



FirstEnergy Nuclear Operating Company

Perry Nuclear Power Plant  
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David B. Hamilton  
Vice President

440-280-5382

February 14, 2018  
L-17-350

10 CFR 50.90

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

SUBJECT:  
Perry Nuclear Power Plant  
Docket No. 50-440, License No. NPF-58  
Application to Revise Technical Specifications to Adopt TSTF-546, "Revise APRM Channel Adjustment Surveillance Requirement"

Pursuant to 10 CFR 50.90, FirstEnergy Nuclear Operating Company (FENOC) is submitting a request for an amendment to the Technical Specifications (TSs) for Perry Nuclear Power Plant (PNPP).

The proposed change is consistent with TSTF-546, "Revise APRM Channel Adjustment Surveillance Requirement." The proposed amendment alters Surveillance Requirement (SR) 3.3.1.1.2 of Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation." The proposed change revises the SR to verify that calculated (i.e., calorimetric heat balance) power is no more than 2 percent greater than the average power range monitor (APRM) channel output. The SR requires the APRM channel to be adjusted such that calculated power is no more than 2 percent greater than the APRM indicated power when operating at  $\geq 23.8$  percent of rated thermal power (RTP). This change revises the SR to distinguish between APRM indications that are consistent with the accident analyses and those that provide additional margin.

Enclosure A provides a description and assessment of the proposed changes.  
Enclosure B provides the existing TS pages marked up to show the proposed changes.  
Enclosure C provides revised (clean) TS pages.  
Enclosure D provides TS Bases pages marked up to show the associated TS Bases changes and is provided for information only.

Approval of the proposed amendment is requested by February 28, 2019. Once approved, the amendment shall be implemented within 90 days.

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There are no regulatory commitments contained in this letter. If there are any questions, or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at 330-315-6810.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 14, 2018.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Hamilton', with a stylized flourish at the end.

David B. Hamilton

Enclosures:

- A. Description and Assessment of License Amendment Request to Adopt TSTF-546
- B. Proposed Technical Specification Changes (Mark-Up)
- C. Revised Technical Specification Pages
- D. Proposed Technical Specification Bases Changes (Mark-Up) – Information Only

cc: NRC Region III Administrator  
NRC Resident Inspector  
NRR Project Manager  
Executive Director, Ohio Emergency Management Agency,  
State of Ohio (NRC Liaison)  
Utility Radiological Safety Board

**Enclosure A**  
**L-17-350**

**Description and Assessment of  
License Amendment Request to Adopt TSTF-546  
(3 pages follow)**

# Description and Assessment of License Amendment Request to Adopt TSTF-546

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## 1.0 DESCRIPTION

The proposed amendment alters Surveillance Requirement (SR) 3.3.1.1.2 of Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation." This proposed change revises the SR to compare the calculated (i.e., calorimetric heat balance) power to the average power range monitor (APRM) indications, and to adjust the APRM consistent with the heat balance power if the calculated power is more than 2 percent greater than the APRM channel output when operating at  $\geq 23.8$  percent of rated thermal power (RTP). This change revises the SR to require adjustment only if the APRM indication deviates from the calculated power in the nonconservative direction.

## 2.0 ASSESSMENT

### 2.1 Applicability

FirstEnergy Nuclear Operating Company (FENOC) has reviewed the safety evaluation provided to the Technical Specifications Task Force in a letter dated August 31, 2017 (NRC ADAMS Accession No. ML17206A431). This included a review of the NRC staff's evaluation, as well as the information provided in TSTF-546. As described herein, FENOC has concluded that the justifications, plant design description, and safety analysis description presented in TSTF-546 and the safety evaluation prepared by the NRC staff are applicable to Perry Nuclear Power Plant (PNPP), Unit No. 1 and justify this amendment for the incorporation of the changes to the PNPP TSs.

### 2.2 Variations

FENOC is proposing the following variation from the TS changes described in the TSTF-546, Revision 0, or the NRC staff's safety evaluation dated August 31, 2017. This variation does not affect the applicability of TSTF-546 or the NRC staff's safety evaluation to the proposed license amendment.

The PNPP TS utilizes a power level of 23.8 percent in SR 3.3.1.1.2, in lieu of 25 percent.

## 3.0 REGULATORY ANALYSIS

### 3.1 No Significant Hazards Consideration Analysis

FENOC requests adoption of TSTF-546, Revision 0, "Revise APRM Channel Adjustment Surveillance Requirement," which is an approved change to the standard technical specifications (STS), into the PNPP Technical Specifications (TSs). The proposed change alters Surveillance Requirement (SR) 3.3.1.1.2 of Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation." This proposed change revises the SR to compare the calculated (i.e., calorimetric heat

balance) power to the Average Power Range Monitoring (APRM) indications, and to adjust the APRM consistent with the heat balance power if the calculated power is more than 2 percent greater than the APRM channel output when operating at  $\geq 23.8$  percent of rated thermal power (RTP). This change revises the SR to require adjustment only if the APRM indication deviates from the calculated power in the nonconservative direction.

