TENNESSEE VALLEY AUTHORITY

1101 Market Street, Chattanooga, Tennessee 37402

CNL-21-020

November 5, 2021

10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Browns Ferry Nuclear Plant, Units 1, 2, and 3 - Application Requesting NRC Prior Approval of a Proposed Chilled-Water Cross-tie Modification to Support System Operability (BFN-TS-518)**

In accordance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.90, "Application for amendment of license, construction permit, or early site permit," Tennessee Valley Authority (TVA) requests an amendment to the Renewed Facility Operating License (RFOL) Nos. DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, respectively. The amendment proposes the use of a cross-tie between the BFN Unit 3 chilled water system and the BFN Units 1 and 2 chilled water system supplying the electric board room (EBR) air handling units (AHU). The use of the cross-tie will support operability of the BFN Units 1 and 2 EBR air conditioning systems and their supported electrical equipment.

Additionally, TVA is requesting a one-time use of a change to the BFN Technical Specifications (TS) 3.8.7, "Distribution Systems - Operating," to allow for the installation of the cross-tie modification between the BFN Units 1 and 2 EBR AHUs and the BFN Unit 3 control bay chiller. This TS change would allow the equipment in the Units 1 and 2 EBRs to remain operable while the cross-tie modification is completed and tested for operation. Once the cross-tie is installed and declared operational, this TS change would no longer be required.

The enclosure provides the description and technical evaluation of the proposed change, a regulatory evaluation, and a discussion of environmental considerations. Attachment 1 to the enclosure provides BFN Units 1, 2, and 3, Updated Final Safety Analysis Report pages marked up to show the proposed changes. Attachment 2 to the enclosure provides the BFN Units 1, 2, and 3 TS pages marked up to show the proposed changes. Attachment 3 to the enclosure provides the BFN Units 1, 2, and 3 TS pages retyped with the proposed changes.

TVA has determined that there is no significant hazards consideration associated with the proposed changes and that the changes to the RFOLs qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosure to the Alabama Department of Public Health.

TVA requests NRC approval of the proposed license amendment within one year from the date of this letter with implementation within 60 days following NRC approval.

There are no new regulatory commitments contained in this letter. Please address any questions regarding this submittal to Kimberly D. Hulvey, Senior Manager, Fleet Licensing at 423-751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 5th day of November 2021.

Respectfully,

James T. Polickoski
Director, Nuclear Regulatory Affairs

Enclosure:

Evaluation of the Proposed Change

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant
NRC Project Manager - Browns Ferry Nuclear Plant
State Health Officer, Alabama Department of Public Health

ENCLOSURE

Evaluation of the Proposed Change

Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3 - Application Requesting NRC Prior Approval of a Proposed Chilled-Water Cross-tie Modification to Support System Operability (BFN-TS-518)

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Subject: **Browns Ferry Nuclear Plant, Units 1, 2, and 3 - Application Requesting NRC Prior Approval of a Proposed Chilled-Water Cross-tie Modification to Support System Operability (BFN-TS-518)**

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2. Proposed TS Pages (Markups) for BFN Units 1,2,3
3. Proposed TS Bases Pages (Final Typed) for BFN Units 1,2,3

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, Renewed Facility Operating License Nos. DPR-33, DPR-52 and DPR-68. The requested amendment proposes the use of a cross-tie between the BFN Unit 3 control bay (CB) chilled water system and the BFN Unit 1/2 CB chilled water system supplying the electric board room (EBR) air handling units (AHUs). The use of the cross-tie will support operability of the BFN Unit 1 and Unit 2 EBR air conditioning system and their supported electrical equipment.

Additionally, TVA is requesting a one-time use technical specification (TS) change that provides an exception to the required actions of TS 3.8.7, "Distribution Systems - Operating," during the installation and testing of the cross-tie. This would allow the equipment in the Units 1 and 2 EBRs to remain operable and would avoid entering multiple TS limiting condition for operation (LCO) conditions and their required actions during the installation and avoid a three-unit shutdown.

2.0 DETAILED DESCRIPTION

2.1 Reason for the Proposed Change

The reason for the proposed amendment is to create a defense-in-depth strategy that supports operability of the Unit 1 and Unit 2 EBR air conditioning system by providing an alternate source of chilled water if both normal chilled-water sources are unavailable. In turn, this change reduces potential impacts to BFN Initiating Events.

On multiple occasions, BFN has experienced the loss of both Unit 1/2 CB chillers supporting the Unit 1 and Unit 2 EBR air conditioning system. In those cases, the EBR air conditioning losses required declaring the electrical equipment in the EBRs inoperable. The concurrent losses to safety-related equipment supported by the electric boards resulted in entering the required actions of TS LCO 3.0.3, applicable to Units 1, 2, and 3. In the two most recent instances, utilizing an alternate chilled-water source as proposed by this amendment would have allowed the Unit 1 and Unit 2 EBR air conditioning systems and their supported electrical equipment to remain OPERABLE.

Prior to the year 2000, the Unit 1 and Unit 2 EBRs were each independently cooled by two 100 percent capacity direct expansion (DX) air conditioning units. In 2000, implementation of a design change converted the Unit 1 and Unit 2 EBR DX air conditioning units to chilled-water AHUs and replaced the Unit 1/2 CB chillers. The single air-cooled chilled-water system serves nine local AHUs, including four AHUs for Unit 1 and Unit 2 EBRs. Because of this design change, the loss of two Unit 1/2 CB chillers immediately results in the inoperability of both Unit 1 and Unit 2 EBR air conditioning systems and the associated supported systems based on the TS definition of OPERABLE-OPERABILITY.

