



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

March 29, 2017

ANO Site Vice President  
Arkansas Nuclear One  
Entergy Operations, Inc.  
1448 S.R. 333  
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - ISSUANCE OF AMENDMENT  
RE: ADOPTION OF TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER  
TSTF-545, REVISION 3, "TS INSERVICE TESTING PROGRAM REMOVAL &  
CLARIFY SR USAGE RULE APPLICATION TO SECTION 5.5 TESTING"  
(CAC NO. MF7535)

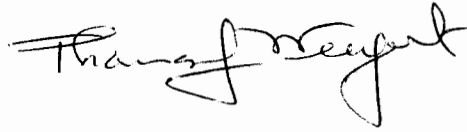
Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 305 to Renewed Facility Operating License No. NPF-6 for Arkansas Nuclear One, Unit 2 (ANO-2). The amendment consists of changes to the technical specifications (TS) in response to your application dated March 25, 2016, as supplemented by letter dated December 7, 2016.

The amendment deletes TS 6.5.8, "Inservice Testing Program." A new defined term, "Inservice Testing Program," is added to TS Section 1.0, "Definitions." In addition, existing uses of the term "Inservice Testing Program" in the TSs are capitalized throughout to indicate that it is now a defined term. These changes are based on NRC-approved Technical Specifications Task Force (TSTF) Standard Technical Specifications Change Traveler TSTF-545, Revision 3, "TS Inservice Testing Program Removal & Clarify SR [Surveillance Requirement] Usage Rule Application to Section 5.5 Testing."

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

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas J. Wengert". The signature is written in a cursive style with a large, sweeping initial "T".

Thomas J. Wengert, Senior Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosures:

1. Amendment No. 305 to NPF-6
2. Safety Evaluation

cc w/encls: Distribution via Listserv



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

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 305  
Renewed License No. NPF-6

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee), dated March 25, 2016, as supplemented by letter dated December 7, 2016, 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 as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-6 is hereby amended to read as follows:

- (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 305, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Renewed Facility  
Operating License No. NPF-6  
and Technical Specifications

Date of Issuance: March 29, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 305  
RENEWED FACILITY OPERATING LICENSE NO. NPF-6  
ARKANSAS NUCLEAR ONE, UNIT 2  
DOCKET NO. 50-368

Replace the following pages of the Renewed Facility Operating License No. NPF-6 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

3

INSERT

3

Technical Specifications

REMOVE

1-6  
3/4 4-2a  
3/4 4-3  
3/4 4-4  
3/4 4-29  
3/4 5-5  
3/4 6-10  
3/4 6-17  
3/4 7-1  
3/4 7-5  
3/4 7-10  
3/4 9-9a  
6-7

INSERT

1-6  
3/4 4-2a  
3/4 4-3  
3/4 4-4  
3/4 4-29  
3/4 5-5  
3/4 6-10  
3/4 6-17  
3/4 7-1  
3/4 7-5  
3/4 7-10  
3/4 9-9a  
6-7

- (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 or instrument calibration or associated with radioactive apparatus or components; and
- (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 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; and 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 3026 megawatts thermal. Prior to attaining this power level EOI shall comply with the conditions in Paragraph 2.C.(3).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 305, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

Exemptive 2nd paragraph of 2.C.2 deleted per Amendment 20, 3/3/81.

(3) Additional Conditions

The matters specified in the following conditions shall be completed to the satisfaction of the Commission within the stated time periods following issuance of the renewed license or within the operational restrictions indicated. The removal of these conditions shall be made by an amendment to the renewed license supported by a favorable evaluation by the Commission.

2.C.(3)(a) Deleted per Amendment 24, 6/19/81.

## DEFINITIONS

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### MEMBER(S) OF THE PUBLIC

- 1.29 MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational or other purposes not associated with the plant.

### PURGE – PURGING

- 1.30 PURGE or PURGING is the controlled process of discharging air or gas from a confinement to reduce airborne radioactive concentrations in such a manner that replacement air or gas is required to purify the confinement.

### EXCLUSION AREA

- 1.31 The EXCLUSION AREA is that area surrounding ANO within a minimum radius of .65 miles of the reactor buildings and controlled to the extent necessary by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

### UNRESTRICTED AREA

- 1.32 An UNRESTRICTED AREA shall be any area at or beyond the exclusion area boundary.

