



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

December 17, 2021

ANO Site Vice President
Arkansas Nuclear One
Entergy Operations, Inc.
N-TSB-58
1448 S.R. 333
Russellville, AR 72802

**SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - ISSUANCE OF AMENDMENT NO. 327
RE: ADDITION OF TECHNICAL SPECIFICATION LIMITING CONDITION FOR
OPERATION 3.0.6 AND ADOPTION OF SAFETY FUNCTION DETERMINATION
PROGRAM (EPID L-2020-LLA-0252)**

Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 327 to Renewed Facility Operating License No. NPF-6 for Arkansas Nuclear One, Unit 2. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 17, 2020, as supplemented by letters dated May 24 and November 12, 2021.

The amendment revises the TSs to include the provisions of Limiting Condition for Operation (LCO) 3.0.6 in the Standard Technical Specifications. In support of this change, the amendment also adds a new Safety Function Determination Program to the Administrative Controls section of the TSs; add new notes and actions that direct entering the actions for the appropriate supported systems; and makes changes to LCO 3.0.2.

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

Sincerely,

/RA/

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. 327 to NPF-6
2. Safety Evaluation

cc: 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. 327
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 November 17, 2020, as supplemented by letters dated May 24, 2021, and November 12, 2021, 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 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. 327, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications

3. This 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

Jennifer L. Dixon-Herrity, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: December 17, 2021



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

ATTACHMENT TO LICENSE AMENDMENT NO. 327
RENEWED FACILITY OPERATING LICENSE NO. NPF-6
ARKANSAS NUCLEAR ONE, UNIT 2
DOCKET NO. 50-368

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

Renewed Facility Operating License

REMOVE
-3-

INSERT
-3-

Technical Specifications

REMOVE
1-1
3/4 0-1
3/4 0-1a
3/4 3-13
3/4 3-15a
3/4 4-5
3/4 4-14
3/4 6-2
3/4 6-16
3/4 7-15
3/4 8-1
3/4 8-1a
3/4 8-2
3/4 8-2a
3/4 8-5
3/4 8-6
3/4 8-7
3/4 8-10

INSERT
1-1
3/4 0-1
3/4 0-1a
3/4 3-13
3/4 3-15a
3/4 4-5
3/4 4-14
3/4 6-2
3/4 6-16
3/4 7-15
3/4 8-1
3/4 8-1a
3/4 8-2
3/4 8-2a
3/4 8-5
3/4 8-6
3/4 8-7
3/4 8-10
6-18b

- (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. 327, 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

DEFINED TERMS

- 1.1 The DEFINED TERMS of this section appear in capitalized type and are applicable, throughout these Technical Specifications.

THERMAL POWER

- 1.2 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

RATED THERMAL POWER

- 1.3 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 3026 MWt.

OPERATIONAL MODE – MODE

- 1.4 An OPERATIONAL MODE (i.e. MODE) shall correspond to any one inclusive combination of core reactivity condition, power level and average reactor coolant temperature specified in Table 1.1.

ACTION

- 1.5 ACTION shall be those additional requirements specified as corollary statements to each principle specification and shall be part of the specifications.

OPERABLE – OPERABILITY

- 1.6 A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

REPORTABLE OCCURRENCE

- 1.7 A REPORTABLE OCCURRENCE shall be any of those conditions specified in Section 50.73 to 10CFR Part 50.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.0 APPLICABILITY

LIMITING CONDITION FOR OPERATION

- 3.0.1 Limiting Conditions for Operation (LCO) and ACTION requirements shall be applicable during the OPERATIONAL MODES or other conditions specified for each specification, except as provided in LCO 3.0.2, LCO 3.0.8, and LCO 3.0.9.
- 3.0.2 Adherence to the requirements of the LCO and/or associated ACTION within the specified time interval shall constitute compliance with the specification, except as provided in LCO 3.0.5 and LCO 3.0.6. In the event the LCO is restored prior to expiration of the specified time interval, completion of the ACTION statement is not required.
- 3.0.3 In the event a Limiting Condition for Operation and/or associated ACTION requirements cannot be satisfied because of circumstances in excess of those addressed in the specification within 1 hour, action shall be initiated to place the unit in a mode in which the specification does not apply by placing it, as applicable, in at least HOT STANDBY within 6 hours, in at least HOT SHUTDOWN within the next 6 hours, and in at least COLD SHUTDOWN within the following 24 hours unless corrective measures are completed that permit operation under the permissible ACTION statements for the specified time interval as measured from initial discovery or until the reactor is placed in a MODE in which the specification is not applicable. Exceptions to these requirements shall be stated in the individual specification.
- 3.0.4 When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:
- a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time;
 - b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate (exceptions to this Specification are stated in the individual Specifications); or
 - c. When an allowance is stated in the individual value, parameter, or other Specification.

This specification shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.0 APPLICABILITY (continued)

LIMITING CONDITION FOR OPERATION

- 3.0.5 Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.
- 3.0.6 When a supported system LCO is not met solely due to a support system LCO not being met, the ACTIONS associated with this supported system are not required to be entered. Only the support system LCO ACTIONS are required to be entered. This is an exception to LCO 3.0.2 for the supported system. In this event, an evaluation shall be performed in accordance with Specification 6.5.19, "Safety Function Determination Program (SFDP)." If a loss of safety function is determined to exist by this program, the appropriate ACTIONS of the LCO in which the loss of safety function exists are required to be entered.

When a support system's ACTION directs a supported system to be declared inoperable or directs entry into the ACTIONS for a supported system, the applicable ACTIONS shall be entered in accordance with LCO 3.0.2.

- 3.0.7 To be used later.
- 3.0.8 When one or more required snubbers are unable to perform their associated support function(s), any affected supported LCO(s) are not required to be declared not met solely for this reason if risk is assessed and managed, and:
- a. the snubbers not able to perform their associated support function(s) are associated with only one train or subsystem of a multiple train or subsystem supported system or are associated with a single train or subsystem supported system and are able to perform their associated support function within 72 hours; or
 - b. the snubbers not able to perform their associated support function(s) are associated with more than one train or subsystem of a multiple train or subsystem supported system and are able to perform their associated support function within 12 hours.

At the end of the specified period the required snubbers must be able to perform their associated support function(s), or the affected supported system LCO(s) shall be declared not met.

