



Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213
Tel 601-368-5138

Ron Gaston
Director, Nuclear Licensing

10 CFR 50.90

OCAN092102

September 23, 2021

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Response to Request for Additional Information
License Amendment Request for One-Time Change to Support Proactive
Upgrade of the Emergency Cooling Pond Supply Piping

Arkansas Nuclear One, Units 1 and 2
NRC Docket Nos. 50-313 and 50-368
Renewed Facility Operating License Nos. DPR-51 and NPF-6

By Reference 1, Entergy Operations, Inc. (Entergy) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for an amendment for Arkansas Nuclear One, Unit 1 and Unit 2 (ANO-1 and -2) Emergency Cooling Pond (ECP) Technical Specifications (TSs), ANO-1 TS 3.7.8 and ANO-2 TS 3.7.4.1, to allow the ECP to remain operable on a one-time basis for up to 65 days to perform proactive upgrades to the ECP supply piping. This change will allow Entergy the time to perform upgrades on ECP piping from the ECP to the Service Water System (SWS) intake bays prior to a spring outage for each unit.

The NRC staff reviewed the application and determined that additional information was needed to complete its review (Reference 2). In association with the response to Request for Additional Information (RAI) STSB-7, new TS Page Markups (Enclosure Attachment 1), TS Bases Page Markups (Enclosure Attachment 2), and Re-Typed TS Pages (Enclosure Attachment 3) are included. In addition to the changes as a result of RAI STSB-7, the Bases were changed to add a new compensatory measure that was included as a Regulatory Commitment in Attachment 4 of the License Amendment Request (LAR) Enclosure (Reference 1) but was not included in the list of compensatory and defense in depth measures in the Bases.

This response to the RAI does not include any new Regulatory Commitments that were not already identified in Attachment 4 of the LAR Enclosure (Reference 1).

The responses to the RAIs do not affect the no significant hazards consideration provided in Reference 1.

If there are any questions or if additional information is needed, please contact Riley Keele, Manager, Regulatory Assurance, Arkansas Nuclear One, at 479-858-7826.

I declare under penalty of perjury; that the foregoing is true and correct.
Executed on September 23, 2021.

Respectfully,

Ronald W.
Gaston

 Digitally signed by Ronald W.
Gaston
Date: 2021.09.23 07:17:25 -05'00'

Ron Gaston

RWG/rwc

- Reference:
1. Entergy Operations, Inc. (Entergy) letter to the U. S. Nuclear Regulatory Commission (NRC), "License Amendment Request for One-Time change to Support Proactive Upgrade of the Emergency Cooling Pond Supply Piping," (0CAN022102) (ADAMS Accession No. ML21039A756), dated February 8, 2021
 2. NRC email to Robert Clark (Entergy), "ANO-1 and 2 Final RAI RE: License Amendment Request to Allow the ECP to Remain Operable On a One-Time Basis for Up to 65 days to Perform Piping Upgrade (L-2021-LLA-0015)," (0CNA082107), dated August 20, 2021

Enclosure: Response to Request for Additional Information

Attachments to Enclosure:

1. Technical Specifications Page Markups
2. Technical Specification Bases Page Markups – Information Only
3. Retyped Technical Specification Pages

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Arkansas Nuclear One
NRC Project Manager – Arkansas Nuclear One
Designated Arkansas State Official

ENCLOSURE

0CAN092102

**REPONSE TO REQUEST
FOR ADDITIONAL INFORMATION**

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

By letter dated February 8, 2021 (Reference 1), Entergy Operations, Inc. (Entergy) requested license amendments for Arkansas Nuclear One, Unit 1 and Unit 2 (ANO-1 and ANO-2) concerning Emergency Cooling Pond (ECP) Technical Specifications (TSs) ANO-1 TS 3.7.8 and ANO-2 TS 3.7.4.1. The proposed amendments would allow the ECP to remain operable on a one-time basis for up to 65 days, per each unit, to perform proactive upgrades to the ECP supply piping. In its letter dated February 8, 2021, the licensee stated that this change would allow Entergy the time to perform upgrades on piping from the ECP to the Service Water System intake bays prior to a spring outage for each unit.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application and for the staff to complete its review of this application, determined that additional information was required. A Request for Additional Information was issued (Reference 2).

Below are the RAIs and the associated Entergy responses.

RAI STSB-1

Page 7 of the enclosure to the license amendment request (LAR) states, in part:

In accordance with the LCO Note, the temporary pumping system may be removed from service for testing or to support any necessary maintenance provided its availability can be restored within 72 hours, consistent with the TS allowed time to restore an inoperable [Service Water System] SWS loop.

The NRC staff understands that the statement “consistent with the TS allowed time to restore an inoperable SWS loop” refers to the 72-hour Completion Time for one SWS loop inoperable per ANO-1 TS 3.7.7 and ANO-2 TS 3/4.7.3. Please confirm that this understanding is correct.

Entergy Response

The NRC understanding is correct.

RAI STSB-2

Pages 7 and 8 of the enclosure to the LAR list several compensatory measures/actions that the licensee will maintain during the 65-day ECP piping upgrade.

Describe how these compensatory measures will be implemented. In addition, identify any safety-related equipment or functions that would be affected by the compensatory measures and how such safety-related equipment would be addressed.

Emergency Response

The temporary ECP pumping system described in the LAR Enclosure on page 7 is a compensatory measure in the highly unlikely event the preferred Ultimate Heat Sink (UHS) source (Dardanelle Reservoir) is lost or becomes temporarily unavailable during the proactive upgrade of the ECP supply piping. This pumping system (not including the temporary fuel tanks which are addressed in the table below) will not prevent any safety-related structure, system or component (SSC) from performing its safety function. The compensatory and defense in depth measures in the LAR Enclosure on pages 7 and 8, used to support the temporary ECP pumping system, are addressed in the table below.

LAR page 7 and 8, Regulatory Commitments	Implementation Method	Any Impact to Safety-Related SSC
<p>The temporary pump will be tested and minimum flow requirements verified prior to removing the installed ECP supply piping from service.</p>	<p>A procedure change will be developed for the temporary ECP pumping system that will contain steps for testing the system.</p>	<p>The pump, piping and associated equipment will be tested in its final designed temporary configuration. Flow meter(s) will be installed on the pipe going to each SW pump bay. With both Service Water (SW) pumps running, the Lake Sluice gates will be closed and the temporary ECP pump will be started. The test will verify that the system flow criterion is met and the system functions properly. There is no impact to safety-related SSC.</p>
<p>The Army Corps of Engineers will be briefed on the ECP piping upgrade activities and on the increased sensitivity of Lake Dardanelle level during the period of the ANO ECP piping upgrade. The Army Corps will be requested to minimize any activity and provide advanced notification of activity that could impact the lake level or amount of debris in the lake.</p>	<p>A meeting will be held with appropriate Army Corps of Engineers personnel. Meeting minutes will capture the agreed upon communication and planning which will be included as a step(s) or an attachment to the procedure change for the temporary ECP pumping system.</p>	<p>No impact to safety-related SSC</p>

