May 15, 2007

Mr. Timothy G. Mitchell
Vice President, Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S. R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 1 - ISSUANCE OF AMENDMENT RE: RELOCATION OF INVERTER Y-28 AND PANEL C-540 REQUIREMENTS FROM THE TECHNICAL SPECIFICATIONS TO THE TECHNICAL REQUIREMENTS MANUAL (TAC NO. MD2982)

Dear Mr. Mitchell:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 230 to Renewed Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit No. 1 (ANO-1). The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 31, 2006, as supplemented by letter dated January 31, 2007.

The amendment relocates TS 3.8.7 requirements associated with 120 volt (V) inverter Y-28 and TS 3.8.9 requirements associated with the 120 V alternating current electrical power distribution subsystem panel C-540 to the Technical Requirements Manual.

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

Sincerely,

/RA/

Farideh E. Saba, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosures: 1. Amendment No. 230 to DPR-51
2. Safety Evaluation

cc w/encls: See next page

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ENTERGY OPERATIONS, INC.

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 230
Renewed License No. DPR-51

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

   A. The application for amendment by Entergy Operations, Inc. (the licensee), dated August 31, 2006, as supplemented by letter dated January 31, 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 license 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 and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-51 as indicated in the attachment to this license amendment.

3. The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Thomas G. Hiltz, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Facility
Operating License No. DPR-51
and the Technical Specifications

Date of Issuance: May 15, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 230

RENEWED FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

Replace the following pages of the Renewed Facility Operating License No. DPR-51 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.

Operating License

REMOVE	INSERT
- 3 -	- 3 -

Technical Specifications

REMOVE	INSERT
3.8.7-1	3.8.7-1
3.8.7-2	3.8.7-2
3.8.9-1	3.8.9-1
3.8.9-2	3.8.9-2

(4) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(6) EOI, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

c. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

EOI is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 230, are hereby incorporated in the renewed license. EOI shall operate the facility in accordance with the Technical Specifications.

(3) Safety Analysis Report

The licensee's SAR supplement submitted pursuant to 10 CFR 54.21(d), as revised on March 14, 2001, describes certain future inspection activities to be completed before the period of extended operation. The licensee shall complete these activities no later than May 20, 2014.

(4) Physical Protection

EOI shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification,

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 230 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-51

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

1.0 INTRODUCTION

By application dated August 31, 2006 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML062720541), as supplemented by letter dated January 31, 2007 (ADAMS Accession No. ML070440163), Entergy Operations, Inc. (the licensee), requested changes to the Technical Specifications (TSs) for Arkansas Nuclear One, Unit No. 1 (ANO-1).

The proposed changes would relocate TS 3.8.7 requirements associated with 120 volt (V) inverter Y-28 and TS 3.8.9 requirements associated with the 120 V alternating current (AC) electrical power distribution subsystem panel C-540 to the Technical Requirements Manual (TRM).

The supplement dated January 31, 2007, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on November 7, 2006 (71 FR 65142).

2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff used the following NRC requirements to review the licensee's amendment request:

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications," contains the requirements for items that must be in the TSs. Paragraph 50.36(c)(2)(ii) provides four criteria that can be used to determine the requirements that must be included in the TSs. A TS limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:

Criterion 1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Criterion 2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of, or presents a challenge to the integrity of a fission product barrier.

Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 4. A structure, system, or component [SSC] which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Items not meeting any of these four criteria do not need to remain in the TSs.

Part 50 of 10 CFR, Appendix A, General Design Criterion (GDC) 17, “Electric power systems,” requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of SSCs 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. Electric power from the transmission network to the onsite electric distribution system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of a loss of power from the unit, the offsite transmission network, or the onsite power supplies.

GDC 18, “Inspection and testing of electric power systems,” requires, in part that electric power systems that are important to safety be designed to permit appropriate periodic inspection and testing.

Part 50 of 10 CFR, Appendix R, “Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," sets forth fire protection features to satisfy GDC 3, “Fire protection.”

3.0 TECHNICAL EVALUATION

3.1 Description of the ANO-1 Electrical Distribution System

ANO-1 has seven vital inverters that provide uninterruptible power to vital instrument buses. The inverters are normally powered from vital station batteries, but if the direct current (DC) power source is unavailable, the vital instrument buses are fed from vital AC sources (offsite power or diesel generators). Four inverters support the Plant Protective System features that act to trip the reactor and auto-initiate standby safety equipment for the prevention and mitigation of accidents. Two swing inverters provide additional backup. TS 3.8.7 dictates the time in which the four inverters can be removed from service. As ANO-1 requires manual operator action to transfer the emergency core cooling system pump suctions to the

containment sump, it is important to control (1) the time an inverter is out of service and (2) the number of inverters that are removed from service at any time.