### CORE OPERATING LIMITS REPORT

- 1.33 The CORE OPERATING LIMITS REPORT is the ANO-2 specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Technical Specification 6.6.5. Plant operation within these operating limits is addressed in individual specifications.

### INSERVICE TESTING PROGRAM

- 1.34 The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

## REACTOR COOLANT SYSTEM

### SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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- 3.4.1.3 a. At least two of the coolant loops listed below shall be OPERABLE:
1. Reactor Coolant Loop (A) and its associated steam generator and at least one associated reactor coolant pump.
  2. Reactor Coolant Loop (B) and its associated steam generator and at least one associated reactor coolant pump.
  3. Shutdown Cooling Loop (A) #.
  4. Shutdown Cooling Loop (B) #.
- b. At least one of the above coolant loops shall be in operation.\*

APPLICABILITY: Modes 4 and 5.

#### ACTION:

- a. With less than the above required coolant loops OPERABLE, immediately initiate corrective action to return the required coolant loops to OPERABLE status as soon as possible and initiate action to make at least one steam generator available for decay heat removal via natural circulation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.
- b. With no coolant loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required coolant loop to operation.

#### SURVEILLANCE REQUIREMENTS

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- 4.4.1.3.1 The required shutdown cooling loop(s) shall be determined OPERABLE per the INSERVICE TESTING PROGRAM.
- 4.4.1.3.2 The required reactor coolant pump(s), if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.
- 4.4.1.3.3 The required steam generator(s) shall be determined OPERABLE by verifying the secondary side water level to be  $\geq 23\%$  indicated level at least once per 12 hours.
- 4.4.1.3.4 At least one coolant loop shall be verified to be in operation and circulating reactor coolant at least once per 12 hours.

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\* All reactor coolant pumps and decay heat removal pumps may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

# The normal or emergency power source may be inoperable in Mode 5.



## REACTOR COOLANT SYSTEM

### SAFETY VALVES – SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

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- 3.4.2 A minimum of one pressurizer code safety valve shall be OPERABLE with a lift setting of 2500 PSIA  $\pm$  3%\*.

APPLICABILITY: MODE 4 with Tc > 220 °F.

ACTION:

With no pressurizer code safety valve OPERABLE, reduce Tc to  $\leq$  220 °F within 12 hours.

#### SURVEILLANCE REQUIREMENTS

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- 4.4.2 No additional Surveillance Requirements other than those required by the INSERVICE TESTING PROGRAM.

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\* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure. If found outside of a  $\pm$  1% tolerance band, the setting shall be adjusted to within  $\pm$  1% of the lift setting shown.

## REACTOR COOLANT SYSTEM

### SAFETY VALVES – OPERATING

#### LIMITING CONDITION FOR OPERATION

---

3.4.3 All pressurizer code safety valves shall be OPERABLE with a lift setting 2500 psia  $\pm$  3%\*.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15 minutes or be in HOT SHUTDOWN within 12 hours.
- b. The provisions of specification 3.0.4.c may be applied and the requirements of ACTION "a" suspended for one valve at a time for up to 18 hours for entry into and during operation in MODE 3 for the purpose of setting the pressurizer code safety valves under ambient (hot) conditions provided a preliminary cold setting was made prior to heatup.

#### SURVEILLANCE REQUIREMENTS

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4.4.3 No additional Surveillance Requirements other than those required by the INSERVICE TESTING PROGRAM.

---

\* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure. If found outside of a  $\pm$  1% tolerance band, the setting shall be adjusted to within  $\pm$  1% of the lift setting shown.

## SURVEILLANCE REQUIREMENTS

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- 4.4.12.1 Verify both sets of LTOP relief valve isolation valves are open at least once per 72 hours when the LTOP relief valves are being used for overpressure protection.
- 4.4.12.2 The RCS vent path shall be verified to be open at least once per 12 hours\*\* when the vent path is being used for overpressure protection.
- 4.4.12.3 Verify that each SIT is isolated, when required, once every 12 hours.
- 4.4.12.4 No additional LTOP relief valve Surveillance Requirements other than those required by the INSERVICE TESTING PROGRAM.

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\*\* Except when the vent path is provided with a valve which is locked, sealed, or otherwise secured in the open position, then verify this valve is open at least once per 31 days.

## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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- f. By verifying that each of the following pumps develops the indicated differential pressure on recirculation flow when tested pursuant to the INSERVICE TESTING PROGRAM:
1. High-Pressure Safety Injection pump  $\geq$  1360.4 psid with 90 °F water.
  2. Low-Pressure Safety Injection pump  $\geq$  156.25 psid with 90 °F water.
- g. At least once per 18 months by verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

LPSI System  
Valve Number

- a. 2CV-5037-1
- b. 2CV-5017-1
- c. 2CV-5077-2
- d. 2CV-5057-2

- h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystem that alter the subsystem flow characteristics and verifying the following flow rates:

HPSI System – Single Pump

The sum of the injection line flow rates, excluding the highest flow rate is greater than or equal to 570 gpm.

LPSI System – Single Pump

- a. Injection Leg 1,  $\geq$  1059 gpm
- b. Injection Leg 2,  $\geq$  1059 gpm
- c. Injection Leg 3,  $\geq$  1059 gpm
- d. Injection Leg 4,  $\geq$  1059 gpm

## CONTAINMENT SYSTEMS

### 3/4.6.2 DEPRESSURIZATION, COOLING, AND pH CONTROL SYSTEMS

#### CONTAINMENT SPRAY SYSTEM

##### LIMITING CONDITION FOR OPERATION

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3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the RWT on a Containment Spray Actuation Signal (CSAS) and automatically transferring suction to the containment sump on a Recirculation Actuation Signal (RAS). Each spray system flow path from the containment sump shall be via an OPERABLE shutdown cooling heat exchanger.

APPLICABILITY: MODES 1, 2, and 3.

##### ACTION:

- a. With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With both containment spray systems inoperable (Note 1):
  1. Within 1 hour verify both CREVS trains are OPERABLE, and
  2. Restore at least one containment spray system to OPERABLE status within 24 hours.

Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

##### SURVEILLANCE REQUIREMENTS

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4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:

- a. At least once per 31 days by:
  1. Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.
  2. Verifying that the system piping is full of water from the RWT to at least elevation 505' (equivalent to > 12.5% indicated narrow range level) in the risers within the containment.
- b. Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head when tested pursuant to the INSERVICE TESTING PROGRAM.

Note 1: ACTION b is not applicable when the second containment spray system is intentionally made inoperable.

## CONTAINMENT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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- 4.6.3.1.2 Each containment isolation valve shall be demonstrated OPERABLE at least once per 18 months by verifying that on a containment isolation test signal, each isolation valve actuates to its isolation position.
- 4.6.3.1.3 The isolation time of each power operated or automatic containment isolation valve shall be determined to be within its limit when tested pursuant to the INSERVICE TESTING PROGRAM.
- 4.6.3.1.4 The containment purge supply and exhaust isolation valves shall be demonstrated OPERABLE as specified in the Containment Leakage Rate Testing Program.

## 3/4.7 PLANT SYSTEMS

### 3/4.7.1 TURBINE CYCLE

#### SAFETY VALVES

#### LIMITING CONDITION FOR OPERATION

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3.7.1.1 All main steam line code safety valves shall be OPERABLE with lift settings as specified in Table 3.7-5.

APPLICABILITY: MODES 1, 2 and 3\*

ACTION:

MODES 1 and 2

With one or more main steam line code safety valves inoperable, operation in MODES 1 and 2 may proceed provided that within 4 hours, power is reduced to less than or equal to the applicable percent of RATED THERMAL POWER as listed in Table 3.7-1 and within 12 hours, the Linear Power Level – High trip setpoint is reduced per Table 3.7-1; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours.

MODE 3

With one or more main steam line code safety valves inoperable, operation in MODE 3 may proceed provided that at least 2 main steam line code safety valves are OPERABLE on each steam generator; otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

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4.7.1.1 No additional Surveillance Requirements other than those required by the INSERVICE TESTING PROGRAM.

\* Except that during hydrostatic testing in Mode 3, eight of the main steam line code safety valves may be gagged and two (one on each header) may be reset for the duration of the test to allow the required pressure for the test to be attained. The Reactor Trip Breakers shall be open for the duration of the test.

## PLANT SYSTEMS

### EMERGENCY FEEDWATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

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- 3.7.1.2 Two emergency feedwater pumps and associated flow paths shall be OPERABLE with:
- a. One motor driven pump capable of being powered from an OPERABLE emergency bus, and
  - b. One turbine driven pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2, and 3

ACTION:

NOTE: Specification 3.0.4.b is not applicable.

