

## NON-CONCURRENCE PROCESS COVER PAGE

*NCP-2015-012*

The U.S. Nuclear Regulatory Commission (NRC) strives to establish and maintain an environment that encourages all employees to promptly raise concerns and differing views without fear of reprisal and to promote methods for raising concerns that will enhance a strong safety culture and support the agency's mission.

Employees are expected to discuss their views and concerns with their immediate supervisors on a regular, ongoing basis. If informal discussions do not resolve concerns, employees have various mechanisms for expressing and having their concerns and differing views heard and considered by management.

Management Directive, MD 10.158, "NRC Non-Concurrence Process," describes the Non-Concurrence Process (NCP), <http://nrcweb.nrc.gov:8600/policy/directives/catalog/md10.158.pdf>.

The NCP allows employees to document their differing views and concerns early in the decision-making process, have them responded to (if requested), and attach them to proposed documents moving through the management approval chain to support the decision-making process.

NRC Form 757, "Non-Concurrence Process" is used to document the process.

Section A of the form includes the personal opinions, views, and concerns of a non-concurring NRC employee.

Section B of the form includes the personal opinions and views of the non-concurring employee's immediate supervisor.

Section C of the form includes the agency's evaluation of the concerns and the agency's final position and outcome.

NOTE: Content in Sections A and B reflects personal opinions and views and does not represent official factual representation of the issues, nor official rationale for the agency decision. Section C includes the agency's official position on the facts, issues, and rationale for the final decision.

At the end of the process, the non-concurring employee(s):

- Concurred
- Continued to non-concur
- Agreed with some of the changes to the subject document, but continued to non-concur
- Requested that the process be discontinued

The non-concurring employee(s) requested that the record be non-public.

The non-concurring employee(s) requested that the record be public.

This record is non-public and for official use only.

This record has been reviewed and approved for public dissemination.

*6a 2/2/16*

NRC FORM 757 REV. MD 10-156 12/10/15		U. S. NUCLEAR REGULATORY COMMISSION	NCP TRACKING NUMBER
		NON-CONCURRENCE PROCESS	
<b>SECTION A - TO BE COMPLETED BY NON-CONCURRING EMPLOYEE</b>			
TITLE OF SUBJECT DOCUMENT		ADAMS ACCESSION NO	
Amendment No. 171 to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant		ML15307A349	
DOCUMENT SIGNER		SIGNER TELEPHONE NO	
David L. Pelton		(301) 415-2307	
TITLE	ORGANIZATION		
Branch Chief	NRR-DORL-PL3-1		
NAME OF NON CONCURRING EMPLOYEE(S) <i>Roy Mathew, Tania Martinez-Navedo, Swagata Sen, Sheila Ray, and Gurcharan Matharu</i>		TELEPHONE NUMBER	
		415-6561	
TITLE	ORGANIZATION		
Branch Chief	NRR/DE/EEBB		
<input type="checkbox"/> DOCUMENT AUTHOR	<input type="checkbox"/> DOCUMENT CONTRIBUTOR	<input checked="" type="checkbox"/> DOCUMENT REVIEWER	<input type="checkbox"/> ON CONCURRENCE
NON-CONCURRING EMPLOYEE'S SUPERVISOR			
Jacob Zimmerman			
TITLE	ORGANIZATION		
Branch Chief	NRR/DE/EEBB		
<input checked="" type="checkbox"/> I WOULD LIKE MY NON-CONCURRENCE CONSIDERED AND WOULD LIKE A WRITTEN EVALUATION IN SECTION B AND C <input type="checkbox"/> I WOULD LIKE MY NON CONCURRENCE CONSIDERED, BUT A WRITTEN EVALUATION IN SECTIONS B AND C IS NOT NECESSARY			
WHEN THE PROCESS IS COMPLETE, I WOULD LIKE THE NCP FORM		<input checked="" type="checkbox"/> PUBLIC	<input type="checkbox"/> NON-PUBLIC
REASONS FOR NON-CONCURRENCE AND PROPOSED ALTERNATIVES (use continuation pages or attach Word document)			
See Attached			
SIGNATURE	<i>Renee Mathew, Tania Martinez-Navedo, Swagata Sen, Sheila Ray, and Gurcharan Matharu</i>		DATE
		2 Dec 2015	

## REASONS FOR THE NON-CONCURRENCE, POTENTIAL IMPACT ON MISSION, AND THE PROPOSED ALTERNATIVES

### Background:

By application dated March 25, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14084A165), as supplemented by letters dated October 7, 2014, and August 24, 2015 (ADAMS Accession Nos. ML14281A125 and ML15237A035, respectively), FirstEnergy Nuclear Operating Company (the licensee or FENOC) requested changes to the technical specifications (TSs) for the Perry Nuclear Power Plant, Unit 1 (PNPP or Perry). The supplemental letters dated October 7, 2014, and August 24, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on September 16, 2014 (79 FR 55512).

