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United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
Supplement to a License Amendment Request Pursuant to 10CFR50.90:
Activation of Thermal-Hydraulic Stability Monitoring Instrumentation

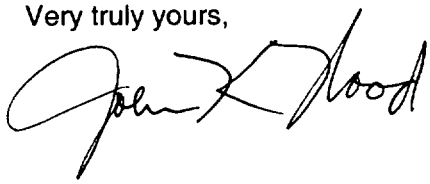
Ladies and Gentlemen:

This letter provides a supplement to a license amendment request for the Perry Nuclear Power Plant (PNPP) for Nuclear Regulatory Commission review and approval. The original request was provided in a letter dated April 5, 2000 (PY-CEI/NRR-2474L). The amendment implements Technical Specification changes associated with thermal-hydraulic stability monitoring. This Supplement revises the newly proposed Specification for the Oscillation Power Range Monitor (OPRM) instrumentation. The supplement provides consistency with the recently implemented Power Uprate amendment. Specifically, it revises the "percent of rated power" values listed in the Applicability, Required Actions, and the Surveillance Requirements, in order to maintain the pre-uprate thermal power levels.

Attachment 1 provides a Summary, a Description of the Proposed Supplement to the Technical Specification Requirements, a Safety Analysis, and an Environmental Consideration. A review was performed of the Significant Hazards Consideration (SHC) provided as Attachment 2 to the letter dated April 5, 2000. No changes to the SHC were determined to be necessary as a result of this supplement. A copy of that SHC is attached for information as Attachment 2. Attachment 3 provides the annotated Technical Specification pages reflecting the proposed supplement. These selected pages supercede the corresponding pages provided in Attachment 3 of the April 5, 2000 letter. Attachment 4 provides an example Power/Flow map showing the post-uprate OPRM Armed Region. Attachment 5 provides, for information, the selected Bases pages that will be revised using the PNPP Bases Control Program.

There are no regulatory commitments in this letter or it's attachments. If you have questions or require additional information, please contact Mr. Gregory A. Dunn, Manager - Regulatory Affairs, at (440) 280-5305.

Very truly yours,



Attachments

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III
State of Ohio

A001

I, John K. Wood, hereby affirm that (1) I am Vice President - Perry, of the FirstEnergy Nuclear Operating Company, (2) I am duly authorized to execute and file this certification as the duly authorized agent for The Cleveland Electric Illuminating Company, Toledo Edison Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.

John K. Wood

Subscribed to and affirmed before me, the 15th day of January 2001

JANE E. MOTT
Notary Public, State of Ohio
My Commission Expires Feb. 20, 2005
(Recorded in Lake County)

SUMMARY

This supplement revises a previously submitted amendment request, which proposed changes to the Perry Nuclear Power Plant (PNPP) Technical Specifications associated with thermal-hydraulic stability monitoring. This supplement provides consistency with the recently implemented Power Uprate amendment. Specifically, in the new Specification 3.3.1.3, "Oscillation Power Range Monitor (OPRM) Instrumentation", the "percent of rated power" values listed in the Applicability and the Surveillance Requirements are revised, in order to maintain the pre-uprate thermal power levels.

DESCRIPTION OF THE PROPOSED SUPPLEMENT TO THE TECHNICAL SPECIFICATION REQUIREMENTS

The changes being proposed by this supplement are in Technical Specification 3.3.1.3, "Oscillation Power Range Monitor (OPRM) Instrumentation":

1. The Applicability, and Required Action C.1, are revised to reference 23.8% Rated Thermal Power (RTP) rather than 25% RTP.

2. The "power level" component of the Enabled (Armed) Region in Surveillance Requirement (SR) 3.3.1.3.5 is specified as 28.6% RTP rather than 30% RTP.

Attachment 4 provides an example Power/Flow Map showing this post-uprate OPRM Armed Region.

Attachment 5 provides, for information, the selected Bases pages that will be revised using the PNPP Bases Control Program. These pages reflect

- the above changes to the power level percentages,
- clearer identification of the cycle-specific setpoints which are included in the Core Operating Limits Report (COLR), and
- clearer explanation of the use of nominal values for the Enabled Region's power and flow setpoints, as identified in the Boiling Water Reactor Owners Group letter BWROG 96113 from K. Donovan (BWROG) to Document Control Desk (NRC), dated September 17, 1996.