On July 14, 2015, and September 10, 2017, unplanned TS LCO entries were made when both Unit 1/2 CB chillers supporting the Units 1 and 2 main control room (MCR) air conditioning system (TS 3.7.4) and the Unit 1 and Unit 2 EBR air conditioning systems (Technical Requirements Manual (TRM) 3.7.6) were determined to be inoperable (References 1 and 2, respectively). Because the Unit 1/2 CB chilled water system provides heat removal for the air conditioning systems, the inoperability of both chillers results in a loss of essential cooling provided by the Unit 1 and Unit 2 EBR air conditioning systems and a loss of safety-related cooling capacity of the Units 1 and 2 MCR air conditioning system. An earlier instance occurred

when the one chiller was inoperable and the other failed to start. After troubleshooting, the chiller that failed to start was successfully started before shutdown of units was required.

In conditions when both EBR air conditioning systems are inoperable, consistent with the TS definition of OPERABLE-OPERABILITY, the Technical Requirements Manual (TRM) requires immediately declaring the electrical equipment in the EBRs inoperable. This would result in entry into TS LCO 3.8.7, "Distribution Systems – Operating," Conditions F (Unit 1) and G (Units 2 and 3). These TS LCO Conditions require, for each unit, with one or more required AC or DC boards inoperable, that the affected standby gas treatment (SGT) system or control room emergency ventilation (CREV) subsystem be declared inoperable immediately. In addition, BFN Units 1 and 2 would enter TS LCO 3.8.7, Conditions H (Unit 1) and I (Unit 2). These TS LCO Conditions require, with two or more electrical power distribution subsystems inoperable that result in a loss of function, that the affected unit enter TS LCO 3.0.3 immediately.

Note that with SGT A and B subsystems inoperable, BFN Units 1, 2, and 3, each would enter TS LCO 3.6.4.3, "SGT System," Condition D. TS LCO Condition D requires that, with two or three SGT subsystems inoperable in MODE 1, 2, or 3, that the unit(s) enter TS LCO 3.0.3 immediately. As a result, BFN Units 1, 2, and 3, would enter TS LCO 3.0.3 with required action within one hour to initiate action to place Units 1, 2, and 3 in MODE 2 within 10 hours, in MODE 3 within 13 hours, and in MODE 4 within 37 hours. Thus, the proposed modification would provide a backup source of chilled water to the Units 1 and 2 EBR air conditioning systems and prevent placing Units 1, 2, and 3 in shutdown as described above.

The proposed amendment allows the use of the proposed modification and provides a one-time extended action completion time to restore the EBRs to provide time to install the cross-tie piping.

2.2 Description of the Proposed Change

TVA proposes to install a manually operated chilled water cross-tie line from the Unit 3 CB chilled water system to the Unit 1/2 CB chilled water system to be used in the event of an abnormal condition when both trains of the Unit 1/2 CB chilled water system are inoperable. This cross-tie line will meet the same seismic requirements as the current chilled water system piping, which is Class I seismic where appropriate. Operation of this cross-tie line will be performed by operations personnel when the Unit 1/2 CB chilled water system is inoperable (i.e., not providing sufficient chilled cooling water for its equipment loads). A simplified drawing of the proposed modification is provided in Figure 1.