The proposed changes would revise the TSs by relocating specific surveillance requirement (SR) frequencies to a licensee-controlled program in accordance with Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies" (ADAMS Accession No. ML071360456). The requested changes are consistent with the U.S. NRC-approved Technical Specification Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control—RITSTF [Risk-Informed TSTF] Initiative 5b" (ADAMS Accession No. ML090850642). The *Federal Register* notice published on July 6, 2009 (74 FR 31996), announced the availability of TSTF-425, Revision 3. When implemented, TSTF-425, Revision 3, relocates most periodic frequencies of TS surveillances to the Surveillance Frequency Control Program (SFCP), and provides requirements for the new SFCP in the Administrative Controls section of the TSs. All surveillance frequencies can be relocated except the following:

- Frequencies that reference other approved programs for the specific interval (such as the Inservice Testing Program or the Primary Containment Leakage Rate Testing Program);
- Frequencies that are purely event-driven (e.g., "Each time the control rod is withdrawn to the 'full out' position");
- Frequencies that are event-driven, but have a time component for performing the surveillance on a one-time basis once the event occurs (e.g., "within 24 hours after thermal power reaching ≥ 95% RTP"); and
- Frequencies that are related to specific conditions (e.g., battery degradation, age and capacity) or conditions for the performance of a surveillance requirement (e.g., "drywell to suppression chamber differential pressure decrease").

Staff from Probabilistic Risk Assessment Branch (APLA) in the Division of Risk Assessment (DRA) has the lead responsibility for this license amendment request (LAR). The Electrical

Engineering Branch (EEEB) staff was requested by the Division of Operating Licensing Branch (DORL) staff to and provide concurrence.

The licensee proposed to add the SFCP to TSs, Section 5.0, "Administrative Controls," Subsection 5.5, "Programs and Manuals." The SFCP describes the requirements for the program to control changes to the relocated surveillance frequencies. The TS Bases for each affected surveillance would be revised to state that the frequency is controlled under the SFCP. The existing TS Bases information describing the basis for the surveillance frequency will be relocated to the licensee-controlled SFCP. The proposed changes to the Administrative Controls section of the TSs to incorporate the SFCP include a specific reference to NEI 04-10, Revision 1, as the basis for making any changes to the surveillance frequencies once they are relocated out of the TSs.

In a letter dated September 19, 2007 (ADAMS Accession No. ML072570267), the NRC staff approved Topical Report NEI 04-10, Revision 1, as acceptable for referencing in licensing actions, to the extent specified and under the limitations delineated in NEI 04-10, Revision 1, and in the NRC staff's safety evaluation (SE) for NEI 04-10, Revision 1.

This SE concluded "The NRC staff has reviewed NEI 04-10, Revision 1, a risk-informed methodology using plant-specific risk insights and performance data to revise surveillance frequencies within an SFCP, allowing for licensee control of the surveillance frequencies. This methodology would support a proposed change to a licensee's TSs by relocating surveillance frequencies to a licensee-controlled document, allowing those frequencies to be revised in accordance with NEI 04-10, Revision 1, as referenced in the Administrative Controls Section of the TSs

The NRC staff finds that the proposed implementing methodology satisfies the key principles of risk-informed decision making applied to changes to TSs as delineated in RG 1.177 and RG 1.174, in that:

- The proposed change meets current regulations;
- The proposed change is consistent with defense-in-depth philosophy;
- The proposed change maintains sufficient safety margins;
- Increases in risk resulting from the proposed change are small and consistent with the Commission's Safety Goal Policy Statement; and
- The impact of the proposed change is monitored with performance measurement strategies.

The NRC staff, therefore, finds that this methodology is acceptable for referencing by licensees proposing to amend their TS to establish a SFCP provided that the conditions in Section 4.0 of this SE are satisfied." Section 4 of this SE provided limitations and conditions for PRA.

The EEEB staff normally uses SRP Section 8, Code of Federal Regulations (CFRs), and Regulatory Guides (RGs) and industry Standards that are applicable to the current licensing basis of US operating fleet of nuclear plants. Accordingly, the EEEB staff used the specific documents applicable to Perry (current licensing basis) to review the proposed SE and associated amendments.

Issue:

The Perry amendment SE concludes that "The proposed licensee adoption of TSTF 425, Revision 3, and risk-informed methodology of NRC-approved NEI 04-10, Revision 1, as referenced in the Administrative Controls section of TSs, satisfies the key principles of risk-informed decision making applied to changes to TSs as delineated in RG 1.177 and RG 1.174, in that:

- The proposed change meets current regulations;
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- The proposed change maintains sufficient safety margins;
- Increases in risk resulting from the proposed change are small and consistent with the Commission's Safety Goal Policy Statement; and
- The impact of the proposed change is monitored with performance measurement strategies.

The regulation in 10 CFR 50.36(c) discusses the categories that will be included in TSs. The regulation in 10 CFR 50.36(c)(3) discusses the specific category of Surveillance Requirements and states: "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met." The NRC staff finds that with the proposed relocation of surveillance frequencies to a licensee-controlled document and administratively controlled in accordance with the TS SFCP, the licensee continues to meet the regulatory requirement of 10 CFR 50.36, and specifically, 10 CFR 50.36(c)(3), Surveillance Requirements."

In addition, the EEEB staff noted that the original SE (ADAMS Accession No. ML071200238) prepared by APLA staff (principal contributor) for approval of TR NEI 04-10 methodology also did not have adequate regulatory and technical bases to conclude that all deterministic criteria are met. It should be noted that the TR SE was not reviewed by the Office of General Council (OGC) to determine whether there are any legal objections for adopting the proposed methodology to satisfy the current NRC applicable regulations. This could be a potential issue that NRC management should look into to see whether TRs are being approved without sufficient legal and technical bases. EEEB staff's position is that the approval of the proposed TS Amendment 171 to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant, Unit No. 1, since the APLA staff evaluation did not provide sufficient technical and regulatory bases (deterministic) to show that the changes proposed in the license amendment are

adequate to ensure public health and safety and all applicable regulatory requirements are met as discussed below. The EEEB staff also notes that there are no regulatory requirements which require that the NRC staff must approve these license amendments (plant-specific licensing action) simply because staff approved a TR.

