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SOUTHERN COMPANY
Energy to Serve Your World℠

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

Joseph M. Farley Nuclear Plant
Technical Specifications Change Request
Elimination of Periodic Protection Channel Response Time Tests

Ladies and Gentlemen:

In accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) proposes to amend the Farley Nuclear Plant (FNP) Unit 1 and Unit 2 Technical Specifications. The amendment will eliminate performance of periodic response time testing of selected Reactor Trip System (RTS) and Engineered Safety Feature Actuation System (ESFAS) equipment as defined in the NRC-approved version of WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests." In lieu of measurement, the amendment will allow verification of component response times provided the specific protection system equipment and the verification methodology have been previously reviewed and approved by the NRC. These requirements are reflected in the modifications to the Technical Specifications Definitions for "ESF Response Time" and "RTS Response Time" in Section 1.1 and the Bases for RTS and ESFAS response time testing Surveillance Requirements 3.3.1.14 and 3.3.2.9.

The FNP-specific safety analysis is provided in Attachment I. As defined by 10 CFR 50.92, SNC determined that the proposed change does not involve a significant hazards consideration; the supporting significant hazards evaluation is provided in Attachment II. The proposed Technical Specifications Definitions and Bases changes are provided in Attachment III. In accordance with 10 CFR 50.91(b)(1), a copy of the proposed change has been sent to Dr. D. E. Williamson, the Alabama State Designee. SNC has determined the proposed change will not significantly affect the quality of the human environment.

SNC requests that this change be approved by February 25, 2001 so that selected RTS and ESFAS response time testing surveillance activities can be eliminated from the Unit 2 fourteen refueling outage work schedule.

A001

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

If you have any questions, please advise.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

D N Morey

Dave Morey

Sworn to and subscribed before me this 17th *day of* August *2000*

Martha Dayle Dow

Notary Public

My Commission Expires: November 1, 2001

MGE/maf: rttsr01.doc
Attachments:

I. Safety Assessment & Technical Basis
II. 10 CFR 50.92 Significant Hazards Evaluation
III. Technical Specifications Mark-up & Typed Pages

cc: Southern Nuclear Operating Company
Mr. L. M. Stinson, General Manager - Farley

U. S. Nuclear Regulatory Commission, Washington, D. C.
Mr. L. M. Padovan, Licensing Project Manager - Farley

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

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

ATTACHMENT I

SAFETY ASSESSMENT & TECHNICAL BASIS

JOSEPH M. FARLEY NUCLEAR PLANT

TECHNICAL SPECIFICATIONS CHANGE REQUEST

ELIMINATION OF PERIODIC PROTECTION CHANNEL RESPONSE TIME TESTS

SAFETY ASSESSMENT & TECHNICAL BASIS

JOSEPH M. FARLEY NUCLEAR PLANT
TECHNICAL SPECIFICATIONS CHANGE REQUEST
ELIMINATION OF PERIODIC PROTECTION CHANNEL RESPONSE TIME TESTS

HISTORY/BACKGROUND

Between 1993 and 1998, the Westinghouse Owners Group (WOG) completed two programs that justified relaxing the Technical Specifications surveillance requirements to perform periodic response time testing (RTT) of the Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS). WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the technical basis for not testing certain pressure and differential pressure transmitters and switches. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," provides the technical basis for not testing selected components in the protection system process channels and actuation logic. The methodology for verifying RTS and ESFAS response time criteria using a combination of test data and bounding sensor and/or component response time allocations is also provided in these reports. In Safety Evaluations dated September 5, 1995 and October 6, 1998, the NRC Staff provided generic approval to reference these reports in licensing submittals.

Farley Nuclear Plant (FNP) changed the requirements for periodic pressure sensor RTT when Unit 1 Amendment No. 116 and Unit 2 Amendment No. 108 were implemented in October 1995. Vogtle Electric Generating Plant (VEGP) changed the requirements for periodic RTT of certain pressure sensors and selected process channel and actuation logic components RTT when Unit 1 Amendment No. 106 and Unit 2 Amendment No. 84 were implemented in February 1999.

PROPOSED CHANGE

Southern Nuclear Operating Company (SNC) proposes to eliminate performance of periodic response time testing of certain FNP RTS and ESFAS rack equipment. This change will reduce refueling outage work load and, therefore, result in improved utilization of maintenance resources.

Presently, the FNP Technical Specifications (TS) require periodic verification of RTS and ESFAS response times. The TS allows for the verification of certain sensor response times using bounding allocations or measured times. However, the verification requires measurement of the protection system process channel and actuation logic equipment and the final actuation devices (e.g., reactor trip breaker, motor-operated valve, emergency core cooling water pump, etc.). The proposed change would eliminate the requirement to actually measure the response times of selected protection system process channel and actuation logic equipment. Instead, these response times would be verified by summing allocated times for selected protection system rack components as defined in WCAP-14036-P-A Revision 1. These allocated values will be added to the allocated sensor times and the measured times for the actuated devices and compared to the RTT acceptance criteria provided in Chapter 7 of the Final Safety Analysis Report (FSAR).

