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

October 17, 2011

Mr. Mark B. Bezilla
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 EMERGENCY AMENDMENT REGARDING USE OF A DELAYED CIRCUIT AS A REQUIRED OFFSITE CIRCUIT IN TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES – OPERATING" (TAC NO. ME7263)

Dear Mr. Bezilla:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 160 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 October 11, 2011, as supplemented by letters dated October 13, October 16, and October 17, 2011.

This amendment revises TS 3.8.1, "AC Sources – Operating," to clarify that a delayed access circuit is temporarily qualified for a period until December 12, 2011, as one of two required offsite circuits between the offsite transmission network and the onsite Class 1E alternating current electric power distribution system. This amendment was issued as an emergency amendment to allow the licensee to resume normal power operation.

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,

Michael Mahoney, 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. 160 to NPF-58
2. Safety Evaluation

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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. 160
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 October 11, 2011, as supplemented by letters dated October 13, October 16, and October 17, 2011, 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. 160 are hereby incorporated into the 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 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jacob I. Zimmerman, 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: October 17, 2011

ATTACHMENT TO LICENSE AMENDMENT NO. 160

FACILITY OPERATING LICENSE NO. NPF-58

DOCKET NO. 50-440

Replace the following pages of the Facility Operating License 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
Page 4	Page 4

Replace the following pages of the 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
3.8-1	3.8-1
3.8-2	3.8-2

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. 160, 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 Corp. and Ohio Edison Company

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources-Operating

LCO 3.8.1 The following AC electrical power sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electric Power Distribution System; and

b. Three diesel generators (DGs).

---NOTE---
Until December 12, 2011, a delayed access circuit may be used in place of the circuit associated with the Unit 1 startup transformer.

APPLICABILITY: MODES 1, 2, and 3.

---NOTE---
Division 3 AC electrical power sources are not required to be OPERABLE when High Pressure Core Spray System is inoperable.

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit. AND	1 hour AND Once per 8 hours thereafter (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 Restore required offsite circuit to OPERABLE status.	72 hours AND 24 hours from discovery of two divisions with no offsite power AND 24 hours from discovery that only available circuit is a delayed access circuit and may be used in place of the associated Unit 1 startup transformer until December 12, 2011 AND 17 days from discovery of failure to meet LCO
B. One required DG inoperable.	B.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s). AND B.2 Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable. AND	1 hour AND Once per 8 hours thereafter 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)

(continued)

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 160 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 U.S. Nuclear Regulatory Commission (NRC, the Commission) dated October 11, 2011, as supplemented by letters dated October 13, October 16, and October 17, 2011 (Agencywide Document Access and Management System (ADAMS) Accession Nos. ML112840338, ML112860276, and ML112900202, respectively[1]), FirstEnergy Nuclear Operating Company, et al. (FENOC, the licensee) requested a one-time emergency technical specification (TS) amendment to Facility Operating License No. NPF-58 for Perry Nuclear Power Plant PNPP), Unit 1.

The proposed change would revise TS 3.8.1, "AC [alternating current] Sources – Operating," to clarify that a delayed access circuit is temporarily qualified for a period until December 12, 2011, as one of two required offsite circuits between the offsite transmission network and the onsite Class 1E AC electric power distribution system. The proposed change would also add completion time allowed for circuit restoration if the only operable offsite circuit is the delayed access circuit.

The licensee submitted this emergency TS license amendment request (LAR) due to an unexpected failure of the Unit 1 startup transformer (SUT) on September 29, 2011. This failure resulted in disabling one of the two qualified circuits between the offsite transmission network and the onsite Class 1E AC electric power distribution system required by TS 3.8.1. In accordance with TS 3.8.1, the licensee was required to restore the required offsite circuit to operable status or transition the plant to Mode 3, hot shutdown. Because the licensee could not restore the disabled circuit within the required time frame, the licensee shut down PNPP in an orderly manner. The licensee requested permission to temporarily credit the delayed access circuit for satisfying TS LCO 3.8.1(a) to permit resumption of normal plant operation.

[1] The October 17, 2011, letter was not available in ADAMS at the time of amendment issuance.

The proposed change would clarify that a delayed access circuit is temporarily qualified for a period until December 12, 2011, as an alternate for the inoperable offsite circuit associate with the Unit 1 SUT.