The SE, in general, is written based on risk-based principles rather than risk-informed principles that complement the deterministic principles. This approach tends to ignore the Perry current licensing basis, regulatory requirements, defense in depth, and safety margins. This is not consistent with the Commission's PRA Policy statement and deterministic principles stated in RG 1.177 and RG 1.174. It also does not meet the requirements for Electrical Power Systems. The plant can operate safely only if it operates within the established design bases and licensing basis and within accident analyses assumptions including TS limiting conditions for Operation (LCO).

#### REASONS FOR THE NON-CONCURRENCE

The surveillance frequencies specified in Section 3.8 for AC and DC Electric Power Systems of the current Perry TSs are being revised in accordance with the Surveillance Frequency Control Program specified in TR NEI 04-10 and TSTF. In addition, there are no backstops provided in the TS SFCP to limit the frequency interval for SSCs to demonstrate SSCs can perform their intended design safety functions. The EEEB staff determined that the revised surveillance frequency, if implemented, would violate the current licensing and design basis for Perry. This is because neither the staff SE nor the industry documents provided sufficient regulatory and technical bases to conclude that the proposed change meets the current regulations; consistent with defense-in-depth philosophy; and maintains sufficient safety margins.

The staff has approved several plant-specific licensing actions based on RMTS 5B and TSTF-425 methodology. Recently, EEEB staff noted that one of the licensees' who implemented the NRC approved SFCP program, changed the surveillance frequency of emergency diesel generators (EDGs).

Exelon plants have amended their licensing basis to move TS SR into owner controlled documents in accordance with TSTF-425, Revision 3. Some of the plants have now embarked on extending the intervals between successive surveillances based on PRA results. In January 2015, Limerick engineers requested information from Institute of Electrical and Electronic Engineers (IEEE) subcommittee, responsible for EDGs, to provide technical basis for the current surveillance requirement of 18-24 months for validating EDG performance capabilities. The management at the plant wanted to make economic changes to surveillances that could be extended. The IEEE members agreed that the testing interval for EDGs (18-24 months) was prudent and good practice based on operating experience but could not provide technical or regulatory basis for the periodicity. The Exelon plants have extended surveillance frequencies based on their current licensing basis without NRC approval because NRC has approved plant-specific licensing actions based on TSTF 425 and TR NEI 04-10.

### Regulatory Requirements and Guidance

- General Design Criterion (GDC)-17, "Electric power systems," in Appendix A to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires that nuclear power plants have an onsite electric power system and an offsite electric power system to permit the functioning of structures, systems, and components (SSCs) important to safety. The safety function of each system (assuming the other system is not functioning) is to provide sufficient capacity and capability to assure that (1) fuel design limits and design conditions of the reactor coolant boundary are not exceeded as a result of anticipated operational occurrences (AOOs), and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies (including the batteries) and the onsite electric distribution system are required to have sufficient independence, redundancy, and testability to perform their safety functions, assuming a single failure. Electric power from the transmission network to the onsite electric distribution system is required to be supplied by two physically independent circuits designed and located so as to minimize the likelihood of their simultaneous failure. Each of these circuits are required to be designed to be available in sufficient time following a loss of all onsite AC power supplies and the other offsite electric power circuit, to assure that fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits is required to be available within a few seconds following an accident to assure that core cooling, containment integrity, and other vital safety functions are maintained. In addition, GDC-17 requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as the result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

- GDC 18, "Inspection and testing of electric power systems," requires that Electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components. The systems shall be designed with a capability to test periodically (1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses, and (2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system, and the transfer of power among the nuclear power unit, the offsite power system, and the onsite power system.
- Paragraph 50.36(c)(3) of 10 CFR requires that TSs include surveillances which are requirements relating to test, calibration, or inspection to assure that necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.
- Criterion III, "Design Control," and Criterion XI, "Test Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 require that (1) measures be provided for verifying or checking the adequacy of design through design reviews, the use of alternative or simplified calculational methods,

or the performance of a suitable testing program and (2) a test program be established to ensure that systems and components perform satisfactorily and that the test program include operational tests during nuclear power plant operation.

- The Standard Technical Specifications (NUREGs 1430-1434) define "operable/operability" as follows:

A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety functions, 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 function(s) are also capable of performing their related support function(s).

In order to be considered operable, structures, systems and components (SSC) must be capable of performing the safety functions specified by its design, within the required range of design physical conditions, initiation times, and mission times. In addition, TS operability considerations require that SSCs meet all surveillance requirements (as specified in Surveillance Requirement (SR)). A SSC that does not meet a SR must be declared inoperable. For operability determination purposes, the mission time is the duration of SSC operation that is credited in the design basis for the SSC to perform its specified safety function.

In addition, the staff acceptance of electric power system surveillance requirements are based on plant-specific licensing documents and NRC guidance documents such as RG 1.9, "Application, and Testing of Safety-Related Diesel Generators in Nuclear Power Plants," RG 1.118, "Periodic Testing of Electric Power and Protection Systems," RG 1.129, "Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Power Plants."

#### EEEB Staff Review:

The Commission states in its PRA policy Statement that:

"The use of PRA technology should be increased in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy."

Based on review of the SE, the EEEB staff concludes that neither the licensee nor the staff has provided reasonable technical and regulatory bases to conclude that:

- The proposed change meets current regulations;
- The proposed change is consistent with defense-in-depth philosophy;
- The proposed change maintains sufficient safety margins;

Therefore, the EEEB staff concludes that the licensee did not provide adequate assurance that the extended surveillance frequency specifically for electrical power systems could be utilized while maintaining adequate protection of public health and safety and common defense and security.