Consistent with VEGP Amendment Nos. 106 and 84, the FNP TS Definitions for "ESF Response Time" and "RTS Response Time" in Section 1.1 are modified by adding the following statement.

> In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

Also, the Bases for RTS and ESFAS response time testing Surveillance Requirements (SR) 3.3.1.14 and 3.3.2.9 will be modified to indicate that the response time for the protection system process channels and trip logic is determined based on the NRC-approved verification methods. WCAP-13632-P-A Revision 2 and WCAP-14036-P-A Revision 1 will be added to the Bases References. Additional Bases changes are necessary to correct the description of the relationship between the safety analyses modeling assumptions and response time testing acceptance criteria.

The TS requirements for response time verification will continue to be implemented by SR 3.3.1.14 and SR 3.3.2.9. Mark-ups for the proposed TS and Bases changes are included in Attachment III of this TS amendment request.

DETAILED TECHNICAL BASIS

ELIMINATION OF PERIODIC PROTECTION CHANNEL RESPONSE TIME TESTS

In 1975 RTT requirements were included in the Westinghouse Standard Technical Specifications and were required for all plants licensed after that date. The first RTT guidelines were established by the Institute of Electrical and Electronic Engineers in ANSI/IEEE Standard 338-1975, "Criteria for the Periodic Testing of Class 1E Power and Protection Systems." In 1977 this Standard was revised and accepted by the NRC with NRC Regulatory Guide 1.118, "Periodic Testing of Electric Power and Protection Systems," Revision 1. Following Revision 2 of the Regulatory Guide 1.118, the Instrument Society of America approved Standard ISA S67.06, "Response Time Testing of Nuclear Safety-Related Instrument Channels in Nuclear Power Plants," August 29, 1986.

The purpose of response time testing is to verify the safety analysis assumptions regarding the response time of the protection system instrumentation. The TS response time for RTS and ESF functions is defined as the time interval from the point when a monitored parameter exceeds the trip setpoint at the sensor until stationary gripper voltage is lost (RTS) or the safeguards function is capable of being performed (ESFAS). In order to verify compliance with the safety analysis response time allowance, all components that contribute to response time delays from the sensor to the actuated device must be included in the response time verification. RTT acceptance criteria for applicable RTS and ESFAS functions are provided in FSAR Chapters 7.2 and 7.3.

The TS Bases state that the response time may be measured by any series of sequential, overlapping, or total steps such that the entire response time is measured. This approach is also consistent with ISA Standard 67.06. Given this guidance and the complexity of testing an entire instrument channel and logic train from the sensor to the final device, FNP surveillance procedures typically test each protection system function in three or more separate tests.

IEEE Standard 338-1977 defines a basis for eliminating RTT. Section 6.3.4 states in part: "Response time testing of all safety-related equipment, per se, is not required if, in lieu of response time testing, the response time of the safety system equipment is verified by functional testing, calibration check or other tests or

both." In addition the standard states: "This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics which are detectable during routine periodic tests."

The technical justification contained in WCAP-14036-P-A Revision 1 is based on specific equipment Failure Modes and Effects Analysis (FMEA). The FMEA:

- identifies response time sensitive components on the cards and modules via circuit analysis;
- evaluates the impact on the response time if a component fails or degrades;
- identifies detectability of degraded component via calibration; and
- identifies components that impact calibration but not response time.

The FMEA indicated that some Westinghouse 7300 Process Protection System circuit boards include components where degradation could impact response time. Therefore, to provide verification of the analysis conclusions and to establish certain bounding response times, this FMEA is supplemented by actual testing of selected equipment, including simulation of degraded components on circuit boards. The baseline response times were measured for all circuit boards in the testing scope. Capacitors and resistors of different values were substituted to simulate various degrees of degradation. Calibration checks were performed after each component change to determine if the calibration could or could not detect the degraded component. If the post-component change calibration inaccuracy exceeded 0.5% of span, then the degradation was considered detectable. For degradations that could not be detected during calibration, bounding response time allocations based on the test results were established.

For the Westinghouse Nuclear Instrumentation System (NIS), the FMEA identified no components with a significant response time sensitivity. For the Westinghouse Solid State Protection System (SSPS), the FMEA failed to identify any component that can significantly increase the response times due to degradation or failure that could not be detected by periodic functional testing. The analysis determined that the SSPS signal and logic processing time is bounded by the response of either an input or master relay. As such, the NIS and SSPS equipment was not tested, and the bounding response time allocations were derived from design response time specifications for the components and circuit boards in the signal processing path.

