April 27, 2007

Mr. L. W. Pearce
Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-PY-A290
P.O. Box 97, 10 Center Road
Perry, OH 44081-0097

SUBJECT: PERRY NUCLEAR POWER PLANT, UNIT NO. 1 - ISSUANCE OF AMENDMENT RE: REVISE TECHNICAL SPECIFICATIONS TO CHANGE THE FREQUENCY OF THE MODE 5 INTERMEDIATE RANGE MONITORING INSTRUMENTATION CHANNEL FUNCTIONAL TEST (TAC NO. MD0144)

Dear Mr. Pearce:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No.141 to Facility Operating License No. NPF-58 for the Perry Nuclear Power Plant, Unit No. 1. This amendment revises the Technical Specifications (TSs) in response to your application dated February 14, 2006, as supplemented by letters dated October 17, 2006, and February 8, 2007.

This amendment revises Perry Nuclear Power Plant, Unit No. 1 TS, to change the frequency of the Mode 5 Intermediate Range Monitoring Instrumentation CHANNEL FUNCTIONAL TEST contained in TS 3.3.1.1, from 7 days to 31 days.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/
Thomas J. Wengert, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosures: 1. Amendment No. 141 to NPF-58
2. Safety Evaluation

cc w/encls: See next page

April 27, 2007

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FirstEnergy Nuclear Operating Company
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2. Safety Evaluation

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Perry Nuclear Power Plant, Unit No. 1

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FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRSTENERGY NUCLEAR GENERATION CORP.

OHIO EDISON COMPANY

DOCKET NO. 50-440

PERRY NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.141
License No. NPF-58

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for license filed by FirstEnergy Nuclear Operating Company, et al., (the licensee) dated February 14, 2006, as supplemented by letters dated October 17, 2006, and February 8, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 141 are hereby incorporated into this license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of its issuance and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Russell A. Gibbs, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications and Facility Operating License

Date of Issuance: April 27, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 141

FACILITY OPERATING LICENSE NO. NPF-58

DOCKET NO. 50-440

Replace the following pages of the Facility Operating License and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
License Page 4	License Page 4
3.3-6	3.3-6
3.3-7	3.3-7

renewal. Such sale and leaseback transactions are subject to the representations and conditions set forth in the above mentioned application of January 23, 1987, as supplemented on March 3, 1987, as well as the letter of the Director of the Office of Nuclear Reactor Regulation dated March 16, 1987, consenting to such transactions. Specifically, a lessor and anyone else who may acquire an interest under these transactions are prohibited from exercising directly or indirectly any control over the licenses of PNPP Unit 1. For purposes of this condition the limitations of 10 CFR 50.81, as now in effect and as may be subsequently amended, are fully applicable to the lessor and any successor in interest to that lessor as long as the license for PNPP Unit 1 remains in effect; these financial transactions shall have no effect on the license for the Perry Nuclear facility throughout the term of the license.

(b) Further, the licensees are also required to notify the NRC in writing prior to any change in: (i) the terms or conditions of any lease agreements executed as part of these transactions; (ii) the PNPP Operating Agreement; (iii) the existing property insurance coverage for PNPP Unit 1; and (iv) any action by a lessor or others that may have an adverse effect on the safe operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission’s regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now and hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) <u>Maximum Power Level</u>

FENOC is authorized to operate the facility at reactor core power levels not in excess of 3758 megawatts thermal (100% power) in accordance with the conditions specified herein.

(2) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 141, are hereby incorporated into the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) <u>Antitrust Conditions</u>

a. FirstEnergy Nuclear Generation Corp. and Ohio Edison Company

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 141 TO FACILITY OPERATING LICENSE NO. NPF-58

FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRSTENERGY NUCLEAR GENERATION CORP.

OHIO EDISON COMPANY

PERRY NUCLEAR POWER PLANT, UNIT NO. 1

DOCKET NO. 50-440

1.0 INTRODUCTION

By letter to the Nuclear Regulatory Commission (NRC, the Commission) dated February 14, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML060540393) as supplemented by letters dated October 17, 2006 (ADAMS Accession No. ML062970446) and February 8, 2007 (ADAMS Accession No. ML070470263), FirstEnergy Nuclear Operating Company, et al. (FENOC, the licensee) requested changes to the technical specifications (TSs) for the Perry Nuclear Power Plant, Unit No. 1 (PNPP). The October 17, 2006, and February 8, 2007, supplements contained clarifying information and did not change the NRC staff's initial proposed finding of no significant hazards consideration. The proposed changes would revise the frequency of the Mode 5 Intermediate Range Monitoring (IRM) Instrumentation CHANNEL FUNCTIONAL TEST from 7 days to 31 days. Specifically, the proposed changes would modify:

1.1 TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"

A new Surveillance Requirement (SR) has been added, SR 3.3.1.1.19, requiring the channel functional test to be performed every 31 days.