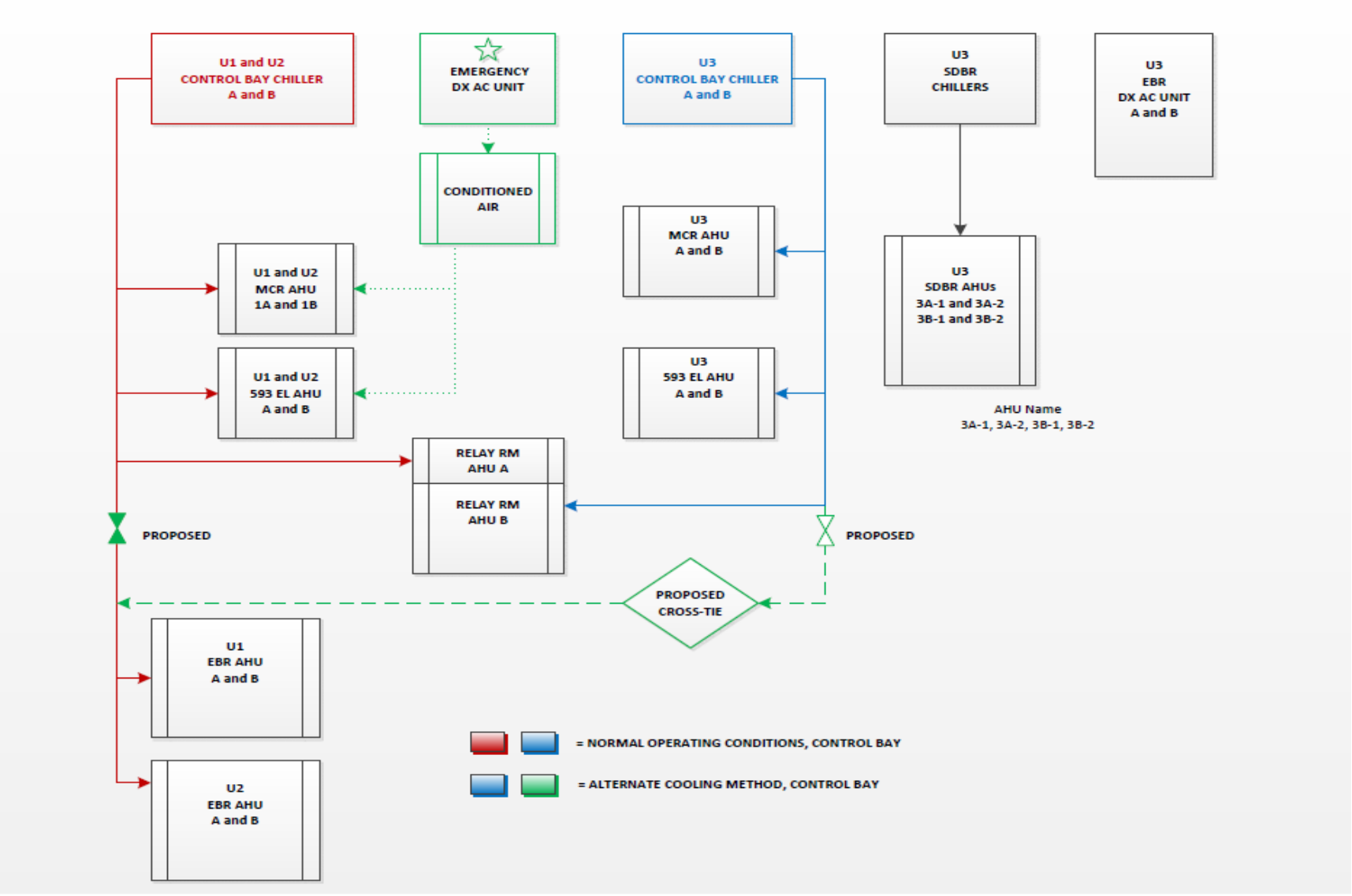

Figure 1 BFN Control Bay Cooling Supply Configurations

In order to support and reflect the proposed cross-tie modification, NRC review and approval are requested for the proposed changes to the Updated Final Safety Analysis Report (UFSAR) and TS.

1) TVA proposes to revise the BFN UFSAR, Section 10.12, “HVAC Systems,” and Appendix F, “Unit Sharing and Interactions,” to reflect the design modification and to incorporate licensing basis changes describing the Unit 3 CB chilled water system as both a shared system and as an alternate chilled-water source for Unit 1 and Unit 2 EBR AHUs.

   UFSAR, Section 10.12 will be revised to identify that upon loss of both Unit 1/2 CB chillers, supplemental cooling is provided via cross-tie connecting Unit 3 CB chilled water system to the Unit 1 and Unit 2 EBR AHUs.

   UFSAR Appendix F, Section F.7.11, will be revised to identify that the Unit 3 CB chilled water system is shared in that it can supply chilled water to the Unit 1 and Unit 2 EBR AHUs if needed.

   Refer to Attachment 1 for the proposed BFN UFSAR markups as discussed above.

2) TVA requests NRC prior approval for a one-time only change to BFN Units 1, 2, and 3 TS 3.8.7, “Distribution Systems – Operating.” Several of the Conditions for TS 3.8.7 are updated to add the conditional phrase

   > for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

   A new Condition (I for Unit 1, J for Units 2 and 3) and Note is also added that states:

   > ----------NOTE----------
   > Only applicable on a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie.
   > ----------
   >
   > I. Two or more electrical power distributions subsystems inoperable due to installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

   Refer to Attachment 2 for the TS markups as discussed herein.

Installation is expected to last 43 hours based on the estimated work steps required to install and leak check the prepared piping spool sections at the Units 1 and 2 chilled water piping. Therefore, TVA is requesting an exception to the requirements of TS 3.8.7 for 2 days for installation so that essential cooling to the EBR AHUs can be temporarily isolated to complete the proposed cross-tie connections to the chilled-water piping. This is acceptable based on CB and EBR GOTHIC code analysis, which assumes a total loss of EBR cooling in Unit 1 or Unit 2 and defines the most limiting EBR heat up rate of 23.27 hours before reaching the design operating limit of 104 degrees Fahrenheit (°F). This is explained in more detail in Section 3.0.

An additional 7 days is also requested for flow-balancing the system with the Unit 3 chiller cross-tie aligned to the Unit 1 and Unit 2 EBR AHUs. During this time, the Unit 1 and Unit 2

EBR AHUs and the aligned Unit 3 CB chilled water system train will be available but will not be OPERABLE. The standby Unit 3 CB chilled water system train and both Unit 1/2 CB chilled water system trains remain OPERABLE. Because the limiting EBR takes approximately 24 hours to reach 104°F, there is ample time to realign the systems to their normal configurations before cooling is needed. Therefore, the requested time to complete the installation and testing and to restore the affected electrical power distribution subsystems to OPERABLE status is 9 days, 2 days for installation and 7 days for testing.

3.0 TECHNICAL EVALUATION

Providing an alternate backup source of cooling water via the cross-tie line to the Unit 1 and Unit 2 EBR AHU piping would allow BFN Units 1, 2, and 3 to continue to operate with the required cooling for all three units and prevent a potential three-unit shutdown when the Unit 1/2 CB chilled water system is unavailable. An available alternate cooling source for the Unit 1/2 EBR AHUs is proposed by the installation of an isolable cross-tie connecting chilled water from the Unit 3 CB chilled water system. The following technical evaluation discusses this proposed modification.

Cross-tie Use

The rated certified capacity of each Unit 3 chiller including fouling factors is 112.5 tons. The current design-basis heat loads on the Unit 3 chiller total 74 tons, and the additional design basis heat loads from Unit 1 and Unit 2 EBRs increases the design requirement to 105.3 tons. This leaves approximately 7.2 tons of excess heat removal capacity.

The cross-tie modification does not result in a reduction of system or equipment redundancy, diversity, separation, or independence. The Unit 3 CB chilled water system consists of two 100-percent capacity trains. Each train is seismically-qualified where appropriate and has a safety-related power source, maintaining redundancy. No methods of cooling are being removed. Instead, a new method of cooling the Unit 1 and Unit 2 EBRs is added, maintaining diversity. The Unit 3 CB chilled water system will be isolable from the Unit 1/2 CB chilled water system, maintaining separation. This maintains independence of the different chilled water systems. Therefore, utilizing chilled water from the Unit 3 CB chilled water system to provide essential cooling for Unit 1 and Unit 2 EBR AHUs, does not affect BFN's compliance with General Design Criterion (GDC) 5, "Sharing of structures, systems, and components," because sharing will not significantly impair its ability to perform its safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.