WCAP-14036-P-A Revision 1 also describes the method for integrating component response time allocations into the determination of the response time limits for the protection channel and actuation logic equipment. The NRC previously reviewed and approved the use of sensor response time allocations in lieu of actual response time testing for pressure and differential pressure transmitters at FNP, based on the methodology and recommendations in Westinghouse WCAP-13632-P-A Revision 2. This same verification methodology is applied to the components associated with signal and logic processing of the total response time. The resultant protection system equipment allocations are then combined with sensor allocations or test results and the final actuation device response time test results to ensure that applicable RTS and ESFAS response time criteria are satisfied.

The NRC staff reviewed and approved the technical justifications and response time verification methods presented in WCAP-14036-P-A Revision 1. In NRC Safety Evaluation dated October 6, 1998, the staff requires each licensee to confirm that the FMEA "is applicable to the equipment actually installed in the licensee's facility and that the analysis is valid for the versions for the boards used in their protection system." The RTS and ESFAS equipment installed at FNP are the Westinghouse 7300 Process Protection System, Nuclear Instrumentation System (NIS), and Solid State Protection System (SSPS). SNC verified that this equipment and the associated component boards are the same as the equipment and boards described in the WCAP.

A summary of the FNP RTS and ESF signal processing channels and actuation logic with response time allocations is provided in Table I and Table II. The individual components and circuit boards associated with the Westinghouse 7300 Process Protection System, NIS and SSPS at FNP have been verified by engineering review and plant inspection to be of the proper circuit board group/model and revision level encompassed in the FMEA. FNP will administratively control maintenance and design modifications on RTS and ESF protection equipment to ensure that any circuit board or component replacement will be verified to be equal to or equivalent to the model and revision level approved by the NRC staff in WCAP-14036-P-A, Revision 1 or in a subsequent licensing submittal. Therefore the proposed change to the TS Definitions and Bases associated with the RTS and ESFAS surveillance requirements that eliminate periodic response time testing of selected protection system components is acceptable.

CORRECTIONS TO THE BASES FOR SURVEILLANCE REQUIREMENTS 3.3.1.14 & 3.3.2.9

To ensure the TS Bases information pertaining to the RTS and ESFAS response time testing surveillances correctly reflects the FNP safety analyses modeling assumptions, SNC is proposing additional Bases changes with this licensing submittal. Specifically, the Bases presently indicate that individual component response times are not modeled in the safety analyses. For most RTS and ESFAS functions, this statement is true. However, some components are modeled separately (e.g., the RTD & thermowell combination is separately modeled as a first order lag in the analyses that credit the OTΔT reactor trip function as the primary trip signal for event mitigation). Therefore, this statement will be revised to indicate that component response times are not "typically" modeled in the safety analyses in both Bases SR 3.3.1.14 and SR 3.3.2.9.

Bases SR 3.3.1.14 indicates that the safety analyses model the RTS total response time to the point where control and shutdown rods are fully inserted in the core. This statement is not correct because the rod cluster control assembly insertion time is separately modeled "to dash pot entry" (ref. FSAR Chapter 15.1.5) and separately measured during periodic rod drop surveillance testing (ref. TS SR 3.1.4.3). Furthermore, the TS Definitions indicate that the time to be measured should be to the point of "loss of stationary gripper voltage." In fact, as described in FSAR Chapter 15.1.3, the safety analyses model the RTS response time to the point when "the rods are free and begin to fall." Therefore, the response time testing methodology must account for the time delay associated with the stationary gripper release. This issue was identified in Westinghouse Technical Bulletin NSD-TB-92-03-R1, "Undervoltage Trip Protection," dated April 13, 1994, and has been addressed by FNP. To ensure consistency with the FNP safety analyses modeling and the plant surveillance procedures, the TS Bases must be revised. The proposed revision to the statement in error is:

> The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point "when the rods are free to fall (i.e., loss of control rod drove mechanism (CRDM) stationary gripper voltage including gripper release delay time (ref. 15))."

In addition, Westinghouse Technical Bulletin NSD-TB-92-03-R1 will be added to the Bases References.

Bases SR 3.3.2.9 indicates that the safety analyses model the total response time to the point where the ESF equipment "in both trains" reaches the required functional state. However, this is not totally correct because both trains are not always modeled (e.g., when a loss of one emergency diesel generator is modeled as the worse case active failure, then the associated train of ESF equipment is assumed to fail). Therefore, this statement will be corrected by deleting the reference to "in both trains."

These proposed Bases changes are consistent with the FNP safety analyses modeling as documented in FSAR Chapters 6 and 15; therefore, the proposed changes are acceptable.

ENVIRONMENTAL REVIEW

The proposed change to the protection system response time verification method does not alter any RTS and ESFAS design requirements, equipment specifications or safety analyses modeling assumptions. The change does not require any hardware modifications. The plant operating procedures are not impacted. The plant Technical Specifications RTS and ESFAS response time verification surveillance frequency is not changed. The protection system limiting conditions for operation and calibration and functional testing requirements are not altered. Therefore the proposed change will not increase the amount of any effluent which may be released offsite or the individual or cumulative occupational radiation exposure. In addition, SNC has determined that the proposed change involves no significant hazards consideration. As such, this change meets the criterion for "categorical exclusion" for not requiring an environment review in accordance with 10 CFR 51.22.