2.0 REGULATORY EVALUATION

The NRC staff referenced the following NRC requirements and guidance documents during its review of the LAR:

- General Design Criterion (GDC) 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulation (10 CFR)*, Part 50, 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 safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical in the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. Each of these circuits shall 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 specified acceptable fuel design limits and design conditions of reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident (LOCA) to assure that core cooling, containment integrity, and other vital safety functions are maintained.

- GDC 18, "Inspection and Testing of Electric Power Systems," requires, in part, 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.

- 10 CFR 50.36(c)(2), "Limiting Conditions for Operation [LCO]," requires the TSs to include the LCO and actions required to be taken by the licensee when the LCO is not met. Power operation may be initiated and continued without restriction only when the LCO is met.

- 10 CFR 50.63, "Loss of All Alternating Current Power," requires that each light-water cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout (SBO).

- Regulatory Guide (RG) 1.32, "Criteria for Safety Related Electric Power Systems for Nuclear Power Plants," February 1977, Revision 2, provides guidelines for onsite and offsite electrical power systems for nuclear plants.

- RG 1.93, "Availability of Electric Power Sources," December 1974, Revision 0, states that the RG is applicable to nuclear power plants with two physically independent circuits from the offsite transmission network, each of which is either continuously available or can be made available within a few seconds following a LOCA.

- NUREG-0887, "Safety Evaluation Report related to the operation of Perry Nuclear Power Plant, Unit 1 and 2," dated May 1982, Section 8.2, states, in part, that the electrical grid is the source of energy for the offsite power system. "The safety function of the offsite power system (assuming that the onsite power systems are not available) is to provide sufficient capacity and capability to ensure that the specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary will not be exceeded, and to ensure that core cooling, containment integrity and other vital functions will be maintained in the event of postulated accidents. The objectives of this review are to determine that the offsite power system (1) satisfies the criteria set forth in Section 8.1 of this report, and (2) can reliably perform its design functions during normal plant operation, anticipated operational occurrences, and accident conditions . . . . .A Startup Transformer for each unit is designed as the preferred power source for the unit Class 1E buses. Unit 1 Startup Transformer is the preferred power source for Unit 1 Class 1E buses, and is an alternate preferred, power source for Unit 2 Class 1E buses and vice versa. The normal preferred source of power to Class 1E equipment is from the unit Startup Transformer through the 13.8-kV startup bus and one winding of the 13.8-kV/4.16-kV [kilo-Volt] interbus transformer. One secondary winding of the one unit interbus transformer feeds the 4.16 kV Class 1E loads of the associated unit. The other secondary winding of the interbus transformer feeds the 4.16-kV Class 1E bus of the second unit as the alternate source."

3.0 TECHNICAL EVALUATION

The offsite power system for PNPP is described in Section 8.2, "Offsite Power System," of the PNPP updated safety analysis report (USAR). The 345 kV switchyard that serves PNPP includes four transmission circuit terminals. The switchyard is arranged in a breaker-and-a-half configuration and serves as the interface between the preferred source (two SUTs) and the offsite transmission network. FENOC's transmission network supplies the offsite AC power for the starting, normal operation, and safe shutdown of PNPP. The preferred power system consists of at least two independent 345 kV circuits from FENOC's transmission network to the standby power distribution system. The interfaces between the transmission station and Class 1E power system consists of 345 kV transmission circuits, disconnect switches, SUTs, circuits in cable tray and underground duct banks, interbus transformers, and 5 and 15 kV switchgear. The NRC staff recognizes that PNPP was planned for a two-unit site and that Unit No. 2 was not completed.

An additional path from the transmission system to the Class 1E system is available as an alternate offsite power source for emergency situations. For Unit 1, the 15 kV Bus L10 can be supplied from Buses L11 or L12, via the unit auxiliary transformer. The L10 bus is common to the Unit 1 SUT and can supply power to the safety-related busses. A direct current (DC) motor-operated main generator disconnect switch is provided to facilitate the availability of this path.

The additional path described above (i.e., back-feed through the unit auxiliary transformer), while not considered a TS qualified circuit, is an example of how PNPP is capable of being supplied from an additional source of power from the offsite power system.