- 3.0.9 When one or more required barriers are unable to perform their related support function(s), any supported system LCO(s) are not required to be declared not met solely for this reason for up to 30 days provided that at least one train or subsystem of the supported system is OPERABLE and supported by barriers capable of providing their related support function(s), and risk is assessed and managed. This specification may be concurrently applied to more than one train or subsystem of a multiple train or subsystem supported system provided at least one train or subsystem of the supported system is OPERABLE and the barriers supporting each of these trains or subsystems provide their related support function(s) for different categories of initiating events.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
7. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	2/Bus	1/Bus	2/Bus	1,2,3	9,14
b. 460 volt Emergency Bus Undervoltage (Degraded Voltage)	2/Bus	2/Bus	2/Bus	1,2,3	14
8. EMERGENCY FEEDWATER (EFAS)					
a. Manual (Trip Switches)	2 sets of 2 per S/G	2 sets of 2 per S/G	2 sets of 2 per S/G	1,2,3	9
b. SG Level and Pressure (A/B) – Low and ΔP (A/B) – High	4/SG	2/SG	3/SG	1,2,3	10,11
c. SG Level (A/B) – Low and No S/G Pressure – Low Trip (A/B)	4/SG	2/SG	3/SG	1,2,3	10,11
d. ESFAS Logic					
1. Matrix Logic	6	1	3	1,2,3	12
2. Initiation Logic	4	2	4	1,2,3	9
e. Automatic Actuation Logic	2	1	2	1,2,3	13

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 12 – With the number of OPERABLE channels one less than the Minimum Channels OPERABLE, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION 13 – With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing provided the other channel is OPERABLE. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION 14 – With the number of OPERABLE 460 volt Degraded Voltage (Functional Unit 7.b) channels one less than the Total Number of Channels or with both 4.16 kv Loss of Voltage (Functional Unit 7.a) channels inoperable on a single bus:

- a. Immediately declare the affected diesel generator inoperable, and
- b. Restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

REACTOR COOLANT SYSTEM

PRESSURIZER

LIMITING CONDITION FOR OPERATION

- 3.4.4 The pressurizer shall be OPERABLE with a water volume of ≤ 910 cubic feet (equivalent to $\leq 82\%$ of wide range indicated level) and both pressurizer proportional heater groups shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- (a) With the pressurizer inoperable due to water volume ≥ 910 cubic feet, be in at least HOT SHUTDOWN with the reactor trip breakers open within 12 hours.
- (b) With the pressurizer inoperable due to a single proportional heater group having less than a 150 KW capacity, restore the inoperable proportional heater group to OPERABLE status within 72 hours, or be in at least HOT SHUTDOWN within 12 hours.
- (c) With the pressurizer inoperable due to both proportional heater groups being inoperable for any reason (Note 1), restore at least one proportional heater group to OPERABLE status within 24 hours, or be in at least HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

- 4.4.4.1 The pressurizer water volume shall be determined to be within its limits in accordance with the Surveillance Frequency Control Program.
- 4.4.4.2 The pressurizer proportional heater groups shall be determined to be OPERABLE in accordance with the Surveillance Frequency Control Program by verifying that the summed power consumption of the two proportional heater groups is ≥ 150 KW.

Note 1: Action (d) is not applicable when the second group of required pressurizer heaters is intentionally made inoperable.

REACTOR COOLANT SYSTEM

REACTOR COOLANT SYSTEM OPERATIONAL LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.6.2 Reactor Coolant System operational leakage shall be limited to:

- a. No PRESSURE BOUNDARY LEAKAGE,
- b. 1 GPM UNIDENTIFIED LEAKAGE,
- c. 150 gallons per day primary to secondary leakage through any one steam generator (SG),
- d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and
- e. Leakage as specified in Table 3.4.6-1 for those Reactor Coolant System Pressure Isolation Valves identified in Table 3.4.6-1.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE or any primary to secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With any Reactor Coolant System operational leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE and primary to secondary leakage, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than the above limit, isolate (Note 1) the high pressure portion of the affected system from the low pressure portion within 4 hours by use of at least two valves* in each high pressure line having a non-functional valve and be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Note 1: Enter applicable ACTION(s) for system(s) made inoperable by an inoperable pressure isolation valve.

- * These valves may include check valves for which the leakage rate has been verified, manual valves or automatic valves. Manual and automatic valves shall be tagged as closed to preclude inadvertent valve opening.

CONTAINMENT SYSTEMS

CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

- 3.6.1.2 Containment leakage rates shall be in accordance with the Containment Leakage Rate Testing Program.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the containment leakage rate exceeding the acceptance criteria of the Containment Leakage Rate Testing Program, within 1 hour, restore leakage to within limits or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

- 4.6.1.2 The containment leakage rates shall be determined in accordance with the Containment Leakage Rate Testing Program.

CONTAINMENT SYSTEMS

3/4.6.3 CONTAINMENT ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.6.3.1 Each containment isolation valve shall be OPERABLE.*

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Note: Enter applicable ACTION(s) for system(s) made inoperable by containment isolation valves.

With one or more isolation valve(s) inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and either:

- a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or
- b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or
- c. Isolate the affected penetration within 4 hours by use of at least one closed manual valve or blind flange; or
- d. Be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.3.1.1 Each containment isolation valve shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit by performance of a cycling test and verification of isolation time.

* Locked or sealed closed valves may be opened on an intermittent basis under administrative control.

PLANT SYSTEMS

3/4.7.3 SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1 At least two independent service water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Notes:

1. Enter applicable ACTION(s) of LCO 3.8.1.1, "AC Sources – Operating," for diesel generator made inoperable by service water system.
2. Enter applicable ACTION(s) of LCO 3.4.1.3, "Reactor Coolant System – Shutdown," if a required shutdown cooling loop is made inoperable by service water system.

With only one service water loop OPERABLE, restore at least two loops 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. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two service water loops shall be demonstrated OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.
- b. In accordance with the Surveillance Frequency Control Program during shutdown, by verifying that each automatic valve servicing safety related equipment actuates to its correct position on CCAS, MSIS and RAS test signals.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system and
- b. Two separate and independent diesel generators each with:
 1. A day fuel tank containing a minimum volume of 300 gallons of fuel,
 2. A separate fuel storage system, and
 3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

NOTE: Specification 3.0.4.b is not applicable to diesel generators.

- a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, perform the following:
 1. Demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and
 2. Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required features(s), declare required features(s) with no offsite power available inoperable when its redundant required features(s) is inoperable, and
 3. Restore the offsite A.C. circuit 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. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in a 10-year period.

ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

- b. With one diesel generator of the above required A.C. electrical power source inoperable, perform the following:
 - 1. Demonstrate the OPERABILITY of both the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and
 - 2. Within 4 hours from discovery of one required diesel generator inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) supported by the inoperable diesel generator inoperable when its redundant required feature(s) is inoperable, and
 - 3. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator within 24 hours by:
 - i. Determining the OPERABLE diesel generator is not inoperable due to a common cause failure, or
 - ii. Perform Surveillance Requirement 4.8.1.1.2.a.4 unless:
 - a. The remaining diesel generator is currently in operation, or
 - b. The remaining diesel generator has been demonstrated OPERABLE within the previous 24 hours, and
 - 4. Restore the diesel generator to OPERABLE status within 14 days (See Note 1) or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

Note 1 – If the Alternate A.C. Diesel Generator (AACDG) is determined to be inoperable during this period, then a 72 hour restoration period is applicable until either the AACDG or the diesel generator is returned to operable status (not to exceed 14 days from the initial diesel generator inoperability).

ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

- c. With one offsite A.C. circuit and one diesel generator of the above required A.C. electrical power sources inoperable (see Note 2), perform the following:
1. Demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and,
 2. Within 4 hours from discovery of one required diesel generator inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) supported by the inoperable diesel generator inoperable if its redundant required feature(s) is inoperable, and
 3. If the diesel generator became inoperable due to any cause other than preplanned preventative maintenance or testing, then
 - i. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, except when:
 - a. The remaining diesel generator is currently in operation, or
 - b. The remaining diesel generator has been demonstrated OPERABLE within the previous 8 hours, and
 4. Restore at least one of the inoperable sources to OPERABLE status within 12 hours, and
 5. Restore the remaining inoperable A.C. Source to an OPERABLE status (Offsite A.C. Circuit within 72 hours or Diesel Generator within 14 days (see b.4, Note 1)) based on the time of the initiating event that caused the inoperability.

Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

Note 2 – Enter applicable ACTIONS of LCO 3.8.2.1, "A.C. Distribution – Operating," when ACTION c is entered with no AC power to any train.

ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

- d. With two offsite A.C. circuits of the above required A.C. electrical power sources inoperable, perform the following:
1. Perform Surveillance Requirement 4.8.1.1.2.a.4 on the diesel generators within the next 8 hours except when:
 - i. The diesel generators are currently in operation, or
 - ii. The diesel generators have been demonstrated OPERABLE within the previous 8 hours, and
 2. Within 12 hours from discovery of two required offsite A.C. circuits inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) inoperable when its redundant required feature(s) is inoperable, and
 3. Restore one of the inoperable offsite A.C. circuits to OPERABLE status within 24 hours, and
 4. Restore both A.C. circuits within 72 hours of the initiating event,
- Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.
- e. With two diesel generators of the above required A.C. electrical power sources inoperable, perform the following:
1. Demonstrate the OPERABILITY of the two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and
 2. Restore one of the inoperable diesel generators to OPERABLE status within 2 hours, and
 3. Restore the remaining inoperable diesel generator within 14 days (see b.4, Note 1) of the initiating event.

Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. One diesel generator with:
 1. A day fuel tank containing a minimum volume of 300 gallons of fuel,
 2. A fuel storage system, and
 3. A fuel transfer pump.

APPLICABILITY: MODES 5 and 6, or during movement of recently irradiated fuel assemblies or movement of new fuel assemblies over recently irradiated fuel assemblies.

ACTION:

Note: Enter applicable ACTIONS of LCO 3.8.2.2, "A.C. Distribution – Shutdown," and LCO 3.8.2.4, "D.C. Sources – Shutdown," with one required train de-energized.

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend the movement of recently irradiated fuel assemblies, the movement of new fuel assemblies over recently irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.

SURVEILLANCE REQUIREMENT

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1 and 4.8.1.1.2 except for Requirement 4.8.1.1.2a.5.

ELECTRICAL POWER SYSTEMS

3/4.8.2 ONSITE POWER DISTRIBUTION SYSTEMS

A.C. DISTRIBUTION – OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 The following A.C. electrical busses shall be OPERABLE and energized with tie breakers open between redundant busses:

4160 volt Emergency Bus # 2A3

4160 volt Emergency Bus # 2A4

480 volt Emergency Bus # 2B5

480 volt Emergency Bus # 2B6

120 volt A.C. Vital Bus # 2RS1

120 volt A.C. Vital Bus # 2RS2

120 volt A.C. Vital Bus # 2RS3

120 volt A.C. Vital Bus # 2RS4

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Note: Enter applicable ACTIONS of LCO 3.8.2.3, "DC Sources – Operating" for DC train(s) made inoperable by inoperable power distribution subsystems.

With less than the above complement of A.C. busses OPERABLE, restore the inoperable bus to OPERABLE status within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.2.1 The specified A.C. busses shall be determined OPERABLE with tie breakers open between redundant busses in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and indicated power availability.

ELECTRICAL POWER SYSTEMS

A.C. DISTRIBUTION – SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, the following A.C. electrical busses shall be OPERABLE:

- 1 - 4160 volt Emergency Bus
- 1 - 480 volt Emergency Load Center Bus
- 4 - 480 volt Motor Control Center Busses
- 2 - 120 volt A.C. Vital Busses

APPLICABILITY: MODES 5 and 6, or during movement of recently irradiated fuel assemblies or movement of new fuel assemblies over recently irradiated fuel assemblies.

ACTION:

With less than the above complement of A.C. busses OPERABLE and energized, immediately declare affected required features inoperable OR:

- a. Immediately suspend the movement of recently irradiated fuel assemblies, the movement of new fuel assemblies over recently irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM or boron concentration, and
- b. Immediately initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status, and
- c. Immediately declare associated required shutdown cooling subsystem(s) inoperable and not in operation.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The specified A.C. busses shall be determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and indicated power availability.

ELECTRICAL POWER SYSTEMS

DC SOURCES – SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.4 As a minimum, the following DC electrical equipment and bus shall be energized and OPERABLE:

- 1 - 125-volt DC bus, and
- 1 - 125-volt battery bank and charger supplying the above DC bus.

APPLICABILITY: MODES 5 and 6, or during movement of recently irradiated fuel assemblies or movement of new fuel assemblies over recently irradiated fuel assemblies.

ACTION:

- a. With the required battery charger inoperable:
 - i. Restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours, and
 - ii. Verify battery float current ≤ 2 amps once per 12 hours.
- b. With the requirements of ACTION 'a' not met or with the above complement of DC equipment and bus otherwise inoperable, immediately declare affected required features inoperable OR:
 - i. Immediately suspend the movement of recently irradiated fuel assemblies, the movement of new fuel assemblies over recently irradiated fuel assemblies, and any operations involving positive reactivity additions that could result in loss of required SDM or boron concentration, and
 - ii. Immediately initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status, and
 - iii. Immediately declare associated required shutdown cooling subsystem(s) inoperable and not in operation.

