*.

COA 6 – Injection of more than one RWST volume or alternate water source bypassing the RWST.

Basis: Two RWST volumes are approximately 1 million gallons. Injection of more than one RWST volume will place containment above the maximum flood level of elevation of 115 feet (approximately 593,000 gallons). Additional RWST volumes are addressed in severe accident guideline SAG-4, *Inject into Containment*. However, using an alternate water source to make up is addressed in ECP-1.1, *Loss of Emergency Coolant Recirculation*, and does not need to be revisited. Therefore, COA 6 is already implemented and additional implementation is not needed.

COA 7 – More aggressive cooldown and depressurization guidance for small break LOCA.

Basis: SNC currently uses an aggressive cooldown and depressurization method in ECP-1.1, *Loss of Emergency Coolant Recirculation*, with limits based on our Technical Specifications (TS). SNC intends on using this same method in the new ECP-1.3, *Recirculation Sump Blockage*. Guidance will be provided to cooldown at the maximum practicable rate not to exceed 100 degrees per hour (TS limit).

COA 8 – Provide guidance on symptoms and identification of containment sump blockage.

Basis: Specific indications of sump blockage will be described within ESP-1.3, *Transfer to Cold Leg Recirculation*, ECP-1.1, *Loss Of Emergency Coolant Recirculation*, and ECP-1.3, *Recirculation Sump Blockage*. Operators will be directed to monitor RHR pump flow, discharge pressure, and motor amps. Since Containment Spray pump parameters can only be monitored locally, operators will be directed to monitor these parameters (suction and discharge pressure) locally if conditions allow. Currently ESP-1.3 and ECP-1.1 have directions to check containment sump levels. Current applicable Emergency Operating Procedures (E-1, *Loss of Reactor or Secondary Coolant*, ESP-1.1, *SI Termination*, and ESP-1.2, *Post LOCA Cooldown and Depressurization*) have a transition on their foldout page to ECP-1.1.

COA 9 – Develop contingency actions to be taken in response to containment sump blockage.

Basis: Explicit guidance provided in the new ECP-1.3, *Recirculation Sump Blockage*, will be implemented. Transitions from ESP-1.3 *Transfer to Cold Leg Recirculation*, and ECP-1.1 *Loss Of Emergency Coolant Recirculation*, will direct the operating crew to ECP-1.3.

Verification and Validation (V&V) will be performed before training segments begin in 2005 and operators will be trained during the first two segments of 2005 on the response to emergency sump blockage. The new procedures will go into effect by July 8, 2005.

Candidates for Operator Action (COAs) not selected for implementation:

COA 1B - Operator action to secure both spray pumps before recirculation alignment.

Basis: FNP uses tri-sodium phosphate (TSP) for post LOCA pH control. It is required that at least one train of CS remain running for 8 hours following actuation of CS to complete the mixing of the sump water with the TSP which buffers the boric acid that was injected prior to the recirculation phase. In addition, at least one train of CS is required for containment pressure and dose control during the injection and initial recirculation phases. Therefore, SNC has not selected COA 1B for implementation.

COA 2 – Manually establish one train of containment sump recirculation prior to automatic recirculation swapover.

Basis: Evaluation of the current calculations for CS and RHR pumps NPSH available show that establishing recirculation prior to reaching the current swap-over criteria is not supported. Therefore, COA 2 is not appropriate.

COA 3 – Terminate one train of safety injection after recirculation alignment.

Basis: Current SNC licensing bases indicates adequate post-LOCA core cooling with only one train of ECCS in operation. A single failure of the operating ECCS train after the plant operator has secured one train of ECCS would result in an interruption of ECCS flow until the operator could manually re-start the secured ECCS train. Since the current FSAR Chapter 15 analyses do not account for this potential interruption in ECCS flow, significant reanalysis and a potential licensing amendment would be required. This scenario has been analyzed in WCAP-16204 Appendix B using the RELAPS computer code. Westinghouse has concluded that because fuel clad surface temperatures would rise very rapidly, it is expected that peak cladding temperature acceptance criterion could be exceeded. Additionally, it is not expected that sufficient time would be available for operators to perform effective mitigative actions. Based on the above discussions, SNC has not selected COA 3 for implementation.

COA 4 – Early termination of one RHR pump prior to recirculation alignment.

Basis: COA 4 does not apply to Westinghouse designed plants per WCAP-16204.

COA 10 – Termination of one train of HPSI prior to recirculation alignment.

Basis: COA 10 evaluation is applicable to Combustion Engineering designed plants only.

COA 11 – Prevent or delay Containment Spray for small break LOCAs.

Basis: COA 11 is only applicable for plants with ice-condenser containments per WCAP-16204.