SAFETY ANALYSIS

Previous Correspondence

The need to revise these power levels was previously addressed in docketed correspondence.

The original Power Uprate license amendment request included a General Electric Company attachment, NEDC-32907P "Safety Analysis Report for Perry Nuclear Power Plant 5% Thermal Power Uprate". In this report, Section 2.4 "Stability" stated "To ensure maintenance of the same level of protection against the occurrence of a thermal-hydraulic instability, the instability exclusion region boundaries are unchanged with respect to absolute power level (MWt). This approach is consistent with the generic approach in Section 3.2 of LTR-2 (Reference 1)." It also stated that "Perry is implementing long term stability Option III. The Option III solution monitors Oscillation Power Range Monitor (OPRM) signals to determine when a reactor scram is required. The OPRM signal is evaluated by the Option III stability algorithms to determine when the signal is becoming sufficiently periodic and large to warrant a reactor scram to disrupt the oscillation. The OPRM system may only cause a scram when plant operation is in the Option III Armed Region. The Armed Region will be defined in plant procedures and will be added to the Perry

power/flow operating map (Figure 2-1). The Armed Region will be modified for power uprate operation to maintain the pre-uprate absolute power and flow coordinates. The stability based MCPR calculations show no significant changes from the pre-uprate conditions." This statement was identified as a regulatory commitment in the letter. Submittal of this supplement serves as part of the implementation of that commitment.

The NRC Safety Evaluation for Amendment 112, Power Uprate, noted "When Option III is implemented, the power-to-flow operating map will be defined in plant procedures to include an armed region that is used for Option III. The armed region will be modified for uprated power conditions to maintain the current absolute power and flow coordinates. The licensee indicates that its stability-based MCPR calculations show no significant changes from current conditions."

The values needed to maintain the pre-uprate absolute power coordinates (rounded to the nearest tenth of a percent of RTP) are provided in the Technical Specification markups (25% → 23.8% RTP and 30% → 28.6% RTP). Although the GE and NRC letters also referred to "maintaining the pre-uprate flow coordinates", the flow coordinates did not change with power uprate. This is because rated core flow did not change (rated core flow remained at 104 Mlb/hr). Therefore the Armed Region flow requirement of "recirculation drive flow is < the value corresponding to 60% of rated core flow", remains unchanged.

Revised Justification for the Applicability/Required Action Change from 25% to 23.8% RTP

Attachment 1 of the OPRM license amendment request letter included a discussion of how the APPLICABILITY of the new Specification was established.

<<NOTE: revision marks show the necessary changes to the quote from the April 5th letter>>

> "The OPRM instrumentation is required to be OPERABLE in order to detect and suppress neutron flux oscillations in the event of thermal-hydraulic instability. As described in References 1, 2, and 3, the power/core flow region protected against anticipated oscillations is defined by THERMAL POWER > ~~30~~ 28.6% RTP and recirculation drive flow < the value corresponding to 60% of rated core flow. The OPRM trip is required to be enabled in this region, and the OPRM must be capable of enabling the trip function as a result of transients that place the core into that power/flow region. Therefore, the OPRM is required to be OPERABLE with THERMAL POWER ≥ ~~25~~ 23.8% RTP, and at all core flows while above that THERMAL POWER. It is not necessary for the OPRM to be OPERABLE with THERMAL POWER < ~~25~~ 23.8% RTP because instabilities would not be expected to grow large enough to threaten the MCPR Safety Limit. This expectation is due, in part, to the large MCPR margin that exists at low power."

Revised Justification for the Surveillance Requirement Change from 30% to 28.6% RTP

Attachment 1 of the OPRM license amendment request letter included discussions confirming applicability of the various Boiling Water Reactor Owners Group (BWROG) topical reports that address the OPRM and the associated instability functions, set points and margins. In the section discussing NEDO-31960-A and Supplement 1, an NRC request was responded to as follows:

<<NOTE: revision marks show the necessary changes to the quote from the April 5th letter>>

"**(iii) Implementation of Option III or III-A will require that the selected bypass region outside of which the detect and suppress action is deactivated be defined in the Technical Specifications.**"

Response: This region is included in Surveillance Requirement 3.3.1.3.5 (see Attachment 3). The exclusion region methodology (safety analyses contained in NEDO-31960) would define a curved region on the power to flow operating map cutting across the corner of the map near the intersection of the natural circulation line and the highest flow control line. The proximity of the line to the corner would depend upon plant-specific stability characteristics. To ease implementation of the solution in the Perry design, conservative, squared off boundaries at <60% rated core flow and >~~30~~ 28.6% rated power will be used. This is consistent with the boundaries discussed in NEDO-32465, Section 2.2 "Licensing Compliance", which states "the trip function will be enabled when both the power level is greater than 30% of rated* and the core flow is less than 60%." Also, since the actual flow input to the OPRMs is taken from the recirculation pump drive flow instrumentation, the "flow" wording used in SR 3.3.1.3.5 is "recirculation drive flow is < the value corresponding to 60% of rated core flow."