SUMMARY

SNC proposes to change the method for verifying the response time of selected RTS and ESFAS rack equipment. The change allows use of bounding component time allocations versus performance of process channel and actuation logic RTT. The change requires revision to the TS Definitions and Bases. WCAP-14036-P-A Revision 1 provides the technical basis and the methodology for eliminating periodic RTT of selected protection system rack equipment. The NRC has reviewed and approved this report. As required by the NRC, this assessment establishes the applicability of WCAP-14036-P-A Revision 1 to the protection system circuit boards and components currently installed at FNP Units 1 and 2. Additional Bases revisions are included to ensure that the FNP safety analyses modeling assumptions are properly described in the FNP TS Bases. Therefore, the proposed TS Definition and Bases changes are acceptable.

TABLE I

FARLEY NUCLEAR PLANT UNITS 1 & 2
REACTOR TRIP SYSTEM
PROCESS CHANNEL & ACTUATION LOGIC RESPONSE TIME ALLOCATIONS

RTS FUNCTION [a]	7300 / NIS PROCESS CHANNEL STRING [b,c]	TIME	SSPS [d]	TIME
PZR PRESS HI	NLP + NAL	65ms	Input + Logic + UV	20ms
PZR PRESS LO	NLP + NLL + NAL	65ms	Input + Logic + UV	20ms
SG WTR LVL LO-LO	NLP + NAL	65ms	Input + Logic + UV	20ms
RCS FLOW LO	NLP + NAL	65ms	Input + Logic + UV	20ms
OPDT (Vary Tavg)	NRA + NSA + NSA + NLL + NSA + NSA + NAL	368ms	Input + Logic + UV	20ms
OPDT (Vary Delta T)	NRA + NSA + NSA + NLL + NAL	293ms	Input + Logic + UV	20ms
OTDT (Vary Tavg)	NRA + NSA + NSA + NLL + NLL + NSA + NAL	330.5ms	Input + Logic + UV	20ms
OTDT (Vary Delta T)	NRA + NSA + NSA + NLL + NAL	293ms	Input + Logic + UV	20ms
OTDT (Vary Press)	NLP + NPC + NSA + NAL	102.5ms	Input + Logic + UV	20ms
OTDT (Vary Flux)	NIS ISO AMP + NPC + NSA + NCH + NSA + NAL	148.5ms	Input + Logic + UV	20ms
NIS PR HIGH FLUX – LO	SUM AMP + BISTABLE	65ms	Input + Logic + UV	20ms
NIS PR HIGH FLUX – HI	SUM AMP + BISTABLE	65ms	Input + Logic + UV	20ms

a) RTS functions requiring periodic response time verification as defined by FSAR Table 7.2-5 & TS Table 3.3.1-1.
b) Allocation values for 7300 cards are from Tables 4-7 through 4-12 of WCAP-14036-P-A Rev. 1. Installed cards are verified to be: 4NCH, 4NRA, 6NLP, 4NSA, and 9NAL (or older artwork levels). No allocations are provided for NLL and NPC. The NLL dynamic response is verified during periodic calibration (Section 4.0). The NPC potentiometers are used to change gain and do not impact response time (Section 4.4).
c) Allocation values for NIS racks are from Section 4.6 of WCAP-14036-P-A Rev. 1. The installed NIS components are verified to be: Summing and Level Amp (3359C48G01), Isolation Amp (6065D75G01), and Bistable Relay Driver Assy (3359C39G01).
d) Allocation values for SSPS are based on input relays as per Section 4.8 of WCAP-14036-P-A Rev. 1. The SSPS input relays are verified to be either C. P. Clare GP1 or Midtex/AEMCO 156 or series relays. The response time of SSPS actuation logic and undervoltage driver cards is bounded by the input relay allocation (Section 4.8).

TABLE II

FARLEY NUCLEAR PLANT UNITS 1 & 2
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
PROCESS CHANNEL & ACTUATION LOGIC RESPONSE TIME ALLOCATIONS

ESFAS FUNCTION [a]	7300 PROCESS CHANNEL STRING [b]	TIME	SSPS [c]	TIME
CTMT PRESS HI-1	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms
CTMT PRESS HI-2	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms
CTMT PRESS HI-3	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms
STM LINE PRESS LO	NLP + NLL + NAL	65ms	Input + Logic + Master + Slave	88ms
STM LINE HI DIFF PRESS	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms
PZR PRESS LO	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms
SG WTR LVL HI-HI	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms
SG WTR LVL LO-LO	NLP + NAL	65ms	Input + Logic + Master + Slave	88ms

a) ESFAS functions requiring periodic response time verification as defined by FSAR Table 7.3-16 & TS Table 3.3.2-1.
b) Allocation values for 7300 cards are from Tables 4-7 through 4-12 of WCAP-14036-P-A Rev. 1. Installed cards are verified to be: 6NLP and 9NAL (or older artwork levels). No allocations are provided for NLL. The NLL dynamic response is verified during periodic calibration (Section 4.0).
c) Allocation values for SSPS are based on input, master and slave relays as per Section 4.8 of WCAP-14036-P-A Rev. 1. The SSPS input and master relays are verified to be either C. P. Clare GP1, Midtex/AEMCO 156, or Potter & Brumfield KH series relays. The SSPS slave relays are verified to be Westinghouse AR-type relays. The response time of SSPS actuation logic and safeguards driver cards is bounded by the input or master relay allocation (Section 4.8).