SURVEILLANCE REQUIREMENTS

- 4.8.2.4.1 The above required 125-volt D.C. bus shall be determined OPERABLE and energized in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and indicated power availability.
- 4.8.2.4.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirements 4.8.2.3.1, 4.8.2.3.2, and 4.8.2.3.3; however, while each of these Surveillance Requirements must be met, Surveillance Requirements 4.8.2.3.2 and 4.8.2.3.3 are not required to be performed.

6.5.19 Safety Function Determination Program (SFDP)

This program ensures loss of safety function is detected and appropriate actions taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other appropriate limitations and remedial or compensatory actions may be identified to be taken as a result of the support system inoperability and corresponding exception to entering supported system ACTIONS. This program implements the requirements of LCO 3.0.6. The SFDP shall contain the following:

- a. Provisions for cross train checks to ensure a loss of the capability to perform the safety function assumed in the accident analysis does not go undetected,
- b. Provisions for ensuring the plant is maintained in a safe condition if a loss of function condition exists,
- c. Provisions to ensure that an inoperable supported system's allowed outage time is not inappropriately extended as a result of multiple support system inoperabilities, and
- d. Other appropriate limitations and remedial or compensatory actions.

A loss of safety function exists when, assuming no concurrent single failure, no concurrent loss of offsite power, or no concurrent loss of onsite diesel generator(s), a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

- a. A required system redundant to the system(s) supported by the inoperable support system is also inoperable, or
- b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable, or
- c. A required system redundant to the support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate ACTIONS of the LCO in which the loss of safety function exists are required to be entered. When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate ACTIONS to enter are those of the support system.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 327 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT 2

DOCKET NO. 50-368

1.0 INTRODUCTION

By letter dated November 17, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20322A426), as supplemented by letters dated May 24, 2021, and November 12, 2021 (ADAMS Accession Nos. ML21144A287 and ML21318A001, respectively), Entergy Operations, Inc. (the licensee), requested changes to the Technical Specifications (TSs) for Arkansas Nuclear One, Unit 2 (ANO-2).

The proposed changes would revise the ANO-2 TSs to include the provisions of Limiting Condition for Operation (LCO) 3.0.6 in the Improved Standard Technical Specifications (ISTS)¹. In support of this change, the amendment would also add a new Safety Function Determination Program (SFDP) to the Administrative Controls section of the TSs; add new notes and actions that direct entering the actions for the appropriate supported systems; and makes changes to TS LCO 3.0.2.

The supplemental letters dated May 24, 2021, and November 12, 2021, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 23, 2021 (86 FR 11013).

¹ The ISTS is a common expression used by industry stakeholders when referring to the current Standard Technical Specifications. The current Standard Technical Specifications referenced in the LAR and applicable to Combustion Engineering Plants (e.g., ANO-2) are in NUREG-1432, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4, April 2012 (ADAMS Accession Nos. ML12102A165 and ML12102A169, respectively).

2.0 REGULATORY EVALUATION

2.1 Description of Proposed TS Changes

In the license amendment request (LAR) dated November 17, 2020, as supplemented, the licensee requested changes to the TSs that would incorporate the provisions of LCO 3.0.6 of the ISTS. The proposed change also would add a new SFDP to the Administrative Controls section of the TSs to ensure that a loss of safety function is detected, and appropriate actions are taken when using the provisions of LCO 3.0.6.

The provisions of LCO 3.0.6 establish an allowance for not entering Actions associated with a supported system when a supported system LCO is not met solely due to a support system LCO not being met. The proposed change will remove the potential confusion and inconsistency of requirements related to the entry into multiple support and supported systems' Actions. The actions necessary to ensure the plant is maintained in a safe condition are included in the support systems' Actions, which may include directions to enter the Actions for the supported system when appropriate. The specific proposed TS changes are described below.

2.1.1 Proposed TS Changes to Incorporate LCO 3.0.6

The licensee proposed the following ANO-2 TS changes to incorporate the provisions of LCO 3.0.6 in the ISTS. Throughout this section of the safety evaluation (SE), the impacted TSs (described in the LAR and supplemental letters) are shown in italics. The proposed additions are underlined, and the proposed deletions are shown in strikethrough.

- Revise ANO-2 LCO 3.0.2 to include a new reference to LCO 3.0.6 (consistent with ISTS), as an exception to ANO-2 LCO 3.0.2. The term "Specification" in LCO 3.0.2 is also replaced by the acronym "LCO" as defined in ANO-2 LCO 3.0.1 and the title "Limiting Condition for Operation" is replaced with the LCO acronym for consistency. In addition, the ANO-2 LCO 3.0.2 current reference to LCO 3.0.6 is revised to LCO 3.0.5 due to the deletion of LCO 3.0.5 resulting in the current LCO 3.0.6 (related to conditions when returning equipment to service) being renumbered as LCO 3.0.5. The proposed changes are as follows:

3.0.2 Adherence to the requirements of the ~~Limiting Condition for Operation~~ and/or associated ACTION within the specified time interval shall constitute compliance with the specification, except as provided in LCO Specification 3.0.56 and LCO 3.0.6. In the event the ~~Limiting Condition for Operation~~ is restored prior to expiration of the specified time interval, completion of the ACTION statement is not required.

- Revise ANO-2 TSs definition for "Operable – Operability" to adopt the ISTS definition for "Operable – Operability." Note, the existing LCO 3.0.5 is proposed for deletion based on proposed changes to LCO 3.8.1.1, "A.C. [Alternating Current or AC] Sources" (discussed later). These changes permit adoption of the ISTS version of the TS definition of "Operable." The proposed changes are as follows:

A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when. ~~Implicit in this definition shall be the assumption that all necessary~~

attendant instrumentation, controls, normal ~~or~~ emergency electrical power sources, cooling ~~and~~ seal water, lubrication, ~~and~~ other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

- Delete Action (b) of ANO-2 LCO 3.4.4, "Pressurizer," due to the adoption of the ISTS definition of "Operable" described above. The proposed change would delete all text, as shown:

~~(b) With the pressurizer inoperable due to an inoperable emergency power supply to the pressurizer heaters, either restore the inoperable emergency power supply in accordance with TS 3.8.1.1, Action b.3, for an inoperable Emergency Diesel Generator, or be in at least HOT SHUTDOWN within 12 hours.~~

Actions (c) and (d) of LCO 3.4.4 would be renumbered as Actions (b) and (c), respectively, due the deletion of Action (b) above.

