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SOUTHERN COMPANY
Energy to Serve Your World℠

September 27, 2005

Docket Nos.: 50-348
50-364

NL-05-1381

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

Joseph M. Farley Nuclear Plant - Units 1 and 2
Request to Revise Technical Specifications to
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Ladies and Gentlemen:

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Southern Nuclear Operating Company (SNC) proposes to revise the Technical Specifications (TS) (Appendix A) to Facility Operating License Nos. NPF-2 and NPF-8 for the Farley Nuclear Plant (FNP) Units 1 and 2, respectively.

This amendment request eliminates the Power Range Neutron Flux- High Negative Rate Reactor Trip function, based on the NRC approved methodology contained in Westinghouse Topical Report WCAP-11394-P-A, "Methodology for the Analysis of the Dropped Rod Event." The changes will allow the elimination of a trip circuitry that is not credited in the FNP safety analysis, and which can result in an unnecessary reactor trip. These changes will be implemented sequentially, concurrent with each unit's refueling outage during which the design change is implemented. Additionally, this amendment request deletes TS Bases text associated with an unconservative local DNBR.

The FNP cycle specific reload process ensures and confirms that the dropped Rod Cluster Control Assembly (RCCA) analysis is performed in accordance with methodology contained in WCAP-11394-P-A, consistent with the NRC's Safety Evaluation Report for Topical Report WCAP-11394-P.

Enclosure 1 provides a description and justification for the proposed change. Enclosure 2 provides a 10 CFR 50.92 Significant Hazards Evaluation and Environmental Assessment. Enclosure 3 includes the marked-up TS pages and Bases pages for the proposed change. Enclosure 4 includes the associated TS pages and Bases pages with the proposed change incorporated. The Bases pages will be implemented under the plant Bases Control Program contingent upon NRC approval of this amendment request.

SNC requests approval of the proposed license amendment by October 7, 2006, with the amendments being implemented prior to the end of refueling outages U2RF18 and U1RF21 for Unit 2 and Unit 1 respectively.

A copy of the proposed changes has been sent to Dr. D. E. Williamson, the Alabama State Designee, in accordance with 10 CFR 50.91(b)(1).

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 27 *day of* September *2005.*

Notary Public

My commission expires: NOTARY PUBLIC STATE OF ALABAMA AT LARGE
MY COMMISSION EXPIRES: June 10, 2008
BONDED THRU NOTARY PUBLIC UNDERWRITERS

LMS/WAS/sdl

Enclosures:
1: Description of and Justification for Proposed Changes
2: 10 CFR 50.92 Significant Hazards Evaluation and Environmental Assessment
3: Marked-up Technical Specification Pages and Bases Pages
4: Clean Typed Technical Specification Pages and Bases Pages

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. J. R. Johnson, General Manager – Plant Farley
RTYPE: CFA04.054; LC# 14111

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

State of Alabama
Dr. D. E. Williamson, State Health Officer – Alabama Department of Public Health

Enclosure 1

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

<u>Description of and Justification for Proposed Changes</u>

Enclosure 1

Joseph M. Farley Nuclear Plant
Request to Revise Technical Specifications to
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Description of and Justification for Proposed Changes

Description of Proposed Changes

The proposed changes to the Technical Specifications (TS) for each unit are as follows. These changes will be implemented sequentially, concurrent with each unit's refueling outage during which the design change is implemented.

> Function 3.b, Power Range Neutron Flux- High Negative Rate, the Applicable Modes or Other Specified Conditions, the Required Channels, Conditions, Surveillance Requirements, Allowable Value, and Trip Setpoint in TS 3.3.1, "RTS Instrumentation," are being deleted. Additionally, this change deletes TS Bases text associated with an unconservative local DNBR.

Justification for Proposed Changes

In general, the proposed changes to the TS involve the deletion of Function 3.b, Power Range Neutron Flux- High Negative Rate in TS 3.3.1, "RTS Instrumentation" and the deletion of TS Bases text associated with an unconservative local DNBR. These changes proposed for the Farley TS are based on the NRC approved methodology contained in Westinghouse Topical Report WCAP-11394-P-A, "Methodology for the Analysis of the Dropped Rod Event." The basis for the proposed TS changes is discussed below.