In PNPP's USAR, Section 8.2.2.3, "Capacity," it states that each of the circuits from the transmission network to the onsite electric distribution system has the capacity and capability to supply the loads during normal and abnormal operating conditions, accident conditions or plant shutdown conditions. The most critically sized component is the SUT. The maximum load could occur with one SUT out-of-service, an accident in one unit and a unit trip with shutdown in the other unit. Under these assumptions, all auxiliary loads are transferred to the remaining SUT; each SUT is sized-based on this criteria.

In PNPP's USAR, Section 3.1.2.2.8.1, it describes compliance with GDC 17. Specifically, it states that onsite and offsite power systems each independently provide the total power requirements for essential systems to perform the required engineered safety feature function. The onsite power required to operate protective systems equipment is supplied by one 100 percent capacity diesel generator per division. The offsite power required to operate engineered safety feature (ESF) systems is supplied by two independent sources from the 345 kV switchyard. Each offsite source supplies the total power requirements for one unit's ESF systems and is the alternate source for the other unit.

According to PNPP's USAR, ESF loads are assigned to three independent load groups designated as Division 1, Division 2, and Division 3. Division 1 and Division 2 are redundant while Division 3 supplies power for the high pressure core spray system (HPCS). Each division consists of a 4.16 kV switchgear assembly, diesel generator standby power supply (with the exception of Unit 2, Division 1), 480-volt double ended (Division 1 and Division 2) and single ended (Division 3) power centers and motor control centers (Division 1 and Division 2) and motor control center (Division 3), 120-volt AC and 125-volt DC distribution panels, battery, battery chargers, and interconnecting cables. ESF loads are assigned to divisions in such a manner that loss of a single division from any cause does not affect redundant equipment. However, the automatic restart of safety-related heating, ventilation and air conditioning and its supporting equipment after a loss of offsite power (LOOP) does depend on proper operation of under-voltage relays in both Division 1 and Division 2.

The PNPP Class 1E, Division 1 and Division 2, 125-volt DC systems are two completely redundant systems. Each is capable of supplying required DC power to associated loads needed for safe shutdown. Each system includes a 60-cell, 1260-ampere hour battery, a 400-ampere battery charger and a load center. A 400-ampere reserve battery charger is provided for each division. These 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-volt DC system by means of the maintenance tie buses. Maintenance tie buses connect only the same divisions of the two units (i.e., Unit 1, Division 1 to Unit 2, Division 1). If the Class 1E

batteries are the only available power source, the maintenance tie circuit breakers may be closed to allow the Unit 1 - Unit 2 Class 1E batteries to be paralleled for additional capacity. The licensee credits cross connection of Unit 1- Unit 2 Class 1E batteries to meet the SBO requirements.

The LCO for TS 3.8.1 requires the following AC electrical power sources to be operable (a) two qualified circuits between the offsite transmission network and the onsite Class 1E AC electrical power distribution system (the 4.16 kV ESF buses) and (b) three diesel generators. The TS actions provide limitations on plant operation when this requirement is not met. RG 1.93, applicable for nuclear plants with two independent offsite circuits that are available within a few seconds of a LOCA, provides regulatory guidance for LCOs that are applicable when the available electric sources are less than required.

The purpose of this safety evaluation is to address a deviation from the normal offsite circuit configurations as approved in the PNPP licensing basis for meeting the LCO requirements, and provide a more limiting completion time for situations when only a delayed access circuit is considered to be operable for a one-time temporary application. Specifically, the licensee proposed adding a note at the end of the clauses for LCO 3.8.1. The note would state the following: "Until December 12, 2011, a delayed access circuit may be used in place of the circuit associated with the Unit 1 Startup Transformer." The licensee also proposed adding an additional completion time requirement to LCO 3.8.1, Condition A. The additional completion time would read "AND 24 hours from discovery that only available circuit is a delayed access circuit and may be used in place of the associated Unit 1 SUT until December 12, 2011."

The licensee proposed operating PNPP with a single SUT. In the event of loss of this transformer, PNPP would rely on operators to take manual action to align the ESF buses through the main and auxiliary transformers. This alignment would include manipulation and opening a disconnect switch that isolates the main generator from the isolated phase bus. In this case, the licensee is crediting available DC power for reactor core isolation cooling and manual safety relief valve operation to preclude fuel cladding and reactor coolant pressure boundary damage.