In support of this change, Surveillance Requirement (SR) 4.4.4.2.a would be deleted and SR 4.4.4.2.b moved into the introductory statement of SR 4.4.4.2:

4.4.4.2 The pressurizer proportional heater groups shall be determined to be OPERABLE.

- ~~(a) In accordance with the Surveillance Frequency Control Program by verifying emergency power is available to the heater groups, and~~
- (b) In accordance with the Surveillance Frequency Control Program by verifying that the summed power consumption of the two proportional heater groups is \geq [greater than or equal to] 150 KW [kilowatts or kW].

- Delete current ANO-2 LCO 3.0.5 based upon the revised definition for "Operable - Operability" (described above) and modifications to ANO-2 LCO 3.8.1.1 (described below) to address potential operability impacts when a required power source is inoperable (proposed change aims to gain greater consistency with ISTS). The proposed change would delete all text, as indicated below:

~~3.0.5 When a system, subsystem, train, component or device is determined to be inoperable solely because its emergency power source is inoperable, or solely because its normal power source is inoperable, it may be considered OPERABLE for the purpose of satisfying the requirements of its applicable Limiting Condition for Operation, provided: (1) its corresponding normal or emergency power source is OPERABLE; and (2) all of its redundant system(s), subsystem(s), train(s), component(s), and device(s) are OPERABLE, or likewise satisfy the requirements of this specification. Unless both conditions (1) and (2) are satisfied within 2 hours, action shall be initiated to place the unit in a MODE in which the applicable Limiting Condition for Operation does not apply by placing it, as applicable, in at least HOT STANDBY within 6 hours, in at least HOT~~

~~SHUTDOWN within the next 6 hours, and in at least COLD SHUTDOWN within the following 24 hours. This specification is not applicable in MODES 5 or 6.~~

- Current ANO-2 LCO 3.0.6 would be renumbered to ANO-2 LCO 3.0.5 to be consistent with ISTS LCO 3.0.5. The proposed change is as indicated below (note that only the number changes):

~~3.0.65~~ *Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.*

- New ANO-2 LCO 3.0.6 would be added to incorporate ISTS LCO 3.0.6, which establishes an allowance for not entering Actions associated with a supported system when the supported system LCO is not met solely due to a support system LCO not being met. In this event, new ANO-2 LCO 3.0.6 requires that an evaluation be performed in accordance with proposed new TS 6.5.19, "Safety Function Determination Program" (described later). If a loss of safety function is determined to exist by this program, the appropriate Actions of the LCO in which the loss of safety function exists are required to be entered. The proposed new TS 3.0.6 is shown below (note, all new text):

3.0.6 When a supported system LCO is not met solely due to a support system LCO not being met, the ACTIONS associated with this supported system are not required to be entered. Only the support system LCO ACTIONS are required to be entered. This is an exception to LCO 3.0.2 for the supported system. In this event, an evaluation shall be performed in accordance with Specification 6.5.19, "Safety Function Determination Program (SFDP)." If a loss of safety function is determined to exist by this program, the appropriate ACTIONS of the LCO in which the loss of safety function exists are required to be entered.

When a support system's ACTION directs a supported system to be declared inoperable or directs entry into the ACTIONS for a supported system, the applicable ACTIONS shall be entered in accordance with LCO 3.0.2.

- Action Notes and/or Actions would be added that direct entering the Actions for supported systems:
1. Revise ANO-2 LCO 3.3.2.1, "Engineered Safety Feature Actuation System Instrumentation," Table 3.3-3, Functional Unit 7.a, "4.16 kv Emergency Bus Undervoltage (Loss of Voltage)," and 7.b, "460 volt Emergency Bus Undervoltage (Degraded Voltage)," to require entry into applicable Actions of the associated emergency diesel generator (EDG) for inoperable loss of voltage (LOV) and degraded voltage (DV) channels when any DV relay (channel) or both LOV relays on a respective safety bus are inoperable (discussed later). To address this, a new Action 14 is proposed (note, all new text):

ACTION 14 – **With the number of OPERABLE 460 Volt Degraded Voltage (Functional Unit 7.b) channels one less than the Total Number of Channels** or with both 4.16 kv Loss of Voltage (Functional Unit 7.a) channels inoperable on a single bus:

- a. **Immediately declare the affected diesel generator inoperable, and**
- b. **Restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

Note that while Action 14 is a new action, it was developed from Action 9 and the wording above in **bold type** is carried forward from the existing Action 9.

2. An Action Note to ANO-2 LCO 3.4.6.2, “Reactor Coolant System Operational Leakage,” would be added, as shown:

Enter applicable ACTION(s) for system(s) made inoperable by an inoperable pressure isolation valve.

3. The Action for ANO-2 LCO 3.6.1.2, “Containment Leakage,” would be revised to provide remedial action consistent with ISTS 3.6.1, “Containment (Atmospheric and Dual).” ANO-2 LCO 3.6.1.2 requires revision to meet the intent of ISTS SFDP-related Action since the current TS 3.6.1.2 Action does not provide appropriate remedial action when in Modes 1, 2, 3, or 4. The proposed change is as follows:

With the containment leakage rate exceeding the acceptance criteria of the Containment Leakage Rate Testing Program, within 1 hour, restore leakage to within limits or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours~~With containment leakage rates not within limits, restore containment leakage to within limits, prior to increasing the Reactor Coolant System temperature above 200 °F.~~

4. An Action Note would be added to ANO-2 LCO 3.6.3.1, “Containment Isolation Valves”:

Enter applicable ACTION(s) for system(s) made inoperable by containment isolation valves.

5. Action Notes would be added to ANO-2 LCO 3.7.3.1, “Service Water System”:

Enter applicable ACTION(s) of LCO 3.8.1.1, “A.C. Sources,” for diesel generator made inoperable by service water system.

Enter applicable ACTION(s) of LCO 3.4.1.3, "Reactor Coolant System – Shutdown," if a required shutdown cooling loop is made inoperable by service water system.

6. Action a for ANO-2 LCO 3.8.1.1 (one inoperable offsite source) would be revised to include the following:

Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s), declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable, and

Because Actions are normally listed in the order of the time permitted to perform the action, this new action would be numbered Action a.2 and the current Action a.2 would be renumbered as Action a.3.

7. Action b for ANO-2 LCO 3.8.1.1 (one inoperable diesel generator) would be revised to include the following:

Within 4 hours from discovery of one required diesel generator inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) supported by the inoperable diesel generator inoperable when its redundant required feature(s) is inoperable, and

Because Actions are normally listed in the order of the time permitted to perform the action, this new action would be numbered Action b.2 and current Actions b.2 and b.3 would be renumbered as Actions b.3 and b.4, respectively.