LAR page 7 and 8, Regulatory Commitments	Implementation Method	Any Impact to Safety-Related SSC
<p>The 65-day allowance for the ECP to remain operable during the ECP supply piping upgrade will be applied only prior to a spring outage to provide additional margin to the TS maximum ECP temperature limit.</p>	<p>The procedure change for the temporary ECP pumping system will limit system use to prior to the spring outage in which the upgrade will be installed.</p>	<p>No impact to safety-related SSC.</p>
<p>The temporary pump system will be started to ensure its continued availability on a weekly basis.</p>	<p>A procedure change will be developed for the temporary ECP pumping system that will contain steps for testing the system.</p>	<p>The start test will not be a flow test and as such will only require a small recirculation flow. The recirculation flow would be routed back to the ECP or the flow test line may be used. As such, no safety-related SSC will be impacted.</p>
<p>Personnel trained to start the pump will be dedicated and onsite 24 hours a day, stationed in reasonable proximity of the pump, during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective ANO Control Room.</p>	<p>The procedure change for the temporary ECP pumping system will include shift compliment requirements for dedicated trained personnel to operate the temporary ECP pumping system.</p>	<p>Additional trained personnel dedicated and on-site 24 hours a day. Since existing shift complement will not be impacted, there is no impact to SSCs.</p>
<p>During the ANO-2 ECP piping upgrade, equipment will be staged near each ECP pipe opening to allow pipe closure, within 48 hours, when external flooding is projected to exceed 350 ft Mean Sea Level (MSL).</p>	<p>The ANO-2 site flood response procedure will be changed to add actions to stage the necessary equipment if procedure entry conditions are met and to close the opening should flood levels exceed 350 feet MSL. The procedure change for the temporary ECP pumping system will ensure the required equipment is staged to restore the buried ECP supply pipe.</p>	<p>The staged equipment that will seal the opening cut into the ANO-2 buried ECP pipe will be rated for the system hydrostatic forces. This will functionally restore the normal ECP supply piping pressure boundary to allow it to perform its safety-related function. No other SSCs would be impacted.</p>

LAR page 7 and 8, Regulatory Commitments	Implementation Method	Any Impact to Safety-Related SSC
<p>No elective maintenance or elective testing will be performed that could challenge the Dardanelle Reservoir Service Water System (SWS) suction source.</p>	<p>As part of the temporary modification engineering change development, elective maintenance and elective testing will be identified that potentially could affect SWS suction source from the Dardanelle Reservoir. The start dates for these activities will be adjusted either before or after the 65-day window and documented in the turnover steps for the temporary modification.</p>	<p>Testing and maintenance activities schedules will remain within their allowed frequencies. Therefore, there will be no impact to safety-related SSCs.</p>
<p>The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status.</p>	<p>As part of the procedure change for the temporary ECP pumping system, the SWS pumps, bays, traveling screens, and sluice gates will have steps to add them to protected status prior to placing the temporary pumping system into service.</p>	<p>Placing equipment in protected status does not affect safety-related SSC functions.</p>
<p>The intake traveling screens will be inspected for debris and general physical condition at least once per shift.</p>	<p>The procedure change for the temporary ECP pumping system will include general inspection of the accessible portions (i.e., above water level) of the intake structure traveling screens for debris and physical condition.</p>	<p>The inspections are visual inspections and does not impact the non-safety-related traveling screen operation. No safety-related SSCs are impacted by the inspections.</p>
<p>The accessible portions of the temporary ECP system piping will be inspected weekly.</p>	<p>The weekly inspection will be controlled in accordance with the temporary modification engineering change process.</p>	<p>The inspection is visual and does not impact any safety-related SSC.</p>

LAR page 7 and 8, Regulatory Commitments	Implementation Method	Any Impact to Safety-Related SSC
<p>Fish nets will be installed in the Dardanelle Reservoir SWS intake canal when required by existing winter operations procedural guidance and inspected for any gross physical damage or large quantities of debris twice a week, weather permitting, to ensure the nets remain intact and capable of performing the intended function.</p>	<p>The existing procedure for installing the fish (shad) nets also requires an inspection of the nets twice per week. The procedure change for the temporary ECP pumping system will ensure the fish (shad) nets are installed as required by the temporary modification engineering change to meet this regulatory commitment.</p>	<p>The fish net inspection is a visual inspection and does not impact safety-related SSCs.</p>
<p>An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation.</p>	<p>A temporary fuel tank will be installed for the temporary ECP pumping system. The temporary engineering change process will define the necessary volume and tank level required for the pump to operate for 24 hrs. The temporary modification for the temporary ECP pumping system will include steps to perform a check of the fuel tank level weekly after each pump test and add fuel if necessary.</p>	<p>The temporary ECP pumping system fuel tanks will be located near the ECP. A berm will be placed around the tanks adequate to hold the fuel tank volume should a leak occur. The berm will prevent fuel oil from entering the ECP, which could affect heat transfer from the surface of the ECP. No other safety-related SSCs are impacted by the fuel tank.</p>
<p>At least once per week, a briefing will be conducted for applicable personnel to ensure individuals remain cognizant of the cues that would prompt Operator action to start the temporary pumping system and open the discharge valve.</p>	<p>The procedure change for the temporary ECP pumping system will include steps to perform the weekly shift briefing. The project schedule will include weekly repetitive activities to perform the weekly shift briefs to ensure individuals remain cognizant of the cues that would prompt action to start the temporary pumping system and open the discharge valve.</p>	<p>The briefing does not impact safety-related SSCs</p>

LAR page 7 and 8, Regulatory Commitments	Implementation Method	Any Impact to Safety-Related SSC
<p>The ECP level will be maintained ≥ 5.5 ft. during the 65-day preventative maintenance window.</p>	<p>The current Operations procedure for Operations Rounds Required Readings checks ECP level daily. The existing acceptance criterion maintains level ≥ 5.5 ft. slightly above the TS minimum level of 5.2 ft. to provide operational margin.</p>	<p>The ECP is designed with an overflow spillway should ECP level exceed 5.8 ft. Maintaining the level above the minimum TS level of 5.2 ft. will not impact the ECP since it is within the operating level of the ECP. No other safety-related SSCs are impacted.</p>
<p>Additional Commitment from LAR Enclosure Attachment 4. Prior to removing the installed ECP supply piping from service, Entergy will reassess the risk impact against the acceptance guidelines for a small risk increase as defined in Regulatory Guide (RG) 1.177 (ICCDP $< 1E-6$ and ICLERP $< 1E-7$) and will inform the NRC before proceeding if either criterion is not met.</p>	<p>The temporary modification engineering change for the temporary ECP pumping system will contain a requirement to perform a probabilistic risk assessment (PRA) review, as required by the proposed Technical Specification (TS) note in RAI STSB-7 response, prior to placing the system in service.</p>	<p>The PRA evaluation does not affect SSCs.</p>

RAI STSB-3

Regarding specific compensatory measures:

a. The fourth bullet on Page 7 of the LAR enclosure states:

The temporary pump system will be started to ensure its continued availability on a weekly basis.

Describe how this weekly testing will be proceduralized and documented.