[* The last reference in the above quoted paragraph to "30% of rated" was not marked for change because it is a direct quote from NEDO-32465, and therefore cannot be "changed".]

Conclusion of the Safety Analysis

The absolute power levels that applied at the time the stability solutions were developed are being maintained by the proposed supplement (with rounding to the nearest tenth of a percent of RTP). Therefore, the conclusion of the safety analysis that was provided in the letter dated April 5, 2000 remains valid, i.e.,

"The implementation of the OPRM instrumentation will maintain the margin of safety associated with the MCPR safety limit for instability events, without relying on operator action. The system is designed and installed in a manner that does not degrade the APRM, LPRM or RPS systems. The new automatic features provide equivalent or better protection than the current interim corrective actions. The Specification changes provide appropriate controls over plant operation with the new instrumentation installed."

ENVIRONMENTAL CONSIDERATION

The conclusions of the Environmental Consideration that were provided in the letter dated April 5, 2000 remain valid, i.e.,

"The proposed Technical Specification change request was evaluated against the criteria of 10CFR51.22 for environmental considerations. The proposed change does not significantly increase individual or cumulative occupational radiation exposures, does not significantly change the types or significantly increase the amounts of effluents that may be released off-site and, as discussed in Attachment 2, does not involve a significant hazards consideration. Based on the foregoing, it has been concluded that the proposed Technical Specification change meets the criteria given in 10CFR51.22(c)(9) for categorical exclusion from the requirement for an Environmental Impact Statement."

This Significant Hazards Consideration is unchanged from the one provided with the letter dated April 5, 2000.

Significant Hazards Consideration

The standards used to arrive at a determination that a request for amendment does not involve a significant hazard are included in Commission regulation 10CFR50.92, which states that operation of the facility in accordance with the proposed changes would not:

1) involve a significant increase in the probability or consequences of an accident previously evaluated; or
2) create the possibility of a new or different kind of accident from any accident previously evaluated; or
3) involve a significant reduction in a margin of safety.

The proposed amendment has been reviewed with respect to these three factors and it has been determined that the proposed change does not involve a significant hazard because:

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

   The proposed change specifies limiting conditions for operation, required actions and surveillance requirements for the Oscillation Power Range Monitor (OPRM) system, and allows operation in regions of the power to flow map currently restricted by the requirements of Interim Corrective Actions (ICAs) and certain limiting conditions of operation of Technical Specification (TS) 3.4.1. The restrictions of the ICAs and TS 3.4.1 were imposed to ensure adequate capability to detect and suppress conditions consistent with the onset of thermal-hydraulic (T-H) oscillations that may develop into a T-H instability event. A T-H instability event has the potential to challenge the Minimum Critical Power (MCPR) safety limit. The OPRM system can automatically detect and suppress conditions necessary for T-H instability. With the activation of the OPRM System, the restrictions of the ICAs and TS 3.4.1 will no longer be required.

   The probability of a T-H instability event is impacted by power to flow conditions during operation inside specific regions of the power to flow map, in combination with power shape and inlet enthalpy conditions, such that only under such conditions can the occurrence of an instability event be postulated to occur. Operation in these regions may increase the probability that operation with conditions necessary for a T-H instability can occur. However, when the OPRM is OPERABLE with operating limits as specified in the Core Operating Limits Report (COLR), the OPRM can automatically detect the onset of significant local power oscillations and generate a trip signal. Actuation of a Reactor Protection System (RPS) trip will suppress conditions necessary for T-H instability and decrease the probability of a T-H instability event. In the event the trip capability of one or more of the OPRM channels is not maintained, the proposed change includes Required Actions which limit the period of time before the affected OPRM channel (or RPS system) must be placed in the tripped condition. If these actions would result in a trip function such as a scram, or if the OPRM trip capability is not maintained, an alternate method to detect and suppress thermal hydraulic oscillations is required, i.e., the same ICAs as are in place today. In either case the duration of the period of time allowed by the Required Actions is limited, and the probability of a T-H instability event during this limited time is not significantly increased.