The seventh inverter, Y-28, supplies uninterruptible power to the C-540 distribution panel. Panel C-540 is the 120 VAC power source to instrumentation that affects the following components:

- Some Alternate Shutdown Instrumentation
- One Subcooling Margin Channel
- One Diverse Reactor Overpressure Protection System (DROPS) Channel
- Decay Heat Removal (DHR) Automatic Closure Interlock (ACI)
- One Channel of Pressurizer Level/Pressure Control
- One Channel of Emergency Feedwater Initiation and Control (EFIC)

3.2 Evaluation of Proposed Changes

The licensee proposed to relocate the requirements set forth in TS 3.8.7 for inverter Y-28 and TS 3.8.9 for distribution panel C-540 to the TRM. The licensee states that the loss of the instrumentation that affects components listed in Section 3.1 will not interfere with a reactor trip signal or automatic actuation of any TS-required safety system and hence, the operability requirements of inverter Y-28 and panel C-540 need not be controlled in the TSs.

When inverter Y-28 is removed from service, panel C-540 is placed on “Alternate Source to Load,” i.e., bypassing the inverter. The loss of inverter Y-28 does not render the equipment powered by panel C-540 inoperable since the equipment would be alternatively fed from a vital AC bus. The single-failure criterion, as defined in 10 CFR Part 50, Appendix A, is upheld since both a loss of panel C-540 and a loss of redundant equipment are needed to adversely affect safety functions. Furthermore, inverter Y-28 and panel C-540 do not support “energize-to-actuate” engineered safety feature components.

Instrumentation Powered by Panel C-540

A loss of C-540 requires entry into Operations Procedure 1107.003. This procedure lists the components lost, describes the impact of each, and references to applicable TSs are provided where appropriate. Many of the instruments powered from C-540 result in TS entry if found to be inoperable and many are associated with compliance with 10 CFR Part 50, Appendix R, requirements. The current TS for C-540 only refers to other TSs that need to be assessed for impact based on the loss of C-540 components. The assessment of the affected components is provided below to describe the connection between C-540 supplied components and other TSs.

In its January 31, 2007, supplemental letter, the licensee stated that 10 CFR Part 50, Appendix R, requirements apply to Alternate Shutdown Instrumentation. The licensee further stated that site procedures establish fire-related compensatory measures when panel C-540 is inoperable to reduce the risk of fire in areas that could threaten safe shutdown procedures. For example, the licensee stated that operable fire detection and suppression systems would be verified and fire watches would be established in the vicinity of redundant cabling areas upon the loss of panel C-540. The purpose of these compensatory actions is to enhance the

protection of safe shutdown indications until panel C-540 can be restored. Thus, panel C-540 operability requirements are covered by 10 CFR Part 50, Appendix R.

Panel C-540 powers wide range reactor coolant system (RCS) pressure input to DROPS. If panel C-540 is de-energized, only one DROPS channel would be affected, and both channels are required to be bypassed, which prevents spurious DROPS actuation when panel C-540 is re-energized. The loss of panel C-540 also causes the loss of wide range pressure indication on the alternate shutdown display and in the control room, but redundant indication is available. The loss of PT-1041 requires entry into TS 3.3.15, "Post Accident Monitoring Instrumentation." Lastly, the loss of the RCS pressure input results in the loss of one subcooling margin channel. Furthermore, the licensee stated that operators can determine subcooling margin from available RCS pressure and temperature indications.

The loss of panel C-540 results in the loss of several steam generator (SG) pressure and level instruments. Although the indications failing low would cause a half-leg trip of Channel B EFIC emergency feedwater (EFW) and main steam line isolation functions (MSLI), three other EFIC channels remain unaffected and Channel B may be placed in bypass to minimize inadvertent EFIC actuation in accordance with TS 3.3.11, "EFIC System Instrumentation." The loss of SG pressure and level instruments will cause two valves that provide EFW Pump A feed to each SG, to receive a full open signal and remain open if a valid EFIC actuation signal is received. Neither of the valves will close to isolate an affected SG, but each line has a redundant valve that will close to isolate an SG depending on SG pressures. This ensures that the MSLI function of the EFW system is maintained. To limit feed when SG levels have reached post-trip values, manual operator action is required to control SG level. As the loss of the pressure and level instruments prevent compliance with the single-failure criterion, Action C of TS 3.3.11 requires restoration within 72 hours or commencement of a plant shutdown.

Upon the loss of panel C-540, the DHR system ACI function is lost to suction valve CV-1410 but a redundant valve is unaffected. In Modes 4, 5, or 6, the ACI function is not required as the DHR system is in service. In Modes 1 through 4, when the DHR system is not in service, TS 3.4.14, "RCS Pressure Isolation Valve Leakage," applies.

In conjunction with the loss of panel C-540 is the loss of one of two source range neutron flux indications. For Modes 2 through 5, one source range channel is required to be operable, however the loss of one channel while in Modes 1, 2, or 3 would require entry into TS 3.3.15, "Post Accident Monitoring Instrumentation." In Mode 6, the loss of a source range monitor will prevent core alterations as specified in TS 3.9.2, "Nuclear Instrumentation."