ATTACHMENT II

10 CFR 50.92 SIGNIFICANT HAZARDS EVALUATION

JOSEPH M. FARLEY NUCLEAR PLANT

TECHNICAL SPECIFICATIONS CHANGE REQUEST

ELIMINATION OF PERIODIC PROTECTION CHANNEL RESPONSE TIME TESTS

10 CFR 50.92 SIGNIFICANT HAZARDS EVALUATION

JOSEPH M. FARLEY NUCLEAR PLANT
TECHNICAL SPECIFICATIONS CHANGE REQUEST
ELIMINATION OF PERIODIC PROTECTION CHANNEL RESPONSE TIME TESTS

CHANGE DESCRIPTION

Southern Nuclear Operating Company (SNC) proposes to eliminate performance of periodic response time testing of certain Farley Nuclear Plant (FNP) Reactor Trip System (RTS) and Engineered Safety Feature Actuation System (ESFAS) equipment as defined in WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests." In lieu of measurement, the amendment will allow verification of selected component response times provided that the protection system equipment and the verification methodology have been previously approved by the NRC. These requirements are reflected in the modifications to the Technical Specifications Definitions for "ESF Response Time" and "RTS Response Time" in Section 1.1. In addition, the Bases for RTS and ESFAS response time testing Surveillance Requirements (SR) 3.3.1.14 and 3.3.2.9 are modified to indicate that the response time for the protection system process channels and trip logic will be determined based on the NRC-approved verification methods.

10 CFR 50.92 EVALUATION

As required by 10 CFR 50.91 (a)(1), an analysis is provided to demonstrate that the proposed Technical Specifications amendment involves no significant hazards consideration.

WCAP-14036-P-A Revision 1 provides the technical justification for deletion of periodic response time testing of selected protection system process channels and trip logic equipment. The justifications are built upon specific equipment failure modes and effects analysis (FMEA). To provide verification of the analysis conclusions and to establish certain bounding response times, the FMEA is supplemented by actual testing of selected equipment, including simulation of degraded components. Bounding response time allocations are based on the FMEA, test results, and/or design specifications.

WCAP-14036-P-A Revision 1 also describes the method for integrating component response time allocations into the determination of the response time limits for the protection channel and actuation logic equipment. This information is then combined with sensor allocations or test results and the final actuation device (e.g., trip breakers, valves, pumps, etc.) response time test results to ensure that applicable RTS and ESFAS response time criteria are satisfied.

The NRC staff reviewed and approved the technical justifications and response time verification methods presented in WCAP-14036-P-A Revision 1. In NRC Safety Evaluation dated October 6, 1998, the staff requires each licensee to confirm that the FMEA "is applicable to the equipment actually installed in the licensee's facility and that the analysis is valid for the versions for the boards used in their protection system." The RTS and ESFAS equipment installed at FNP are the Westinghouse 7300 Process Protection System, Nuclear Instrumentation System (NIS), and Solid State Protection System (SSPS). SNC verified that this equipment and the associated component boards are the same as the equipment and boards described in the WCAP.

Conformance of the proposed amendment to the standards for a determination of no significant hazard as defined in 10 CFR 50.92 is shown in the following.

1) The proposed license amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

This change to the Technical Specifications does not result in a condition where the design, material, and construction standards that were applicable prior to the change are altered. The same RTS and ESFAS instrumentation is being used. The time response allocations and modeling assumptions used in the Chapter 6 and Chapter 15 safety analyses of the Final Safety Analysis Report (FSAR) are not changed; only the method of verifying response time is changed. The proposed change will not modify any system interface or equipment design specification. The proposed change can not increase the likelihood of an accident since such postulated events are independent of this change. The proposed activity will not change, degrade or prevent actions or alter any assumptions previously made in evaluating the radiological consequences of an accident described in the FSAR. Therefore, the proposed amendment does not result in a significant increase in the probability or consequences of an accident previously evaluated.

2) The proposed license amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

This change does not alter the performance of the protection channel and actuation logic equipment used in the RTS and ESFAS. These protection systems will still have response time verified by test before being placed in operational service. Changing the method of periodically verifying instrument response for these systems (assuring equipment operability) from time response testing to calibration and functional testing will not create any new accident initiators or scenarios. Periodic surveillance of these systems will continue and may be used to detect degradation that could cause the response time characteristic to exceed the total allowance. The total time response allowance for each function and the response time allowance for individual components (e.g., circuit boards and relays) bound all degradation that cannot be detected by periodic surveillance. Therefore, implementation of the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) The proposed license amendment does not involve a significant reduction in margin of safety.