Safety is the fundamental regulatory objective, and compliance with NRC requirements plays a fundamental role in giving the NRC confidence that safety is being maintained. NRC requirements, including technical specifications, other license conditions, orders, and regulations, have been designed to ensure adequate protection--which corresponds to "no undue risk to public health and safety" through acceptable design, construction, operation, maintenance, modification, and quality assurance measures. In the context of risk-informed regulation, compliance plays a very important role in ensuring that key assumptions used in underlying risk and engineering analyses remain valid.

The Commission's policy on PRA ("Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities," dated August 16, 1995), states the following:

Defense-in-depth is a philosophy used by the NRC to provide redundancy for facilities with "active" safety systems, e.g. a commercial nuclear power [plant], as well as the philosophy of a multiple-barrier approach against fission product releases.

An instructive discussion of the defense-in-depth philosophy also appears in director's decisions relating to a petition on Davis-Besse (FirstEnergy Nuclear Operating Company (Davis-Besse Nuclear Power Station, Unit 1), DD-03-3, 58 NRC 151, 163 (2003)).

The decision described defense-in-depth as encompassing the following requirements:

- (1) require the application of conservative codes and standards to establish substantial safety margins in the design of nuclear plants;
- (2) require high quality in the design, construction, and operation of nuclear plants to reduce the likelihood of malfunctions, and promote the use of automatic safety system actuation features;
- (3) recognize that equipment can fail and operators can make mistakes and, therefore, require redundancy in safety systems and components to reduce the chance that malfunctions or mistakes will lead to accidents that release fission products from the fuel;
- (4) recognize that, in spite of these precautions, serious fuel-damage accidents may not be completely prevented and, therefore, require containment structures and safety features to prevent the release of fission products; and
- (5) further require that comprehensive emergency plans be prepared and periodically exercised to ensure that actions can and will be taken to notify and protect citizens in the vicinity of a nuclear facility.

Based on the above safety principles, the EEEB staff performed the Perry SE concurrence review. The staff's review concluded that the proposed changes to the Perry TS regarding surveillance frequencies of AC and DC electric power systems in accordance with the TS

SFCP, would not satisfy the regulatory requirements specified above and the Perry licensing basis for electric power systems.

Conclusions:

Section 182 of the Atomic Energy Act as implemented by 10 CFR 50.36 requires that those design features of the facility which, if altered or modified, would have a significant effect on safety be included in technical specifications required by 10 CFR 50.36. TSs are to be derived from the analyses and evaluation included in the safety analysis report. They establish, among other things, performance levels of equipment required for safe operation of the facility. The current licensing basis for electric power systems for Perry is in accordance with GDC 18, RG 1.93, and acceptance criteria provided in SRP Chapter 8. Therefore, the proposed Perry TS for Electric Power System changes do not meet the current regulatory requirements and staff requirements for electric power systems, based on deterministic criteria of preventing loss of safety functions of electric power systems and operating within the current licensing bases requirements. In addition, the EEEB staff concludes that the licensee did not demonstrate the proposed TS SFCP would continue to meet the surveillance requirements specified in its current licensing basis.

POTENTIAL IMPACT ON MISSION

The NRC mission to protect public health, safety, and the environment is directly affected by approving the proposed license amendment for Perry using the RMTS 5b methodology because the regulatory requirements, safety margins, and defense in depth for demonstrating the safety functions are compromised (licensing and oversight for reactors).

PROPOSED ALTERNATIVES

Option 1

Delete changes to the surveillance frequencies based on TS SFCP for all applicable TS Section 3.8 from Amendment No. 171. In addition, DORL should ensure that the TS SFCP does not affect changes to other TS system current licensing basis.

Option 2

Since most of the TS systems are affected, approval of the Topical Report (RMTS 5B) should be withdrawn based on not meeting the current regulatory requirements and NRC deterministic design criteria. The staff also notes that a similar risk-informed approach is taken for RMTS 4B (changing completion times) licensing actions. This TR methodology and the staff evaluations also do not support the deterministic criteria and detailed analysis to confirm that equipment reliability is maintained consistent with plant's design basis and accident analyses assumptions. Although TR for RMTS 4B is not within the scope of this NCP, it should be withdrawn so that staff does not take non-conservative plant-specific licensing actions.

Option 3

Deny the amendment based for not meeting the deterministic criteria and current regulatory requirements.

## REASONS FOR THE NON-CONCURRENCE, POTENTIAL IMPACT ON MISSION, AND THE PROPOSED ALTERNATIVES

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Issue:

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In addition, the EEEB staff noted that the original SE (ADAMS Accession No. ML071200238) prepared by APLA staff (principal contributor) for approval of TR NEI 04-10 methodology also did not have adequate regulatory and technical bases to conclude that all deterministic criteria are met. It should be noted that the TR SE was not reviewed by the Office of General Council (OGC) to determine whether there are any legal objections for adopting the proposed methodology to satisfy the current NRC applicable regulations. This could be a potential issue that NRC management should look into to see whether TRs are being approved without sufficient legal and technical bases. EEEB staff’s position is that the approval of the proposed TS Amendment 171 to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant, Unit No. 1, since the APLA staff evaluation did not provide sufficient technical and regulatory bases (deterministic) to show that the changes proposed in the license amendment are

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The SE, in general, is written based on risk-based principles rather than risk-informed principles that complement the deterministic principles. This approach tends to ignore the Perry current licensing basis, regulatory requirements, defense in depth, and safety margins. This is not consistent with the Commission's PRA Policy statement and deterministic principles stated in RG 1.177 and RG 1.174. It also does not meet the requirements for Electrical Power Systems. The plant can operate safely only if it operates within the established design bases and licensing basis and within accident analyses assumptions including TS limiting conditions for Operation (LCO).