1.2 TS Table 3.3.1.1-1 (page 1 of 3), "Reactor Protection System Instrumentation"

The SR for functions 1a and 1b have been changed from SR 3.3.1.1.5 to SR 3.3.1.1.19, which effectively increases the surveillance test interval for the Mode 5 channel functional test from 7 days to 31 days.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Paragraph 50.36(c)(3), "Surveillance Requirements," defines SRs as 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. Also, 10 CFR Part 50, Appendix A, General Design Criterion 21, "Protection system reliability and testability," requires in part that the protection system be designed for high functional reliability and inservice testability such that "(1) no single failure results in loss of protection function, and (2) removal from service of any component or channel does not result in loss of the required minimum redundancy unless the acceptable reliability of operation of the protection system can be otherwise demonstrated."

The licensee's evaluation was based on an analysis of instrument component drift performance with reference to Generic Letter (GL) 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," and not on a component reliability analysis as in previous channel functional test evaluations. The licensee's amendment request was based on a traditional engineering analysis instead of the guidance in Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-informed Decisions on Plant-Specific Changes to the Licensing Basis," and RG 1.177, "An Approach for Plant-Specific Risk Informed Decision Making: Technical Specifications."

3.0 TECHNICAL EVALUATION

3.1 Background

The primary purpose of the surveillance testing is to assure that the components in a standby system (safety system) will be operable when needed. The risk contribution associated with the surveillance test interval (STI) is mainly due to the possibility that the component will fail between consecutive tests. Testing these components detects failures that may have occurred since the last surveillance, thus limiting the risk due to undetected failures. However, increasing the time between surveillance tests may also have some benefits. Increased STIs may reduce test-induced transients, test-caused failures, equipment wear, and reduce resource requirements for testing. The disadvantage is that the time that a component will be subject to failure (the fault exposure time) increases with an increased STI.

Previous generic studies, including NEDC-30851P-A, "Technical Specification Improvement Analysis for BWR Reactor Protection System," evaluated the relaxation of STIs for boiling water reactor (BWR) reactor protection system (RPS) instrumentation, including analog transmitter trip units and channel-functional-test-related instrumentation. The current 3-month surveillance interval for channel functional testing is based on topical reports submitted by General Electric Co. (GE), of which NEDC-30851P-A is representative. These reports presented an approach using reliability analysis to identify improvements in testing intervals and allowable outage times (AOTs) for the RPS and related instrumentation. As part of the NEDC-30851P-A evaluation, sensitivity studies were performed on RPS trip system fault trees. GE found that for each initiating event the RPS unavailability was relatively insensitive to the change in component failure rates. The impact on RPS failure frequency was also found to be negligible.

In the safety evaluation reports (SERs) for NEDC-30851P-A dated July 15, 1987, and January 24, 1988, the NRC staff also concluded that uncertainties in component failure rates do not significantly affect RPS unavailability. The NRC staff also concluded that the estimated increase in RPS's unavailability due to the proposed TS changes would not result in a significant net change in the core damage frequency. Therefore, the NRC staff found a quarterly functional test interval to be acceptable. However, the RPS IRM functions were not explicitly modeled in NEDC-30851P-A. Consequently, NEDC-30851P-A did not propose changes to the existing functional test frequency of the RPS IRM function.

3.2 Evaluation of TS Changes to Test Frequency

The licensee evaluated the proposed TS changes in accordance with the guidance provided in GL 91-04. In accordance with GL 91-04, the licensee should provide the following information, to provide an acceptable basis for increasing the calibration interval for instruments that are used to perform safety functions:

(1) Confirm that instrument drift as determined by as-found and as-left calibration data from surveillance and maintenance records has not, except on rare occasions, exceeded acceptable limits for a calibration interval.

(2) Confirm that the values of drift for each instrument types (make, model, and range) and applications have been determined with a high probability and a high degree of confidence. Provide a summary of the methodology and assumptions used to determine the rate of instrument drift with time based upon historical plant calibration data.

(3) Confirm that the magnitude of instrument drift has been determined with a high probability and a high degree of confidence for a bounding calibration interval of 30 months for each instrument type (make, model number, and range) and application that performs a safety function. Provide a list of the channels by TS section that identifies these instrument applications.

(4) Confirm that a comparison of the projected instrument drift errors has been made with the values of drift used in the setpoint analysis. If this results in revised setpoints to accommodate larger drift errors, provide the proposed TS changes to update trip setpoints. If the drift errors result in a revised safety analysis to support existing setpoints, provide a summary of the updated analysis conclusions to confirm that safety limits and safety analysis assumptions are not exceeded.