   Several changes to TS 3.4.1 are made which are more consistent with, or conservative with, respect to the reviewed and approved Standard Technical Specifications for Boiling Water Reactors. These generic changes are considered applicable to the Perry Nuclear Power

This Significant Hazards Consideration is unchanged from the one provided with the letter dated April 5, 2000.

Significant Hazards Consideration

Plant. They simply provide guidance on the operator actions to be taken and the associated time limits when the Specification is entered, and do not impact the probability of occurrence of an accident. For the above reasons, the proposed change does not result in a significant increase in the probability of an accident previously evaluated.

An unmitigated T-H instability event is postulated to cause a violation of the MCPR safety limit. The proposed change ensures mitigation of T-H instability events prior to challenging the MCPR safety limit if initiated from anticipated conditions, by detection of the onset of oscillations and actuation of an RPS trip signal. The OPRM also provides the capability of an RPS trip being generated for T-H instability events initiated from unanticipated but postulated conditions. These mitigating capabilities of the OPRM system will become available as a result of the proposed change and have the potential to reduce the consequences of anticipated and postulated T-H instability events. The OPRM installation has been evaluated to not adversely impact other installed equipment such as the Average Power Range Monitors (APRMs) or the RPS in a manner that could prevent response to various postulated events, so those events will not have increased consequences due to the OPRMs. Therefore, the proposed change does not significantly increase the consequences of an accident previously evaluated.

Therefore, the proposed change, which specifies limiting conditions for operation, required actions and surveillance requirements for the OPRM system, and allows operation in certain regions of the power to flow map, does not significantly increase either the probability or consequences of an accident previously evaluated.

2. The proposed change would not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change specifies limiting conditions for operation, required actions and surveillance requirements of the OPRM system, and allows operation in regions of the power to flow map currently restricted by the requirements of ICAs and TS 3.4.1. The OPRM system uses input signals shared with APRM and rod block functions to monitor core conditions and generate an RPS trip when required. Quality requirements for software design, testing, implementation and module self-testing of the OPRM system provide assurance that new equipment malfunctions due to software errors are not created. The design of the OPRM system also ensures that neither operation nor malfunction of the OPRM system will adversely impact the operation of other systems and no accident or equipment malfunction of these other systems could cause the OPRM system to malfunction or cause a different kind of accident. Therefore, operation with the OPRM system does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Operation in regions currently restricted by the requirements of ICAs and TS 3.4.1 is within the nominal operating domain and ranges of plant systems and components, and within the range for which postulated accidents have been evaluated. Therefore operation within these regions does not create the possibility of a new or different kind of accident from any accident previously evaluated. The changes to TS 3.4.1 to be more consistent, or conservative, with respect to the reviewed and approved Standard Technical Specifications, simply provide guidance on the operator actions to be taken and the associated time limits when the

This Significant Hazards Consideration is unchanged from the one provided with the letter dated April 5, 2000.

Significant Hazards Consideration

Specification is entered, and also do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Therefore, the proposed change, which specifies limiting conditions for operation, required actions and surveillance requirements of the OPRM system, and allows operation in certain regions of the power to flow map, does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed change will not involve a significant reduction in the margin of safety.

The proposed change specifies limiting conditions for operation, required actions and surveillance requirements of the OPRM system and allows operation in regions of the power to flow map currently restricted by the requirements of ICAs and TS 3.4.1.

The OPRM system monitors small groups of LPRM signals for indication of local variations of core power consistent with T-H oscillations, and generates an RPS trip when conditions consistent with the onset of oscillations are detected. An unmitigated T-H instability event has the potential to result in a challenge to the MCPR safety limit. The OPRM system provides the capability to automatically detect and suppress conditions which might result in a T-H instability event, and thereby maintains the margin of safety by providing automatic protection for the MCPR safety limit while reducing the burden on the control room operators. Therefore, operation with the OPRM system does not involve a significant reduction in a margin of safety. In the event an OPRM channel becomes inoperable, the proposed change includes actions which limit the period of time before the affected OPRM channel (or RPS system) must be placed in the trip condition. If these actions would result in a trip function such as a scram (or if the OPRM trip capability is not maintained), the alternate method to detect and suppress thermal hydraulic oscillations (the current ICAs) is required to be put in place. The duration of the period of time allowed by the Required Actions is limited, and the probability of a significant T-H instability event during this limited time is not significantly increased.

