



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 17, 2015

Mr. Ernest J. Harkness
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 CONCERNING TECHNICAL SPECIFICATION 3.8.4 "DC
SOURCES – OPERATING" (TAC NO. MF5298) (L-14-271)

Dear Mr. Harkness:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 170 to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant, Unit No. 1. The amendment consists of changes to the technical specifications (TSs) in response to your application dated November 24, 2014, as supplemented by letter dated May 12, 2015.

The amendment revises the battery capacity testing surveillance requirements in the TSs to reflect test requirements when the battery is near end of life.

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, reading "Kimberly J. Green", is positioned above the typed name.

Kimberly J. Green, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosures:

1. Amendment No. 170 to NPF-58
2. Safety Evaluation

cc w/encls: Distribution via ListServ



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRSTENERGY NUCLEAR GENERATION, LLC

OHIO EDISON COMPANY

DOCKET NO. 50-440

PERRY NUCLEAR POWER PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 170
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, FENOC), dated November 24, 2014, as supplemented by letter dated May 12, 2015, 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.

Enclosure 1

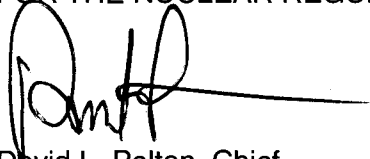
2. Accordingly, the license is amended by changes to the Technical Specifications (TSs) as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 170, 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 the date of its issuance, and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read 'D. Pelton', with a long horizontal line extending to the right.

David L. Pelton, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating License
and Technical Specifications

Date of Issuance: August 17, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 170

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

License NPF-58

- 4 -

TSs

3.8-27

INSERT

License NPF-58

- 4 -

TSs

3.8-27

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) Maximum Power Level

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) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 170 are hereby incorporated into the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.
 - (3) Antitrust Conditions
 - a. FirstEnergy Nuclear Generation, LLC and Ohio Edison Company

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8 4.8 -----NOTE----- Credit may be taken for unplanned events that satisfy this SR -----</p> <p>Verify battery capacity is $\geq 80\%$ of the manufacturer's rating when subjected to a performance discharge test.</p>	<p>60 months</p> <p><u>AND</u></p> <p>12 months when battery shows degradation, or has reached 85% of the expected life with capacity < 100% of manufacturer's rating</p> <p><u>AND</u></p> <p>24 months when battery has reached 85% of the expected life with capacity $\geq 100\%$ of manufacturer's rating</p>



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. NPF-58
FIRSTENERGY NUCLEAR OPERATING COMPANY
FIRSTENERGY NUCLEAR GENERATION, LLC
OHIO EDISON COMPANY
PERRY NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-440

1.0 INTRODUCTION

By application dated November 24, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14328A665), as supplemented by letter dated May 12, 2015 (ADAMS Accession No. ML15149A163), 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 letter dated May 12, 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 or Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 17, 2015 (80 FR 13907).

The proposed change would revise TSs, Surveillance Requirement (SR) 3.8.4.8 frequencies for battery capacity testing to be consistent with the battery capacity testing frequencies recommended by the Institute of Electrical and Electronics Engineers (IEEE) Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications." The proposed changes would also add a note allowing credit to be taken for unplanned events that satisfy SR 3.8.4.8.

2.0 REGULATORY EVALUATION

The following NRC requirements and guidance documents are applicable to the NRC staff's review of the license amendment request (LAR):

General Design Criterion (GDC) 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, Part 50, of the *Code of Federal Regulations* (10 CFR) requires, in part, that nuclear power plants have onsite and offsite electric power

systems to permit the functioning of structures, systems, and components that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure.

GDC-18, "Inspection and testing of electric power systems," requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.

10 CFR 50.36(c)(3), "Technical Specifications," requires that TSs include SRs, which 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.