Based on the NRC staff's review of the PNPP USAR, the staff observed that PNPP is designed to cope for four hours during an SBO event. According to the PNPP USAR, the licensee relies on the Class 1E DC system to cope with an SBO event. In response to a NRC staff request for additional information (RAI), the licensee reevaluated the impact of having only one immediate offsite power source available for SBO and concluded that EDG reliability had to be maintained at 97.5 percent to remain in compliance with the SBO rule for the 4-hour coping duration.

In its October 13, 2011, response, the licensee provided details of a time study performed to show the time necessary to align the back-feed source to supply the onsite safety buses. Based on its review of the licensee's response, the NRC staff finds that the licensee has demonstrated that the back-feed source can be established within 129 minutes.

The NRC staff confirmed that the PNPP Class 1E batteries are sized to support both LOOP/LOCA and SBO events. In its October 13, 2011 response, the licensee noted that the PNPP Class 1E batteries have additional margin on the order of 200 percent for Division 1 Class 1E batteries and 276 percent for Division 2 Class 1E batteries.

In response to a NRC staff RAI regarding the DC loads that were used for SBO calculations, the licensee reevaluated the SBO calculation and provided the following information in a letter dated October 16, 2011:

1. The Division 1 and Division 2 battery continuous loads during a design basis 4-hour SBO have been conservatively assumed the same as those during a 2-hour design basis LOOP/LOCA scenario.

2. In accordance with plant procedures, the Unit 1 and 2 batteries will be cross-tied and operating in parallel after 35 minutes to meet the 4-hour coping duration

3. Nonessential (non-critical) loads will be shed from the Division 1 and 2 batteries by opening disconnect switches and molded case circuit breakers within three hours (180 minutes) of the SBO event

4. The analytical evaluation and battery performance testing indicates that the batteries have adequate capacity and capability to support a 4-hour SBO event.

In addition, in its October 16, 2011, response, the licensee indicated that Unit 1 and Unit 2 Class 1E batteries have sufficient capacity to mitigate all design basis events including an SBO based on the results of last battery surveillance tests. Based on the licensee's responses to procedurally cross-tie battery systems and shed non-essential loads to satisfy the four-hour coping duration, the NRC staff finds that PNPP has adequate capacity to support aligning the back-feed source in sufficient time to preclude fuel cladding and reactor coolant pressure boundary damage during a SBO event that requires restoration of offsite power though the back-feed circuit.

The NRC staff requested the licensee to provide additional details on the operational history of the Unit 1 SUT, Unit 2 SUT, and auxiliary transformer. Specifically, the NRC staff requested the licensee to provide the initial root cause analysis for the Unit 1 SUT, the dissolved gas analyses (DGAs) for each transformer, TS surveillance history for the auxiliary transformer, and normal and refueling outage loading for each transformer.

In its October 13, 2011, response, the licensee stated that the initial root cause investigation indicates that the Unit 1 SUT failure was a result of a combination of energized equipment and impure water (lake water) sprayed over the bushing and transformer surfaces during freezing conditions that created an electrically conductive path from the 345 kV termination point at the top of the bushing (C phase) to the grounded metal case of the transformer. Once this path was established, the resultant flashover caused the destruction of the transformer bushing, and the actuation of the Unit 1 SUT differential and lockout protective relays. The licensee redirected deluge system nozzles away from the transformer bushings on both SUTs as a corrective action from the root cause investigation to prevent recurrence.

In its October 11, 2011, letter, the licensee stated that transformer failure rates are significantly higher after being de-energized and re-energized and this was a contributory factor leading to failure of the Unit 1 SUT. The licensee evaluated the cyclic operation of the Unit 1 and Unit 2 SUTs and industry experiences and concluded that cyclic history may not have been as prevalent of a failure mode as originally identified in the LAR. The licensee is

continuing to evaluate the root cause of the sudden failure of the Unit 1 SUT and will evaluate applicability to the remaining operating transformers. In the interim, the licensee has proposed enhanced monitoring of the Unit 2 SUT. This includes monthly performance of DGA, weekly performance of thermography and checking electromagnetic interference and acoustic measurements to detect imminent problems.