This change does not affect the total RTS and ESFAS response times assumed in the safety analyses. The periodic response time verification method for the 7300 Process Protection racks, NIS racks, and SSPS actuation logic is modified to allow use of actual test data or engineering data. The method of verification still provides assurance that the total system response is within that defined in the safety analysis. Periodic calibrations and functional tests will continue to be performed and may be used to detect degradation which might cause the response time to exceed the total allowance. The time response allowance for each component and function bounds all degradation that cannot be detected by periodic surveillance. Based on the above, it is concluded that the proposed license amendment request does not result in a significant reduction in margin with respect to plant safety.

CONCLUSION

Based on the preceding analysis, it is concluded that elimination of periodic response time testing of selected RTS and ESFAS protection channel and actuation logic equipment defined in WCAP-14036-P-A Revision 1 is acceptable and the proposed license amendment does not involve a significant hazards consideration finding as defined in 10 CFR 50.92.

ATTACHMENT III

TECHNICAL SPECIFICATIONS CHANGES

JOSEPH M. FARLEY NUCLEAR PLANT

ELIMINATION OF PERIODIC PROTECTION CHANNEL RESPONSE TIME TESTS

TECHNICAL SPECIFICATIONS CHANGE REQUEST

FNP Technical Specifications Changed Page List

FNP Technical Specifications Marked-up Pages

FNP Technical Specifications Typed Pages

FNP TECHNICAL SPECIFICATIONS

Marked-up Pages

FNP TECHNICAL SPECIFICATIONS

DEFINITIONS AND BASES

Changed Pages	Revision/Instruction
1.1-3	Replace
1.1-4	Replace
1.1-5	Replace
1.1-6	Replace
B 3.3.1-58	Replace
B 3.3.1-59	Replace
B 3.3.1-60	Replace
B 3.3.2-46	Replace
B 3.3.2-47	Replace
B 3.3.2-48	Replace

1.1 Definitions

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME

The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) seal water injection or leakoff), that is captured and conducted to collection systems or a sump or collecting tank;

2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or

3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System;

b. Unidentified LEAKAGE

All LEAKAGE (except RCP seal water injection or leakoff) that is not identified LEAKAGE;

c. Pressure Boundary LEAKAGE

LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.

1.1 Definitions

QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 2775 MWt.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All rod cluster control assemblies (RCCAs) are fully inserted except for the single RCCA of highest reactivity worth, which is assumed to be fully withdrawn. With any RCCA not capable of being fully inserted, the reactivity worth of the RCCA must be accounted for in the determination of SDM; and b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the hot zero power temperatures.
SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing each slave relay and verifying the OPERABILITY of each slave relay. The SLAVE RELAY TEST shall include, as a minimum, a continuity check of associated testable actuation devices.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during

In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

(continued)

¶ WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 17) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection channel response time.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.13 (continued)

previous 31 days. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock. This test may be performed with the reactor at power below P-9 and/or prior to reactor startup.

SR 3.3.1.14

SR 3.3.1.14 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in FSAR, Table 7.2.5 (Ref. 8). Individual component response times are not modeled in the analyses.

typically

when the rods are free to fall

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point ~~at which the equipment reaches the required functional state~~ (i.e., control and shutdown ~~rods fully inserted in the reactor core)~~.

loss of control rod drive mechanism (CRDM) stationary gripper voltage, including gripper release delay time (Ref. 15)

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function set to one, or with the time constants set to their nominal value. The test results must be compared to properly defined acceptance criteria.

response time

response time

, signal processing and actuation logic

Response time may be verified by actual tests in any series of sequential, overlapping or total channel measurements, or by summation of allocated sensor response times with actual test on the remainder of the channel in any series of sequential or overlapping measurements. Allocations for specific pressure and differential pressure sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications.

, signal conditioning and actuation logic

-P-A

(Ref. 16)

WCAP 13632, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. The allocations for these sensor response times must be verified prior to placing the ~~sensor~~ in operational service and re-verified following

component

Response time verification for other sensor types must be demonstrated by test.

(continued)

Specific components identified in the WCAP may be replaced without verification testing.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.14 (continued)

maintenance that may adversely affect response time. In general, electric repair work does not impact response time provided the parts used for repair are of the same type and value. One example where time response could be affected is replacing the sensing assembly of a transmitter. ~~Response time verification for other sensor types must be demonstrated by test.~~

As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Each verification shall include at least one Logic train such that both Logic trains are verified at least once per 36 months. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.3.1.14 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. FSAR, Chapter 7.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.
4. IEEE-279-1971
5. 10 CFR 50.49.
6. WCAP 13751, FNP RTS/ESFAS Setpoint Methodology Study.