Regulatory Guide (RG) 1.129, "Maintenance, testing, and Replacement of vented Lead-acid storage batteries for nuclear power plants," provides guidance to manage battery degradation such that a battery in service would retain its readiness for supporting design-basis events. RG 1.129 endorses with certain clarifying regulatory positions the IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

NUREG-1434, "Standard Technical Specifications – General Electric Plants (BWR/6)," Revision 4.

3.0 TECHNICAL EVALUATION

3.1 Background

According to PNPP Updated Safety Analysis Report, Chapters 1 and 8, the plant consists of one 1,277 Mega Watts electric (net) operating unit, which generates power at 22 kilovolts (kV), and one similar unit (Unit 2), which is not yet completed. The power from Unit 1 (and future Unit 2) is fed through an isolated phase bus to the unit's main transformer where it is stepped up to 345 kV and delivered to the adjacent 345 kV switchyard. The engineering safety feature loads for each unit are assigned to three independent load groups designated as Division 1, Division 2, and Division 3. Divisions 1 and 2 are redundant, while Division 3 supplies power for the high pressure core spray (HPCS) system. Each division includes a Class 1E 125-volt direct current (VDC) system, which consists of a battery, one or two battery chargers, a direct current (DC) load center, distribution panels, and associated equipment.

Maintenance tie buses are provided between the divisions associated with Units 1 and 2, and only connect the same divisions of the two units (Division 1, Division 2, and Division 3 of Unit 1 to Division 1, Division 2, and Division 3 of Unit 2, respectively). The maintenance tie bus circuit breakers are normally open and are manually operated under administrative control. These breakers permit isolation of the battery and normal battery charger associated with either Unit 1 or Unit 2 for purposes of maintenance, testing, or equalizing of the battery. If the DC batteries are the only available power sources, the maintenance tie circuit breakers may be closed to allow the Unit 1 and Unit 2 batteries to be paralleled. No other interdivisional ties are provided between the divisions associated with Unit 1 or Unit 2.

Each Division 1 or Division 2 Class 1E 125 VDC system is capable of supplying required DC power to associated loads needed for safe shutdown. Each system includes a 1260-amp-hour battery and a 400-amp battery charger. For Division 1, both Unit 1 and Unit 2 have identical 61-cell batteries. For Division 2, both Unit 1 and Unit 2 have identical 60-cell batteries. In addition, a 400-amp reserve battery charger is provided for each division. The reserve battery chargers are located with the equipment associated with Unit 1, but can be connected to the appropriate division of either the Unit 1 or Unit 2, Class 1E 125 VDC system by means of the maintenance tie buses.

The Division 3 Class 1E 125 VDC system is an independent and redundant system capable of supplying required DC power to the HPCS system logic, the Division 3 diesel generator control system, and other Division 3 DC controls. The system includes a 250-amp-hour battery and a 50-amp battery charger. For Division 3, both Unit 1 and Unit 2 have identical 60-cell batteries. In addition, a 50-amp reserve battery charger is provided. The reserve battery charger is located with the equipment associated with Unit 1 but can be connected to the Unit 2, Class 1E 125 VDC system by means of the maintenance tie bus.

As stated in the LAR, the guidance in IEEE 485-1997, "IEEE Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications," was used for the design (loading, sizing, and capacity) of the Divisions 1, 2, and 3 Class 1E batteries.

The Class 1E batteries are maintained and tested in accordance with IEEE Standard 450-1995, which is a revision of IEEE Standard 450-1975 endorsed by RG 1.129. The IEEE Standard 450-1995 recommended frequencies for battery performance discharge test include a 24-month testing frequency when a battery reaches 85 percent of its expected life with capacity greater than or equal to 100 percent of manufacturer's rating. PNPP's current battery performance discharge test (SR 3.8.4.8) frequency does not align with IEEE Standard 450-1995 recommendations. The licensee proposed changes to SR 3.8.4.8 to correct this issue and take credit for unplanned events that satisfy the SR.

3.2 Proposed Changes

The current SR 3.8.4.8 states:

Verify battery capacity is $\geq 80\%$ of the manufacturer's rating when subjected to a performance discharge test.