#### REASONS FOR THE NON-CONCURRENCE

The surveillance frequencies specified in Section 3.8 for AC and DC Electric Power Systems of the current Perry TSs are being revised in accordance with the Surveillance Frequency Control Program specified in TR NEI 04-10 and TSTF. In addition, there are no backstops provided in the TS SFCP to limit the frequency interval for SSCs to demonstrate SSCs can perform their intended design safety functions. The EEEB staff determined that the revised surveillance frequency, if implemented, would violate the current licensing and design basis for Perry. This is because neither the staff SE nor the industry documents provided sufficient regulatory and technical bases to conclude that the proposed change meets the current regulations; consistent with defense-in-depth philosophy; and maintains sufficient safety margins.

The staff has approved several plant-specific licensing actions based on RMTS 5B and TSTF-425 methodology. Recently, EEEB staff noted that one of the licensees' who implemented the NRC approved SFCP program, changed the surveillance frequency of emergency diesel generators (EDGs).

Exelon plants have amended their licensing basis to move TS SR into owner controlled documents in accordance with TSTF-425, Revision 3. Some of the plants have now embarked on extending the intervals between successive surveillances based on PRA results. In January 2015, Limerick engineers requested information from Institute of Electrical and Electronic Engineers (IEEE) subcommittee, responsible for EDGs, to provide technical basis for the current surveillance requirement of 18-24 months for validating EDG performance capabilities. The management at the plant wanted to make economic changes to surveillances that could be extended. The IEEE members agreed that the testing interval for EDGs (18-24 months) was prudent and good practice based on operating experience but could not provide technical or regulatory basis for the periodicity. The Exelon plants have extended surveillance frequencies based on their current licensing basis without NRC approval because NRC has approved plant-specific licensing actions based on TSTF 425 and TR NEI 04-10.

## Regulatory Requirements and Guidance

- General Design Criterion (GDC)-17, "Electric power systems," in Appendix A to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires that nuclear power plants have an onsite electric power system and an offsite electric power system to<sup>15</sup> permit the functioning of structures, systems, and components (SSCs) important to safety. The safety function of each system (assuming the other system is not functioning) is to provide sufficient capacity and capability to assure that (1) fuel design limits and design conditions of the reactor coolant boundary are not exceeded as a result of anticipated operational occurrences (AOOs), and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies (including the batteries) and the onsite electric distribution system are required to have sufficient independence, redundancy, and testability to perform their safety functions, assuming a single failure. Electric power from the transmission network to the onsite electric distribution system is required to be supplied by two physically independent circuits designed and located so as to minimize the likelihood of their simultaneous failure. Each of these circuits are required to be designed to be available in sufficient time following a loss of all onsite AC power supplies and the other offsite electric power circuit, to assure that fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits is required to be available within a few seconds following an accident to assure that core cooling, containment integrity, and other vital safety functions are maintained. In addition, GDC-17 requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as the result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

- GDC 18, "Inspection and testing of electric power systems," requires that Electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components. The systems shall be designed with a capability to test periodically (1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses, and (2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system, and the transfer of power among the nuclear power unit, the offsite power system, and the onsite power system.
- Paragraph 50.36(c)(3) of 10 CFR requires that TSs include surveillances which are requirements relating to test, calibration, or inspection to assure that necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.
- Criterion III, "Design Control," and Criterion XI, "Test Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 require that (1) measures be provided for verifying or checking the adequacy of design through design reviews, the use of alternative or simplified calculational methods,

or the performance of a suitable testing program and (2) a test program be established to ensure that systems and components perform satisfactorily and that the test program include operational tests during nuclear power plant operation.

- The Standard Technical Specifications (NUREGs 1430-1434) define "operable/operability" as follows:

A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety functions, 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 function(s) are also capable of performing their related support function(s).

In order to be considered operable, structures, systems and components (SSC) must be capable of performing the safety functions specified by its design, within the required range of design physical conditions, initiation times, and mission times. In addition, TS operability considerations require that SSCs meet all surveillance requirements (as specified in Surveillance Requirement (SR)). A SSC that does not meet a SR must be declared inoperable. For operability determination purposes, the mission time is the duration of SSC operation that is credited in the design basis for the SSC to perform its specified safety function.

In addition, the staff acceptance of electric power system surveillance requirements are based on plant-specific licensing documents and NRC guidance documents such as RG 1.9, "Application, and Testing of Safety-Related Diesel Generators in Nuclear Power Plants," RG 1.118, "Periodic Testing of Electric Power and Protection Systems," RG 1.129, "Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Power Plants."

#### EEEB Staff Review:

The Commission states in its PRA policy Statement that:

"The use of PRA technology should be increased in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy."

Based on review of the SE, the EEEB staff concludes that neither the licensee nor the staff has provided reasonable technical and regulatory bases to conclude that:

- The proposed change meets current regulations;
- The proposed change is consistent with defense-in-depth philosophy;
- The proposed change maintains sufficient safety margins;

Therefore, the EEEB staff concludes that the licensee did not provide adequate assurance that the extended surveillance frequency specifically for electrical power systems could be utilized while maintaining adequate protection of public health and safety and common defense and security.