In its October 13, 2011, letter, the licensee provided the DGA for each transformer. DGA is an industry recognized testing methodology to detect transformer degradation. The NRC staff reviewed the DGAs and determined that additional information was needed to further understand the upward trend in ethane and carbon monoxide gases in the auxiliary transformer and the upward trend in ethane, methane, carbon monoxide, and carbon dioxide gases in the Unit 2 SUT. In its October 16, 2011, response, the licensee stated that gases such as methane, carbon monoxide, and ethane have shown an overall upward trend since 2000. However, the actions prescribed in Institute of Electrical and Electronic Engineers standards (IEEE C57.104-2008) were not taken because the trigger point for the identified gases had not been reached and key parameters are within the allowable band. The DGA data is monitored and trended by the PNPP system engineer who routinely evaluates the data.

Based on this information, the NRC staff finds that the licensee has provided reasonable assurance that a Unit 2 SUT is currently capable of performing its intended functions and will be adequately monitored for any performance degradation during the time period when crediting the delayed access circuit for satisfying TS LCO 3.8.1(a).

In order to verify the capacity and capability of the proposed delayed access circuit, the NRC staff requested the licensee to provide an overview of the limiting case that was evaluated. In letters dated October 13, 2011, and October 16, 2011, the licensee stated that a load flow analyses was performed for the limiting case of post-LOCA steady state conditions with a minimum acceptable grid voltage of 0.96 per unit. In addition, the licensee evaluated a large motor start to verify the adequacy of degraded voltage relay settings, voltage and timing, to ensure that the perturbation did not separate the plant safety buses from the delayed access circuit with the grid voltage at 0.96 per unit. The licensee concluded that the back-feed circuit will maintain adequate voltages at the plant safety buses for the postulated conditions.

In its October 16, 2011, letter, the licensee provided the TS surveillance history for the delayed access circuit. Specifically, the licensee provided the performance history for TS Surveillance Requirement (SR) 3.8.1.1, "Verify correct breaker alignment and indicated power available for each required offsite circuit," for the period from April 2006, to September 2011, when the delayed access source was credited by the licensee as an offsite power source. Based on its review of the licensee's response, the NRC staff found that the data indicates that the SRs performed on the delayed access power source were successful except for one unsuccessful occurrence on July 27, 2009. The licensee stated that the unacceptable SR performance was due to the inability to electrically operate a motor operated disconnect (MOD) associated with the delayed access circuit. The licensee subsequently determined that the delayed access offsite power source was available by manually operating the MOD and has since pre-staged tools, procedures, and access to facilitate manual MOD operation. Based on this information, the NRC staff has reasonable assurance that the delayed access circuit is available and could provide a delayed source of offsite electrical power to the Class 1E bus(es), if required.

The NRC staff requested information on the protective schemes associated with the back-feed circuit to evaluate the adequacy of relay settings for large transients such as simultaneous energization of unit auxiliary and main transformers. In its letter dated October 16, 2011, the licensee stated that the same level of protection is afforded during forward or back-feed transmission, therefore, no additional analysis is required to evaluate the relay performance for the back-feed circuit and protective relay setpoints do not require readjustment when using the back-feed circuit. The licensee also stated that the level of protection of electrical equipment will not change with the proposed back-feed configuration. A follow-up call with the licensee on October 17, 2011, confirmed that the offsite transmission system back-feeding through the main transformer and the auxiliary transformer, as an alternate offsite source, has been evaluated by the licensee. Based on its evaluation, the licensee concluded that the back-feed circuit including inrush current from the transformers will support their intended design function.

Based on its review of the licensee's responses to the NRC staff's RAIs associated with capability and capacity of the delayed access circuit, the NRC staff finds that this circuit is acceptable for performing the limited functions that that the licensee has evaluated to maintain the plant in safe condition until a normal source of offsite power can be restored.

The licensee provided the following Regulatory Commitments to limit the risk associated with the use of the back-feed configuration for the duration of the temporary license amendment:

1. A protected area will be established around the Unit 2 SUT and associated cabling, buses and switchgear in accordance with "Protected Equipment Postings" to ensure that no work will be conducted in the vicinity of these components that could affect this electrical capability.

2. A daily inspection will be conducted to ensure no loose equipment or debris is in the vicinity of the Unit 2 SUT that could be picked up by high winds.

3. Daily communication will be conducted with the system control center to ensure grid stability is maintained and any potential issues are communicated to the plant for awareness purposes. No unnecessary switchyard work will be performed. This means work will be restricted to those activities necessary to maintain switchyard reliability.