(continued)

BASES

REFERENCES (continued)

7. WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," and supplements to that report as approved by the NRC and documented in the SERs and SSER (letters to J.J. Sheppard from Cecil O. Thomas dated February 21, 1985; Roger A. Newton from Charles E. Rossi dated February 22, 1989; and Gerard T. Goering from Charles E. Rossi dated April 30, 1990).

8. FSAR, Table 7.2.5.

9. RPS Functional System Description (FSD) ~~2~~ 1Q ~~A~~ 181007.

10. WCAP 12925, Median Signal Selector (MSS).

11. WCAP 13807/13808, Elimination of Feedwater Flow trip via Implementation of MSS.

12. Joseph M. Farley Nuclear Power Plant Unit 1 (2) Precautions, Limitations and Setpoints ~~1~~ 9 U~~1~~ 266647 (U~~1~~ 280912).

13. Westinghouse Technical Bulletin, ESBU-TB-92-14-R1, "Decalibration Effects Of Calorimetric Power Level Measurements On The NIS High Power Reactor Trip At Power Levels Less Than 70% RTP."

14. NRC Generic Letter 85-09, "Technical Specifications For Generic Letter 83-28 [Required Actions Based On Generic Implications Of Salem ATWS Events], Item 43."

15. Westinghouse Technical Bulletin, NSD-TB-92-03-R1, "Undervoltage Trip Protection."

16. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," Jan., 1996.

17. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," Oct., 1998.

¶ WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 14) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.9

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in the FSAR, Table 7.3-16 (Ref. 9). Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment ~~in both trains~~ reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

typically

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer functions set to one or with the time constants set to their nominal value. The test results must be compared to properly defined acceptance criteria.

response time

response time

Response time may be verified by actual tests in any series of sequential, overlapping or total channel measurements, or by summation of allocated sensor response times with actual tests on the remainder of the channel in any series of sequential or overlapping measurements. Allocations for specific pressure and differential pressure sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. The allocations for these sensor response times must be verified prior to placing the ~~sensor~~ in operational service and re-verified following maintenance that may adversely affect response time. In general, electric repair work does not impact response time provided the parts used for repair are of the same type and value. One example where time response could be affected is replacing the sensing assembly of a transmitter. Response time verification for other sensor types must be demonstrated by test.

, signal processing and actuation logic

¶

-P-A,

(Ref. 13)

, signal processing and actuation logic

component

Specific components identified in the WCAP may be replaced without verification testing.

ESF RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Each verification shall include at least one Logic train such that both Logic trains are verified at least once per 36 months. Testing of the final actuation devices, which make up

(continued)

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---Included for Information only---

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.9 (continued)

the bulk of the response time, is included in the testing of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 month Frequency is consistent with the typical refueling cycle and is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 1005 psig in the SGs. Based on operating experience, 24 hours is a sufficient time duration for performance of the TDAFW pump response time test. A steam pressure of 1005 psig corresponds to the RCS no-load T_{avg} for MODE 2. Valid response time tests can be performed at lower SG pressures.

SR 3.3.2.10

SR 3.3.2.10 is the performance of a TADOT as described in SR 3.3.2.6, except that it is performed for the AFW pump start on trip of all MFW pumps Function and the Frequency is prior to reactor startup if not performed within the previous 92 days. This Frequency is based on operating experience.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 7.
3. FSAR, Chapter 15.
4. IEEE-279-1971.
5. 10 CFR 50.49.
6. WCAP 13751, FNP RTS/ESFAS Setpoint Methodology Study.

(continued)

BASES

REFERENCES (continued)

7. NUREG-1218, April 1988.

8. WCAP-10271-P-A, Supplement 2, Rev. 1, "Updated Approved Version," June 1990.

9. FSAR, Table 7.3-16

10. A 181007 Reactor Protection System FSD.

11. Westinghouse Functional Diagrams U-166231 thru U-166245.

12. Joseph M. Farley Nuclear Power Plant Unit 1 (2) Precautions, Limitations, and Setpoints + U-266647 (U-280912).

13. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," Jan., 1996.

14. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," Oct., 1998.

FNP TECHNICAL SPECIFICATIONS

Typed Pages

1.1 Definitions

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.
LEAKAGE	LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) seal water injection or leakoff), that is captured and conducted to collection systems or a sump or collecting tank;

2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or

3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System;

b. Unidentified LEAKAGE

All LEAKAGE (except RCP seal water injection or leakoff) that is not identified LEAKAGE;

(continued)

1.1 Definitions

LEAKAGE (continued)	c. Pressure Boundary LEAKAGE LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.
MASTER RELAY TEST	A MASTER RELAY TEST shall consist of energizing each master relay and verifying the OPERABILITY of each relay. The MASTER RELAY TEST shall include a continuity check of each associated slave relay.
MODE	A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.
OPERABLE—OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Tests and Operation, of the FSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.