Frequency

60 months

AND

NOTE: Only applicable when battery shows degradation or has reached 85% of the expected life

18 months

The licensee proposed changes to replace the current "18 month" frequency of SR 3.8.4.8 with frequencies recommended by IEEE Standard 450-1995, and add a note to allow credit to be taken for unplanned events that satisfy SR 3.8.4.8 consistently with NUREG-1434, "Standard Technical Specifications – General Electric Plants (BWR/6)," Revision 4, TS 3.8.6, "Battery

Parameters,” SR 3.8.6.6.

The revised SR 3.8.4.8 would state:

-----NOTE-----

Credit may be taken for unplanned events that satisfy this SR

Verify battery capacity is $\geq 80\%$ of the manufacturer’s rating when subjected to a performance discharge test.

Frequency

60 months

AND

12 months when battery shows degradation, or has reached 85% of the expected life with capacity $< 100\%$ of manufacturer’s rating.

AND

24 months when battery has reached 85% of the expected life with capacity $\geq 100\%$ of manufacturer’s rating.

3.3 Staff Evaluation

A battery performance discharge test is a constant-current or constant-power capacity test done on a battery after it has been in service, to detect any change in the battery’s capacity. The test is intended to determine overall battery degradation due to age and usage. According to IEEE Standard 450, degradation is indicated when the battery capacity drops more than 10 percent from its capacity on the previous performance test, or is below 90 percent of the manufacturer’s rating. An annual performance test is recommended if the battery shows signs of degradation or has reached 85 percent of the service life expected for the application. If the battery has reached 85 percent of service life but still delivers a capacity of 100 percent or greater of the manufacturer’s rated capacity, performance testing at two-year intervals is recommended. These frequencies are incorporated into revision 4 of NUREG-1434, TS SR 3.8.6.6 (PNPP SR 3.8.4.8).

The proposed frequencies (12 months and 24 months) when the battery has reached 85 percent of its expected service life are consistent with the recommendations of IEEE Standard 450 and NUREG-1434. Therefore, the NRC staff finds the proposed frequencies acceptable.

NUREG-1434, TS SR 3.8.6.6 includes a note that states: “Credit may be taken for unplanned events that satisfy this SR.” The licensee proposed to add this note to PNPP TS SR 3.8.4.8. The licensee stated that the note would allow control room staff to take credit for the SR performance when an emergent or unplanned activity requires performance of an associated SR 3.8.4.8 surveillance instruction (for example, battery capacity testing following maintenance or replacement). Taking credit for SR performance would reset the next required SR performance due date for that particular battery and prevent unnecessary cycling of plant equipment. The NRC staff finds that the proposed note does not change the intent of SR 3.8.4.8, is consistent with NUREG-1434 TS SR 3.8.6.6, and therefore, is acceptable.

NUREG-1434, TS SR 3.8.6.6 includes a second note that prohibits performance of the SR in Mode 1 or 2, but allows portions of the surveillance to be performed to reestablish operability provided that an assessment determines that plant safety is maintained or enhanced. The licensee did not adopt the note because the current SR 3.8.4.8 does not include any mode restrictions or require any plant safety assessments to be performed when reestablishing operability of a battery. The licensee stated that the Unit 2 Class 1E batteries serve as backups to the operating Unit 1 Class 1E batteries such that the backup batteries substitute for the Unit 1 Class 1E batteries through maintenance tie buses to satisfy the operability requirements while maintenance, testing, or equalizing activities are being performed on the Unit 1 Class 1E batteries. Thus, SR 3.8.4.8 can be performed in any mode of operation and no plant safety assessment is needed to reestablish operability of the Unit 1 batteries. Based on this information, the NRC staff finds that the note for mode restrictions does not apply to PNPP Class 1E battery capacity testing, and therefore, its exclusion is acceptable.

NUREG-1434, TS SR 3.8.6.6 includes a provision that allows a modified performance discharge test to be performed for the SR. The licensee did not include this provision in SR 3.8.4.8. The staff finds that acceptable because the modified performance discharge test is an alternate test that is not required to meet the intent of the SR.