Under normal circumstances, the Unit 1/2 CB chilled water system supplies these AHUs:

- Unit 1 EBRs – 2 AHUs @ 100 percent capacity each
- Unit 2 EBRs – 2 AHUs @ 100 percent capacity each
- Units 1 and 2 Main Control Room – 2 AHUs @ 100 percent capacity each
- Units 1 and 2 Safety-related Equipment Rooms on EL[1] 593 – 2 AHUs @ 100 percent capacity each
- Common Switchyard Relay Room EL 617 ft – 1 AHU @ 100 percent capacity

[1] Elevation about sea level expressed in feet.

and the Unit 3 CB chilled water system supplies these AHUs:

- Unit 3 Safety-related Equipment Rooms on EL 593 ft – 2 AHUs @ 100 percent capacity
- Unit 3 Main Control Room & office spaces, EL 617 ft – 2 AHUs @ 100 percent capacity
- Common Switchyard Relay Room, EL 617 ft – 1 AHU @ 100 percent capacity

When the cross-tie is in use, the Unit 3 CB chilled water system will supply the Unit 1 and Unit 2 EBR AHUs in addition to its normal loads. Note that, as shown in Figure 1, the Unit 3 4kV and 480V shutdown board rooms are independently cooled by their own chilled-water or air conditioning system. The other Unit 1 and Unit 2 loads not served by the cross-tie, excluding the common switchyard relay room, which is already served by the Unit 3 CB chilled water system, are supplied by emergency direct expansion units when the Unit 1/2 CB chilled water system is unavailable. The emergency direct expansion units have a safety-related power source, are seismically-qualified, and have periodic preventive maintenance performed to maintain functionality.

Normally, the Unit 1 and Unit 2 EBR AHUs will be aligned to the Unit 1/2 CB chilled water system. When the Unit 3 CB chilled water cross-tie is needed, utilization of the cross-tie will require operators to isolate the Unit 1/2 CB chilled water system and align to the Unit 3 CB chilled water system via the cross-tie line. Alignment of the proposed cross-tie would involve manually manipulating several valves that are readily accessible in the control building. This valve manipulation would be similar to swapping chiller trains or the local startup of the emergency CB chiller unit. Based on the CB and EBR GOTHIC Analysis, which assumes a total loss of EBR cooling in Units 1 or 2, the most limiting EBR heat up rate is 23.27 hours before reaching the design operating limit of 104°F. Therefore, alignment of the proposed cross-tie would not be a time critical evolution.

After implementing the Unit 3 CB chilled water system cross-tie, TRM LCO 3.7.6 Action B.1, “Declare the electrical equipment in the [EBRs] inoperable,” would not be required if at least one Unit 3 chiller is available to provide cooling to the Unit 1 and Unit 2 EBR AHUs. Instead, the Unit 1 or Unit 2 MCR will inform the Unit 3 MCR that both Unit 1/2 CB chillers are inoperable and implementation of the Unit 3 cross-tie is required. The units would coordinate an implementation plan in accordance with BFN Operating Instructions.

Although the equipment in the Unit 1 and Unit 2 EBRs would remain OPERABLE, the Unit 1/2 MCR air conditioning systems would be inoperable. Units 1 and 2 would enter TS LCO 3.7.4, Conditions A and B. Condition A required action with one Unit 1/2 MCR air conditioning subsystem inoperable is to restore Unit 1/2 MCR air conditioning subsystem to OPERABLE status with a completion time of 30 days. Condition B required actions with two Unit 1/2 MCR air conditioning subsystems inoperable is to immediately initiate action to restore one Unit 1 and 2 MCR air conditioning subsystem to OPERABLE status, to place an alternate method of MCR cooling in operation within 24 hours, and to restore one MCR air conditioning subsystem to OPERABLE status within 7 days. Thus, with both trains of Unit 1/2 CB chilled water system inoperable, the use of the cross-tie is limited to 7 days.

BFN Unit 3 chiller performance is verified by performing TS Surveillance Requirement (SR) 3.7.4.1, which ensures that the CB air conditioning system has the capability to remove the assumed heat load to maintain the required environmental conditions for plant operators and safety-related equipment by verifying proper chilled water temperatures and chilled water flows.

The SR verifies that the heat removal capability of the system is sufficient to remove the MCR heat load assumed in the safety analyses. This SR consists of a combination of testing and calculation, both of which will be revised as necessary to include the additional heat loads imposed by the Unit 1 and Unit 2 EBRs via the proposed cross-tie. The SR 3.7.4.1 is performed in accordance with the Surveillance Frequency Control Program.

Therefore, based on the above discussion, use of the cross-tie does not impair the system's ability to perform its safety function. Additionally, use of the cross-tie prevents the unnecessary shutdown of all three units in the event that both trains of the Unit 1/2 CB chilled water system are inoperable.

Cross-tie Installation

Connecting the Unit 3 CB chilled water system to the Unit 1 and Unit 2 EBR AHUs requires temporarily isolating the Unit 1 and Unit 2 EBR AHUs from the Unit 1/2 CB chilled water system. During this evolution, the Unit 1/2 CB chilled water system continues to supply chilled water to the Unit 1 and 2 MCR AHUs and the EL 593 ft AHUs (see Figure 1). Therefore, the Units 1 and 2 MCR air conditioning subsystems will remain OPERABLE during the evolution. Additionally, the equipment on EL 593 ft and the switchyard relay room will continue to be cooled. Therefore, the only cooling consideration is for the Unit 1 and Unit 2 EBRs.