Operation in regions currently restricted by the requirements of ICAs and Technical Specification 3.4.1 is within the nominal operating domain and ranges of plant systems and components, and within the range assumed for initial conditions considered in the analysis of anticipated operational occurrences and postulated accidents. Therefore, operation in these regions does not involve a significant reduction in the margin of safety. The changes to TS 3.4.1 to be more consistent, or conservative, with respect to the reviewed and approved Standard Technical Specifications, simply provide guidance on the operator actions to be taken and the associated time limits when the Specification is entered, and also do not significantly reduce the margin of safety.

Therefore, the proposed change, which specifies limiting conditions for operation, required actions and surveillance requirements of the OPRM system, and allows operation in certain regions of the power to flow map, does not involve a significant reduction in a margin of safety.

Based on the above considerations, it is concluded that a significant hazard would not be introduced as a result of this proposed change. Also, since NRC approval of this change must be obtained prior to implementation, no unreviewed safety question can exist.

3.3 INSTRUMENTATION

3.3.1.3 Oscillation Power Range Monitor (OPRM) Instrumentation

LCO 3.3.1.3 Four channels of the OPRM Period Based Algorithm instrumentation shall be OPERABLE.

APPLICABILITY: THERMAL POWER ≥ ~~25%~~ 23.8% RTP

New LCO

ACTIONS

----------NOTES----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip. OR A.2 Place associated RPS trip system in trip. OR A.3 Initiate alternate method to detect and suppress thermal hydraulic instability oscillations.	30 days 30 days 30 days
B. OPRM trip capability not maintained.	B.1 Initiate alternate method to detect and suppress thermal hydraulic instability oscillations.	12 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to < ~~25%~~ 23.8% RTP.	4 hours