Safety is the fundamental regulatory objective, and compliance with NRC requirements plays a fundamental role in giving the NRC confidence that safety is being maintained. NRC requirements, including technical specifications, other license conditions, orders, and regulations, have been designed to ensure adequate protection--which corresponds to "no undue risk to public health and safety" through acceptable design, construction, operation, maintenance, modification, and quality assurance measures. In the context of risk-informed regulation, compliance plays a very important role in ensuring that key assumptions used in underlying risk and engineering analyses remain valid.

The Commission's policy on PRA ("Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities," dated August 16, 1995), states the following:

Defense-in-depth is a philosophy used by the NRC to provide redundancy for facilities with "active" safety systems, e.g. a commercial nuclear power [plant], as well as the philosophy of a multiple-barrier approach against fission product releases.

An instructive discussion of the defense-in-depth philosophy also appears in director's decisions relating to a petition on Davis-Besse (FirstEnergy Nuclear Operating Company (Davis-Besse Nuclear Power Station, Unit 1), DD-03-3, 58 NRC 151, 163 (2003)).

The decision described defense-in-depth as encompassing the following requirements:

- (1) require the application of conservative codes and standards to establish substantial safety margins in the design of nuclear plants;
- (2) require high quality in the design, construction, and operation of nuclear plants to reduce the likelihood of malfunctions, and promote the use of automatic safety system actuation features;
- (3) recognize that equipment can fail and operators can make mistakes and, therefore, require redundancy in safety systems and components to reduce the chance that malfunctions or mistakes will lead to accidents that release fission products from the fuel;
- (4) recognize that, in spite of these precautions, serious fuel-damage accidents may not be completely prevented and, therefore, require containment structures and safety features to prevent the release of fission products; and
- (5) further require that comprehensive emergency plans be prepared and periodically exercised to ensure that actions can and will be taken to notify and protect citizens in the vicinity of a nuclear facility.

Based on the above safety principles, the EEEB staff performed the Perry SE concurrence review. The staff's review concluded that the proposed changes to the Perry TS regarding surveillance frequencies of AC and DC electric power systems in accordance with the TS

SFCP, would not satisfy the regulatory requirements specified above and the Perry licensing basis for electric power systems.

#### Conclusions:

Section 182 of the Atomic Energy Act as implemented by 10 CFR 50.36 requires that those design features of the facility which, if altered or modified, would have a significant effect on safety be included in technical specifications required by 10 CFR 50.36. TSs are to be derived from the analyses and evaluation included in the safety analysis report. They establish, among other things, performance levels of equipment required for safe operation of the facility. The current licensing basis for electric power systems for Perry is in accordance with GDC 18, RG 1.93, and acceptance criteria provided in SRP Chapter 8. Therefore, the proposed Perry TS for Electric Power System changes do not meet the current regulatory requirements and staff requirements for electric power systems, based on deterministic criteria of preventing loss of safety functions of electric power systems and operating within the current licensing bases requirements. In addition, the EEEB staff concludes that the licensee did not demonstrate the proposed TS SFCP would continue to meet the surveillance requirements specified in its current licensing basis.

#### POTENTIAL IMPACT ON MISSION

The NRC mission to protect public health, safety, and the environment is directly affected by approving the proposed license amendment for Perry using the RMTS 5b methodology because the regulatory requirements, safety margins, and defense in depth for demonstrating the safety functions are compromised (licensing and oversight for reactors).

#### PROPOSED ALTERNATIVES

##### Option 1

Delete changes to the surveillance frequencies based on TS SFCP for all applicable TS Section 3.8 from Amendment No. 171. In addition, DORL should ensure that the TS SFCP does not affect changes to other TS system current licensing basis.

##### Option 2

Since most of the TS systems are affected, approval of the Topical Report (RMTS 5B) should be withdrawn based on not meeting the current regulatory requirements and NRC deterministic design criteria. The staff also notes that a similar risk-informed approach is taken for RMTS 4B (changing completion times) licensing actions. This TR methodology and the staff evaluations also do not support the deterministic criteria and detailed analysis to confirm that equipment reliability is maintained consistent with plant's design basis and accident analyses assumptions. Although TR for RMTS 4B is not within the scope of this NCP, it should be withdrawn so that staff does not take non-conservative plant-specific licensing actions.

##### Option 3

Deny the amendment based for not meeting the deterministic criteria and current regulatory requirements.

NRC FORM 757  
NRC MD 10.158  
(07-2015)

U. S. NUCLEAR REGULATORY COMMISSION

NCP TRACKING NUMBER

**NON-CONCURRENCE PROCESS**

NCP-2015-009 *GBM*  
*012*

**SECTION B - TO BE COMPLETED BY NON-CONCURRING EMPLOYEE'S SUPERVISOR**

**TITLE OF SUBJECT DOCUMENT**

License Amendment No. 171 to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant

ADAMS ACCESSION NO.  
MI.15307A349

**NAME**

Jacob I. Zimmerman

**TITLE**

Chief, Electrical Engineering Branch

TELEPHONE NUMBER  
(301) 415-1220

**ORGANIZATION**

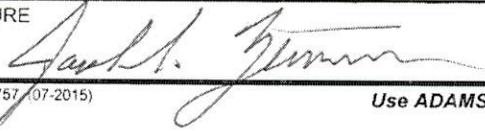
NRR/Division of Engineering

**COMMENTS FOR THE NCP REVIEWER TO CONSIDER (use continuation pages or attach Word document)**

I agree with the comments, logic, and reasoning provided by the Electrical Engineering Branch (EEEB) staff expressing their concerns with approving the Perry license amendment request (LAR) to relocate the periodic frequencies of Technical Specification surveillances to the Surveillance Frequency Control Program (SFCP) for the AC and DC electric power systems.