Current analysis indicates that the Unit 1 and Unit 2 EBRs will not reach the design operating limit of 104°F for approximately 24 hours during a design-basis accident when no cooling is provided to the EBRs, the doors are closed, and the reactor building is already at 127°F. During the 43-hour cross-tie installation, the piping to the EBR AHUs will be open to the atmosphere for approximately 16 hours and available for use within 20 to 22 hours after opening the system. This includes connecting both the supply and return lines to the cross-tie. This is less than the approximate 24 hours for the EBRs to heat up to 104°F when no action is taken to provide cooling to the rooms.

Additionally, BFN will take the following compensatory actions during installation of the Unit 3 CB chilled water crosstie to reduce risk:

- Remove missile hazards from the switchyard preferably by removing any trucks that may be present. If work trucks are found in the switchyard, remove potential missile hazards from the associated work trucks, and remove the trucks from the area if it is deemed safe to do so. If moving the trucks is deemed to be a higher risk than to secure them in place, document the assessment in the narrative logs.
- No work will be allowed in the switchyard or transformer yard. Shift manager permission is required for all access into the switchyard or transformer yard; these permission rights cannot be delegated. Remove potential missile threats from the switchyard and transformer yard.
- No planned electrical system AC or DC work will be authorized. Shift manager permission is required for all emergent electrical system AC or DC work during installation of the crosstie; these permission rights cannot be delegated.
- While the work will be planned to avoid predicted severe weather, in the case of severe weather, monitor plant areas for flying debris hazards every shift, in accordance with plant procedures.
- Monitor the ambient air temperature in the 1A, 1B, 2A, and 2B EBRs and their associated 480V shutdown board rooms twice per shift and document the temperatures in the narrative logs. If the temperatures in these board rooms exceed 100°F, open the

associated board room doors and install fans to assist in maintaining the associated temperatures below 100°F. Do not block open the electric board room doors unless their ambient air temperature exceeds 100°F.
- Maintain one train of the Unit 1/2 CB chillers in operation.
- No hot work in the plant is authorized during this period.
- No high-risk activities are authorized during this period.

Given the above compensatory actions, and the time required for the EBRs to heat up to the design operating temperature of the equipment in the EBRs, there is reasonable assurance of the public health and safety during the cross-tie installation.

Cross-tie Testing and Flow-balancing

After installation, flow-balancing the system is required with the Unit 3 chiller cross-tie aligned to the Unit 1 and Unit 2 EBR AHUs. During this time, the Unit 1 and Unit 2 EBR AHUs and the aligned Unit 3 CB chilled water system train will be available but will not be OPERABLE because chilled water flow to the EBR AHUs and other Unit 3 CB chilled water system loads is varying while it is adjusted to design values. The standby Unit 3 CB chilled water system train (the train not being flow-balanced at the time) and both Unit 1/2 CB chilled water system trains remain OPERABLE. Because the limiting EBR takes approximately 24 hours to reach 104°F, there is ample time to realign the systems to their normal configurations before cooling is needed.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements

Design Criteria

During the construction permit licensing process, each of the three BFN units was evaluated against the then-current draft of the Atomic Energy Commission (AEC) Proposed General Design Criteria. Units 1 and 2 were evaluated against the AEC-27 Criteria, while Unit 3 was evaluated against the AEC-70 Criteria. Although neither version of these proposed criteria had been adopted as regulatory requirements, the design, material procurement, and fabrication of each reactor unit was responsive to the respective applicable criteria for a construction permit. Although the later criteria (AEC-70) did not wholly complement the earlier AEC-27 criteria, and also contained many aspects which could have been modified or clarified before their formal adoption, the design bases of each unit were reevaluated (at the time of initial Final Safety Analysis Report preparation) against the draft of the AEC-70 criteria current at the time of operating license application.

Based on the understanding of the intent of the proposed criteria current at the time of operating license application, it was concluded that each BFN unit conforms to the intent of the AEC General Design Criteria for Nuclear Power Plant Construction Permits.

> *Criterion 5—Sharing of structures, systems, and components*. Structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.

During normal cooling, all heat loads for the Unit 1/2 CB Chilled Water System are isolated from the Unit 3 CB chilled water system. In the event that both trains of the Unit 1/2 CB chilled water system are inoperable, emergency backup cooling is provided to the Unit 1 and 2 MCR and the safety-related equipment along the EL 593 ft hallway. However, no backup cooling is available for the Unit 1 and 2 EBRs.

The Unit 3 CB chilled water system is being modified so that, if both trains of the Unit 1/2 CB chilled water system are inoperable, the Unit 3 CB chilled water system can provide adequate heat removal capability for its safety-related heat loads in addition to those for the Unit 1 and 2 EBRs. This modification is acceptable based upon design analysis and will be confirmed by periodic surveillance testing. The Unit 3 CB chilled water system has access to both normal and emergency power and, where appropriate, is designed to Class I seismic requirements. Also, Unit 3 does not rely on the Unit 3 CB chilled water system for EBR or 4kV shutdown board room cooling required for orderly shutdown and cooldown; this is accomplished independently with redundant air conditioning systems and chillers, respectively. Therefore, sharing the Unit 3 CB chilled water system in this capacity will not impair the ability of the system to perform its safety functions while simultaneously performing the safety functions associated with the Unit 1/2 EBR AHUs.

4.2 No Significant Hazards Consideration Analysis

The requested amendment proposes the use of a cross-tie between the BFN Unit 3 CB chilled water system and the BFN Unit 1/2 CB chilled water system supplying the EBR AHUs. The use of the cross-tie will support operability of the BFN Unit 1 and Unit 2 EBR air conditioning system and their supported electrical equipment.