Background

The dropped Rod Cluster Control Assembly (RCCA) methodology contained in Westinghouse Topical Report WCAP-10297-P-A, "Dropped Rod Methodology for Negative Flux Rate Trip Plants," consisted of two sets of analytical cases; 1) those dropped rod cases that would result in a reactor trip which required no further analysis to confirm that the design departure from nucleate boiling ratio (DNBR) limit is met, (since the reactor was shutdown), and 2) those dropped rod cases that would not result in a reactor trip and thus required a confirmation that the DNBR design basis was met. The Power Range Neutron Flux- High Negative Rate Reactor Trip function was credited in the methodology contained in WCAP-10297-P-A to terminate a dropped RCCA event when the reactivity worth of the dropped RCCA(s) exceeded the minimum worth detectable by the power range neutron detectors. If the reactivity worth of the dropped RCCA(s) was lower than the minimum worth detectable by the power range neutron detectors, no credit for Power Range Neutron Flux- High Negative Rate Reactor Trip function was taken in the analysis. No other safety analyses credit this reactor trip function.

WCAP-11394-P-A concluded that sufficient DNBR margin existed for Westinghouse plant designs and fuel types without crediting the Power Range Neutron Flux- High Negative Rate Reactor Trip function, regardless of the reactivity worth of the dropped RCCA or RCCA bank, when confirmed on a plant and cycle-specific basis. The NRC Safety Evaluation Report for WCAP-11394-P concluded that the analysis contained an acceptable analysis procedure for analyzing the dropped RCCA event for which no credit is taken for any direct reactor trip due to

the dropped RCCA(s) or for an automatic power reduction due to the dropped RCCA(s). The analysis of the Farley Nuclear Plant (FNP) dropped RCCA event is performed in accordance with the methodology contained in WCAP-11394-P-A. Therefore, the Power Range Neutron Flux-High Negative Rate Reactor Trip function is not required to ensure that the design DNBR limits are met, and can be eliminated.

Evaluation

The original design basis for the Power Range Neutron Flux- High Negative Rate Reactor Trip function was to mitigate the consequences of one or more dropped RCCAs. In the event of one or more dropped RCCAs, the Reactor Trip System (RTS) would detect the rapidly decreasing neutron flux (i.e., high negative flux rate) due to the dropped RCCA(s) and would trip the reactor, thus terminating the transient and ensuring that the design DNBR limits were met. On January 20, 1982, Westinghouse Topical Report WCAP-10297-P, "Dropped Rod Methodology for Negative Flux Rate Trip Plants," was submitted to the NRC for review and approval. WCAP-10297-P contained a new methodology for the analysis of a dropped RCCA(s) event. WCAP-10297-P concluded that the Power Range Neutron Flux- High Negative Rate Reactor Trip function was only required when the reactivity worth of the dropped RCCA(s) exceeded a certain value. The reactivity worth value was dependent upon the plant design and fuel type. The NRC approved the methodology in WCAP-10297-P in March 1983.

The Westinghouse Owners Group (WOG) subsequently submitted Westinghouse Topical Report, WCAP-11394-P, "Methodology for the Analysis of the Dropped Rod Event," to the NRC on May 22, 1987 for review and approval. The methodology contained in WCAP-11394-P is an extension of the NRC approved methodology contained in WCAP-10297-P-A. The conclusion reached in WCAP-11394-P was that sufficient DNBR margin is maintained with all Westinghouse plant designs and fuel types, such that the Power Range Neutron Flux- High Negative Rate Reactor Trip function is not required regardless of the reactivity worth of the dropped RCCA(s). The use of this approach is required to be demonstrated using plant and cycle-specific analysis. The NRC SER for WCAP-11394-P stated, "A further review by the staff (for each cycle) is not necessary, given the utility assertion that the analysis described by Westinghouse has been performed and the required comparisons have been made with favorable results."