Entergy Response to RAI STSB-3a

As part of the Entergy temporary modification engineering change process, a procedure change will be developed to perform weekly testing that will confirm that the pump will start and develop required pressure. Test results from the execution of each weekly task will be reviewed by Operations and Engineering and documented in datasheets retained as a station record.

b. The third bullet on Page 8 of the LAR enclosure states:

The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status.

Please list/describe the specific steps involved in ensuring “protected train status.”

Entergy Response to RAI STSB-3b

1. Signs, placards, and barricades will be used to identify the protected equipment.
2. Stanchions, barrier tape, or robust barrier(s) will be installed to limit access.
3. Bump guards or other methods of robust barriers will be installed to prevent inadvertent operations (as long as operability is not affected).

c. The last bullet states:

The ECP level will be maintained \geq (greater than or equal to) 5.5 ft. during the 65-day preventative maintenance window.

Briefly describe how the ECP level will be maintained during the preventive maintenance window.

Entergy Response to RAI STSB-3c

The procedure for Technical Specification surveillances daily rounds checks ECP level each day. The TS minimum level for ECP is 5.2 ft. The current procedure acceptance criteria for ECP level are \geq 5.5 ft. to maintain operating margin. The ECP level can be raised by discharging SW to the ECP as necessary.

RAI STSB-4

Page 8 of the enclosure to the LAR states, in part (emphasis added):

The first three items above are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one of the other ongoing commitments during the maintenance window, Entergy **intends to consider the ECP to remain operable** in such an event provided action is taken to restore the commitment **without delay**. This is considered reasonable since failure to meet one or more ongoing commitments does not immediately render the temporary ECP pumping system unavailable. The markup of the respective TS Bases included in Attachment 2 of this enclosure provides the Operator guidance necessary to properly apply the proposed LCO Note.

The following are associated with the items shown in bold text above:

a. Please provide or refer to specific actions in ensuring the operability of the ECP.

Entergy Response to RAI STSB-4a

The specific actions that will ensure operability of the ECP are encompassed in the regulatory commitments listed in Attachment 4 of Reference 1. As part of the response to RAI STSB-7, Entergy has added these commitments to the new TS note as condition “c” to ensure they are implemented and maintained as part of the license.

b. Please specify the delay time or explain the term “delay”?

Entergy Response to RAI STSB-4b

Entergy considers inability to meet one of the regulatory commitments as a missed surveillance and will invoke either ANO-1 Technical Specifications SR 3.0.3 or ANO-2 Technical Specification SR 4.0.3 guidance. The reference paragraph above is revised as follows to eliminate the term delay and provide guidance for time to restore the commitment:

The first three items above are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one of the other ongoing commitments during the maintenance window, Entergy intends to consider the ECP to remain operable and will apply the guidance for a missed surveillance in either ANO-1 Technical Specifications SR 3.0.3 or ANO-2 Technical Specification SR 4.0.3 and take action to restore the commitment~~without delay~~. This is considered reasonable since failure to meet one or more ongoing commitments does not immediately render the temporary ECP pumping system unavailable. The markup of the respective TS Bases included in Attachment 2 of this enclosure provides the Operator guidance necessary to properly apply the proposed LCO Note.

RAI STSB-5 (Ref. Page 8 of 26 of the enclosure)

A statement in the first paragraph of “Plant Operation with Application of the LCO Note” states, in part:

The temporary ECP pumping system will be capable of supplying the SWS with the necessary flow to facilitate a normal plant shutdown or a shutdown during accident conditions.

Discuss how the use of a temporary nonsafety-related system will ensure the necessary flow to facilitate a normal plant shutdown or a shutdown during accident conditions.

Entergy Response to RAI STSB-5

Even though the equipment used for the temporary pumping system will be acquired as commercial equipment, the design, construction, operating, training, testing and inspection actions will ensure the system will provide adequate reliability to ensure the required ECP flow will be delivered during normal and accident shutdown conditions. Specifically, the following LAR content describes the actions Entergy will take with respect to design, construction, operating, training, testing and inspection to ensure the reliability of the temporary non-safety system:

1. Design

The ECP is a safety-related SSC; therefore, the temporary ECP pumping system modification engineering change, that will develop drawings, specifications, and calculations, will be classified as a safety-related Engineering Change. The Entergy temporary modification process for safety-related packages applies the 10 CFR 50 Appendix B Criterion III governing design. Use of the ANO design process will ensure design inputs are correctly translated into design outputs through independent verification. Applying the safety-related design process to the non-safety-related pumping system will ensure the system is designed to meet the intended function.

Section 3.2 Justification page 7 and 8 of 26 in the LAR Enclosure

Contingencies

“The temporary pumping system will be sized to provide adequate flow to support the safety-related equipment of both trains of the SWS to safely shutdown the unit under normal or accident conditions (the other ANO unit will maintain full ECP flow capacity from its normal ECP suction line).”

“An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation.”

Section 3.2 Justification page 9 of 26

Temporary Pumping System

“The temporary pumping system will consist of a diesel-driven pump, fuel tank, suction strainer, high density polyethylene (HDPE) and carbon steel (CS) suction and discharge piping, and valves to control flow. The pump and fuel tank will be located adjacent to the ECP with a containment system to prevent any potential fuel spill from entering the ECP.”

“To minimize debris from entering the system, temporary strainers will be installed in the ECP with a screen mesh equivalent to the existing ECP intake screens. The strainers will be sized to meet the pump net positive suction head (NPSH) requirements at the current design basis ECP temperature and level. While the temporary ECP system is in place, stop logs will be installed in the ECP intake to allow access to the ECP pipe. The stop logs will be designed to withstand seismic, hydrostatic pressure, and appropriate wind loads.”

Section 3.2 Justification page 10 of 26

Temporary Pumping System

“The HDPE piping will be run from the submerged strainer up to the pump skid and then generally above ground to the SWS intake building. The routing has been chosen to minimize potential tornado missile damage by locating the pipe adjacent to robust structures.”

“To improve the temporary system reliability, external electrical power will not be required for the system. The only device requiring electrical power will be the engine control panel which is supplied by the engine DC battery.”

Section 3.4 Defense-in-Depth Principles pages 17 and 18 of 26

- "Preserve system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty."

“Independence between the two UHS sources will be maintained since operation and design of the existing Dardanelle Reservoir sluice gates that separate the two sources are not impacted by the temporary designs.”

“The PRA analysis indicates that the proposed temporary ECP pumping system provides acceptable system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty.”

Section 3.5 Safety Margins page 19 and 20 of 26

“Although the temporary equipment will not be manufactured under a 10 CFR 50, Appendix B, program, installation, testing, and inspections will demonstrate the functional and pressure capability of the equipment to meet design requirements which will provide reasonable assurance that the equipment is free of defects.”

“The PRA results for the 65-day piping upgrade indicate that the risk is within the NRC guidance for acceptable change. Therefore, this TS change will not significantly affect safety margin in that sufficient safety margin is maintained and the accident analyses acceptance criteria are met.”