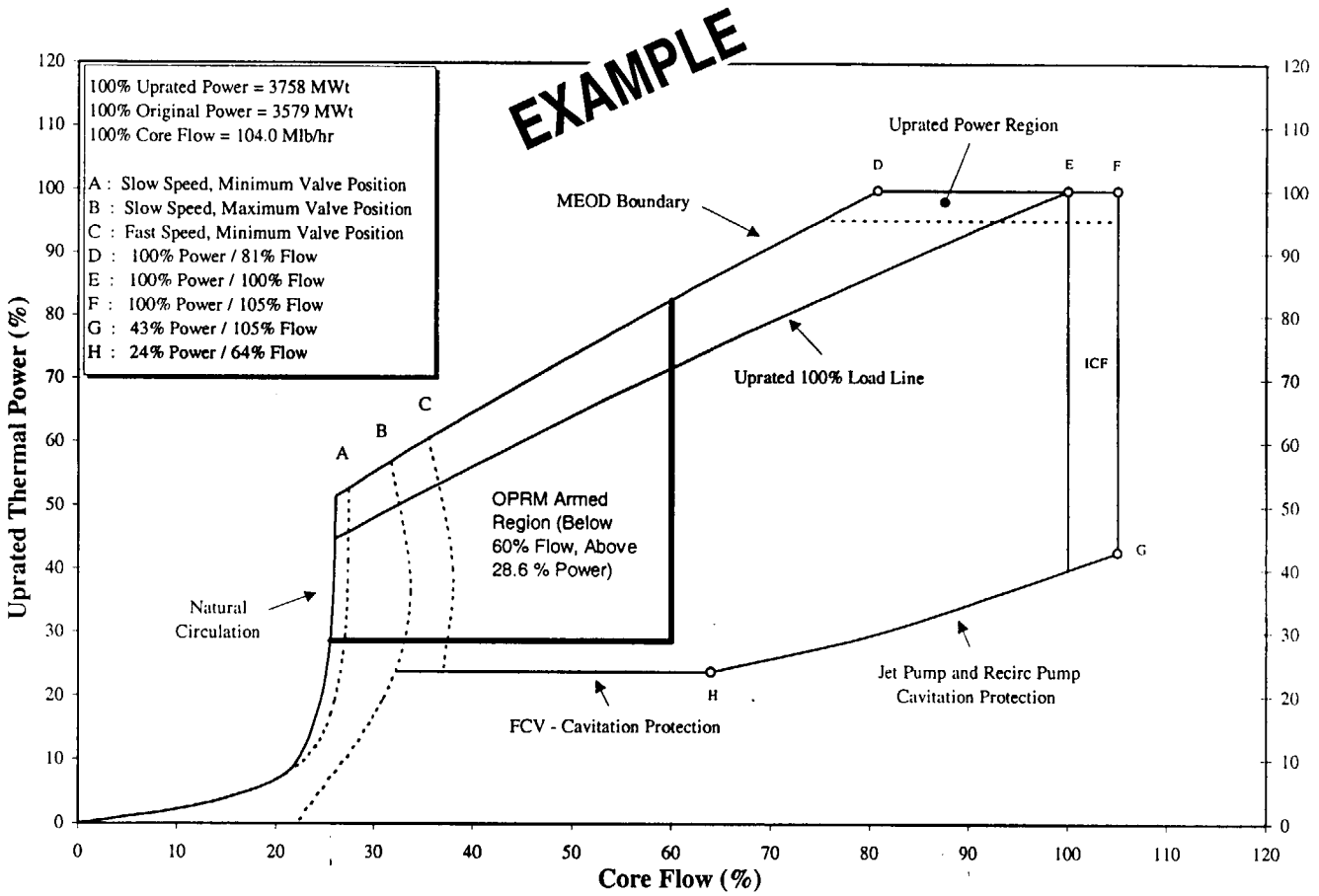
This Supplement

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the OPRM maintains trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.3.1	Perform CHANNEL FUNCTIONAL TEST.	184 days
SR 3.3.1.3.2	Calibrate the local power range monitors.	1000 MWD/T average core exposure
SR 3.3.1.3.3	----------NOTE---------- Neutron detectors are excluded. --- Perform CHANNEL CALIBRATION.	This Supplement 24 months
SR 3.3.1.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	24 months
SR 3.3.1.3.5	Verify OPRM is not bypassed when THERMAL POWER is > ~~30%~~ 28.6% RTP and recirculation drive flow is < the value corresponding to 60% of rated core flow.	24 months
SR 3.3.1.3.6	----------NOTE---------- Neutron detectors are excluded. --- Verify the RPS RESPONSE TIME is within limits.	24 months on a STAGGERED TEST BASIS

Perry 105% Power Uprate Power/Flow Map
(OPRM Armed Region)



BASES

APPLICABLE SAFETY ANALYSES (continued)

The OPRM Instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Four channels of the OPRM period based detection algorithm are required to be OPERABLE to ensure that stability related oscillations are detected and suppressed prior to exceeding the MCPR safety limit. Only one of the two OPRM modules. period based detection algorithm is required for OPRM channel OPERABILITY. The highly redundant and low minimum number of required LPRMs in the OPRM cell design ensures that large numbers of cells will remain OPERABLE, even with large numbers of LPRMs bypassed.

APPLICABILITY

The OPRM instrumentation is required to be OPERABLE in order to detect and suppress neutron flux oscillations in the event of thermal-hydraulic instability. As described in References 1, 2, and 3, the power/core flow region protected against anticipated oscillations is defined by THERMAL POWER > ~~30%~~ 28.6 % RTP and recirculation drive flow < the value corresponding to 60% of rated core flow. The OPRM trip is required to be enabled in this region, and the OPRM must be capable of enabling the trip function as a result of transients that place the core into that power/flow region. Therefore, the OPRM is required to be OPERABLE with THERMAL POWER ≥ ~~25%~~ 23.8 % RTP, and at all core flows while above that THERMAL POWER. It is not necessary for the OPRM to be OPERABLE with THERMAL POWER < ~~25%~~ 23.8 % RTP because instabilities would not be expected to grow large enough to threaten the MCPR Safety Limit. This expectation is due, in part, to the large MCPR margin that exists at low power (Ref. 6).