Additionally, TVA is requesting a one-time use TS change that provides an exception to the Required Actions of TS 3.8.7, “Distribution Systems - Operating,” during the installation and testing of the cross-tie. This would allow the equipment in the Units 1 and 2 EBRs to remain operable and would avoid entering multiple TS LCO conditions and their required actions during the installation and avoid a three-unit shutdown.

A written evaluation of the significant hazards consideration of a proposed license amendment is required by Title 10 of the *Code of Federal Regulations (CFR)* 50.92. According to 10 CFR 50.92, a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

- Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- Involve a significant reduction in a margin of safety.

As required by 10 CFR 50.91(a), the TVA analysis of the issue of no significant hazards consideration using the standards in 10 CFR 50.92 is presented below.

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

   Response: No

The BFN CB chillers are not discussed in any accident or transient currently evaluated in the Updated Final Safety Analysis Report (UFSAR) (Chapter 14). The chillers, air conditioning systems or their control systems are not initiators of any accident evaluated in the UFSAR. A failure of a chiller system does not contribute to the frequency of occurrence of an accident.

Implementation of the proposed cross-tie modification makes it possible for the both the Unit 1/2 CB chilled water system and the Unit 3 CB chilled water system to provide essential cooling for the Unit 1 and Unit 2 EBR AHUs. This ability increases the reliability of the EBR air conditioning system and ensures the availability of electrical equipment relied upon for accident mitigation.

The proposed changes do not adversely affect accident initiators or precursors nor alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed changes do not adversely affect the ability of structures, systems, and components to perform their intended safety function to mitigate the consequences of an initiating event within the assumed limits. The proposed changes do not affect the source term, containment isolation, or radiological consequences of any accident previously evaluated. Further, the proposed changes do not increase the types and the amounts of radioactive effluent that may be released, nor significantly increase individual or cumulative occupation/public radiation exposures.

Therefore, these proposed changes do not involve a significant increase in the probability or consequences of an accident previously identified.

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

Response: No

Chillers and their associated piping and components are not initiators of accident scenarios. The cross-tie piping is not fundamentally different from the existing chilled-water piping. Without a credible accident initiator, a new accident cannot be created due to a failure of the chillers or piping. Therefore, this activity does not create the possibility for an accident of a different type than any previously evaluated in the UFSAR.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No

The Unit 3 chillers each have a rated capacity of 112.5 tons. The current design-basis heat loads on the Unit 3 chiller are 74 tons. The additional design-basis heat loads from Units 1 and 2 EBRs increases the design requirement to 105.3 tons. This leaves approximately 7.2 tons of excess heat removal capacity.

BFN Unit 3 chiller performance is verified via SR 3.7.4.1. The procedure used ensures that the Unit 3 control room air conditioning system has the capability to remove the assumed heat load to maintain the required environmental conditions for plant operators and safety-related control equipment by verifying proper chilled water temperatures and chilled water flows. The testing in the procedure verifies that the heat removal capability of the system is sufficient to remove the MCR heat load assumed in the safety analyses. This procedure consists of a combination of testing and calculation, both of which will be revised as necessary to include the additional design-basis heat loads from the Unit 1 and Unit 2 EBRs via the cross-tie.

The design modification will be consistent with the design requirements for the control building HVAC system. The cross-tie piping and components will be safety-related and seismically-qualified where appropriate. The Unit 3 CB chilled water system is safety-related and is seismically-qualified where appropriate. The U3 CB chillers have the capacity, with sufficient design margin, to absorb the additional design-basis accident heat loads to maintain the Units 1 and 2 reactor building EL 593 ft and EBR temperatures within acceptable limits for operation of equipment and for uninterrupted safe occupancy.

Unlike Units 1 and 2, essential cooling for the Unit 3 4-kiloVolt (KV) electric boards and 480 Volt (V) shutdown boards are independent from the Unit 3 CB chilled water system. The 4-kV electric boards for Unit 3 are located in rooms within the Unit 3 diesel generator building and are cooled by redundant air-conditioning units. The rooms containing the Unit 3 480V shutdown boards are cooled by two 100 percent capacity air-conditioning units located in the Unit 3 reactor building. Therefore, the reduction in design margin for the Unit 3 CB chilled water system as a result of the design-basis heat loads from the Units 1 and 2 EBR AHUs does not impair the ability of Unit 3 to safely shutdown the reactor (Unit 3) or maintain it in a safe shutdown condition. Additionally, the cross-tie will not be used as an alternate chilled water source for the Unit 3 CB chiller loads. Therefore, margin for the control bay chillers for Units 1 and 2 is maintained.

As stated with Nuclear Energy Institute (NEI) guidance NEI 96-07, Revision 1, “Guidelines for 10 CFR 50.59 Evaluation,” Section 4.3.2, a change, which may reduce system/equipment redundancy, diversity, separation or independence would require prior NRC approval. However, in this case, the proposed cross-tie modification does not result in a reduction of system/equipment redundancy, diversity, separation or independence. Adequate design margin and system redundancy is maintained. Therefore, utilizing chilled water from the Unit 3 CB chilled water system to provide cooling for Unit 1 and Unit 2 EBR AHUs, does not negatively affect BFNs compliance with GDC 5, “Sharing of structures, systems, and components,” because its safety function is not impaired by the sharing of these chilled water systems between units. However, because unit sharing in this capacity is not currently identified in the licensing basis, BFN is seeking NRC prior approval via this license amendment request to implement and utilize the proposed design modification to maintain operability of the Unit 1 and Unit 2 EBR air conditioning system.

Therefore, the proposed changes associated with this license amendment request do not involve a significant reduction in margin of safety.