The proposed changes to the FNP TS are based on the NRC approved methodology presented in WCAP-11394-P-A. This methodology assumes no direct reactor trip or automatic power reduction to mitigate the consequences of the dropped RCCA(s). Due to the plant specific nature of the core physics characteristics and the thermal-hydraulic dropped rod limit lines, plant-specific data are combined with the appropriate correlation and set of statepoints to verify that the DNBR design basis is met for the dropped RCCA(s) event for every fuel cycle design. Therefore, there is no adverse impact that increases the risk to the health and safety of the public as a result of the proposed changes to the FNP TS.

The dropped RCCA(s) analyses do not rely on actuation of the Power Range Neutron Flux- High Negative Rate Reactor Trip function to mitigate the consequences of the event. These analyses

were performed in accordance with the NRC approved methodology for the analysis of dropped RCCA(s) events contained in WCAP 11394-P-A. The analysis statepoints consider dropped RCCA worths up to 1,000 percent mille rho (pcm). The key reload-related analysis assumptions and confirmation that the DNBR design basis is met are confirmed as part of the reload safety analysis for each reactor core reload. Therefore, the conclusion presented in the UFSAR Section 15.2.3.3 that the DNBR design basis is met for a dropped RCCA(s) event remains valid for the proposed TS changes, which are based on the NRC approved methodology contained in WCAP-11394-P-A.

The FNP cycle specific reload process ensures and confirms that the dropped RCCA analysis is performed in accordance with methodology contained in WCAP-11394-P-A, consistent with the NRC's Safety Evaluation Report for Topical Report WCAP-11394-P. The Power Range Neutron Flux- High Negative Rate Reactor Trip function is not credited in the FNP cycle-specific dropped RCCA analysis, and the analysis and limits are in accordance with WCAP-11394-P-A. The FNP Reload Evaluations for operating cycles reflect this analysis and acceptance criteria.

No other safety analyses are impacted by this change, since no other safety analyses credit the Power Range Neutron Flux- High Negative Rate Reactor Trip function.

The proposed TS change to Delete Reactor Trip System, Function 3.b, Power Range Neutron Flux- High Negative Rate function is not affected by the requirements of 10 CFR 50.36(c)(2)(ii)(A)-(D), Criterion 1 through 4, which require a technical specification to be established for each item meeting one or more of the criteria of Criterion 1 through 4. This function does not meet any of the four criteria as outlined in the response for each criterion given below.

Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

SNC discussion regarding Criterion 1:

The Power Range Neutron Flux- High Negative Rate Trip is not used for detection and indication in the control room of any degradation of the reactor coolant pressure boundary.

Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

SNC discussion regarding Criterion 2:

The Power Range Neutron Flux- High Negative Rate Trip is not an initial condition of a design basis accident or transient analysis.

Description of and Justification for Proposed Changes

Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

SNC discussion regarding Criterion 3:

No credit is taken for the Power Range Neutron Flux- High Negative Rate Trip in the FNP accident analysis. The Power Range Neutron Flux- High Negative Rate Trip is not considered as part of the primary success path related to the integrity of a fission product barrier.

Criterion 4: A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

SNC discussion regarding Criterion 4:

The Power Range Neutron Flux- High Negative Rate is not relied upon as a signal to initiate a reactor trip for any events modeled in the scope of the PRA model.
The Power Range Neutron Flux- High Negative Rate Trip function is not significant to public health and safety in that no credit was taken for this trip in any accident analysis.

Additionally, text in the TS Bases for LCO 3.3.1, page B 3.3.1-11, associated with an unconservative local DNBR is being deleted. WCAP-11394-P-A indicates that the analysis for a dropped rod event envelops a multiple rod drop accident at high power levels, and that such an accident will not result in an unconservative local DNBR. The WCAP information supersedes the TS Bases information that is being deleted. Farley Units 1 and 2 Dropped Rod Analysis has been performed in accordance with the Dropped Rod Analysis methodology contained in WCAP-11394-P-A.