In the LAR, the licensee stated that the maintenance tie circuit breaker may be closed to allow the Unit 1 and Unit 2 Class 1E batteries to be paralleled if the DC batteries are the only available power sources. The NRC staff requested the licensee to address whether the impact of paralleling the Units 1 and 2 Class 1E batteries such as contribution of additional short circuit current from the Unit 2 batteries, protection coordination, and protective devices ratings among other factors has been considered in the design of Unit 1 125 VDC system. In its letter dated May 12, 2015, the licensee confirmed that factors (e.g., short circuit current, protection coordination, and protective device ratings) related to paralleling the Unit 1 and 2 Class 1E batteries were considered in the design of the Unit 1, Class 1E 125 VDC battery systems. Based on this information, the staff finds that the Class 1E 125 VDC battery systems will perform their required safety functions when the Units 1 and 2 Class 1E batteries are paralleled without affecting the operation of their supported safety-related equipment.

3.4 Technical Conclusion

The NRC staff reviewed the licensee's proposed changes to the TS battery capacity testing SR 3.8.4.8. The changes would revise the SR frequencies and add a note allowing credit to be taken for unplanned events that satisfy the SR. Based on the above technical evaluation, the staff concludes that the proposed TS changes provide reasonable assurance of the availability of required safety equipment needed to shut down the reactor and keep it in a safe condition following an accident. Furthermore, the staff finds that the proposed TS changes do not impact the licensee's continued compliance with 10 CFR 50.36(c) and GDC 17. Therefore, the staff concludes that, based on the current design of the PNPP Class 1E 125 VDC battery systems, the proposed changes in the LAR are 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

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes the surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents 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 the amendment involves no significant hazards consideration and there has been no public comment on such finding (80 FR 13907). Accordingly, the 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 the amendment.

6.0 CONCLUSION

The Commission 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) there is reasonable assurance that 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.

Principal Contributor: A. Foli

Date of issuance: August 17, 2015

August 17, 2015

Mr. Ernest J. Harkness
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 CONCERNING TECHNICAL SPECIFICATION 3.8.4 "DC
SOURCES – OPERATING" (TAC NO. MF5298) (L-14-271)

Dear Mr. Harkness:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 170 to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant, Unit No. 1. The amendment consists of changes to the technical specifications (TSs) in response to your application dated November 24, 2014, as supplemented by letter dated May 12, 2015.

The amendment revises the battery capacity testing surveillance requirements in the TSs to reflect test requirements when the battery is near end of life.

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Kimberly J. Green, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosures:

1. Amendment No. 170 to NPF-58
2. Safety Evaluation

cc w/encs: Distribution via ListServ

DISTRIBUTION:

PUBLIC

LPL3-1 R/F

RidsAcrsAcnw_MailCTR Resource

RidsNrrDssStsb Resource

RidsNrrDorLDpr Resource

RidsNrrDorLpl3-1 Resource

RidsNrrDeEeeb Resource

RidsNrrDssStsb Resource

RidsNrrPMPerry Resource

RidsNrrLAMHenderson Resource

RidsRgn3MailCenter Resource

AFoli

ADAMS Accession No.: ML15201A529

***see email from KGreen to DPelton 8/17/15**

OFFICE	NRR/DORL/LPL3-1	NRR/DORL/LPL3-1/PM	NRR/DORL/LPL3-1/LA	NRR/DE/EEEB
NAME	JSchafler	KGreen	(SRohrer for) MHenderson	JZimmerman
DATE	7/24/2015	7/24/2015	7/21/2015	7/14/2015
OFFICE	NRR/DSS/STSB*	OGC	NRR/DORL/LPL3-1/BC	NRR/DORL/LPL3-1/PM
NAME	RElliott	BMizuno (NLO)	DPelton	KGreen
DATE	7/28/2015	8/13/2015	8/17/2015	8/17/2015

OFFICIAL RECORD COPY