Based on the above, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

4.3 Conclusions

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

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any radioactive effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Licensee Event Report 50-259/2015-003-00, “Loss of Cooling to the Unit 1 and Unit 2 Shutdown Board Rooms Due To Fouled Chiller Coils,” dated September 14, 2015 (ML15257A131)

2. Licensee Event Report 50-259/2017-004-00, “Safety System Functional Failures Due to the Inoperability of Both Unit 1 and 2 Control Bay Chillers,” dated November 9, 2017 (ML17313A848)

Attachment 1

Updated Final Safety Analysis Report

Page Markups

The control room air handling units provide ventilation to the main control room area. Two 100-percent capacity air handling units are provided, each containing: heating and cooling coils, a humidifier, controls, and motor-operated dampers. The dampers isolate the air handling unit when on standby. The air handling cooling coils are equipped with vent and drain valves. Room return air is proportionally mixed with fresh air by manual dampers and filtered by renewable media filter cells rated at 85-percent NBS.

Fresh air is mechanically supplied for makeup to air-conditioning systems, for ventilating system requirements, and for pressurizing the Control Building. Fresh air supply systems separately serve the Units 1 and 2 air-conditioned spaces except the Electric Board Rooms, the Unit 3 air-conditioned spaces except the electric board rooms and spreading rooms. Each of the air-conditioned spaces has two 100-percent capacity supply fans.

Each spreading room is ventilated by one 100-percent capacity fresh-air supply fan. Two 100-percent capacity exhaust fans serve both spreading rooms. The fresh air is filtered. The air flow is balanced with the exhaust flow exceeding the total supply flow in order to prevent a positive pressure in the spreading rooms in relation to the Control Bay Habitability Zone (CBHZ) thus precluding the possibility of unfiltered air inleakage into the CBHZ. Dampers exist in the ventilation exhaust lines from the spreading rooms. Manual provisions exist to restart one spreading room ventilation system independent of the other.

Two 100-percent capacity, air-cooled, water-chilling units, located on the Unit 1 and 2 Diesel Generator Building roof, provide essential cooling for the Units 1 and 2 control bay air-conditioning systems.

Two 100-percent capacity chilled water pumps for Unit 3 are each designed to circulate water through a water cooled water chilling unit. Chilled water is then circulated through a chilled water piping loop to each air-handling unit's cooling coil. The system is equipped with test wells for temperature monitoring.

Two 100-percent capacity hot water pumps are each designed to circulate water that is heated by a hot water generator located in the Unit 1 mechanical equipment room. The hot water is circulated through a hot water piping loop to various air-handling unit heating coils and reheat coils mounted in branch air supply ducts.

To prevent overheating of essential electrical equipment as a result of loss of cooling due to failure of both water chillers serving Units 1 and 2, or by the rupture of the chilled water loops, supplementary cooling is provided. Water-cooled condensing units are connected to direct-expansion cooling coils mounted in each air-conditioning system return air separate duct. Condenser cooling water is taken from the Emergency Equipment Cooling Water System.

The Unit 3 control bay ventilation and heating instruments are strategically located to sense a mixture of return and supply air for optimum system performance.

To provide an alternative means of protection for the electrical equipment in the Unit 1 and 2 Electrical Board Rooms against the failure of both chillers, a cross-tie to the Unit 3 Control Bay Chilled Water System can be engaged to provide a redundant source of chilled water. The cross-tie connections are isolated through manual, normally-closed valves. There is adequate margin in the Unit 3 chillers to supply the cross-tie loads of the Units 1 and 2 Electrical Board Rooms air handling units in addition to the air handling units normally supplied by the Unit 3 chillers.

The battery chargers are also unitized in normal operation; however, a spare charger can be manually switched to any of the unit or station batteries.

A possible shared influence is related to circuit faults. Circuits that are assigned to a given separations division are not permitted to be routed with circuits assigned to the other separations division. Hence, a faulted circuit could influence only one separations division. Non-divisional circuits routed with both divisions have two isolation devices. Additionally, selective coordination is provided such that the device nearest the fault isolates the faulted circuit. For ungrounded DC control circuits, fuses are provided in both the positive and negative circuit to provide backup protection should one of the fuses fail to open the faulted conductors.

The 250-V DC Control Power Supply System consists of five batteries and chargers (one set assigned for each of the Unit 1 and Unit 2 shutdown boards and shutdown board 3EB). Thus, the sharing is limited to one of the four shutdown boards that supplies the Standby AC Power Supply System for Units 1 and 2.

F.7.11 Subsections of the Heating and Ventilating Systems

These shared systems are described in paragraph 5.3.3.6 and Subsection 10.12 of the FSAR. The effect of loss of normal ventilation in the Reactor Building is discussed briefly in paragraph F.7.1.

The Turbine Building heating and ventilating system is shared in the sense that the turbines are in a common ventilation zone. Each unit has its own complement of intake and exhaust fans, and the normal air flow patterns should not cause any significant cross flow in the common turbine room.

For the purpose of this description, the control bay includes the shutdown board rooms which are actually within the Reactor Building, but outside the perimeter of secondary containment.

The Unit 1 and Unit 2 rooms contain both the 4-kV and 480-V shutdown boards whereas the Unit 3 rooms contain only the 480-V shutdown boards. (The Unit 3 4-kV shutdown boards are housed in the Unit 3 Diesel Generator Building.)