4. There will be operators assigned each shift to respond to a plant-centered LOOP event and briefed on their specific actions to be taken in the event of a loss of the Unit 2 SUT while switchyard power is available.

5. The health of Unit 2 SUT will be monitored on a regular basis and degradation indicating a potential failure will result in a controlled shutdown.

6. The reactor core isolation cooling system will be posted and protected in accordance with "Protected Equipment Postings."

The NRC staff finds that these compensatory measures will minimize the likelihood of losing the instantaneous offsite circuit during the time period when crediting the delayed access circuit for temporally satisfying the requirements of TS LCO 3.8.1(a).

Based on the NRC staff's request, the licensee provided a detailed schedule for justifying the time period for temporarily crediting a delayed access circuit as an alternate circuit for the circuit associated with the Unit 1 SUT. The NRC staff reviewed this schedule and determined that the time period requested by the licensee is reasonable given the activities that must be performed to obtain a replacement SUT and place it into service.

Based on the above, the NRC staff finds that temporarily crediting the delayed access circuit to satisfy TS LCO 3.8.1(a) requirements would maintain safety since the delayed access circuit provides reasonable assurance of continued availability of offsite electrical power to maintain the reactor in a safe condition. The NRC staff also finds that the licensee's implementation of the Regulatory Commitments provides additional assurance of the availability of the remaining sources of AC power during the time period when crediting the delayed access circuit for satisfying the requirements of TS LCO 3.8.1(a).

The NRC staff finds the temporary addition of the 24 hour completion time from discovery that only available circuit is a delayed access circuit and may be used in place of the associated Unit 1 SUT until December 12, 2011, is acceptable since it provides a reasonable completion time recognizing the limitations of the delayed access circuit (i.e., not an immediate access AC power source) during the replacement period (until December 12, 2011) of the Unit 1 SUT.

The NRC staff did not review the adequacy of the delayed circuit as a permanently qualified circuit as required by TS 3.8.1(a). The NRC staff's review of the documentation submitted by the licensee, including calculations, was limited to the specific information referenced in the above safety evaluation.

3.1 Risk Assessment

Though the licensee's application contained risk information, it was not intended to be "risk-informed" per the NRC's RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed Activities"). As a result, the NRC staff did not review the risk information presented in the application to determine its technical quality or applicability to this specific application and did not utilize or rely upon any of the licensee's risk information in making a conclusion on the LAR. Rather, the NRC staff performed a conservative assessment of the plant's current conditions to evaluate the risk significance of the licensee's request.

To support the staff's risk perspective on this application, the current NRC Standardized Plant Analysis Risk (SPAR) model for PNPP was used, with some simple modeling changes to account for the current plant conditions (i.e., unavailability of the Unit 1 SUT). The model only addresses internal initiating events while at full power. Other hazards (such as fires and earthquakes) are not addressed by the current SPAR model, but this limitation is not expected to significantly change the insights gained by the NRC staff's analysis due to the limited duration of operations without the Unit 1 SUT (i.e., about two months) and the conservative approach used in modeling the current condition. Specifically, the affected Unit 1 SUT was set to failed in the SPAR model and no credit was given to the licensee's ability to back-feed via the main and auxiliary transformers.

In the SPAR model, the core damage frequency (CDF) from internal initiating events under nominal plant operating conditions is about 3.7×10^{-6}/year. This CDF will increase by about 1.5×10^{-6}/year due to the Unit 1 SUT being unavailable for two months. This increase in CDF is small and consistent with the acceptance guidelines for a one-time temporary change.
The risk increase described above is exclusively related to loss of offsite power events, with grid-related events the most significant contributor. Based on the results of the NRC staff's analysis, specific attention should be given to ensuring the capability and reliability of offsite power during the period in which the Unit 1 SUT is unavailable. Further, actions that could potentially disrupt the supply of offsite power to the plant should be limited (e.g., limiting activities in the switchyard). Such actions are identified by the licensee's Regulatory Commitments.