Enclosure 2

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

<u>10 CFR 50.92 Significant Hazards Evaluation and Environmental Assessment</u>

Enclosure 2

Joseph M. Farley Nuclear Plant
Request to Revise Technical Specifications to
Delete Reactor Trip System, Function 3. b.,
Power Range Neutron Flux- High Negative Rate

10 CFR 50.92 Significant Hazards Evaluation and Environmental Assessment

Proposed Changes

Southern Nuclear Operating Company (SNC) proposes to revise the Joseph M. Farley Nuclear Plant Unit 1 and Unit 2 Technical Specifications (TS). The proposed changes to the TS involve the deletion of Function 3.b, Power Range Neutron Flux- High Negative Rate in TS 3.3.1, "RTS Instrumentation." The changes proposed to the Farley TS are based on the NRC approved methodology contained in Westinghouse Topical Report WCAP-11394-P-A, "Methodology for the Analysis of the Dropped Rod Event." The following is a description of the proposed changes. These changes will be implemented sequentially, concurrent with each unit's refueling outage during which the design change is implemented.

Function 3.b, Power Range Neutron Flux- High Negative Rate, the Applicable Modes or Other Specified Conditions, the Required Channels, Conditions, Surveillance Requirements, Allowable Value, and Trip Setpoint in TS 3.3.1, "RTS Instrumentation," are being deleted.

and

Text in the TS Bases for LCO 3.3.1, page B 3.3.1-11, associated with an unconservative local DNBR is being deleted.

Evaluation

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

   No. The proposed changes do not significantly increase the probability or consequences of an accident previously evaluated in the Updated Final Safety Analysis Report (UFSAR). All of the safety analyses have been evaluated for impact due to this change. The elimination of the Power Range Neutron Flux- High Negative Rate Reactor Trip function and the elimination of text in the TS Bases for LCO 3.3.1, page B 3.3.1-11, associated with an unconservative local DNBR, does not affect the dropped RCCA analyses nor any other analyses, since it is not credited in any of the safety analyses; therefore, the probability of an accident has not been increased. All dose consequences have been evaluated with respect to the proposed changes, there is no impact due to the proposed change, and all acceptance criteria continue to be met. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any previously evaluated?

   No. The proposed changes do not create the possibility of a new or different kind of accident from any accident already evaluated in the UFSAR. No new accident scenarios, failure mechanisms or limiting single failures are introduced as result of the proposed changes. The changes have no adverse effects on any safety-related system. Therefore, all accident

analyses criteria continue to be met and these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

   No. The proposed changes do not involve a significant reduction in a margin of safety. The dropped RCCA(s) event does not credit the Power Range Neutron Flux- High Negative Rate Reactor Trip function. The conclusion presented in the UFSAR Section 15.2.3.3 that the DNBR design basis is met for a dropped RCCA(s) event remains valid for the proposed changes, which are based on the NRC approved methodology contained in WCAP-11394-P-A. Additionally, WCAP-11394-P-A indicates that the analysis for a dropped rod event envelops a multiple rod drop accident at high power levels, and that such an accident will not result in an unconservative local DNBR. All applicable acceptance criteria continue to be met. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Conclusion

Based on the preceding evaluation, Southern Nuclear has determined that the proposed change meets the requirements of 10 CFR 50.92(c) and does not involve a significant hazards consideration.

Environmental Evaluation

Southern Nuclear has reviewed the proposed change pursuant to 10 CFR 50.92 and determined that it does not involve a significant hazards consideration. In addition, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite and there is no significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

Enclosure 3

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Marked-Up Technical Specification Pages and Bases Pages

List of Affected Pages

3.3.1-14
B 3.3.1-10
B 3.3.1-11
B.3.3.1-12
B 3.3.1-38

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Unit 2 - Cycle 18

Changed Pages List

The pages provided in this section will be issued prior to Unit 2 entering Mode 5 for Cycle 19 (Spring 2007).