Section 3.2 Justification page 10 of 26

Seismic Considerations

“Although the temporary ECP supply system does not fully meet the quality, seismic, or tornado missile design basis, the temporary ECP pump and piping will be restrained or protected to ensure functionally during high wind and seismic events.”

"The temporary ECP pumping system is a commercial non-Safety-related system being installed as a compensatory measure. However, to provide high confidence that the system to remain functional during a seismic event, the system piping and equipment anchorage will be analyzed to withstand seismic loads generated from the current ANO maximum DBE ground acceleration of 0.20g. The seismic capability of the temporary equipment will be established through qualitative evaluation using generic industry data compared with the ANO DBE. Restraints will be provided, if necessary, such that the system will remain functional during a seismic event. The temporary pump skid and wind barriers will be located far enough from the ECP edge such that the pond embankment will not be affected by the skid during a seismic event."

Section 3.4 Defense-in-Depth Principles page 19 of 26

- Continue to meet the intent of the plant's design criteria.

"The temporary system pump, associated controls, fuel tank, and valve's seismic capability is substantiated through comparison to generic industry data. Based on the robustness of the temporary pumping system, the PRA found that the system provided sufficient capability to resist seismic events that have the potential to occur during the pipe upgrade window. A similar approach was taken with respect to wind resistance and tornado missile protection. While the system does not provide complete protection against high winds and tornado missiles, the PRA found that the wind capacity of the temporary ECP pumping system and the site features do provide sufficient protection against the potential wind events that could occur during the piping upgrade window."

Section 3.4 Defense-in-Depth Principles page 17 of 26

- "Preserve system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty."

"The ability of the temporary pumping system to withstand the wind and seismic events has been shown through risk insights to be equivalent to the existing ECP delivery system for the 65-day duration of the planned upgrade activity."

"The interaction of the temporary pumping system with the ECP does not degrade the ECP ability to remove decay heat or its ability to withstand external events."

Section 3.2 Justification page 10 of 26

Wind Considerations

"The wind load is considered minimal due to the shape factor of the pipe and that the pipe will be on the ground or inside the intake structure. To reduce the risk of wind damage to the pump and fuel tank, both will be enclosed by barriers. The barriers around the pump will have sufficient wind loading capacity to resist the ANO-2 80 mph maximum wind speed which is bounding for the two units."

The temporary piping and equipment will be restrained to limit movement and stresses due to wind, seismic, and thermal expansion within ASME code or Plastic Pipe Institute limits.”

Section 3.2 Justification page 11 of 26

Fire Considerations

“In order not to increase the combustible loading in the SWS intake building and potentially affect redundant SWS trains, the portion of the temporary pipe routed in the SWS intake building will be made from non-combustible material.”

2. Construction

Section 3.4 Defense-in-Depth Principles page 19 of 26

- Continue to meet the intent of the plant’s design criteria.

“The intent of the ANO-1 and ANO-2 design criteria with respect to this activity is to ensure an ultimate heat sink is available for at least 30 days to support normal, shutdown, and emergency operations. The temporary ECP pumping system is a compensatory measure which provides an alternate means of delivering ECP water to the SWS pump bays. The temporary equipment is intended to provide features that maintain the ECP’s ability to fulfill its required design function when utilized as planned during piping upgrade period. Although the temporary equipment and piping material will not be designed or manufactured to nuclear quality standards, the temporary pumping system will be tested to nuclear quality standards as identified in the ANO-1 and ANO-2 SAR. A system hydrostatic and functional test will be performed prior to placing the temporary pumping equipment in service to ensure the pressure boundary material meets design pressure and the equipment performs as designed. In addition, periodic pump test and physical inspections on accessible portions of the system will be performed to detect any future material degradation or reliability concerns. These measures will provide equivalent quality methods that demonstrate reasonable assurance as to the materials and equipment ability to function as designed.”

3. Operations and Training

Section 3.2 Justification pages 7 and 8 of 26

Contingencies

“Personnel trained to start the pump will be dedicated and onsite 24 hours a day, stationed in reasonable proximity of the pump, during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective ANO Control Room.”

"At least once per week, a briefing will be conducted for applicable personnel to ensure

individuals remain cognizance of the cues that would prompt Operator action to start the temporary pumping system and open the discharge valve.”

Section 3.4 Defense-in-Depth Principles page 18 of 26

- Preserve sufficient defense against human errors.

“Pre-job briefs will be conducted prior to and during the evolution to reinforce good human performance behaviors and other barriers that reduce risk. Other defense-in-depth measures will be established, as outlined in Section 3.1, providing additional barriers that are intended to minimize the potential for human errors. Therefore, the proposed change preserves sufficient defense against human errors.”

Section 3.2 Justification page 10 of 26

Exposure to Low Temperatures

“The temporary ECP system pump and piping will be exposed to ambient conditions during the winter/early spring season. This area of Arkansas can experience temperatures below freezing for several days during this time period. To preclude freezing within the temporary ECP system, temporary heating to the pump area, and insulating the piping or establishing sufficient minimum flow through the piping will be performed.”

Section 3.4 Defense-in-Depth Principles page 16 of 26

- Preserve a reasonable balance among the layers of defense.

“A dedicated person trained on operating the temporary pump system will be onsite 24 hours a day with direct communication to the Control Room during the ECP piping upgrade to start the pump when required such that the existing operations staff will not be challenged with additional actions.”

4. Testing and Inspections

Section 3.2 Justification pages 7 and 8 of 26

Contingencies

- The temporary pump will be tested, and minimum flow requirements verified prior to removing the installed ECP supply piping from service.
- The temporary pump system will be started to ensure its continued availability on a weekly basis.
- The accessible portions of the temporary ECP system piping will be inspected weekly.

RAI STSB-6

The proposed TS NOTE is added at the top of ANO-1 TS LCO 3.7.8, page 3.7.8-1, whereas same proposed NOTE is added on ANO-2 TS LCO 3/4 7-16 (pdf page 34) after the TS surveillance (4.7.4.1). Please explain the proposed TS formatting.

Entergy Response to RAI STSB-6

ANO-1 TS have been converted to the Improved Standard TS (ISTS). The ISTS format requires LCO notes to go between the LCO and the Applicability. ANO-2 TS have not been converted to the ISTS. The current TS convention for ANO-2 TS requires all Notes to go at the bottom of the page the Note applies to.

RAI STSB-7

The proposed TS NOTE states:

The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours.

In the enclosure to the LAR, the licensee provided an evaluation of the proposed changes. Section 3.2, "Justification," of the enclosure contains a list of compensatory measures the licensee will implement in support of the temporary ECP pumping system. The licensee stated that these are considered regulatory commitments and will be maintained during the 65-day ECP piping upgrade. The regulatory commitments are identified in Attachment 4 of the enclosure to the LAR. The licensee further stated that these commitments will expire at the end of the 65-day preventative maintenance window. It appears that part of the justification for the proposed 65-day operability of the ECP in support of the upgrade of the ECP piping supply to the SWS intake bays relies on the compensatory measures identified in Section 3.2 of the enclosure.