1.1 Definitions

PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.6. Plant operation within these operating limits is addressed in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits."
QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 2775 MWt.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All rod cluster control assemblies (RCCAs) are fully inserted except for the single RCCA of highest reactivity worth, which is assumed to be fully withdrawn. With any RCCA not capable of being fully inserted, the reactivity worth of the RCCA must be accounted for in the determination of SDM; and

(continued)

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the hot zero power temperatures.
SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing each slave relay and verifying the OPERABILITY of each slave relay. The SLAVE RELAY TEST shall include, as a minimum, a continuity check of associated testable actuation devices.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT)	A TADOT shall consist of operating the trip actuating device and verifying the OPERABILITY of required alarm, interlock, and trip functions. The TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the required accuracy.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.13 (continued)

previous 31 days. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock. This test may be performed with the reactor at power below P-9 and/or prior to reactor startup.

SR 3.3.1.14

SR 3.3.1.14 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in FSAR, Table 7.2.5 (Ref. 8). Individual component response times are not typically modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point when the rods are free to fall (i.e., control and shutdown loss of control rod drive mechanism (CRDM) stationary gripper voltage, including gripper release delay time (Ref. 15)).

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function set to one, or with the time constants set to their nominal value. The test results must be compared to properly defined acceptance criteria.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel in any series of sequential or overlapping measurements. Allocations for specific pressure and differential pressure sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications.

WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 16) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.14 (continued)

types must be demonstrated by test.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 17) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for the sensor, signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electric repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where time response could be affected is replacing the sensing assembly of a transmitter.

As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Each verification shall include at least one Logic train such that both Logic trains are verified at least once per 36 months. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.3.1.14 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. FSAR, Chapter 7.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.
4. IEEE-279-1971

(continued)

BASES

REFERENCES (continued)

5. 10 CFR 50.49.

6. WCAP 13751, FNP RTS/ESFAS Setpoint Methodology Study.

7. WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," and supplements to that report as approved by the NRC and documented in the SERs and SSER (letters to J.J. Sheppard from Cecil O. Thomas dated February 21, 1985; Roger A. Newton from Charles E. Rossi dated February 22, 1989; and Gerard T. Goering from Charles E. Rossi dated April 30, 1990).

8. FSAR, Table 7.2.5.

9. RPS Functional System Description (FSD) A-181007.

10. WCAP 12925, Median Signal Selector (MSS).

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12. Joseph M. Farley Nuclear Power Plant Unit 1 (2) Precautions, Limitations and Setpoints U-266647 (U-280912).

13. Westinghouse Technical Bulletin, ESBU-TB-92-14-R1, "Decalibration Effects Of Calorimetric Power Level Measurements On The NIS High Power Reactor Trip At Power Levels Less Than 70% RTP."

14. NRC Generic Letter 85-09, "Technical Specifications For Generic Letter 83-28 [Required Actions Based On Generic Implications Of Salem ATWS Events], Item 43."

15. Westinghouse Technical Bulletin, NSD-TB-92-03-R1, "Undervoltage Trip Protection."

16. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," Jan., 1996.

17. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," Oct., 1998.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.9

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in the FSAR, Table 7.3-16 (Ref. 9). Individual component response times are not typically modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer functions set to one or with the time constants set to their nominal value. The test results must be compared to properly defined acceptance criteria.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel in any series of sequential or overlapping measurements. Allocations for specific pressure and differential pressure sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications.

WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 13) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 14) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for the sensor, signal processing and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.9 (continued)

electric repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where time response could be affected is replacing the sensing assembly of a transmitter.

ESF RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Each verification shall include at least one Logic train such that both Logic trains are verified at least once per 36 months. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 month Frequency is consistent with the typical refueling cycle and is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 1005 psig in the SGs. Based on operating experience, 24 hours is a sufficient time duration for performance of the TDAFW pump response time test. A steam pressure of 1005 psig corresponds to the RCS no-load T_{avg} for MODE 2. Valid response time tests can be performed at lower SG pressures.

SR 3.3.2.10

SR 3.3.2.10 is the performance of a TADOT as described in SR 3.3.2.6, except that it is performed for the AFW pump start on trip of all MFW pumps Function and the Frequency is prior to reactor startup if not performed within the previous 92 days. This Frequency is based on operating experience.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

REFERENCES

1. FSAR, Chapter 6.

2. FSAR, Chapter 7.

(continued)

BASES

REFERENCES (continued)

3. FSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. WCAP 13751, FNP RTS/ESFAS Setpoint Methodology Study.

7. NUREG-1218, April 1988.

8. WCAP-10271-P-A, Supplement 2, Rev. 1, "Updated Approved Version," June 1990.

9. FSAR, Table 7.3-16

10. A 181007 Reactor Protection System FSD.

11. Westinghouse Functional Diagrams U-166231 thru U-166245.

12. Joseph M. Farley Nuclear Power Plant Unit 1 (2) Precautions, Limitations, and Setpoints U-266647 (U-280912).

13. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," Jan., 1996.

14. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," Oct., 1998.