3.3.1-14
B 3.3.1-11
B.3.3.1-12

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.12	NA	NA
	3 (a), 4 (a), 5 (a)	2	C	SR 3.3.1.12	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.14	≤ 109.4% RTP	≤ 109% RTP
b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10 SR 3.3.1.14	≤ 25.4% RTP	≤ 25% RTP
3. Power Range Neutron Flux Rate						
a. High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
b. High Negative Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP
	2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP

[Unit 1 only]

(a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Power Range Neutron Flux—High Positive Rate (continued)

Power Range Neutron Flux — High and Low Setpoint trip Functions to ensure that the criteria are met for a rod ejection event.

The LCO requires all four of the Power Range Neutron Flux — High Positive Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

In MODE 1 or 2, when there is a potential to add a large amount of positive reactivity from a rod ejection accident (REA), the Power Range Neutron Flux — High Positive Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — High Positive Rate trip Function does not have to be OPERABLE because other RTS trip Functions and administrative controls will provide protection against positive reactivity additions. Also, since only the shutdown banks may be withdrawn in MODE 3, 4, or 5, the remaining complement of control bank worth ensures a sufficient degree of SDM in the event of an REA. In MODE 6, no rods are withdrawn and the SDM is increased during refueling operations. The reactor vessel head is also removed or the closure bolts are detensioned preventing any pressure buildup.

[Unit 1 only]

b. Power Range Neutron Flux—High Negative Rate

The Power Range Neutron Flux — High Negative Rate trip Function ensures that protection is provided for multiple rod drop accidents. At high power levels, a multiple rod drop accident could cause local flux peaking that would result in an unconservative local DNBR. DNBR is defined as the ratio of the heat flux required to cause a DNB at a particular location in the core to the local heat flux. The DNBR is indicative of the margin to DNB.

The LCO requires all four Power Range Neutron Flux — High Negative Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

[Unit 1 only]

b. Power Range Neutron Flux—High Negative Rate (continued)

In MODE 1 or 2, when there is potential for a multiple rod drop accident to occur, the Power Range Neutron Flux — High Negative Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — High Negative Rate trip Function does not have to be OPERABLE because the core is not critical and DNB is not a concern.

4. Intermediate Range Neutron Flux

The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides diverse protection to the Power Range Neutron Flux — Low Setpoint trip Function. The NIS intermediate range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS intermediate range channels also provide a control interlock signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor. No credit is taken in the safety analyses for this trip function.

The LCO requires two channels of Intermediate Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. The trip function is accomplished by a 1-out-of-2 trip Logic.

Because this trip Function is important only during startup, there is generally no need to disable channels for on-line testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux — High Setpoint trip and the Power Range Neutron Flux — High Positive Rate trip provide core protection for a rod

(continued)

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Unit 1 - Cycle 21

Changed Pages List

The pages provided in this section will be issued prior to Unit 1 entering Mode 5 for Cycle 22 (Fall 2007).

3.3.1-14
B 3.3.1-10
B 3.3.1-11
B.3.3.1-12
B 3.3.1-38

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.12	NA	NA
	3 (a), 4 (a), 5 (a)	2	C	SR 3.3.1.12	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.14	≤ 109.4% RTP	≤ 109% RTP
b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10 SR 3.3.1.14	≤ 25.4% RTP	≤ 25% RTP
3. Power Range Neutron Flux Rate						
a. High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
b. [Unit 1 only] High Negative Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP
	2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP

(a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Power Range Neutron Flux—Low

The LCO requirement for the Power Range Neutron Flux—Low trip Function ensures that protection is provided against a positive reactivity excursion from low power or subcritical conditions.

The LCO requires all four of the Power Range Neutron Flux—Low channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

In MODE 1, below the Power Range Neutron Flux (P-10 setpoint), and in MODE 2, the Power Range Neutron Flux—Low trip must be OPERABLE. This Function may be manually blocked by the operator when two out of four power range channels are greater than approximately 10% RTP (P-10 setpoint). This Function is automatically unblocked when three out of four power range channels are below the P-10 setpoint. Above the P-10 setpoint, positive reactivity additions are mitigated by the Power Range Neutron Flux—High trip Function.

- High Positive

In MODE 3, 4, 5, or 6, the Power Range Neutron Flux—Low trip Function does not have to be OPERABLE because the reactor is shut down. Other RTS trip Functions and administrative controls provide protection against positive reactivity additions or power excursions in MODE 3, 4, 5, or 6.