With one emergency feedwater pump inoperable, restore the inoperable pump to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

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- 4.7.1.2 Each emergency feedwater pump shall be demonstrated OPERABLE:
- a. At least once per 31 days by:
    1. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.
  - b. In accordance with the INSERVICE TESTING PROGRAM by:
    1. Verifying the developed head of each EFW pump at the flow test point is greater than or equal to the required developed head. This surveillance requirement is not required to be performed for the turbine driven EFW pump until 24 hours after exceeding 700 psia in the steam generators.



## PLANT SYSTEMS

### MAIN STEAM ISOLATION VALVES

#### LIMITING CONDITION FOR OPERATION

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3.7.1.5 Each main steam isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- MODE 1 - With one main steam isolation valve inoperable, POWER OPERATION may continue provided the inoperable valve is either restored to OPERABLE status or closed within 4 hours; otherwise, be in HOT SHUTDOWN within the next 12 hours.
- MODES 2 and 3 - With one main steam isolation valve inoperable, subsequent operation in MODES 1, 2 or 3 may proceed provided the isolation valve is maintained closed; otherwise, be in HOT SHUTDOWN within the next 12 hours.

#### SURVEILLANCE REQUIREMENTS

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4.7.1.5 Each main steam isolation valve shall be demonstrated OPERABLE by verifying full closure within 3 seconds when tested pursuant to the INSERVICE TESTING PROGRAM.

## REFUELING OPERATIONS

### SHUTDOWN COOLING – TWO LOOPS

#### LIMITING CONDITION FOR OPERATION

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3.9.8.2 Two independent shutdown cooling loops shall be OPERABLE.\*

APPLICABILITY: MODE 6 when the water level above the top of the irradiated fuel assemblies seated within the reactor pressure vessel is less than 23 feet.

ACTION:

- a. With less than the required shutdown cooling loops OPERABLE, immediately initiate corrective action to return the loops to OPERABLE status as soon as possible.
- b. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.8.2 The required shutdown cooling loops shall be determined OPERABLE per the INSERVICE TESTING PROGRAM.

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\* The normal or emergency power source may be inoperable for each shutdown cooling loop.

## ADMINISTRATIVE CONTROLS

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### 6.5.7 Reactor Coolant Pump Flywheel Inspection Program

This program shall provide for the inspection of each reactor coolant pump flywheel per the recommendation of Regulatory Position C.4.b of Regulatory Guide 1.14, Revision 1, August 1975. The volumetric examination per Regulatory Position C.4.b.1 will be performed on approximately 10-year intervals.

### 6.5.8 DELETED



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 305 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT 2

DOCKET NO. 50-368

1.0 INTRODUCTION

By application dated March 25, 2016, as supplemented by letter dated December 7, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML16088A186 and ML16342B191, respectively), Entergy Operations, Inc. (Entergy, the licensee), requested changes to the technical specifications (TSs) for Arkansas Nuclear One, Unit 2 (ANO-2). Specifically, the licensee requested changes to the TSs consistent with Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-545, Revision 3, "TS Inservice Testing Program Removal & Clarify SR [Surveillance Requirement] Usage Rule Application to Section 5.5 Testing," dated October 21, 2015 (ADAMS Accession No. ML15294A555).

The supplemental letter dated December 7, 2016, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on June 7, 2016 (81 FR 36618).

The licensee's proposed changes delete ANO-2 TS 6.5.8, "Inservice Testing Program," and adds a new defined term, "INSERVICE TESTING PROGRAM," to the TSs. All existing references to the "Inservice Testing Program" in the ANO-2 TS SRs are replaced with "INSERVICE TESTING PROGRAM" so that the SRs refer to the new definition in lieu of the deleted program. The licensee also proposed additional TS format changes unrelated to TSTF-545, Revision 3.

The licensee's letter dated March 25, 2016, also included a request to use American Society of Mechanical Engineers (ASME) Code Case OMN-20, "Inservice Test Frequency," as an alternative to certain ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) requirements at ANO-2. The U.S. Nuclear Regulatory Commission (NRC) considered this request separately from the proposed license amendment, and authorized the licensee's use of this alternative by letter dated December 9, 2016 (ADAMS Accession No. ML16130A471).

