

Dave Morey
Vice President
Farley Project

Southern Nuclear
Operating Company
P.O. Box 1295
Birmingham, Alabama 35201
Tel 205.992.5131



October 23, 1998

Docket Nos.: 50-348
50-364

10 CFR 50.54(f)

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

Joseph M. Farley Nuclear Plant
Response to Generic Letter 98-04

Ladies and Gentlemen:

On July 14, 1998, the Nuclear Regulatory Commission (NRC) issued Generic Letter 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System after a Loss-of-Coolant Accident because of Construction and Protective Coating Deficiencies and Foreign Material in Containment." The generic letter addresses the NRC staff's concerns regarding the impact of potential coating debris on the operation of safety related system, structures, and components during a postulated design basis loss-of-coolant accident (LOCA). Protective coatings are necessary inside containment to control radioactive contamination and to protect surfaces from erosion and corrosion. The NRC staff is concerned that significant detachment of the coatings from the substrate may make the emergency core cooling system (ECCS) and containment spray system (CSS) unable to satisfy the requirements of 10 CFR 50.46(b)(5) to provide long-term cooling and core spray functions following a LOCA. Generic Letter 98-04 requests information under 10 CFR 50.54(f) to evaluate the addressees' programs for ensuring Service Level 1 protective coatings inside containment do not detach from their substrate during a design basis LOCA and interfere with the operation of the ECCS and CSS. The NRC intends to use this information to assess whether current regulatory requirements are being correctly implemented and whether these requirements need to be revised.

9810300325 981023
PDR ADOCK 05000348
P PDR

A080

The attachment provides the required 120-day response for Plant Farley Unit 1 and Unit 2.

Mr. D. N. Morey states he is Vice President of Southern Nuclear Operating Company and 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

D. N. Morey

Dave Morey

Sworn to and subscribed before me this 23rd day of October 1998

Carol H. Taylor
Notary Public

My Commission Expires June 24, 2001

DSM/clt:gl9804.doc

Attachment: Response to Generic Letter 98-04

cc: Mr. L. A. Reyes, Region II Administrator
Mr. J. I. Zimmerman, NRR Project Manager
Mr. T. P. Johnson, FNP Sr. Resident Inspector

ATTACHMENT

Response to Generic Letter 98-04

ATTACHMENT

Joseph M. Farley Nuclear Plant
SNC Response to NRC Generic Letter 98-04

“Potential For Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-Of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment”

Licenseses were required to submit a written response that includes the information outlined below in items 1, and 2i or 2ii. Each item is addressed below.

- (1) A summary description of the plant-specific program or programs implemented to ensure that Service Level 1 protective coatings used inside the containment are procured, applied, and maintained in compliance with applicable regulatory requirements and the plant-specific licensing basis for the facility. Include a discussion of how the plant-specific program meets the applicable criteria of 10 CFR Part 50, Appendix B, as well as information regarding any applicable standards, plant-specific procedures, or other guidance used for: (a) controlling the procurement of coatings and paints used at the facility, (b) the qualification testing of protective coatings, and (c) surface preparation, application, surveillance, and maintenance activities for protective coatings. Maintenance activities involve reworking degraded coatings, removing degraded coatings to sound coatings, correctly preparing the surfaces, applying new coatings, and verifying the quality of the coatings.**

Response to Item 1:

Controls for the procurement, application, and maintenance of Service Level 1¹ protective coatings used inside the Farley Nuclear Plant (FNP) containments have been implemented in a manner that is consistent with the licensing basis and regulatory requirements applicable to FNP. The requirements of 10 CFR Part 50, Appendix B are implemented through specification of appropriate technical and quality requirements for the Service Level 1 coatings program that includes ongoing maintenance activities.