3. Power Range Neutron Flux Rate

s

The Power Range Neutron Flux Rate trips use the same NIS detectors as discussed for Function 2 above.

a. Power Range Neutron Flux—High Positive Rate

The Power Range Neutron Flux—High Positive Rate trip Function ensures that protection is provided against rapid increases in neutron flux that are characteristic of an RCCA drive rod housing rupture and the accompanying ejection of the RCCA. In certain cases, this Function compliments the

(continued)

3.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Power Range Neutron Flux—High Positive Rate (continued)

Power Range Neutron Flux — High and Low Setpoint trip Functions to ensure that the criteria are met for a rod ejection event.

The LCO requires all four of the Power Range Neutron Flux — High Positive Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

In MODE 1 or 2, when there is a potential to add a large amount of positive reactivity from a rod ejection accident (REA), the Power Range Neutron Flux — High Positive Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — High Positive Rate trip Function does not have to be OPERABLE because other RTS trip Functions and administrative controls will provide protection against positive reactivity additions. Also, since only the shutdown banks may be withdrawn in MODE 3, 4, or 5, the remaining complement of control bank worth ensures a sufficient degree of SDM in the event of an REA. In MODE 6, no rods are withdrawn and the SDM is increased during refueling operations. The reactor vessel head is also removed or the closure bolts are detensioned preventing any pressure buildup.

b. [Unit 1 only] Power Range Neutron Flux—High Negative Rate

The Power Range Neutron Flux — High Negative Rate trip Function ensures that protection is provided for multiple rod drop accidents.

The LCO requires all four Power Range Neutron Flux — High Negative Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

b. [Unit 1 only] Power Range Neutron Flux—High Negative Rate (continued)

In MODE 1 or 2, when there is potential for a multiple rod drop accident to occur, the Power Range Neutron Flux—High Negative Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux—High Negative Rate trip Function does not have to be OPERABLE because the core is not critical and DNB is not a concern.

4. Intermediate Range Neutron Flux

The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides diverse protection to the Power Range Neutron Flux — Low Setpoint trip Function. The NIS intermediate range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS intermediate range channels also provide a control interlock signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor. No credit is taken in the safety analyses for this trip function.

The LCO requires two channels of Intermediate Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. The trip function is accomplished by a 1-out-of-2 trip Logic.

Because this trip Function is important only during startup, there is generally no need to disable channels for on-line testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux — High Setpoint trip and the Power Range Neutron Flux — High Positive Rate trip provide core protection for a rod

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

within the allowed 48 hour Completion Time, the unit must be placed in a MODE in which the requirement does not apply. To achieve this status, the RTBs must be opened within the next hour. The additional hour provides sufficient time to accomplish the action in an orderly manner. With the RTBs open, these Functions are no longer required.

The Completion Time is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

D.1.1, D.1.2, D.2.1, D.2.2, and D.3

Condition D applies to the Power Range Neutron Flux — High and Power Range Neutron Flux Rate Functions.

- High Positive

The NI44 power range detector provides input to the CRD System therefore, the NIS has a two-out-of-four trip logic. A known inoperable channel must be placed in the tripped condition. This results in a partial trip condition requiring only one-out-of-three logic for actuation. The 6 hours allowed to place the inoperable channel in the tripped condition is justified in WCAP-10271-P-A (Ref. 7).

In addition to placing the inoperable channel in the tripped condition, THERMAL POWER must be reduced to ≤ 75% RTP within 12 hours. Reducing the power level prevents operation of the core with radial power distributions beyond the design limits. With one of the NIS power range detectors inoperable, 1/4 of the radial power distribution monitoring capability is lost.

As an alternative to the above actions, the inoperable channel can be placed in the tripped condition within 6 hours and the QPTR monitored once every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued unit operation at power levels ≥ 75% RTP. The 6 hour Completion Time and the 12 hour Frequency are consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)."