## 2.0 REGULATORY EVALUATION

### 2.1 Description of Inservice Testing Requirements and TSTF-545

An inservice test is a test to assess the operational readiness of a structure, system, or component after first electrical generation by nuclear heat. The ASME OM Code provides requirements for inservice testing of certain components in light-water nuclear power plants. The ASME OM Code identifies the components subject to the testing (i.e., pumps, valves, pressure relief devices, and dynamic restraints), responsibilities, methods, intervals, parameters to be measured and evaluated, criteria for evaluating results, corrective actions, personnel qualification, and recordkeeping. Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(f), "Inservice testing requirements," requires that inservice testing of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda. The facility's TSs also prescribe inservice testing requirements and frequencies for ASME Code Class 1, 2, and 3 components.

The regulation in 10 CFR 50.55a(f)(5)(ii) states, in part, "If a revised inservice test program for a facility conflicts with the technical specifications for the facility, the licensee must apply to the Commission for amendment of the technical specifications to conform the technical specifications to the revised program." TSTF-545, Revision 3, provides guidance to licensees on how to request license amendments that would eliminate conflicting requirements between 10 CFR 50.55a, "Codes and Standards," and the TSs. TSTF-545, Revision 3, proposes elimination of the Inservice Testing Program from the Administrative Controls section of the TSs. The TSs contain surveillances that require testing or test intervals in accordance with the Inservice Testing Program. The elimination of the Inservice Testing Program from the TSs could cause uncertainty regarding the correct application of these SRs. Therefore, TSTF-545, Revision 3, also proposes adding a new definition, "INSERVICE TESTING PROGRAM," to the TSs, which would be defined as "the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." TSTF-545, Revision 3, proposes replacement of existing uses of the term, "Inservice Testing Program," with the defined term, as denoted by capitalized letters, throughout the TSs.

The NRC approved TSTF-545, Revision 3, by letter dated December 11, 2015 (ADAMS Package Accession No. ML15317A071), and published a notice of availability in the *Federal Register* on March 28, 2016 (81 FR 17208).

### 2.2 Proposed Technical Specifications Changes

The licensee requested to delete TS 6.5.8 from the Administrative Controls section of TSs and replace it with the word "DELETED." TS 6.5.8 currently states:

This program provides controls for inservice testing of ASME Code Class 1, 2, and 3 components. The program shall include the following:

- a. Testing frequencies applicable to the ASME Code for Operation and Maintenance (OM) of Nuclear Power Plants and applicable Addenda as follows:

<u>ASME OM Code terminology for inservice testing activities</u>	<u>Required frequencies for performing inservice testing activities</u>
Weekly	At least once per 7 days
Monthly	At least once per 31 days
Every 6 weeks	At least once per 42 days
Quarterly or every 3 months	At least once per 92 days
Semiannually or every 6 months	At least once per 184 days
Every 9 months	At least once per 276 days
Yearly or annually	At least once per 366 days
Biennially or every 2 years	At least once per 731 days

- b. The provisions of Specification 4.0.2 are applicable to the above required frequencies and to other normal and accelerated frequencies specified as 2 years or less in the Inservice Testing Program for performing inservice testing activities.,
- c. The provisions of Specification 4.0.3 are applicable to inservice testing activities, and
- d. Nothing in the ASME OM Code shall be construed to supersede the requirements of any Technical Specification.

SR 4.0.2 allows an extension of inservice testing intervals by up to 25 percent. If it is discovered that a surveillance associated with an inservice testing activity was not performed within the required interval, SR 4.0.3 allows the licensee to delay declaring the associated limiting condition for operation not met in order to perform the missed surveillance. The licensee did not request changes to SR 4.0.2 or SR 4.0.3.

The licensee requested to revise the Definitions section of TSs by adding the term, "INSERVICE TESTING PROGRAM," with the following definition: "The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." The licensee also requested that all existing occurrences of "Inservice Testing Program" in TS SRs be replaced with "INSERVICE TESTING PROGRAM," so that the SRs refer to the new definition in lieu of the deleted program.