Provide justification for the proposed 65-day operability that does not mention the compensatory measures. Alternatively, consider rewording the proposed TS NOTE language to indicate that the 65-day operability is contingent on implementation of the compensatory measures identified in Section 3.2 of enclosure to the LAR.

Entergy Response to RAI STSB-7

The proposed ANO-1 and ANO-2 TS note is being revised to add an additional requirement (c.) as follows:

The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and*
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and*
- c. The regulatory commitments described in ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.*

Revised TS Page Markups (Attachment 1), Revised TS Bases Page Markups (Attachment 2) and Re-Typed TS Pages (Attachment 3) are included as part of the Enclosure to the RAI responses.

RAI DRA-1

In the LAR, the licensee states that Regulatory Guides (RGs) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to The Licensing Basis," and 1.177, "Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," were used to develop the application.

In RG 1.174, the NRC staff describes five Key Principles of risk-informed decision making. The guidance in Section C.2.2.1 of RG 1.177 indicates that consideration of compensatory measures is part of ensuring that the defense-in-depth philosophy is maintained. This is part of Key Principle 2. The guidance in Section C.2.3.6 of RG 1.177 states that when compensatory measures are part of the analysis of a Technical Specification change, those measures should be included in the application.

On page 8/26 of the enclosure to the LAR, the following ANO-2 compensatory measure is identified:

During the ANO-2 ECP piping upgrade, equipment will be staged near each ECP pipe opening to allow pipe closure, within 48 hours, when external flooding is projected to exceed 350 [feet mean sea level] ft. MSL.

It is unclear to the NRC staff whether there is or should be a corresponding ANO-1 action. Therefore, provide the following:

- a. Clarify whether there is a corresponding ANO-1 measure
- b. If there is, provide similar detail for the ANO-1 measure
- c. If there is not a corresponding ANO-1 measure, explain why this measure is indicated for ANO-2, but not for ANO-1.

Entergy Response to RAI DRA-1

The second paragraph on page 7 of 26 in the LAR enclosure explains the need for the ANO-2 compensatory measure is due to sluice gate control circuits below the flood elevation. This is due to the potential adverse impact that could occur to the ANO-2 SWS if the sluice gate control circuits were submerged while energized. Inadvertent sluice gate closure could occur due to an electrical short in the sluice gate control circuit. This could result in a loss of UHS source to the ANO-2 SWS. For this reason, the ANO-2 Natural Emergencies Abnormal Operating Procedure conservatively aligns the ECP to the SWS and de-energize the control circuits prior to a flood level of 350 ft. MSL.

The ANO-1 sluice gates do not have this same susceptibility to an inadvertent actuation due to the physical location of the vulnerable control circuit components. ANO-1 is not required to align the ECP to the ANO-1 SWS and de-energize the sluice gate control circuits in the event of a projected flood at the site greater than 350 ft. MSL since Lake Dardanelle would remain available as UHS. For this reason, there is no required contingency for ANO-1 to stage equipment near each ECP pipe opening to allow pipe closure within 48 hours when external flooding is projected to exceed 350 ft. MSL.

RAI EMIB-1

In Section 3.2, "Justification" of the LAR, the licensee stated that a temporary ECP diesel-driven pumping system will be utilized as a compensatory measure in the highly unlikely event the preferred ultimate heat sink source (i.e., Dardanelle Reservoir) is lost or becomes temporarily unavailable during the proactive upgrade of the ECP supply piping. In addition, the licensee stated that proper SWS bay level will be maintained by the pump using a mechanical float control valve to regulate flow from the temporary ECP pump.

The licensee also stated that prior to removing the installed ECP supply piping from service, the temporary pump will be tested, and minimum flow requirements verified.

However, based on the information provided in the LAR, it is not clear to the NRC staff how sufficient minimum flow requirements would be determined. Please describe how the minimum system flow requirements would be determined and why they would be sufficient to support the intended safety function of the ECP temporary pumping system.

Entergy Response to RAI EMIB-1

In a conference call on August 18, 2021, the NRC Staff clarified that they were requesting information on how the full flow test will be performed. To perform the test, ANO will install the temporary pumping system into two SW pump bays and test the temporary system while the SW pumps are running, close the Lake Sluice gates and start the temporary pump. The test will verify the system minimum flow using flow meters, validate level control requirements are achieved in the SW Bays, and the system functions properly.

RAI EMIB-2

In Section 3.2 of the LAR, the licensee stated that an adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation. Provide the basis for the fuel storage requirement of 24 hours of continuous pump operation. The response should define the expected mission time and, if greater than 24 hours, how the fuel supply would be replenished. In addition, please clarify whether there will be a fuel refilling procedure in place.

Entergy Response to RAI EMIB-2

The 24-hour fuel storage requirement is based on meeting the PRA mission time for the SW system to ensure safe and stable operation of the plant. The PRA assumes that within a 24-hour period additional resources would be in place. The design basis mission time for the SW system is 30 days since it supports containment and core cooling during a Loss of Coolant Accident (LOCA). Entergy maintains a Purchase Order for diesel fuel delivery service to supply fuel for the Emergency Diesel Generators (EDGs) regularly because of EDG testing fuel consumption. A procedure change for the temporary ECP pumping system will have instructions for refilling the fuel tank for the temporary ECP pumping system by the local vendor. As a backup fuel supply, Entergy maintains a portable 500-gallon diesel fuel tank trailer within each of the FLEX buildings that could be used to replenish the temporary pumping system fuel tank and provide an additional 24 hours of run time.

RAI IOLB-1

In Section 3.0, "Technical Evaluation," of the LAR, Entergy stated the following, in part:

Existing procedures direct Operators to transfer the suction of the SWS pumps from the reservoir to the ECP if bay level drops below 333 ft. MSL. This is accomplished by first initiating manual closure of the Dardanelle Reservoir sluice gate and then opening the ECP supply sluice gate once level in the SWS bay starts to drop. This sequence minimizes ECP inventory loss to the lake. The same sequence would be followed when the temporary system is in place but rather than opening the ECP sluice gate, the temporary pump would be started since the pump discharges directly into the respective SWS pump bay.

Based on Entergy's statements, the NRC staff understands that the manual operator actions do not change. However, the location (i.e., intake building) where the operator takes these actions and where (i.e., temporary pumping system) does change.

Existing procedures allow for minimal disruptions because the operator is familiar with the actions they must take and there is confidence that the operators can complete these actions within the time available. However, it is not clear to the NRC staff that the temporary system described by Entergy is similar enough to the current system such that the existing ANO procedures would be applicable.

Please confirm that the existing procedures contain the necessary information so that the operator(s) will be able to use the existing procedures on the temporary system instead of

relying on temporary procedures.

Entergy Response to RAI IOLB-1

The intent of the referenced discussion was to communicate that there would be a change to the existing procedure for initiation of the ECP supply to the SW pumps with minimum impact on system initiation time. As part of the temporary modification engineering change process, a procedure change will be developed to replace the step for opening the ECP sluice gate with a step to notify the dedicated personnel to start the temporary ECP pumping system. Training will also be performed on the procedure change prior to implementation.