8. Action c for ANO-2 LCO 3.8.1.1 (one diesel generator and one offsite source inoperable) would be revised to include the following:

Within 4 hours from discovery of one required diesel generator inoperable concurrent with inoperability of redundant required feature(s), declare required feature(s) supported by the inoperable diesel generator inoperable when its redundant required feature(s) is inoperable, and

Because Actions are normally listed in the order of the time permitted to perform the action, this new action would be numbered Action c.2 and the current Actions c.2, c.3, and c.4 would be renumbered as Actions c.3, c.4, and c.5, respectively.

9. Action Note 2 to ANO-2 LCO 3.8.1.1, Action c (one diesel generator and one offsite source inoperable) would be added to include the following:

Enter applicable ACTIONs of LCO 3.8.2.1, "A.C. Distribution – Operating," when ACTION c is entered with no AC power to any train.

10. Action d for ANO-2 LCO 3.8.1.1 (two offsite sources inoperable) would be revised to include the following:

Within 12 hours from discovery of two required offsite A.C. circuits inoperable concurrent with inoperability of redundant required feature(s),

declare required feature(s) inoperable when its redundant required feature(s) is inoperable, and

Because Actions are normally listed in the order of the time permitted to perform the action, this new action would be numbered Action d.2 and current Actions d.2 and d.3 would be renumbered as Actions d.3 and d.4, respectively.

In addition, Action d would be relocated in its entirety from TS page 3/4 8-2 to page 3/4 8-2a due to space limitations.

11. Action e.3 for ANO-2 LCO 3.8.1.1, "A.C. Sources," would be revised to refer to Action b.4, Note 1 (vs. Action b.3), because the sub-bullets of LCO 3.8.1.1, Action b, would be renumbered, as described above.

12. An Action Note would be added to ANO-2 LCO 3.8.1.2, "Shutdown," as follows:

Enter applicable ACTIONS of LCO 3.8.2.2, "A.C. Distribution – Shutdown," and LCO 3.8.2.4, "DC [Direct Current] Sources – Shutdown," with one required train de-energized.

13. An Action Note would be added to ANO-2 LCO 3.8.2.1, "A.C. Distribution – Operating," as follows:

Enter applicable ACTION(s) of LCO 3.8.2.3, "DC Sources – Operating" for DC train(s) made inoperable by inoperable power distribution subsystems.

14. Actions for ANO-2 LCO 3.8.2.2, would be revised, as follows:

With less than the above complement of A.C. busses OPERABLE and energized, immediately declare affected required features inoperable OR:

- a. Immediately suspend the movement of recently irradiated fuel assemblies, the movement of new fuel assemblies over recently irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM or boron concentration, and-
- b. Immediately initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status-, and
- c. Immediately declare associated required shutdown cooling subsystem(s) inoperable and not in operation.

Note that the words that are not underlined would be carried forward from the existing Action. Since the original LCO only contained one Action, the Action section would be reformatted into Actions a, b, and c and the original action would be moved to Action a.

15. Action b of ANO-2 LCO 3.8.2.4, "D.C. Sources – Shutdown," would be revised, as follows:

- b. *With the requirements of ACTION 'a' not met or with the above complement of DC equipment and bus otherwise inoperable, immediately declare affected required features inoperable OR:*
 - i. *~~i~~Immediately suspend the movement of recently irradiated fuel assemblies, the movement of new fuel assemblies over recently irradiated fuel assemblies, and any operations involving positive reactivity additions that could result in loss of required SDM or boron concentration, and*
 - ii. *Immediately initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status, and*
 - iii. *Immediately declare associated required shutdown cooling subsystem(s) inoperable and not in operation.*

Note that the words that are not underlined would be carried forward from the existing Action. Since the original LCO only contained one action in Action b, Action b was reformatted into sub actions i, ii, and iii, and the original action would be moved to Action b.i.

2.1.2 Proposed Change to TS Section 6.0, "Administrative Controls"

A new Administrative Controls TS 6.5.19 would be added to gain consistency with ISTS, as follows (the wording would be slightly modified to accommodate the old standard wording of the ANO-2 TSs (i.e., ISTS "Required Action" would be replaced with "ACTION" and "Completion Time" would be replaced with "allowable outage time"):

This program ensures loss of safety function is detected and appropriate actions taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other appropriate limitations and remedial or compensatory actions may be identified to be taken as a result of the support system inoperability and corresponding exception to entering supported system ACTIONS. This program implements the requirements of LCO 3.0.6. The SFDP shall contain the following:

- a. *Provisions for cross train checks to ensure a loss of the capability to perform the safety function assumed in the accident analysis does not go undetected.*
- b. *Provisions for ensuring the plant is maintained in a safe condition if a loss of function condition exists.*
- c. *Provisions to ensure that an inoperable supported system's allowed outage time is not inappropriately extended as a result of multiple support system inoperabilities, and*

d. Other appropriate limitations and remedial or compensatory actions.

A loss of safety function exists when, assuming no concurrent single failure, no concurrent loss of offsite power, or no concurrent loss of onsite diesel generator(s), a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

- a. A required system redundant to the system(s) supported by the inoperable support system is also inoperable, or
- b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable, or
- c. A required system redundant to the support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate ACTIONS of the LCO in which the loss of safety function exists are required to be entered. When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate ACTIONS to enter are those of the support system.

2.2 Regulatory Requirements, Licensing Information, and Guidance Documents

The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(b), requires each license authorizing operation of a utilization facility to include TSs. The TSs will be derived from the analyses and evaluations included in the safety analysis report, and amendments thereto, submitted pursuant to 10 CFR 50.34 (describing the technical information to be included in applications for an operating license). Pursuant to 10 CFR 50.36(c), TSs are required to include items in the following five categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) SRs; (4) design features; and (5) administrative controls. The Commission may include such additional TSs as it finds appropriate.

The regulation in 10 CFR 50.36(c)(2) establishes the requirement for TSs to include LCOs. LCOs are the lowest functional capability or performance level of equipment required for the safe operation of the facility. When an LCO is not met, the licensees must shut down the reactor or follow any remedial action permitted by the TSs until the LCO can be met.

The regulation in 10 CFR 50.36(c)(3) establishes the requirement for TSs to include SRs. SRs 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.”

The regulation in 10 CFR 50.36(c)(5) establishes the requirements for TSs to include administrative controls. Administrative controls in part, are “the provisions relating to the organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.”