### 2.3 Regulatory Requirements and Guidance

The NRC staff considered the following regulatory requirements, guidance, and licensing information during its review of the proposed changes:

#### *Technical Specifications*

Paragraph 50.36(c) of 10 CFR requires TSs to include the following categories: (1) safety limits, limiting safety systems settings, and control settings; (2) limiting conditions for operation; (3) SRs; (4) design features; (5) administrative controls; (6) decommissioning; (7) initial notification; and (8) written reports. Section 50.36(c)(3) of 10 CFR states that "[s]urveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met." Section 50.36(c)(5) of

10 CFR states that “[a]dministrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.”

The NRC staff’s guidance for review of the TSs is in NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition,” Chapter 16, “Technical Specifications,” Revision 3, dated March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the staff has prepared improved STSs for each of the LWR nuclear steam supply systems and associated balance-of-plant equipment systems. In April of 2012, the NRC most-recently published NUREG-1432, Revision 4, “Standard Technical Specifications – Combustion Engineering Plants” (ADAMS Accession No. ML12102A165).

The licensee’s proposed amendment is based on TSTF-545, Revision 3, which is an NRC-approved change to the improved STSs. The NRC staff’s review includes consideration of whether the proposed changes are consistent with TSTF-545, Revision 3. Special attention is given to TS provisions that depart from the improved STSs, as modified by NRC-approved TSTF travelers, to determine whether proposed differences are justified by uniqueness in plant design or other considerations so that 10 CFR 50.36 is met. In addition, the guidance states that comparing the change to previous STS can help clarify the TS intent.

#### *Inservice Testing*

Pursuant to 10 CFR 50.54, “Conditions of licenses,” the applicable requirements of 10 CFR 50.55a are conditions of every nuclear power reactor operating license issued under 10 CFR Part 50. These requirements include inservice testing of pumps and valves at nuclear power reactors in accordance with the ASME OM Code as specified in 10 CFR 50.55a(f). The regulations in 10 CFR 50.55a(f) state, in part:

Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME BPV [Boiler and Pressure Vessel] Code and ASME Code for Operation and Maintenance of Nuclear Power Plants as specified in this paragraph. Each operating license for a boiling or pressurized water-cooled nuclear facility is subject to the following conditions [referring to 10 CFR 50.55a(f)(1) through (f)(6)]. . . .

The ASME OM Code is a consensus standard, which is incorporated by reference into 10 CFR 50.55a. During the incorporation process, the NRC staff reviewed the ASME OM Code requirements for technical sufficiency and found that the ASME OM Code inservice testing program requirements were suitable for incorporation into the NRC’s rules.

The regulation in 10 CFR 50.55(a)(f)(5)(ii) states, in part: “If a revised inservice test program for a facility conflicts with the technical specifications for the facility, the licensee must apply to the Commission for amendment of the technical specifications to conform the technical specifications to the revised program.”

NUREG-1482, Revision 2, “Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants,” Final Report, October 2013 (ADAMS Accession No. ML13295A020) provides guidance for the inservice testing of pumps and valves.

NUREG-0800, Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints," Revision 3, March 2007 (ADAMS Accession No. ML070720041), provides guidance and acceptance criteria for the NRC staff review of the inservice testing program for pumps and valves.

### 3.0 TECHNICAL EVALUATION

The NRC staff evaluated the licensee's application to determine if the proposed changes are consistent with the guidance, regulations, and licensing information discussed in Section 2.3 of this safety evaluation (SE). In determining whether an amendment to a license will be issued, the Commission is guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Among the considerations are whether the TSs, as amended, would provide the necessary administrative controls per 10 CFR 50.36(c)(5) (i.e., provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner). In making its determination as to whether to amend the license, the staff considered those regulatory requirements that are automatically conditions of the license through 10 CFR 50.54. Where the regulations already condition the license, there is no need for a duplicative requirement in the TSs; the regulations provide the necessary reasonable assurance of the health and safety of the public.

#### 3.1 Deletion of the Inservice Testing Program from the TSs

TS 6.5.8 requires the licensee to have an inservice testing program that provides controls for inservice testing of ASME Code Class 1, 2, and 3 components (i.e., pumps and valves). Through 10 CFR 50.54, the applicable requirements of 10 CFR 50.55a are conditions of every nuclear power reactor operating license issued under 10 CFR Part 50. These requirements include 10 CFR 50.55a(f), which specifies the requirements for the inservice testing of pumps and valves. Therefore, requiring the licensee to have an inservice testing program in TSs is duplicative of the license condition in 10 CFR 50.54. Thus, with the proposed TS changes, the licensee will still be required to maintain an inservice testing program in accordance with the ASME OM Code, as specified in 10 CFR 50.55a(f). For the reasons explained below, it is not necessary to have additional administrative controls in the TSs relating to the inservice testing program to assure operation of the facility in a safe manner.