RAI IOLB-2a

In the letter dated February 8, 2021, Section 3.2, "Justification," subsection, "Intake Building Considerations," Entergy stated the following, in part:

During installation and use of the temporary ECP piping, one or both of the SWS intake building access doors will be removed to allow routing the temporary ECP pipe into the SWS bays. Temporary security measures will be in place to limit access to the building. Temporary closure of the door opening will be provided, when needed, to maintain ambient temperatures inside the Intake Building during extreme cold weather conditions.

Please provide additional information on the training and/or procedures that would be available to the operators to determine when the door opening must be temporarily closed and how.

Entergy Response to RAI IOLB-2a

ANO-1 procedure for the Intake Building Ventilation directs Operators to install covers over the fixed opening in the two Intake Structure entrance doors when outside air temperature is predicted to go below freezing in the next 18 hrs. The procedure also directs the covers to be removed prior to outside air temperature exceeding 85 °F. During the maintenance window, the two entrance doors will be removed. Temporary enclosures will be fabricated to fit around the pipes entering the door opening and provide necessary personnel access. The temporary enclosures will be installed when the ambient temperature is predicted to go below freezing. If the temporary enclosure is installed and outside air temperatures are expected to go above 85 °F, it will be removed.

ANO-2 Freeze protection procedure closes the movable louvers in the Intake Building entrance doors prior to freezing conditions or by October 1. The louvers are only required to be open if outside air temperature is expected to go above 75 °F with two SWS pumps in operation or if three SWS pumps will be in operation. Like ANO-1, temporary enclosure will be fabricated to close the opening around the temporary piping routed through the door and installed or removed as necessary based on ambient air temperatures.

Operating procedures for ANO-1 and ANO-2 Intake Building ventilation will be revised to reflect the temporary enclosure use. As part of the temporary modification engineering

change process and the procedure change process, training will be evaluated and provided if warranted.

RAI IOLB-2b

With respect to routing the temporary ECP pipe in the SWS bays via the SWS intake building access doors, please discuss, as applicable, any impediments that Entergy has considered and the resolution to those considerations.

Entergy Response

The ANO-1 planned pipe configuration will leave adequate clearance beside the pipe for egress to and from each access door. The reduced opening was still considered adequate for access by Operations, Security, and Fire brigade. Access to the Motor Control Center, SWS pumps, and SWS motors and Fire System Pump equipment on the second floor would not be impacted.

The ANO-2 planned pipe configuration will leave adequate clearance beside the pipe for egress to and from each access door. The reduced opening was still considered adequate for access by Operations, Security, and Fire brigade. Access to the Motor Control Center and SWS pumps would not be impacted. A portion of the ANO-2 stairs up to the SWS motors will have to be removed to facilitate the temporary pipe routing. Scaffold will be built to bridge over the temporary piping and provide access to the second floor.

REFERENCES

1. Entergy Operations, Inc. (Entergy) letter to the U. S. Nuclear Regulatory Commission (NRC), "License Amendment Request for One-Time change to Support Proactive Upgrade of the Emergency Cooling Pond Supply Piping," (0CAN022102) (ADAMS Accession No. ML21039A756), dated February 8, 2021
2. NRC email to Robert Clark (Entergy), "ANO-1 and 2 Final RAI RE: License Amendment Request to Allow the ECP to Remain Operable On a One-Time Basis for Up to 65 days to Perform Piping Upgrade (L-2021-LLA-0015)," (0CNA082107), dated August 20, 2021

ENCLOSURE, ATTACHMENT 1

OCAN092102

TECHNICAL SPECIFICATION PAGE MARKUPS
(4 Pages)

3.7 PLANT SYSTEMS

3.7.8 Emergency Cooling Pond (ECP)

LCO 3.7.8 The ECP shall be OPERABLE.

-----NOTE-----

The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Degradation of the ECP noted pursuant to SR 3.7.8.4 below or by other inspection.	A.1 Determine ECP remains acceptable for continued operation.	7 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> LCO not met for reasons other than Condition A.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

Move to next page

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-ft.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

Moved from
Page 3.7.8-1

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-ft.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	<p>-----NOTE----- Only required to be performed from June 1 through September 30. -----</p> <p>Verify average water temperature is ≤ 100 °F.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	<p>Perform soundings of the ECP to verify:</p> <ol style="list-style-type: none"> 1. A contained water volume of ECP ≥ 70 acre-feet, and 2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained. 	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.4	Perform visual inspection of the ECP to verify conformance with design requirements.	In accordance with the Surveillance Frequency Control Program

PLANT SYSTEMS

3/4.7.4 EMERGENCY COOLING POND

LIMITING CONDITION FOR OPERATION

3.7.4.1 The emergency cooling pond (ECP) shall be OPERABLE¹ with:

- a. A minimum contained water volume of 70 acre-feet.
- b. An average water temperature of ≤ 100 °F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With the volume and/or temperature requirements of the above specification not satisfied or, with the requirements of Action b not met, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. If degradation is noted pursuant to 4.7.4.1.d below or by other inspection, perform an evaluation to determine that the ECP remains acceptable for continued operation within 7 days.

SURVEILLANCE REQUIREMENTS

4.7.4.1 The ECP shall be determined OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by verifying that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-feet.
- b. In accordance with the Surveillance Frequency Control Program during the period of June 1 through September 30 by verifying that the pond's average water temperature at the point of discharge from the pond is within its limit.
- c. In accordance with the Surveillance Frequency Control Program by making soundings of the pond and verifying:
 1. A contained water volume of ECP ≥ 70 acre-feet, and
 2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained.
- d. In accordance with the Surveillance Frequency Control Program by performance of a visual inspection of the ECP to verify conformance with design requirements.

Note 1: The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.

ENCLOSURE, ATTACHMENT 2

0CAN092102

TECHNICAL SPECIFICATION BASES PAGE MARKUPS

INFORMATION ONLY

(7 Pages)

LCO

The ECP is a backup system that is required to be OPERABLE to support the SWS. To be considered OPERABLE, the ECP must contain a sufficient volume of water at or below the maximum temperature that would allow the SWS to operate for at least 30 days following the design basis event without exceeding the maximum design temperature of the equipment served by the SWS. To meet this condition, the ECP initial temperature should not exceed 100 °F, and the volume of water should not fall below 70 acre-feet during normal unit operation.

The LCO is modified by a Note which permits the ECP to be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.

For the purposes of the proposed LCO Note, a loss of Lake Dardanelle is considered an event that renders the Dardanelle Reservoir unavailable for an extended period of time, likely with no known time for recovery. Such events include failure of the downstream Dardanelle Dam, notification from the Army Corps of Engineers of more than a momentary draw down of lake level below 335 ft mean sea level (MSL), a major oil or chemical spill which renders Lake Dardanelle unfit for use to support cooling of station equipment, or any other event that would result in more than temporary lowering of the intake canal below 335 ft MSL.

Other events that may require short duration use of the temporary pumping system such as clogging of SWS traveling screens are controlled by station procedures and are not considered a loss of Lake Dardanelle event with respect to this LCO Note.