Regulatory Guide 1.54 (June 1973) and related ANSI Standard N101.4 (November 1972) postdate the FNP construction permit (August 1972). Consequently, the licensing commitments for FNP Units 1 and 2 are not subject to the requirements of this regulatory guide or ANSI standard. However, a process specification was applied to the NSSS equipment that required coatings meet the criteria given in ANSI Proposed Standard N-101.2 (1971). Selection of non-NSSS containment interior coating systems was based on then current references such as B. J. Newby, “Applicability of Conventional Protective Coatings to Reactor Containment Building,” IN-1169, June 1968. Coating materials

¹ FNP’s response applies to Service Level 1 coatings used in containment that are procured, applied and maintained by FNP or their contractor. This response does not address the relatively small amount of coatings applied by vendors on supplied equipment and miscellaneous structural supports.

specified were tested by their manufacturers under simulated operating and accident conditions and shipments of the coating materials were accompanied by vendor certification of compliance. Concrete and masonry surfaces were chemically or blast cleaned then surfaced and/or epoxy top coated over the entire area. Surface preparation of the steel liner plate, structural and miscellaneous carbon steel, uninsulated piping, and equipment was performed in accordance with the Steel Structures Painting Council (SSPC) Specifications SSPC-SF5-63 for inorganic zinc primer and SSPC-SP10 for epoxy primer.

Since initial construction of FNP Units 1 and 2, adequate assurance that the applicable requirements for the procurement, application, inspection, and maintenance of Service Level 1 coatings are implemented is provided by procedures and programmatic controls, approved under the FNP Quality Assurance program. Guidance used for controlling the procurement and qualification testing includes the following programs and processes:

- (a) Service Level 1 coatings used for new applications or repair/replacement activities are procured from vendors with a quality assurance program meeting the applicable requirements of 10 CFR Part 50, Appendix B. The applicable technical and quality requirements that the vendors must meet are specified by FNP in procurement documents. Acceptance activities are conducted in accordance with procedures that are consistent with ANSI N45.2 requirements. This specification of required technical and quality requirements combined with appropriate acceptance activities provides assurance that the coatings meet the requirements of the procurement documents.
- (b) The qualification testing of Service Level 1 coatings used for new applications or repair/replacement activities inside containment meets the intent of the applicable requirements contained in ANSI N101.2-1972. These coatings, including any substitute coatings, have been evaluated to meet the intent of the applicable requirements of ANSI N 101.2-1972 and ANSI N512-1974.
- (c) FNP procedures address the surface preparation for bare surfaces, overlap areas, and areas to be overcoated or recoated in such a manner to assure that the Service Level 1 coating, when properly applied, will be in compliance with the surface preparation parameters used for the coating qualification tests. FNP procedures incorporate requirements for the proper application of Service Level 1 coatings. Those requirements address the environmental conditions under which the coatings can be applied, application techniques, film thickness parameters, and the use of experienced painters. FNP procedures in conjunction with the FNP QA Program address the inspection, testing and documentation of the coatings work. Qualification requirements for inspection and testing personnel are included in the applicable procedures.

FNP periodically conducts condition assessments of Service Level 1 coatings inside containment. As localized areas of degraded coatings are identified, those areas are

evaluated and scheduled for repair or replacement, as necessary. The periodic condition assessments, and the resulting repair/replacement activities, assure that the amount of Service Level 1 coatings that may be susceptible to detachment from the substrate during a LOCA event is minimized.

(2) Information demonstrating compliance with item (i) or (ii):

- (i) For plants with licensing-basis requirements for tracking the amount of unqualified coatings inside the containment and for assessing the impact of potential coating debris on the operation of safety-related SSCs during a postulated DB LOCA, the following information shall be provided to demonstrate compliance:**
- (a) The date and findings of the last assessment of coatings, and the planned date of the next assessment of coatings.**
 - (b) The limit for the amount of unqualified protective coatings allowed in the containment and how this limit is determined. Discuss any conservatism in the method used to determine this limit.**

Response to Items 2(i)(a) and (b):

Items (2)(i)(a) and (b) are not applicable to FNP, since neither unit has a licensing commitment for tracking the amount of unqualified coatings inside the containment and for assessing the impact of potential coating debris on the operation of safety-related SSCs during a postulated design basis LOCA.

- (c) If a commercial-grade dedication program is being used at your facility for dedicating commercial-grade coatings for Service Level 1 applications inside the containment, discuss how the program adequately qualifies such a coating for Service Level 1 service. Identify which standards or other guidance are currently being used to dedicate containment coatings at your facility; or,**

Response to Items 2(i)(c):

Item (2)(i)(c) is not applicable to FNP, since commercial grade dedication for Service Level 1 coatings used inside containment is not currently used.