In general, there are two classes of changes to TSs: (1) changes needed to reflect modifications to the design-basis (TSs are derived from the design-basis), and (2) voluntary changes to take advantage of the evolution in policy and guidance as to the required content and preferred format of TSs over time. The proposed amendment relates to the second class of changes. Specifically, the proposed changes are based on TS improvements contained in the ISTS. The NRC staff used this guidance in evaluating the proposed amendments.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated the proposed changes and the licensee's basis for the changes in the LAR and supplements to determine if the amended license, which include the TSs, would provide reasonable assurance that the changes will not endanger the health and safety of the public. Section 2.1 of this SE provides a detailed description of the proposed changes.

3.1 Change to LCO 3.0.2

The NRC staff reviewed the information provided in the LAR. LCO 3.0.2 needed to be modified to reference the new LCO 3.0.6 as an exception, since the newly proposed LCO 3.0.6 is an exception to LCO 3.0.2. In addition, since the current LCO 3.0.6 is being renumbered to LCO 3.0.5, the LCO 3.0.2 reference to LCO 3.0.6 needs to be modified accordingly to refer to LCO 3.0.5. The NRC staff finds adding the new LCO 3.0.6 as an exception to LCO 3.0.2 is acceptable because it is consistent with the guidance provided in the ISTS and is necessary in order for ANO-2 to apply the new LCO 3.0.6. The NRC staff also finds the remaining changes related to renumbering (3.0.6 changed to 3.0.5) and usage of "LCO" are acceptable because they are editorial clarifications and do not substantively change TS requirements.

3.2 Deletion of LCO 3.0.5 and Adoption of the ISTS Definition of Operable

The NRC staff reviewed the information provided in the LAR. In summary, the proposed change deleted the current ANO-2 LCO 3.0.5 and replaced it with changes to ANO-2 LCO 3.8.1.1 (described below in SE Section 3.5.4) to gain consistency with the ISTS with respect to potential operability impacts when a required power source is inoperable. This change, in turn, permits the adoption of the ISTS version of the definition of operability. The NRC staff finds the proposed change to delete LCO 3.0.5 and adopt the ISTS definition for operable acceptable because the proposed change: (a) addresses cross-train operability and the monitoring for the loss of a safety function (described in revised LCO 3.8.1.1), (b) supports adoption of the SFDP, and (c) is consistent with the ISTS guidance. Based on these considerations, the NRC staff concludes that the proposed change provides reasonable assurance of adequate protection of public health and safety, and therefore, is acceptable.

3.3 Addition of LCO 3.0.6

The NRC staff reviewed the information provided in the LAR. The NRC staff finds that the proposed addition of LCO 3.0.6 to the TSs would eliminate potential confusion related to the entry into multiple support and supported systems' LCO Actions. The addition of LCO 3.0.6 makes the ANO-2 TSs more like the associated ISTS guidance, which presents TSs that the NRC has already determined to be acceptable for similarly designed facilities. Based on these considerations, the NRC staff concludes that the addition of LCO 3.0.6 to the ANO-2 TSs provides reasonable assurance of adequate protection of public health and safety, and therefore, is acceptable.

3.4 New Notes that Direct Entering Actions of Supported Systems

The NRC staff reviewed the information provided in the LAR. The NRC staff finds that the proposed Notes described above are acceptable because they direct entering actions for the supported systems in accordance with the use of newly proposed LCO 3.0.6, which is consistent with the ISTS guidance. This will ensure that appropriate actions are taken for the plant conditions when the support system LCO is not met and are necessary to ensure ANO-2 is maintained in a safe condition.

3.5 Changes to LCO Actions and Surveillance Requirements

The reason for these changes, as described in the LAR and the supplemental letters, is that the proposed LCO 3.0.6 requires entering the Actions of the LCOs for supported systems when directed by a support systems' Actions. The proposed Actions are consistent with those included in the ISTS that are applicable to ANO-2.

3.5.1 ANO-2 LCO 3.3.2.1, Table 3.3-3, Functional Units 7.a and 7.b

The NRC staff reviewed the information in the LAR, as supplemented. The NRC staff finds that new Action 14 is appropriate because it is consistent with the ISTS guidance, and it ensures that the effects of a loss of undervoltage protection on the associated EDG are addressed (i.e., immediately declare the affected diesel generator inoperable) and will continue to ensure the condition is corrected in a timely manner.

3.5.2 ANO-2 LCO 3.4.4

The NRC staff reviewed the information provided in the LAR. The NRC staff finds that the deletion of LCO 3.4.4 Action (b) and SR 4.4.4.2.a is acceptable because these requirements are no longer necessary when considering the definition of "Operable," the requirements of LCO 3.8.1.1, the adoption of an SFDP, and the ISTS guidance.

3.5.3 ANO-2 LCO 3.6.1.2

The NRC staff reviewed the information provided in the LAR. The NRC staff finds that the change is appropriate because it provides remedial actions consistent with the ISTS guidance. In particular, the 1 hour allowable outage time (AOT) provides an appropriate period of time to correct the problem commensurate with the importance of maintaining containment during Modes 1, 2, 3, and 4. This time period also ensures that the probability of an accident (requiring containment operability) occurring during periods when the containment is inoperable is minimal.

3.5.4 ANO-2 LCO 3.8.1.1

3.5.4.1 Add New Action a.2

The NRC staff finds the proposed addition of Action a.2 and its 24-hour AOT acceptable since the remaining operable offsite circuit and EDGs are adequate to supply electrical power to remaining trains of the onsite Class 1E distribution system, there is a low probability of a design-basis accident (DBA) occurring during this period, and risk is minimized while allowing time for restoration before subjecting the unit to transients associated with shutdown. The NRC staff

also finds that the addition of Action a.2 to LCO 3.8.1.1 is consistent with the ISTS guidance and provides reasonable assurance of adequate protection of public health and safety, and therefore, is acceptable. In addition, the NRC staff finds the remaining renumbering of subsequent actions acceptable because they are editorial clarifications and do not substantively change TS requirements.

3.5.4.2 Add New Action b.2

The NRC staff reviewed the LAR and supplemental letter dated May 24, 2021. The NRC staff finds the proposed addition of LCO 3.8.1.1, Action b.2 and its 4-hour AOT acceptable because the remaining operable EDG and offsite circuits are adequate to supply electrical power to the onsite Class 1E distribution system, there is a low probability of a DBA occurring during this period, and risk is minimized while allowing time for restoration before subjecting the unit to transients associated with shutdown. The NRC staff also finds that the addition of Action b.2 to LCO 3.8.1.1 is consistent with the ISTS guidance and provides reasonable assurance of adequate protection of public health and safety, and therefore, is acceptable. In addition, the NRC staff finds that the renumbering of subsequent actions acceptable because they are editorial clarifications and do not substantively change TS requirements.