My recommendation to the NCP Reviewer is to seriously consider the concerns of the EEEB staff and withhold approval of the Perry LAR and other similar LARs until all issues are appropriately addressed.

**SIGNATURE**



**DATE**

*12/15/15*

NCP-2015-012

## NON-CONCURRENCE PROCESS

### SECTION C - TO BE COMPLETED BY NCP COORDINATOR

TITLE OF SUBJECT DOCUMENT	ADAMS ACCESSION NO.
LAR 171 to FOL No. NPF-58 for Perry Nuclear Power Plant	ML15307A349

NAME	
G. Edward Miller	

TITLE	TELEPHONE NUMBER
Project Manager	301-415-24

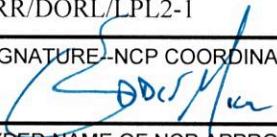
ORGANIZATION	
NRR/DORL/LPL2-1	

AGREED UPON SUMMARY OF ISSUES (use continuation pages or attach Word document)
Please see attached document

EVALUATION OF NON-CONCURRENCE AND RATIONALE FOR DECISION (use continuation pages or attach Word document)
Please see attached document

TYPED NAME OF NCP COORDINATOR	TITLE
G. Edward Miller	Project Manager

ORGANIZATION	
NRR/DORL/LPL2-1	

SIGNATURE--NCP COORDINATOR	DATE
	JAN 22, 2016

TYPED NAME OF NCP APPROVER	TITLE
George Wilson	Deputy Director

ORGANIZATION	
NRR/DORL	

SIGNATURE--NCP APPROVER	DATE
	1/22/16

As the NCP Approver, I have read and considered the submission from EEEB staff. Prior to discussion of the issues, I would like to acknowledge the work of the EEEB staff and thank them for participating in the non-concurrence process. Although we don't always agree on particular issues, it is important for staff to raise issues they perceive for consideration by all involved parties.

The EEEB Non-concurrence has four core objections to the proposed license amendment request (LAR):

1. The proposed amendment would modify the Perry Technical Specification (TSs) in a manner that doesn't meet the current licensing basis of Perry and NRC regulatory requirements. Specifically, General Design Criteria (GDC) 17, GDC 18, 10 CFR 50.36(c)(3), and 10 CFR 50 Appendix B Criterion III. Further, that the proposed change is risk-based and not risk-informed.
2. The Topical Report SE was not reviewed by the Office of the General Counsel (OGC).
3. There are no backstops provided for the Surveillance Requirement (SR) frequencies that have been relocated to the licensee controlled document.
4. The extension does not take into account the Industry standards and vendor recommendations.

The following is a response to each of the four core objections raised by the EEEB staff:

1. The TS Limiting Conditions for Operation (LCOs) are the lowest functional capability or performance levels of equipment required for safe operation of the facility. The FSAR documents the conformance of the plant design to the regulations. The analyses in the FSAR form the bases from which the TS are derived. The specific values, functions, or equipment required by the TS under normal conditions are selected to assure that the system or component will be able to carry out its design functions under accident and transient conditions, including maintaining Defense-in-Depth.

FENOC has not proposed any changes to any LCOs within the Perry TSs as part of this LAR. As such, the proposed LAR cannot impact the manner in which the plant meets the various GDC or Appendix B Criterion cited in the non-concurrence. Instead, the NRC staff's review of the proposed change is governed by 10 CFR 50.36(c)(3). Specifically, the NRC staff needs to verify that proposed SRs<sup>1</sup> continue to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met. The LAR also does not propose any changes to the actual surveillances (i.e., the activity to be performed), only the frequency at which the surveillance would be performed is allowed to be relocated to a licensee controlled program.

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<sup>1</sup> In this context, the SR includes both the activity to be performed and the specific frequency at which the activity need be performed.

As discussed in the NRC staff's SE, the programmatic control of SR frequencies proposed by FENOC would include qualitative considerations, the results of risk-analyses, sensitivity studies, and bounding analyses, as necessary. As discussed in the NRC staff SE for the TR, a frequency determined in a manner that considers these factors will continue to meet 10 CFR 50.36(c)(3). Further, the factors listed previously, continue to incorporate deterministic factors, which would not be included in a risk-based program.

Additionally, changing the interval between performances of a surveillance does not affect the overall design of the system or plant therefore the overall safety margins are unaffected.

Given the above considerations, I find that the proposed LAR would not adversely impact the manner in which the TSs meet the applicable regulatory requirements.