- (ii) For plants without the above licensing-basis requirements, information shall be provided to demonstrate compliance with the requirements of 10 CFR 50.46b(5), "Long-term cooling" and the functional capability of the safety-related CSS as set forth in your licensing basis. If a licensee can demonstrate this compliance without quantifying the amount of unqualified coatings, this is acceptable.**

The following information shall be provided:

- (a) If commercial-grade coatings are being used at your facility for Service Level 1 applications, and such coatings are not dedicated or controlled under your Appendix B Quality Assurance Program, provide the regulatory and safety basis for not controlling these coatings in accordance with such a program. Additionally, explain why the facility's licensing basis does not require such a program.**

Response to Item 2(ii):

The following description and referenced materials describe the licensing basis for FNP Units 1 and 2 relative to conformance with 10 CFR 50.46b(5), "Long-term cooling," specifically with regard to FNP's ability to provide extended decay heat removal including related assumptions for debris that could block containment emergency sump screens:

- The FNP containment sump performance meets the NRC acceptance criteria contained in General Design Criteria 35, 36, and 37, and the four NRC acceptance criteria listed below.
 - A. Housekeeping requirements specified in the quality assurance program and technical specifications.
 - B. The avoidance of materials likely to form debris small enough to pass through sump screens.
 - C. The lack of an apparent mechanism for generating debris large enough to block more than 50 percent of the screen area.
 - D. The ability to monitor and control residual heat removal system status.
- The available Net Positive Suction Head (NPSH) for all ECCS and CSS pumps has been shown to provide adequate margin at limiting runout conditions.
- At the time FNP Unit 1 was licensed, no distinction was drawn between the various potential sources for post-LOCA debris.
- At the time FNP Unit 2 was licensed, the NRC was conducting a generic program (Task Action Plan for Unresolved Safety Issue A-43 titled "Containment Emergency Sump Reliability") that addressed the emergency core cooling system hydraulic performance during recirculation as affected by potential break locations and debris from insulation or other sources.
- Under the commitments stated above, FNP has assumed that the systems that draw from the sumps for emergency core cooling and containment spray systems may

experience blockage of up to 50% of the effective sump area from debris generated as a result of a loss-of-coolant accident (LOCA). The results of the model testing described in FNP FSAR Appendix 6C demonstrates that the FNP Units 1 and 2 emergency core cooling and containment spray systems will continue to provide sufficient cooling flow as to fulfill the long-term cooling functions required to conform with 10 CFR 50.46(b)(5) with sump blockage in excess of 50%.

- For FNP Unit 1, the NRC accepted the model testing results and these systems as meeting the requirements of 10 CFR 50.46(b)(5) in NUREG-0117, Supplement Number 3 to NUREG-75/034, "Safety Evaluation Report Related to Operation of Joseph M. Farley Nuclear Plant Units 1 and 2."
- For FNP Unit 2, the NRC accepted the model testing results, near term actions, and these systems as meeting the requirements of 10 CFR 50.46(b)(5) in NUREG-0117, Supplement Number 5 to NUREG-75/034, "Safety Evaluation Report Related to Operation of Joseph M. Farley Nuclear Plant Unit 2."
- For FNP Units 1 and 2, the NRC closed the licensing actions for Generic Letter 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps," by letter dated July 9, 1998.

The licensing basis for FNP Units 1 and 2, as accepted by the NRC's SERs referenced above, provides both the regulatory and safety basis for safety system performance. Coatings are not treated separately in the licensing basis for FNP because the sump screen blockage assumption does not distinguish among the source terms for LOCA-generated debris. As the NRC noted in NRC Generic Letter 85-22, "Potential for Loss of Post-LOCA Recirculation Capability due to Insulation Debris Blockage," a change in regulatory guidance for the basis for sump screen blockage would constitute a generic backfit. Moreover, industry analysis for coating failure alone during a LOCA, and industry testing of coating failure conducted to date, does not contradict FNP's determination that emergency core cooling system flows following a LOCA will be adequate to maintain the core temperature at an acceptably low value and to remove decay heat for the extended period of time required by the long-lived radioactivity remaining in the core following a design-basis accident. Accordingly, a separate demonstration of the regulatory and safety basis for safety system performance is not required.

Item 2(ii)(a) is not applicable to FNP Units 1 and 2 since commercial grade dedication for Service Level 1 coatings used inside containment are not currently used.