(continued)

Enclosure 4

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Clean Typed Technical Specification Pages and Bases Pages

List of Affected Pages

3.3.1-14
B 3.3.1-10
B 3.3.1-11
B.3.3.1-12
B 3.3.1-38

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Unit 2 - Cycle 18

Changed Pages List

The pages provided in this section will be issued prior to Unit 2 entering Mode 5 for Cycle 19 (Spring 2007).

3.3.1-14
B 3.3.1-11
B.3.3.1-12

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1.	Manual Reactor Trip	1,2	2	B	SR 3.3.1.12	NA	NA
		3 (a) , 4 (a) , 5 (a)	2	C	SR 3.3.1.12	NA	NA
2.	Power Range Neutron Flux						
	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.14	≤ 109.4% RTP	≤ 109% RTP
	b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10 SR 3.3.1.14	≤ 25.4% RTP	≤ 25% RTP
3.	Power Range Neutron Flux Rate						
	a. High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
	b. [Unit 1 only] High Negative Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
4.	Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP
		2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP

(a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Power Range Neutron Flux—High Positive Rate (continued)

Power Range Neutron Flux — High and Low Setpoint trip Functions to ensure that the criteria are met for a rod ejection event.

The LCO requires all four of the Power Range Neutron Flux — High Positive Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

In MODE 1 or 2, when there is a potential to add a large amount of positive reactivity from a rod ejection accident (REA), the Power Range Neutron Flux — High Positive Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — High Positive Rate trip Function does not have to be OPERABLE because other RTS trip Functions and administrative controls will provide protection against positive reactivity additions. Also, since only the shutdown banks may be withdrawn in MODE 3, 4, or 5, the remaining complement of control bank worth ensures a sufficient degree of SDM in the event of an REA. In MODE 6, no rods are withdrawn and the SDM is increased during refueling operations. The reactor vessel head is also removed or the closure bolts are detensioned preventing any pressure buildup.

b. [Unit 1 only] Power Range Neutron Flux—High Negative Rate

The Power Range Neutron Flux — High Negative Rate trip Function ensures that protection is provided for multiple rod drop accidents.

The LCO requires all four Power Range Neutron Flux — High Negative Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

b. [Unit 1 only] Power Range Neutron Flux—High Negative Rate (continued)

In MODE 1 or 2, when there is potential for a multiple rod drop accident to occur, the Power Range Neutron Flux — High Negative Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — High Negative Rate trip Function does not have to be OPERABLE because the core is not critical and DNB is not a concern.

4. Intermediate Range Neutron Flux

The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides diverse protection to the Power Range Neutron Flux — Low Setpoint trip Function. The NIS intermediate range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS intermediate range channels also provide a control interlock signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor. No credit is taken in the safety analyses for this trip function.

The LCO requires two channels of Intermediate Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. The trip function is accomplished by a 1-out-of-2 trip Logic.

Because this trip Function is important only during startup, there is generally no need to disable channels for on-line testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux — High Setpoint trip and the Power Range Neutron Flux — High Positive Rate trip provide core protection for a rod

(continued)

Joseph M. Farley Nuclear Plant, Units 1 and 2
Request for Technical Specifications Change
Delete Reactor Trip System, Function 3.b,
Power Range Neutron Flux- High Negative Rate

Unit 1 - Cycle 21

Changed Pages List

The pages provided in this section will be issued prior to Unit 1 entering Mode 5 for Cycle 22 (Fall 2007).

3.3.1-14
B 3.3.1-10
B 3.3.1-11
B.3.3.1-12
B 3.3.1-38

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.12	NA	NA
	3 (a), 4 (a), 5 (a)	2	C	SR 3.3.1.12	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.14	≤ 109.4% RTP	≤ 109% RTP
b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10 SR 3.3.1.14	≤ 25.4% RTP	≤ 25% RTP
3. Power Range Neutron Flux High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP
	2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP

(a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Power Range Neutron Flux—Low

The LCO requirement for the Power Range Neutron Flux — Low trip Function ensures that protection is provided against a positive reactivity excursion from low power or subcritical conditions.