(continued)

ACTIONS

B.1 (continued)

Because of the low probability of the occurrence of an instability, 12 hours is an acceptable time to initiate the alternate method of detecting and suppressing thermal-hydraulic instability oscillations as described in the Bases for Action A.3 above. The alternate method of detecting and suppressing thermal-hydraulic instability oscillations would adequately address detection and mitigation in the event of instability oscillations. Based on industry operating experience with actual instability oscillations, the operator would be able to recognize instabilities during this time and take action to suppress them through a manual scram. In addition, the OPRM System may still be available to provide alarms to the operator if the onset of oscillations were to occur. Since plant operation is minimized in areas where oscillations may occur, operation without OPRM trip capability is considered acceptable with implementation of the alternate method of detecting and suppressing thermal-hydraulic instability oscillations, during the period when corrective actions are underway to resolve the inoperability that led to entry into Condition B. One reason this Condition may be utilized is to provide time to implement a software upgrade in the plant if a common cause software problem is identified (Ref. 8).

C.1

With any Required Action and associated Completion Time not met, THERMAL POWER must be reduced to < 25% RTP within 4 hours. Reducing THERMAL POWER to < 25% RTP places the plant in a region where instabilities are not likely to occur. The 4 hours is reasonable, based on operating experience, to reduce THERMAL POWER < 25% RTP from full power conditions in an orderly manner and without challenging plant systems.

23.8%

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

For the following OPRM instrumentation surveillances, both OPRM modules are tested, although only one is required to satisfy the surveillance requirement.

SR 3.3.1.3.1

A CHANNEL FUNCTIONAL TEST is performed to ensure that the channel will perform the intended function. A Frequency of 184 days provides an acceptable level of system average availability over the Frequency and is based on the reliability of the channel (Ref. 7).

SR 3.3.1.3.2

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the OPRM System. The 1000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes.

SR 3.3.1.3.3

The CHANNEL CALIBRATION verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations. Calibration of the channel provides a check of the internal reference voltage and the internal processor clock frequency, ~~and~~ the calibration also compares the desired trip setpoints with the confirmation count setpoint (N_p) and the amplitude trip setpoint (S_p) those in processor memory. The Allowable Values for ~~these items~~ are specified in the Core Operating Limits Report (COLR). Since the OPRM is a digital system, the internal reference voltage and processor clock frequency are, in turn, used to automatically calibrate the internal analog to digital converters. As noted, neutron detectors are

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3.3 (continued)

excluded from CHANNEL CALIBRATION because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 1000 MWD/T LPRM calibration using the TIPs (SR 3.3.1.3.2).

The Frequency of 24 months is based upon the assumption of the magnitude of equipment drift provided by the equipment supplier (Ref. 9).

SR 3.3.1.3.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods in LCO 3.1.3, "Control Rod OPERABILITY," and scram discharge volume (SDV) vent and drain valves in LCO 3.1.8, "Scram Discharge Volume (SDV) Vent and Drain Valves," overlaps this Surveillance to provide complete testing of the assumed safety function. The OPRM self-test function may be utilized to perform this testing for those components that it is designed to monitor.

The 24 month Frequency is based on engineering judgment, high reliability of the components, and operating experience.

SR 3.3.1.3.5

This SR ensures that trips initiated from the OPRM System will not be inadvertently bypassed when THERMAL POWER is > 30% RTP and recirculation drive flow is < the value corresponding to 60% of rated core flow.

28.6%

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3.5 (continued)

This normally involves verification of the OPRM bypass function, by ensuring the OPRM modules are enabled when the APRM input is > 30% RTP and the recirculation drive flow input is < the value corresponding to 28.6% of rated core flow. The APRM and recirculation drive flow inputs are calibrated by surveillances in their respective Technical Specifications. ~~Adequate margins for the instrument setpoint methodology are incorporated into the actual setpoints.~~

Because the enabled region conservatively bounds the region where instabilities are actually expected, the above nominal values of power/flow are utilized for the bypass setpoints, without further allowance for instrument drift or uncertainty.

If any bypass channel setpoint is nonconservative (i.e., the OPRM module is bypassed at > 30% RTP and recirculation drive flow < the value corresponding to 28.6% of rated core flow), then the affected OPRM module is considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (enabled). If placed in the enabled condition, this SR is met and the module is considered OPERABLE.

The Frequency of 24 months is based on engineering judgment, high reliability of the components, and operating experience.

SR 3.3.1.3.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis (Ref. 10). The OPRM self-test function may be utilized to perform this testing for those components it is designed to monitor. The LPRM amplifier cards inputting to the OPRM are excluded from the OPRM response time testing. The RPS RESPONSE TIME acceptance criteria are included in Reference 11.

(continued)