3.5.4.3 Add New Action c.2

The NRC staff reviewed the LAR and supplemental letter dated May 24, 2021. The NRC staff finds the proposed addition of LCO 3.8.1.1, Action c.2 and its 4-hour AOT acceptable because the remaining operable EDG and offsite circuit are adequate to supply electrical power to the onsite Class 1E distribution system, there is a low probability of a DBA occurring during this period, and risk is minimized while allowing time for restoration before subjecting the unit to transients associated with shutdown. The NRC staff also finds that the addition of Action c.2 to LCO 3.8.1.1 is consistent with the ISTS guidance and provides reasonable assurance of adequate protection of public health and safety, and therefore, is acceptable. In addition, the NRC staff finds the renumbering of subsequent actions acceptable because they are editorial clarifications and do not substantively change TS requirements.

3.5.4.4 Add New Action d.2

The NRC staff reviewed the LAR and supplemental letter dated May 24, 2021. The NRC staff finds the proposed addition of LCO 3.8.1.1, Action d.2 and its 12-hour AOT acceptable because with both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient occurring during this short period. The NRC staff also finds that the addition of Action d.2 to LCO 3.8.1.1 is consistent with the ISTS guidance and provides reasonable assurance of adequate protection of public health and safety, and therefore, is acceptable. In addition, the NRC staff finds the renumbering of subsequent actions acceptable because they are editorial clarifications and do not substantively change TS requirements.

3.5.5 Revise Actions for LCO 3.8.2.2 and LCO 3.8.2.4

The NRC staff reviewed the information provided in the LAR, as supplemented. The NRC staff finds the proposed additions to ANO-2 LCO 3.8.2.2 and ANO-2 LCO 3.8.2.4 are consistent with the guidance contained in the ISTS and therefore are appropriate. The NRC staff finds that the additions provide reasonable assurance of adequate protection of public health and safety, and therefore, are acceptable. The NRC staff also finds that the renumbering of actions is

acceptable because this is an editorial clarification and does not substantively change TS requirements.

3.6 ISTS Support System LCOs that Direct Entry into Supported System Actions That Are Not Applicable to the ANO-2 TSs

The NRC staff reviewed the information provided in the LAR. The NRC staff finds that no additional changes are proposed because either: (a) the current LCO actions are sufficient or essentially the same as ISTS and therefore, changes are not required to support adopting a SFDP, or (b) the affected ANO-2 system is not an ANO-2 TS-required system. Therefore, no changes to the ANO-2 TS are required to support adopting a SFDP. The NRC staff finds the licensee's approach acceptable because, based on the discussion above, the licensee justified that additional changes to the ANO-2 TSs are not necessary to adopt a SFDP.

3.7 Changes to ANO-2 TS Section 6.0, "Administrative Controls"

The licensee proposed to add the SFDP to the Administrative Controls section of the facility's TSs (i.e., ANO-2 TS 6.5.19, "Safety Function Determination Program (SFDP)"). In accordance with the SFDP, upon entry into LCO 3.0.6, the licensee is required to make an evaluation to determine if a loss of safety function exists. Additionally, the SFDP could identify other limitations, remedial actions, or compensatory actions as a result of the support system inoperability, as well as a corresponding exception to entering supported system conditions and required actions. In brief, the SFDP implements the requirements of LCO 3.0.6. Since the SFDP could identify additional limitations or actions necessary to assure operation of the facility in a safe manner, its addition to the TSs is acceptable. Therefore, in conjunction with the evaluation provided in Section 3.3 of this SE (i.e., LCO 3.0.6), the NRC staff concludes that the addition of ANO-2 TS 6.5.19 is acceptable.

3.8 Technical Evaluation Conclusion

Based on the discussions in Sections 3.1 through 3.7 of this SE, the NRC staff concludes that the proposed changes are acceptable because:

- The addition of the new ANO-2 LCO 3.0.6 makes it clear that supported system TS actions are only required to be entered if directed to do so by the support system TS actions;
- The associated addition of TS Notes and modifications to the Actions of the support systems' LCOs eliminates potential confusion when a support system is determined to be inoperable. The changes also eliminate inconsistency of requirements related to the entry into multiple support and supported systems' LCO actions by providing all the remedial actions necessary to ensure the plant is maintained in a safe condition;
- The addition of the SFDP into the Administrative Controls section of the TSs ensures that the appropriate checks are done as a result of the support systems' inoperability and completes implementation of ANO-2 LCO 3.0.6;
- In support of the addition of the SFDP, the deletion of the current ANO-2 LCO 3.0.5 based on the modifications to ANO-2 LCO 3.8.1.1, provides consistency with the ISTS ensuring that cross-train functional checks are performed, and the potential for a loss of safety function is appropriately assessed;

- The above changes associated with LCO 3.0.5, LCO 3.8.1.1, and the adoption of the SFDP support the adoption of the ISTS version of the definition of operable, which supports removal of redundant controls associated with emergency power availability to heater banks (LCO 3.4.4); and
- The modified Action associated with LCO 3.6.1.2, to provide appropriate remedial actions during operations in Modes 1, 2, 3, and 4, is consistent with the ISTS.

The proposed changes enhance the presentation and clarity of the actions for ANO-2 TSs and more closely match the ISTS guidance. In accordance with the Commission's Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors (58 FR 39132; July 22, 1993), ISTS have been developed and are maintained for each nuclear steam supply system owners' group. The Commission encourages licensees to use the ISTS as the basis for plant-specific TSs.

In addition to the above changes, the licensee proposed a few editorial changes (e.g., renumbering and use of acronyms). The NRC staff finds these changes acceptable because they do not alter the technical requirements, while enhancing the presentation and clarity of the specifications.

The NRC staff further concludes that the proposed changes as discussed above in Section 3.0 are acceptable and there is reasonable assurance that 10 CFR 50.36(c)(2), 10 CFR 50.36(c)(3), and 10 CFR 50.36(c)(5) will continue to be met.

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 September 8, 2021. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to 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 published in the *Federal Register* on February 23, 2021 (86 FR 11013), and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: C. Ashley

Date: December 17, 2021

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - ISSUANCE OF AMENDMENT NO. 327
RE: ADDITION OF TECHNICAL SPECIFICATION LIMITING CONDITION FOR
OPERATION 3.0.6 AND ADOPTION OF SAFETY FUNCTION DETERMINATION
PROGRAM (EPID L-2020-LLA-0252) DATED DECEMBER 17, 2021

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