(5) Confirm that the projected instrument errors caused by drift are acceptable for control of plant parameters to effect a safe shutdown with the associated instrumentation.

(6) Confirm that all conditions and assumptions of the setpoint and safety analyses have been checked and are appropriately reflected in the acceptance criteria of plant surveillance procedures for channel checks, channel functional tests, and channel calibrations.

(7) Provide a summary description of the program for monitoring and assessing the effects of increased calibration surveillance intervals of instrument drift and its effect on safety.

The licensee has performed a safety assessment of the proposed changes to the STI in accordance with the GL 91-04 guidance given above. This assessment entailed reviewing the historical maintenance and surveillance test data at the bounding STI limit, performing an evaluation to ensure that a 31-day interval for the functional test would not invalidate any assumptions in the plant licensing basis and the determination that the effect of the STI extension is small. The licensee performed analysis of the drift for IRM instrumentation and determined that the drift is less than the value assumed in the PNPP calculation. Therefore, there was no change to the plant surveillance procedures. Also, the licensee did not request any TS changes associated with instrument setpoints or allowable values in this amendment request. Therefore, the NRC staff has not reviewed the instrument setpoint methodology for PNPP in this safety evaluation.

As discussed above, STI extension requests are usually risk-informed, performance-based submittals. However, the IRMs are used only during startup/shutdown and refueling mode and, therefore, are not included in the risk model. On that basis, the NRC staff agreed to review the licensee's engineering analysis to demonstrate that the failure of IRMs will not be safety significant. The NRC staff was concerned with the number of failures identified in the licensee's submittal and, consequently, requested the licensee to justify these failures. The licensee, in their letter of October 17, 2006, identified that there were 21 component failures in addition to 13 S4 switch failures.

The licensee further stated that an S4 switch failure does not affect the operability of the IRM function, since the S4 switch is used only during testing. During a conference call on December 6, 2006, the NRC staff asked the licensee to separate these failures and identify only those failures identified by the Mode 5 surveillance testing. The licensee, during the conference call of December 6, 2006, informed the NRC staff that only 4 failures were associated with Mode 5 channel functional tests.

The NRC staff requested the licensee to justify these failures with 95 percent statistical confidence that the failures of an IRM will not result in the loss of the functional requirements of the system. The licensee, by letter dated February 8, 2007, informed the NRC staff that a statistical analysis using a Poisson distribution was performed, and that the analysis indicated that there is greater than 95 percent confidence that the probability of experiencing no more then one failure per 31 days (proposed surveillance test interval) is 95 percent. The licensee has further determined that, with only one channel failure, the required number of IRM channels for both trip systems will be available and therefore, the IRM function will be operable, but degraded.

The licensee has also identified that in the unlikely event that an IRM high-flux trip function loses trip capability in such a manner as to be undetectable, the average power range monitor (APRM) high flux (setdown) trip function is redundant to the IRM high flux trip. Also, TS Section 3.3.1.1, SR 3.3.1.1.6 requires that source range monitors (SRMs) and IRMs be determined to overlap during each startup and SR 3.3.1.1.7 requires that IRMs and APRMs be determined to overlap during each controlled shutdown. Therefore, inoperable IRMs will be detected before neutron flux exceeds the range of the SRMs and before a controlled shutdown by the APRMs. Based on this, the risk in Mode 2 is minimal.

In Mode 5, the IRMs provide core neutron monitoring and protection against an unexpected reactivity excursion which could be caused by a control rod removal or withdrawal. The PNPP Updated Safety Analysis Report (USAR) Section 15.4.1.1, “Control Rod Removal Error During Refueling”, describes that, through plant design features (control rod blocks and refueling interlocks) and procedural controls, the event is prevented. The USAR section indicates that multiple failures are needed in order for the reactivity excursion to occur. The probability of this combined with an IRM failure is considered unlikely.

Based on the above discussion, the licensee has demonstrated that the PNPP IRMs have operated reliably and, in the event of IRM failures, backups are available to the operator to take necessary corrective actions. Failure of IRMs have not been shown to result in any increase in safety significance.

On the basis of its review, the NRC staff concludes that the proposed methodologies to extend surveillance intervals for certain safety-related instrumentation components are consistent with the guidance in GL 91-04. Specifically, the licensee has demonstrated that the effect of extending the STI to 31 days for channel functional testing of IRM instrumentation in Mode 5 is negligible, and the system will continue to perform within assumed limits during the longer STI. Therefore, the NRC staff finds that the STI extension for channel functional testing is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Ohio State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a surveillance requirement with respect to use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (71 FR 15484; March 28, 2006). Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

6.0 CONCLUSION

The NRC staff has concluded, based on the considerations discussed above, that: (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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: H. Garg, NRR

Date: April 27, 2007