The proposed change has been evaluated against the criteria of 10 CFR 50.92(c) to determine if the proposed change results in any significant hazards. The following is the analysis of each of the 10 CFR 50.92(c) criteria:

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

Response: No.

The APRM system and the RPS are not initiators of any accidents previously evaluated. As a result, the proposed change does not affect the probability of any accident previously evaluated. The APRM system and the RPS functions act to mitigate the consequences of accidents previously evaluated. The reliability of APRM system and the RPS is not significantly affected by removing the gain adjustment requirement on the APRM channels when the APRMs are calibrated conservatively with respect to the calculated heat balance. This is because the actual core thermal power at which the reactor will automatically trip is lower, thereby increasing the margin to the core thermal limits and the limiting safety system settings assumed in the safety analyses. The consequences of an accident during the adjustment of the APRM instrumentation are no different from those during the existing surveillance testing period or the existing time allowed to restore the instruments to operable status. As a result, the ability of the APRM system and the RPS to mitigate any accident previously evaluated is not significantly affected.

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

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

Response: No.

The proposed change does not alter the protection system design, create new failure modes, or change any modes of operation. The proposed change does not involve a physical alteration of the plant; no new or different kind of equipment will be installed. Consequently, there are no new initiators that could result in a new or different kind of accident.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The margin of safety provided by the APRM system and the RPS is to ensure that the reactor is shut down automatically when plant parameters exceed the setpoints for the system. Any reduction in the margin of safety resulting from the adjustment of the APRM channels while continuing operation is considered to be offset by delaying a plant shutdown (i.e., a transient) for a short time with the APRM system, the primary indication of core power and an input to the RPS, not calibrated. Additionally, the short time period required for adjustment is consistent with the time allowed by Technical Specifications to restore the core power distribution parameters to within limits and is acceptable based on the low probability of a transient or design basis accident occurring simultaneously with inaccurate APRM channels.

The proposed change does not alter setpoints or limits established or assumed by the accident analyses. The Technical Specifications continue to require operability of the RPS functions, which provide core protection for postulated reactivity insertion events occurring during power operating conditions consistent with the plant safety analyses.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, FENOC concludes that the proposed amendment presents no significant hazards considerations under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 3.2 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

### 4.0 ENVIRONMENTAL EVALUATION

The proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

**Enclosure B**  
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**Proposed Technical Specification Changes (Mark-Up)**  
**(1 page follows)**

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.
2. 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 associated Function maintains RPS trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.2	<p>-----NOTE----- Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 23.8% RTP.</p> <p>----- <del>Verify the absolute difference between</del> Compare the average power range monitor (APRM) channels and to the calculated power. Adjust the APRM channels if the calculated power exceeds the APRM output by more than <math>\leq</math> 2% RTP while operating at <math>\geq</math> 23.8% RTP.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.3	Adjust the channel to conform to a calibrated flow signal.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.4	<p>-----NOTE----- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.</p> <p>----- Perform CHANNEL FUNCTIONAL TEST.</p>	In accordance with the Surveillance Frequency Control Program

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**Enclosure C**  
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**Revised Technical Specification Pages**  
**(1 page follows)**

## SURVEILLANCE REQUIREMENTS

## -----NOTES-----

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.
2. 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 associated Function maintains RPS trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.2	<p>-----NOTE----- Not required to be performed until 12 hours after THERMAL POWER <math>\geq</math> 23.8% RTP. -----</p> <p>Compare the average power range monitor (APRM) channels to the calculated power. Adjust the APRM channels if the calculated power exceeds the APRM output by more than 2% RTP while operating at <math>\geq</math> 23.8% RTP.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.3	Adjust the channel to conform to a calibrated flow signal.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.1.4	<p>-----NOTE----- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -----</p> <p>Perform CHANNEL FUNCTIONAL TEST.</p>	In accordance with the Surveillance Frequency Control Program

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**Enclosure D**  
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**Proposed Technical Specification Bases Changes (Mark-Up) – Information Only**  
**(2 pages follow)**

## BASES

SURVEILLANCE  
REQUIREMENTSSR 3.3.1.1.1 (continued)

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated~~adjusted~~ to the reactor power calculated from a heat balance if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP. If the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP, the APRM is not declared inoperable, but must be adjusted consistent with the heat balance calculated power. If the APRM channel output cannot be properly adjusted, the channel is declared inoperable.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/-2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

A restriction to satisfying this SR when < 23.8% RTP is provided that requires the SR to be met only at  $\geq 23.8\%$  RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 23.8% RTP. At low power levels, a high degree of accuracy is unnecessary because of the large inherent margin to thermal limits (MCPR and APLHGR). At  $\geq 23.8\%$  RTP, the Surveillance is required to have been satisfactorily performed in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 23.8% if the Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 23.8% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

SR 3.3.1.1.3

The Average Power Range Monitor Flow Biased Simulated Thermal Power-High Function uses the recirculation loop drive flows to vary the trip setpoint. This SR ensures that the total loop drive flow signals from the flow unit used to

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