##### *Consideration of TS 6.5.8.a*

The ASME OM Code requires testing to normally be performed within certain time periods. TS 6.5.8.a sets inservice testing frequencies more precisely than those specified in the ASME OM Code and applicable addenda (e.g., "at least once per 31 days" contrasted with "monthly"). However, the NRC staff determined that the more precise inservice testing frequencies are not necessary to assure operation of the facility in a safe manner. Therefore, the NRC staff determined that deletion of TS 6.5.8.a is acceptable.

##### *Consideration of TS 6.5.8.b*

TS 6.5.8.b allows the licensee to extend, by up to 25 percent, the interval between inservice testing activities, as required by TS 6.5.8.a and for other normal and accelerated frequencies specified as 2 years or less in the inservice testing program. Similar to TS 6.5.8.b, the NRC authorization of Code Case OMN-20 on December 9, 2016, also permits the licensee to extend the inservice testing intervals specified in the ASME OM Code by up to 25 percent.



The NRC staff determined that the TS 6.5.8.b allowance to extend inservice testing intervals is not needed to assure operation of the facility in a safe manner. Therefore, the NRC staff determined that deletion of TS 6.5.8.b is acceptable. The deletion of TS 6.5.8.b does not impact the licensee's ability to extend inservice testing intervals using Code Case OMN-20, as authorized by the NRC.

#### *Consideration of TS 6.5.8.c*

TS 6.5.8.c allows the licensee to use SR 4.0.3 when it discovers that an SR associated with an inservice test was not performed within its specified frequency. SR 4.0.3 allows the licensee to delay declaring a limiting condition for operation not met in order to perform the missed surveillance. The use of SR 4.0.3 for inservice tests is limited to those inservice tests required by an SR. In accordance with 10 CFR 50.55a, the licensee may also request relief from the ASME OM Code requirements to address issues associated with a missed inservice test. Deletion of TS 6.5.8.c does not change any of these requirements, and SR 4.0.3 will continue to apply to those inservice tests required by SRs. Based on the above, the NRC staff determined that deletion of TS 6.5.8.c is acceptable.

#### *Consideration of TS 6.5.8.d*

TS 6.5.8.d states that nothing in the ASME OM Code shall be construed to supersede the requirements of any TS. However, the regulations in 10 CFR 50.55a(f)(5)(ii) address what to do if a revised inservice testing program for a facility conflicts with the TSs for the facility; they require the licensee to apply for an amendment to the TSs to conform the TSs to the revised program at least 6 months prior to the start of the period for which the provisions become applicable. Accordingly, there is no need for a TS stating how to address conflicts between the TSs and the inservice testing program because the regulations specify how conflicts must be resolved.

#### *Conclusion Regarding Deletion of TS 6.5.8*

The NRC staff determined that the requirements currently in TS 6.5.8 are not necessary to assure operation of the facility in a safe manner. Based on this evaluation, the staff concludes that deletion of TS 6.5.8 from the licensee's TSs is acceptable, because TS 6.5.8 is not required by 10 CFR 50.36(c)(5).

### 3.2 Definition of INSERVICE TESTING PROGRAM and Revision to SRs

The licensee proposes to revise the TS Definitions section to include the term, "INSERVICE TESTING PROGRAM," with the following definition: "The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." The proposed definition of the INSERVICE TESTING PROGRAM is consistent with the definition in TSTF-545, Revision 3. The definition is acceptable to the NRC staff because it correctly refers to the inservice testing requirements in 10 CFR 50.55a(f).

The licensee requested that all existing references to the "Inservice Testing Program" in SRs be revised to "INSERVICE TESTING PROGRAM" to reference the new TS defined term in lieu of the deleted program. The proposed change is consistent with the intent of TSTF-545, Revision 3, to replace the current references in SRs with the new definition. The NRC staff verified that for each SR reference to the "Inservice Testing Program," the licensee proposed to change the reference to "INSERVICE TESTING PROGRAM." The proposed change does not

alter how the SR testing is performed. However, the inservice testing frequencies could change because the TSs will no longer include the more precise test frequencies in TS 6.5.8.a. As discussed in Section 3.1 of this SE, the staff determined that the TSs do not need to include the more precise testing frequencies currently in TS 6.5.8.a. Based on its review, the staff determined that revising the SRs to refer to the new definition is acceptable because these SRs will continue to be performed in accordance with the requirements of 10 CFR 50.55a(f). The staff also determined that, with the proposed changes that allow less-precise testing frequencies, 10 CFR 50.36(c)(3) will continue to be met because the SRs will continue to ensure 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.