The LCO requires all four of the Power Range Neutron Flux — Low channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

In MODE 1, below the Power Range Neutron Flux (P-10 setpoint), and in MODE 2, the Power Range Neutron Flux — Low trip must be OPERABLE. This Function may be manually blocked by the operator when two out of four power range channels are greater than approximately 10% RTP (P-10 setpoint). This Function is automatically unblocked when three out of four power range channels are below the P-10 setpoint. Above the P-10 setpoint, positive reactivity additions are mitigated by the Power Range Neutron Flux — High trip Function.

In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — Low trip Function does not have to be OPERABLE because the reactor is shut down. Other RTS trip Functions and administrative controls provide protection against positive reactivity additions or power excursions in MODE 3, 4, 5, or 6.

3. Power Range Neutron Flux - High Positive Rate

The Power Range Neutron Flux - High Positive Rate trip uses the same NIS detectors as discussed for Function 2 above.

The Power Range Neutron Flux — High Positive Rate trip Function ensures that protection is provided against rapid increases in neutron flux that are characteristic of an RCCA drive rod housing rupture and the accompanying ejection of the RCCA. In certain cases, this Function compliments the Power Range Neutron

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3. Power Range Neutron Flux—High Positive Rate (continued)

Flux — High and Low Setpoint trip Functions to ensure that the criteria are met for a rod ejection event.

The LCO requires all four of the Power Range Neutron Flux — High Positive Rate channels to be OPERABLE. The channels are combined in a 2-out-of-4 trip Logic.

In MODE 1 or 2, when there is a potential to add a large amount of positive reactivity from a rod ejection accident (REA), the Power Range Neutron Flux — High Positive Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux — High Positive Rate trip Function does not have to be OPERABLE because other RTS trip Functions and administrative controls will provide protection against positive reactivity additions. Also, since only the shutdown banks may be withdrawn in MODE 3, 4, or 5, the remaining complement of control bank worth ensures a sufficient degree of SDM in the event of an REA. In MODE 6, no rods are withdrawn and the SDM is increased during refueling operations. The reactor vessel head is also removed or the closure bolts are detensioned preventing any pressure buildup.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4. Intermediate Range Neutron Flux

The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides diverse protection to the Power Range Neutron Flux — Low Setpoint trip Function. The NIS intermediate range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS intermediate range channels also provide a control interlock signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor. No credit is taken in the safety analyses for this trip function.

The LCO requires two channels of Intermediate Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. The trip function is accomplished by a 1-out-of-2 trip Logic.

Because this trip Function is important only during startup, there is generally no need to disable channels for on-line testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux — High Setpoint trip and the Power Range Neutron Flux — High Positive Rate trip provide core protection for a rod

(continued)

ACTIONS

C.1 and C.2 (continued)

within the allowed 48 hour Completion Time, the unit must be placed in a MODE in which the requirement does not apply. To achieve this status, the RTBs must be opened within the next hour. The additional hour provides sufficient time to accomplish the action in an orderly manner. With the RTBs open, these Functions are no longer required.

The Completion Time is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

D.1.1, D.1.2, D.2.1, D.2.2, and D.3

Condition D applies to the Power Range Neutron Flux — High and Power Range Neutron Flux - High Positive Rate Functions.

The NI44 power range detector provides input to the CRD System therefore, the NIS has a two-out-of-four trip logic. A known inoperable channel must be placed in the tripped condition. This results in a partial trip condition requiring only one-out-of-three logic for actuation. The 6 hours allowed to place the inoperable channel in the tripped condition is justified in WCAP-10271-P-A (Ref. 7).

In addition to placing the inoperable channel in the tripped condition, THERMAL POWER must be reduced to ≤ 75% RTP within 12 hours. Reducing the power level prevents operation of the core with radial power distributions beyond the design limits. With one of the NIS power range detectors inoperable, 1/4 of the radial power distribution monitoring capability is lost.

As an alternative to the above actions, the inoperable channel can be placed in the tripped condition within 6 hours and the QPTR monitored once every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued unit operation at power levels ≥ 75% RTP. The 6 hour Completion Time and the 12 hour Frequency are consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)."

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