One temperature input and one level input are lost to the pressurizer control system when panel C-540 is lost. The licensee's procedures require that the redundant control channel be verified in service. Furthermore, the licensee stated that if the redundant channel fails, manual control is available.

The loss of panel C-540 will result in the loss of the condensate storage tank (Q-CST) level indication in the ANO-1 control room. Given this scenario, level indication could be monitored from the ANO, Unit 2, control room or locally. The ability for the EFW system to automatically actuate, receive a supply from the Q-CST, and control SG level will not be lost.

While four RCS temperature indications would be lost when panel C-540 is lost, these indications do not have a control function and only one is associated with TS 3.3.15. Furthermore, the licensee stated that multiple RCS temperature indications remain available.

The NRC staff agrees with the licensee that the loss of the instrumentation that affects components listed in Section 3.1 will not interfere with a reactor trip signal or automatic actuation of any TS-required safety system and hence, the operability requirements of inverter Y-28 and panel C-540 need not be controlled in the TSs.

10 CFR 50.36 Criteria

Section 50.36 of 10 CFR, "Technical specifications," contains the requirements for items that must be in the TSs. Paragraph 50.36(c)(2)(ii) provides four criteria that can be used to determine the requirements that must be included in the TSs. The NRC staff reviewed each item for meeting one or more of the four criteria for the need to be included in the TSs.

Criterion 1 addresses instrumentation installed to detect excessive RCS leakage. This criterion does not apply since (1) the loss of inverter Y-28 does not result in the loss of any installed instrumentation, and (2) upon the de-energization of panel C-540, redundant instrumentation is available or is governed by other TSs. Hence, inverter Y-28 and panel C-540 do not meet Criterion 1.

Criterion 2 captures those process variables that have initial values in the design-basis accident and transient analyses. The loss of inverter Y-28 does not result in the loss of additional plant equipment and is not associated with the accident analysis. The components lost upon the de-energization of panel C-540 are not required for the initiation or prevention of an accident, as specified in the accident analyses in Chapter 14 of the Safety Analysis Report. Hence, inverter Y-28 and panel C-540 do not meet Criterion 2.

Criterion 3 captures only those SSCs that are part of the primary success path of the safety analysis (an examination of the actions required to mitigate the consequences of the design-basis accident and transients). The licensee stated that inverter Y-28 is not credited in the accident mitigation strategy and the instrument panel C-540 has no "energize-to-actuate" ESF systems. Hence, inverter Y-28 and panel C-540 do not meet Criterion 3.

Criterion 4 captures those SSCs that either operating experience or probabilistic safety assessment has shown to be significant to the public health and safety. Loss of either inverter Y-28 or panel C-540 will not result in the loss of any additional plant equipment. Furthermore, the licensee has compensatory measures in place to enhance the protection of redundant components, given the loss of panel C-540. Hence, inverter Y-28 and panel C-540 do not meet Criterion 4.

Based on the above evaluation, the loss of inverter Y-28 and panel C-540 have minimal impact on unit operation based on the availability of redundant components or the existence of other controlling regulations or TSs. Although the loss of panel C-540 causes the loss of some alternate shutdown instrumentation, 10 CFR Part 50, Appendix R, requirements govern panel C-540 operability. In addition, the NRC staff concludes that the proposed changes do not affect ANO-1's compliance with the requirements of GDC 17 and 18. Therefore, the loss of inverter

Y-28 and its associated distribution panel C-540 will not interfere with a reactor trip signal or automatic actuation of any TS-required safety system. The NRC staff has concluded that inverter Y-28 and panel C-540 operability requirements do not meet any of the 10 CFR paragraph 50.36(c)(2)(ii) criteria for items that must be in the TSs. Therefore, the NRC staff concludes that the licensee has demonstrated that the relocation of inverter Y-28 and panel C-540 operability requirements from the TSs to the TRM is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arkansas 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 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 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 published November 7, 2006 (71 FR 65142). 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) 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: S. Ray

Date: May 15, 2007

cc:
Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

General Manager Plant
Operations
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333
Russellville, AR 72802

Director, Nuclear Safety Assurance
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333
Russellville, AR 72802

Manager, Licensing
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333
Russellville, AR 72802

Director, Nuclear Safety & Licensing
Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213-8298

Section Chief, Division of Health
Radiation Control Section
Arkansas Department of Health and
Human Services
4815 West Markham Street, Slot 30
Little Rock, AR 72205-3867

Section Chief, Division of Health
Emergency Management Section
Arkansas Department of Health and
Human Services
4815 West Markham Street, Slot 30
Little Rock, AR 72205-3867

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 310
London, AR 72847

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

County Judge of Pope County
100 W. Main Street
Russellville, AR 72801

Vice President, Operations Support
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995