4.0 STATEMENT OF EMERGENCY CIRCUMSTANCES

Section 50.91 of 10 CFR Part 50 provides special exceptions for the issuance of amendments when the usual 30-day public notice cannot be met. One type of special exception is an emergency. Specifically, 10 CFR 50.91(a)(5) provides that where the NRC finds that an emergency situation exists, in that failure to act in a timely way would result in the prevention of the resumption of power operation, it may issue a license amendment involving no significant hazards consideration without prior notice and an opportunity for a hearing or public comment. In this situation, the NRC will publish a notice of issuance under 10 CFR 2.106, providing for opportunity of a hearing and for public comment after issuance.

The PNPP's Unit 1 SUT unexpectedly failed on September 29, 2011, at 0529 hours, disabling one of the two qualified circuits between the offsite transmission network and the onsite Class 1E electric power distribution system required by TS 3.8.1. Because the disabled circuit could not be restored within the required timeframe, PNPP was shutdown in an orderly manner. Although the cause of the failure is under investigation in accordance with the licensee's corrective action program, there have been no indications that the licensee could have reasonably anticipated the transformer failure.

Based on the above, the NRC staff finds that an emergency situation exists, in that, failure to act in a timely way would prevent resumption of operation and result in an extended plant shutdown. The licensee has explained why the emergency situation occurred and why it could not be avoided. The NRC staff evaluated the reasons and has determined that emergency circumstances exist pursuant to 10 CFR 50.91(a)(5) and could not have been avoided, that the submittal of information by the licensee was timely, and the licensee did not create the emergency situation. Therefore, this request was handled under the provisions of 10 CFR 50.91(a)(5).

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92(c) state that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or,

(2) Create the possibility of a new or different kind of accident from any previously evaluated; or,

(3) Involve a significant reduction in a margin of safety.

The following analysis was provided by the licensee in their letter dated October 12, 2011.

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

Response: No.

The proposed amendment involves the qualification of a back-feed electrical alignment to meet the requirements of TS 3.8.1 for maintaining the availability of offsite power. The amendment maintains the reliability and redundancy of offsite AC electrical sources, involves no changes to plant equipment design, and creates no accident initiator. Therefore, there is no significant impact on the probability of a previously evaluated accident.

The onsite and offsite electric power systems are designed to provide power to the systems and components necessary to mitigate the consequences of a loss-of-coolant accident (LOCA). The onsite power system is not affected by this change and will continue to perform its design function to mitigate an accident. A single instantaneous offsite circuit is designed to be available within a few seconds following a LOCA to assure that core cooling, containment integrity, and other vital safety functions are maintained. Compensatory measures committed to in the letter dated October 11, 2011; further minimize risk to the availability of the instantaneous offsite circuit during the time period allowed by the proposed change. Because the available onsite power system is not affected, the offsite circuit is capable of providing sufficient power, and risk to the offsite circuit has been minimized, power will still be available as required to mitigate an accident.

The proposed amendment involves the use of a back-feed electrical alignment to temporarily meet the requirements of TS 3.8.1 to maintain the availability of offsite power. The compensatory measures associated with the amendment maintain the reliability of offsite AC electrical sources and ensure timely alignment of the delayed access circuit. These measures ensure continued availability of the offsite power system. The proposed amendment does not involve any change to the onsite power system, so the onsite power system reliability and redundancy is not affected. Since the proposed change does not affect the availability of the offsite or onsite power system, the systems will continue to provide power as required during shutdown as well as reactor power operation.

The back-feed circuit is design 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 specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. The other circuit necessary to meet the LCO [limiting condition for operation] is designed to be available wither a few seconds following a loss-of-coolant accident (LOCA) to assure that core cooling, containment integrity, and other vital safety functions are maintained. Therefore, the proposed Technical Specification change does not involve a significant increase in the consequences of an accident previously evaluated.

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

Response: No.

The proposed amendment involves the qualification of a back-feed electrical alignment to meet the requirements of TS 3.8.1 for maintaining the availability of offsite power. The onsite and offsite electric power systems are designed to provide power to the systems and components necessary to mitigate the consequences of a loss-of-coolant accident (LOCA). The onsite power system is not affected by this change and will continue to perform its design function to mitigate an accident. A single instantaneous offsite circuit is designed to be available within a few seconds following a LOCA to assure that core cooling, containment integrity, and other vital safety functions are maintained. Compensatory measures committed to in the letter dated October 11, 2011; further minimize risk to the availability of the instantaneous offsite circuit during the time period allowed by the proposed change. Because the available onsite power system is not affected, the offsite circuit is capable of providing sufficient power, and risk to the offsite circuit has been minimized, power will still be available as required to mitigate an accident.