Once the LCO Note is applied, the Note may be reapplied during startup should a unit shutdown occur during the 65-day period. If a unit shutdown occurred early in the 65-day maintenance window, the LCO would be exited upon entry into Mode 5; however, the LCO Note may be reapplied when entering Mode 4 from Mode 5, with the start of the 65-day allowable period being retroactive to the initial application of the LCO Note prior to the unit shutdown. For example, if a unit shutdown occurs 10 days following the commencement of the ECP piping upgrade and the unit remains in Mode 5 for 12 days, the proposed LCO Note may be reapplied upon entry into Mode 4 during plant restart; however, the time remaining in the original 65-day ECP piping upgrade window has now been reduced to 43 days ($65 - 10 - 12 = 43$).

The temporary pumping system is considered capable of supplying the SWS from the ECP provided it can be aligned to at least two SWS bays without delay during a loss of Lake Dardanelle event. Application of this LCO Note also requires the following compensatory and/or defense-in-depth measures to be maintained during the 65-day ECP supply piping upgrade. Unforeseen circumstances which may invalidate one or more measures listed below are acceptable provided action is initiated immediately to restore the associated capability.

LCO (continued)

- The temporary pump will be tested and minimum flow requirements verified prior to removing the installed ECP supply piping from service.
- The Army Corps of Engineers will be briefed on the ECP piping upgrade activities and on the increased sensitivity of Lake Dardanelle level during the period of the ANO ECP piping upgrade. The Army Corps of Engineers will be requested to minimize any activity and provide advanced notification of activity that could impact the lake level or amount of debris in the lake.
- The 65-day allowance for the ECP to remain operable during the ECP supply piping upgrade will be applied only prior to a spring outage to provide additional margin to the TS maximum ECP temperature limit.
- The temporary pump system will be started to ensure its continued availability at least weekly.
- Personnel trained to start the pump will be dedicated and onsite 24 hours a day during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective Control Room.
- No elective maintenance or elective testing will be performed that could challenge the Dardanelle Reservoir SWS suction source.
- The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status.
- The intake traveling screens will be inspected for debris and general physical condition at least once per shift.
- The accessible portions of the temporary ECP system piping will be inspected weekly.
- Fish nets will be installed in the Dardanelle Reservoir SWS intake canal when required by existing winter operations procedural guidance and inspected for any gross physical damage or large quantities of debris twice a week, weather permitting, to ensure the nets remain intact and capable of performing the intended function.
- An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation.
- At least once per week, a briefing will be conducted for applicable personnel to ensure individuals remain cognizant of the cues that would prompt operator action to start the temporary pumping system and open the discharge valve.
- The ECP level will be maintained ≥ 5.5 ft during the 65-day preventative maintenance window.
- The risk impact will be reassessed against the acceptance guidelines for a small risk increase as defined in RG 1.177 (Incremental Conditional Core Damage Probability (ICCDP) $< 1E-6$ and Incremental Conditional Large Early Release Probability (ICLERP) $< 1E-7$) prior to removing the installed ECP supply piping from service during the 65-day preventative maintenance window and will inform the NRC before proceeding if either criterion is not met.

The first three items above are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent

meeting one of the other ongoing commitments during the maintenance window, the LCO Note

LCO (continued)

remains applicable (i.e., the ECP may be considered to remain operable) provided action is taken to restore the commitment without delay. This is considered reasonable since failure to meet one or more ongoing commitments does not immediately render the temporary ECP pumping system unavailable.

With the conditions associated with the LCO Note as defined above not met, the ECP may no longer be considered OPERABLE and Condition B becomes applicable.

APPLICABILITY

In MODES 1, 2, 3, and 4, the ECP is a backup system that is required to support the OPERABILITY of the equipment serviced by the SWS and is required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the ECP are determined by the systems it supports. Although the systems it supports may be required to be OPERABLE, the ECP is not required to meet the same OPERABILITY requirements in MODES 5 and 6 as it must in MODES 1, 2, 3, and 4. The definition of OPERABILITY embodies the principle that a system can perform its function(s) only if all necessary support systems are capable of performing their related support functions. If the supported system is capable of performing its safety function without reliance on the ECP, then the ECP is not required to be OPERABLE. Similarly, operation with the ECP in a less than fully qualified state is acceptable provided an assessment has been performed to determine that the supported system remains capable of performing its safety function. It is important to recognize that single failure criteria is not applicable in MODES 5 and 6. Therefore, the availability of Lake Dardanelle as a heat sink during periods of ECP unavailability may be acceptable provided the probability of a loss of lake and the time to respond to a loss of lake event are considered when planning ECP unavailability periods.

ACTIONS

A.1

If degradation is noted during performance of SR 3.7.8.4 or during other inspection, the impact on ECP OPERABILITY must be assessed. As discussed in the SR 3.7.8.4 Bases below, an engineering evaluation is performed of any apparent changes in visual appearance or other abnormal degradation to determine OPERABILITY. The Completion Time associated with this action is reasonable based on the low probability that a loss of the Dardanelle Reservoir would occur in any 7-day period. If, by evaluation, the ECP is determined to be inoperable at any point during the 7-day evaluation period, the ECP must immediately be declared inoperable and Action B applied.

B.1 and B.2

If the ECP is inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating

experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

PLANT SYSTEMS

BASES

3/4.7.4 EMERGENCY COOLING POND

The limitations on the [Emergency Cooling Pond \(ECP\)](#) volume and temperature are based on worst case initial conditions which could be present considering a simultaneous normal shutdown of Unit 1 and emergency shutdown of Unit 2 following a LOCA in Unit 2, using the ECP as a heat sink. The minimum indicated ECP level of 5.2 feet is based on soundings and includes measurement, calculation, and other uncertainties (equivalent to 0.15 feet) to ensure a minimum contained water volume of 70 acre-feet (equivalent to an indicated level of 5.05 feet), crediting operator action to initiate makeup to the ECP upon a loss of Dardanelle Reservoir event as discussed below. These soundings ensure degradation is within acceptable limits such that the indicated level is consistent with the required volume and the pond meets its design basis. The measured ECP temperature at the discharge from the pond is considered a conservative average of total pond conditions since solar gain, wind speed, and thermal current effects throughout the pond will essentially be at equilibrium conditions under initial stagnant conditions. Visual inspections are performed to ensure erosion, undercut caused by wave action, or any physical degradation is within acceptable limits to enable the ECP to fulfill its safety function. An engineering evaluation shall be performed by a qualified engineer of any apparent changes in visual appearance or other abnormal degradation within 7 days to determine operability.

The limitations on minimum water level and maximum temperature are based on providing a 30-day cooling water supply to Safety-related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974. Operator action is credited in the inventory analysis during the transfer of the [Service Water System \(SWS\)](#) to the pond. Specifically, pump returns are transferred to the pond shortly after a loss of lake event and pump suction is transferred later in the event depending on pump bay level. In the time frame between the transfer of the returns and suction to the pond, lake water is pumped into the pond, increasing level by at least 4.5 inches. This additional water is required, along with that maintained by Technical Specifications, to ensure a 66.9-inch pond depth, which ensures a 30-day supply of cooling water.