### 3.3 Deviations from TSTF-545

In its application, the licensee identified the following deviations from TSTF-545, Revision 3, in part:

<b>ANO-2</b>	<b>ISTS</b>	<b>[Deviations]</b>
SR 4.4.1.3.1	N/A	The [inservice testing] program is listed in this ANO-2 SR associated with operable Shutdown Cooling loops. [This SR has no equivalent in the improved STS (ISTS); however, the inservice testing program capitalization is applicable.]
SR 4.4.2	N/A	The [inservice testing] program is listed in this ANO-2 SR associated with operable Pressurizer Safety Valves during operation in Mode 4 with Reactor Coolant System (RCS) cold leg temperature [greater than 220 degrees Fahrenheit. This SR has no equivalent in the ISTS; however, the inservice testing program capitalization is applicable.]
SR 4.4.12.4	N/A	The [inservice testing] program is listed in this ANO-2 SR associated with operable Low Temperature Overpressure relief valves. [This SR has no equivalent in the ISTS; however, the inservice testing program capitalization is applicable.]
N/A	SR 3.5.2.5	The ANO-2 Charging Pumps are non-TS [i.e., the Charging Pumps are not part of the ANO-2 TSs]; therefore, there are no comparable ANO-2 TSs and no change is required.
N/A	SR 3.6.6B.5	This SR is associated with plants that <u>do not</u> credit Containment Spray for iodine removal and is not applicable to ANO-2. Therefore, no TS change is required.
N/A	SR 3.6.7.4	The ANO-2 Containment Spray additive is sodium tetraborate (NaTB) decahydrate and, therefore, the [inservice testing] program is not applicable. No ANO-2 TS change is required.

ANO-2	ISTS	[Deviations]
N/A	SR 3.6.12.1	This SR is associated with "dual" Containment Building designs and is not applicable to ANO-2. No comparable ANO-2 TS exists and, therefore, no TS change is applicable.
SR 4.7.1.1	SR 3.7.1.1	There are minor wording differences between the respective ANO-2 SR and the ISTS version of TSTF-545; however, the [inservice testing] program capitalization remains applicable. Note that the as-left tolerance is listed at the end of ANO-2 TS Table 3.7-5 and is not included in the SR proper.
N/A	SR 3.7.3.1	ANO-2 does not have a TS associated with Main Feedwater valves; therefore, no TS change is applicable.
SR 4.9.8.2	SR N/A	The [inservice testing] program is listed in this ANO-2 SR associated with operable Shutdown Cooling loops during operation in Mode 6 and RCS level is below 23 feet. [This SR has no equivalent in the ISTS; however, the inservice testing program capitalization is applicable.]

The licensee also noted that, because the ANO-2 TSs are of an older standard version and have not been converted to ISTS, the TS numbering is different and the actual TS wording may also differ. The licensee identified the following ANO-2 SRs as containing minor wording differences from the associated ISTS SR, for which capitalization of the inservice testing program remains applicable: SR 4.4.3, SR 4.5.2.f, SR 4.6.2.1, SR 4.6.3.1.3, SR 4.7.1.2, and SR 4.7.1.5.

The NRC staff finds that the proposed deviations are editorial in nature and the licensee's proposed TS changes remain consistent with the intent of TSTF-545, Revision 3. Therefore, the staff finds that the licensee's proposed TS changes are 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 on January 17, 2017. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes SRs. 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 in the *Federal Register* on June 7, 2016 (81 FR 36618). 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.

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Date: March 29, 2017

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - ISSUANCE OF AMENDMENT  
RE: ADOPTION OF TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER  
TSTF-545, REVISION 3, "TS INSERVICE TESTING PROGRAM REMOVAL &  
CLARIFY SR USAGE RULE APPLICATION TO SECTION 5.5 TESTING"  
(CAC NO. MF7535) DATED MARCH 29, 2017

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