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The amendment maintains the reliability and redundancy of offsite AC electrical sources, involves no changes to plant equipment design, and creates no accident initiator.

Therefore, the proposed Technical Specification change does not create the possibility of a new or different kind of an accident previously evaluated.

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

   Response: No.

   The proposed amendment involves the qualification of a back-feed electrical alignment to meet the requirements of TS 3.8.1 for maintaining the availability of offsite power. The onsite and offsite electric power systems are designed to provide power to the systems and components necessary to mitigate the consequences of a loss-of-coolant accident (LOCA). The onsite power system is not affected by this change and will continue to perform its design function to mitigate an accident. A single instantaneous offsite circuit is designed to be available within a few seconds following a LOCA to assure that core cooling, containment integrity, and other vital safety functions are maintained. Compensatory measures committed to in the letter dated October 11, 2011; further minimize risk to the availability of the instantaneous offsite circuit during the time period allowed by the proposed change. Because the available onsite power system is not affected, the offsite circuit is capable of providing sufficient power, and risk to the offsite circuit has been minimized, power will still be available as required to mitigate an accident.

   The proposed amendment involves the use of a back-feed electrical alignment to temporarily meet the requirements of TS 3.8.1 to maintain the availability of offsite power. The compensatory measures associated with the amendment maintain the reliability of offsite AC electrical sources and ensure timely alignment of the delayed access circuit. These measures ensure continued availability of the offsite power system. The proposed amendment does not involve any change to the onsite power system, so the onsite power system reliability and redundancy is not affected. Since the proposed change does not affect the availability of the offsite or onsite power system, the systems will continue to provide power as required during shutdown as well as reactor power operation.

   The amendment maintains the reliability and redundancy of offsite AC electrical sources, involves no changes to plant equipment design, and creates no accident initiator. Therefore, the proposed Technical Specification changes do not involve a significant reduction in margin of safety.

The NRC staff has reviewed the licensee's analysis and, based on this review, has concluded that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has determined that the proposed amendment involves no significant hazards consideration.

6.0 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.

7.0 ENVIRONMENT CONSIDERATION

This amendment changes a requirement with respect to installation or 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 made a final no significant hazards finding with respect to this amendment. 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.

8.0 CONCLUSION

The NRC staff evaluated the licensee's request to clarify that a delayed access circuit is temporarily qualified for a period until December 12, 2011, as one of two required offsite circuits between the offsite transmission network and the onsite Class 1E AC electric power distribution system. The NRC staff also evaluated the licensee's request to add a completion time for circuit restoration if the only operable offsite circuit is the delayed access circuit. Based on the above evaluation, the NRC staff concludes the proposed revision to the PNPP TSs provides reasonable assurance of the continued availability of the required power to maintain the reactor in a safe condition. Therefore, the staff finds the proposed temporary changes to TS 3.8.1(a) acceptable.

The NRC staff has concluded, based on the considerations discussed above, that (1) the amendment does not (a) involve a significant increase in the probability or consequences of an accident previously evaluated or, (b) create the possibility of a new or different kind of accident from any previously evaluated or, (c) involve a significant reduction in a margin of safety and therefore, the amendment involves no significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (3) such activities will be conducted in compliance with the Commission's regulations, and (4) 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: MMcConnell, NRR

Date of issuance: October 17, 2011

October 17, 2011

Mr. Mark B. Bezilla
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 EMERGENCY AMENDMENT REGARDING USE OF A DELAYED CIRCUIT AS A REQUIRED OFFSITE CIRCUIT IN TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES – OPERATING" (TAC NO. ME7263)

Dear Mr. Bezilla:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 160 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 October 11, 2011, as supplemented by letters dated October 13, October 16, and October 17, 2011.

This amendment revises TS 3.8.1, "AC Sources – Operating," to clarify that a delayed access circuit is temporarily qualified, for a period until December 12, 2011, as one of two required offsite circuits between the offsite transmission network and the onsite Class 1E alternating current electric power distribution system. This amendment was issued as an emergency amendment to allow the licensee to resume normal power operation.

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/

Michael Mahoney, 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. 160 to NPF-58
2. Safety Evaluation

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