The LCO is modified by a Note which permits the ECP to be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO LAR correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.

For the purposes of the proposed LCO Note, a loss of Lake Dardanelle is considered an event that renders the Dardanelle Reservoir unavailable for an extended period of time, likely with no known time for recovery. Such events include failure of the downstream Dardanelle Dam, notification from the Army Corps of Engineers of more than a momentary draw down of lake level below 335 ft mean sea level (MSL), a major oil or chemical spill which renders Lake Dardanelle unfit for use to support cooling of station equipment, or any other event that would result in more than temporary lowering of the intake canal below 335 ft MSL.

3/4.7.4 EMERGENCY COOLING POND (continued)

Other events that may require short duration use of the temporary pumping system such as clogging of SWS traveling screens are controlled by station procedures and are not considered a loss of Lake Dardanelle event with respect to this LCO Note.

Once the LCO Note is applied, the Note may be reapplied during startup should a unit shutdown occur during the 65-day period. If a unit shutdown occurred early in the 65-day maintenance window, the LCO would be exited upon entry into Mode 5; however, the LCO Note may be reapplied when entering Mode 4 from Mode 5, with the start of the 65-day allowable period being retroactive to the initial application of the LCO Note prior to the unit shutdown. For example, if a unit shutdown occurs 10 days following the commencement of the ECP piping upgrade and the unit remains in Mode 5 for 12 days, the proposed LCO Note may be reapplied upon entry into Mode 4 during plant restart; however, the time remaining in the original 65-day ECP piping upgrade window has now been reduced to 43 days ($65 - 10 - 12 = 43$).

The temporary pumping system is considered capable of supplying the SWS from the ECP provided it can be aligned to at least two SWS bays without delay during a loss of Lake Dardanelle event. Application of this LCO Note also requires the following compensatory and/or defense-in-depth measures to be maintained during the 65-day ECP supply piping upgrade. Unforeseen circumstances which may invalidate one or more measures listed below are acceptable provided action is initiated immediately to restore the associated capability.

- The temporary pump will be tested and minimum flow requirements verified prior to removing the installed ECP supply piping from service.
- The Army Corps of Engineers will be briefed on the ECP piping upgrade activities and on the increased sensitivity of Lake Dardanelle level during the period of the ANO ECP piping upgrade. The Army Corps of Engineers will be requested to minimize any activity and provide advanced notification of activity that could impact the lake level or amount of debris in the lake.
- The 65-day allowance for the ECP to remain operable during the ECP supply piping upgrade will be applied only prior to a spring outage to provide additional margin to the TS maximum ECP temperature limit.
- The temporary pump system will be started to ensure its continued availability at least weekly.
- Personnel trained to start the pump will be dedicated and onsite 24 hours a day during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective Control Room.
- During the ANO-2 ECP piping upgrade, equipment will be staged near each ECP pipe opening to allow pipe closure, within 48 hours, when external flooding is projected to exceed 350 ft MSL.
- No elective maintenance or elective testing will be performed that could challenge the Dardanelle Reservoir SWS suction source.
- The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status.
- The intake traveling screens will be inspected for debris and general physical condition at least once per shift.

3/4.7.4 EMERGENCY COOLING POND (continued)

- The accessible portions of the temporary ECP system piping will be inspected weekly.
- Fish nets will be installed in the Dardanelle Reservoir SWS intake canal when required by existing winter operations procedural guidance and inspected for any gross physical damage or large quantities of debris twice a week, weather permitting, to ensure the nets remain intact and capable of performing the intended function.
- An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation.
- At least once per week, a briefing will be conducted for applicable personnel to ensure individuals remain cognizant of the cues that would prompt operator action to start the temporary pumping system and open the discharge valve.
- The ECP level will be maintained ≥ 5.5 ft during the 65-day preventative maintenance window.
- The risk impact will be reassessed against the acceptance guidelines for a small risk increase as defined in RG 1.177 (Incremental Conditional Core Damage Probability (ICCDP) $< 1E-6$ and Incremental Conditional Large Early Release Probability (ICLERP) $< 1E-7$) prior to removing the installed ECP supply piping from service during the 65-day preventative maintenance window and will inform the NRC before proceeding if either criterion is not met.

The first three items above are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one of the other ongoing commitments during the maintenance window, the LCO Note remains applicable (i.e., the ECP may be considered to remain operable) provided action is taken to restore the commitment without delay. This is considered reasonable since failure to meet one or more ongoing commitments does not immediately render the temporary ECP pumping system unavailable.

With the conditions associated with the LCO Note (as defined above) not met, the ECP may no longer be considered OPERABLE and Condition B becomes applicable.

ACTION "a" permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE(s) while relying on the ACTION.

3/4.7.5 FLOOD PROTECTION

The limitation on flood protection ensures that facility protective actions will be taken in the event of flood conditions.

ENCLOSURE, ATTACHMENT 3

OCAN092102

RE-TYPED TECHNICAL SPECIFICATION PAGES
(3 Pages)

3.7 PLANT SYSTEMS

3.7.8 Emergency Cooling Pond (ECP)

LCO 3.7.8 The ECP shall be OPERABLE.

-----NOTE-----
 The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Degradation of the ECP noted pursuant to SR 3.7.8.4 below or by other inspection.	A.1 Determine ECP remains acceptable for continued operation.	7 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> LCO not met for reasons other than Condition A.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-ft.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	<p>-----NOTE-----</p> <p>Only required to be performed from June 1 through September 30.</p> <p>-----</p> <p>Verify average water temperature is ≤ 100 °F.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	<p>Perform soundings of the ECP to verify:</p> <ol style="list-style-type: none"> 1. A contained water volume of ECP ≥ 70 acre-feet, and 2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained. 	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.4	Perform visual inspection of the ECP to verify conformance with design requirements.	In accordance with the Surveillance Frequency Control Program

PLANT SYSTEMS

3/4.7.4 EMERGENCY COOLING POND

LIMITING CONDITION FOR OPERATION

3.7.4.1 The emergency cooling pond (ECP) shall be OPERABLE¹ with:

- a. A minimum contained water volume of 70 acre-feet.
- b. An average water temperature of ≤ 100 °F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With the volume and/or temperature requirements of the above specification not satisfied or, with the requirements of Action b not met, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. If degradation is noted pursuant to 4.7.4.1.d below or by other inspection, perform an evaluation to determine that the ECP remains acceptable for continued operation within 7 days.

SURVEILLANCE REQUIREMENTS

4.7.4.1 The ECP shall be determined OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by verifying that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-feet.
- b. In accordance with the Surveillance Frequency Control Program during the period of June 1 through September 30 by verifying that the pond's average water temperature at the point of discharge from the pond is within its limit.
- c. In accordance with the Surveillance Frequency Control Program by making soundings of the pond and verifying:
 1. A contained water volume of ECP ≥ 70 acre-feet, and
 2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained.
- d. In accordance with the Surveillance Frequency Control Program by performance of a visual inspection of the ECP to verify conformance with design requirements.

Note 1: The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure Attachment 4 are implemented.