2. Per Office Instruction LIC-500, the only OGC involvement with the review of a Topical Report (TR) is with respect to the Congressional Review Act (CRA). Specifically, OGC provides a determination of whether the TR constitutes a rule, as defined under the CRA. There is no requirement for seeking OGC review on the NRC staff SE for the Topical Report. In accordance with the practice of STSB (Formerly ITSB), OGC was provided the model SE for TSTF-425, Revision 3, and on June 4, 2009, indicated that they had no legal objection to the document (ADAMS Accession No. ML091800157). Additionally, I would note that neither the action of approving the TR or the TSTF has the effect of modifying any license. For a licensee to adopt either of these documents, said licensee would need to apply for a plant-specific license amendment request. In accordance with LIC-101, OGC review of the associated SE would be sought. A quick spot-check in ADAMS of previously issued TSTF-425 LARs identified no instance where OGC review was not received.
3. The non-concurrence indicated that the frequencies lacked an overall backstop or maximum surveillance interval extension allowed. This is true, however, it is by design. Since there is such a great range of frequencies at which SRs may be required (e.g., some are weekly while others are once every outage), applying a single numerical maximum would likely be impractical and have unintended consequences. Instead, the program limits the magnitude of any one increase in a surveillance test interval (STI) to an increase to the next logical interval or relies on a phased approach. Typically, the STI increase is based on the previous three performances having been satisfactory, when the STI is  $\leq$  6 months, or previous two performances, when the STI is  $>$  6 months. Additionally, should an SR produce unsatisfactory results as a result of the extended STI, the program would force the STI to revert to the previously acceptable frequency. This approach ensures that, while risk-insights can be utilized in determining a frequency, there remain deterministic limits as well.
4. Below is listed the steps from the TR that demonstrate that the proposed change does account for industry standards and vendor manuals:

Excerpts from Step 6:

In general, the next logical STI given in technical specifications is chosen for improvement. For example, an STI of one month would be changed to quarterly, quarterly to semi-annual, semi-annual to annual, etc. If a STI was chosen which goes beyond the next logical interval, a phased implementation would probably be more appropriate and would need to be considered in Step 15.

Excerpts from Step 7, Identify Qualitative Considerations to be addressed:

- Surveillance test and performance history of the components and system associated with the STI adjustment.
- Impact on defense-in-depth protection
- Vendor-specified maintenance frequency
- Test intervals specified in applicable industry codes and standards, e.g., ASME, IEEE, etc.
  - Document that a review of both the committed and current version of applicable industry codes and standards was performed.
  - Any deviations from STIs specified in applicable industry codes and standards currently committed to in the plant licensing basis shall be reviewed and documented
- Document that assumptions in the plant licensing basis would not be invalidated when performing the surveillance at the bounding interval limit for the proposed STI change. For example, if the assumptions in the plant licensing basis would be invalidated at the bounding STI, the STI could be limited accordingly or a more conservative acceptance criteria could be established, as appropriate.
- The degree to which the surveillance provides a conditioning exercise to maintain equipment operability, for example, lubrication of bearings or electrical contact wiping (cleaning) of built up oxidation, and limit the STI accordingly.

From Step 18, Monitoring and feedback (p. 28 in the TR)

First performance monitoring should help confirm that no failure mechanisms that are related to the revised surveillance frequencies become important enough to alter the failure rates assumed in the justification of program changes. Second, performance monitoring should, to the extent practicable, ensure that adequate component capability (i.e., margin) exists relative to design-basis conditions so that component operating characteristics, over time, do not result in reaching a point of insufficient margin before the next scheduled test.

For acceptance guidelines, monitoring programs need be proposed that are capable of adequately tracking the performance of equipment that, when degraded, could alter the conclusions that were key to supporting the acceptance of revised surveillance frequencies. Monitoring programs should be structured such that SSCs are monitored commensurate with their safety significance. This allows for a reduced level of monitoring of components categorized as having low safety significance.

The performance monitoring process should have the following attributes:

- Enough tests are included to provide meaningful data.
- The test is devised such that incipient degradation can reasonably be expected to be detected.
- The licensee trends appropriate parameters as necessary, to provide reasonable assurance that the component will remain operable over the test interval

In Conclusion the DIRS and DRA staff welcome the continuous feedback and improvement of this and other programs. I would call out the IP 71111.22, Appendix A for 5b, as well as the fact that we get feedback from the SRAs and can work with DIRS to improve the process. We also have IMC 0801, ROP Feedback Program, so that others can make recommendations.

Additionally, we welcome feedback on the TRs such as NEI 04-10, Rev. 1, and NEI 06-09. If the staff identifies specific concerns or issues with the NRC-approved TR (either the TR or the SE approving them) they should bring them up utilizing the appropriate process, so that the issues can be resolved. Additionally, I would note that, we are not trying to push these reviews through on precedent, instead we have the forward fit policy (refer to ML101960180, footnote 2 for background) and LIC-202, so if there is ever a specific technical concern with one of these applications (e.g., a SR should be excluded, but isn't under the TSTF), we can pursue it.

Given the questions raised by the non-concurrence, I am directing that the associated SE be augmented to include the following language to further clarify the issue:

The SSC failure rate (per unit time) is assumed to be unaffected by the change in test frequency, such that the failure probability is assumed to increase linearly with time, and will be confirmed by the required monitoring and feedback implemented after the change in surveillance frequency is implemented. The NEI 04-10 process requires consideration of qualitative sources of information with regards to potential impacts of test frequency on SSC performance, including industry and plant-specific operating experience, vendor recommendations, industry standards, and code-specified test intervals. Thus, the process is not reliant upon risk analyses as the sole basis for the proposed changes.

The potential benefits of a reduced surveillance frequency, including reduced downtime and reduced potential for restoration errors, test-caused transients, and test-caused wear of equipment, are identified qualitatively, but not quantitatively assessed.

NEI 04 10, Revision 1, requires performance monitoring of SSCs whose surveillance frequencies have been revised as part of a feedback process to assure that the change in test frequency has not resulted in degradation of equipment performance and operational safety. The monitoring and feedback includes consideration of Maintenance Rule monitoring of equipment performance. In the event of SSC performance degradation, the surveillance frequency will be reassessed in accordance with the methodology, in addition to any corrective actions which may be required by the Maintenance Rule.