The Unit 1, 2, and 3 control bay cooling system consist of two independent central chilled water systems serving two independent area chilled water air handling systems. The Unit 1 and 2 chilled water system consist of two 100% capacity air cooled, water chilling units and nine area chilled water air handling units: four 100% capacity units serving the Unit 1 and 2 Electric Board Rooms located in the Reactor Building, two 100% capacity units serving the Unit 1 and 2 safety related equipment rooms located on the 593 elevation of the Control Building, two 100% capacity units serving the Unit 1 and 2 Control Building, and one 100% capacity unit serving the common Switchyard

The chilled water systems normally operate independently but the Unit 3 chilled water system has the capability to provide supplementary cooling water to the Unit 1 and 2 Electric Board Room Air Handling Units when the cross-tie between the systems is engaged.

BFN-27

when the cross-tie is not engaged

Relay Room also located on the 617 elevation. The Unit 3 chilled water system consist of two 100% capacity chillers and five area chilled water air handling units, two 100% capacity units serving the Unit 3 safety related equipment rooms located on the 593 elevation of the control building, two 100% capacity units serving the Unit 3 control room and office spaces located on the 617 elevation of the control building, and one 100% capacity unit serving the common switchyard relay room located on elevation 617 of the control building.

Separate ventilation systems supply outside air to the Control Building. The outside air serves as makeup air for the air-conditioned areas and for ventilation of the spreading rooms, and the Units 1 and 2 Elevation 606 Mechanical Equipment Room. Two of the outside air systems are shared. The first serves the Unit 1 and Unit 2 Main Control Room, the Switchyard Relay Room, Units 1 and 2 Elevation 606 Mechanical Equipment Room, and the Unit 1 and Unit 2 Auxiliary Instrument Rooms; and the second serves the Units 1 and 2 spreading room. The third and fourth are not shared, as the third serves the Unit 3 Main Control Room and Auxiliary Instrument Rooms, and the fourth serves the Unit 3 spreading room.

The air-conditioning for the Unit 3 4-kV electric board rooms is provided by the Unit 3 Diesel Generator Building systems, as discussed in FSAR paragraph 10.12.5.3. There are two separate systems serving two different areas in the building. Two of the four boards are in one area and two boards are located in the other area.

Maloperation of the air-conditioning or ventilation air systems could adversely affect the operation of any or all generating units in any mode. These systems are therefore designed as redundant sets serving corresponding rooms or groups of rooms. Each redundant set has two 100-percent-capacity air-handling (recirculation) systems and are designed as engineered safeguards support systems. Although the temperature rise in most of the rooms served by the air-conditioning and ventilation air systems would be fairly slow after system failure, calculations show that the ultimate temperatures would be too high to predict reliable operation of the equipment therein. A typical example would be a room containing a 250-V battery charger wherein the continued set operation is contingent on maintaining room ventilation. Therefore, the systems are designed in redundant configurations, have access to normal and emergency power, and, where appropriate, are designed to Class I seismic requirements.

The rooms containing the Unit 1 electric boards and Unit 2 electric boards are cooled by two 100 percent capacity air handling units. The Unit 3 480-V electric boards are cooled by two 100 percent capacity air conditioning units. These units are water cooled and reject the internal room heat load to the EECW system. The conditioned air operates as a closed loop within the corresponding board rooms located in each of the Reactor Buildings.

Attachment 2

Technical Specification Page Markups

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Unit 1 and 2 4.16 kV Shutdown Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	----------NOTE---------- Enter applicable Conditions and Required Actions of Condition B, C, and F when Condition A results in no power source to a required 480 volt board. ---------- A.1 Restore the Unit 1 and 2 4.16 kV Shutdown Board to OPERABLE status. AND A.2 Declare associated diesel generator inoperable.	5 days AND 12 days from discovery of failure to meet LCO Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Unit 1 480 V Shutdown Board inoperable. OR 480 V RMOV Board 1A inoperable. OR 480 V RMOV Board 1B inoperable.	B.1 Restore Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
C. One Unit 1 and 2 DG Auxiliary Board inoperable.	C.1 Restore Unit 1 and 2 DG Auxiliary Board to OPERABLE status.	5 days AND 12 days from discovery of failure to meet LCO

, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One Unit DC Board inoperable. OR One Unit 1 and 2 Shutdown Board DC Distribution Panel inoperable. OR 250 V DC RMOV Board 1A inoperable. OR 250 V DC RMOV Board 1B inoperable. OR 250 V DC RMOV Board 1C inoperable.	D.1 Restore required Board or Shutdown Board DC Distribution Panel to OPERABLE status., for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	7 days AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Unit 1 and 2 4.16kV Shutdown Board A and B inoperable. OR Unit 1 and 2 4.16 kV Shutdown Board C and D inoperable.	----------NOTE---------- Enter applicable conditions and required actions of Condition B, C, and F when Condition E results in no power source to a required 480 volt board. ---------- E.1 Restore one 4.16 kV Shutdown Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
F. One or more required Unit 2 or 3 AC or DC Boards inoperable.	F.1 Declare the affected SGT or CREV subsystem inoperable.	Immediately
G. Required Action and associated Completion Time of Condition A, B, C, D, ~~or E not met.~~ E, or I not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	12 hours 36 hours
H. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	H.1 Enter LCO 3.0.3.	Immediately

, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

Insert 1

INSERT 1

----------NOTE---------- Only applicable on a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie. ---------- I. Two or more electrical power distribution subsystems inoperable due to installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	I.1 Restore affected electrical power distribution subsystems to OPERABLE status.	9 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Unit 1 and 2 4.16 kV Shutdown Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	——NOTE—— Enter applicable Conditions and Required Actions of Condition B, C, D, and G when Condition A results in no power source to a required 480 volt board.	
	A.1 Restore the Unit 1 and 2 4.16 kV Shutdown Board to OPERABLE status.	5 days AND 12 days from discovery of failure to meet LCO
	AND	
	A.2 Declare associated diesel generator inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Unit 2 480 V Shutdown Board inoperable. OR 480 V RMOV Board 2A inoperable. OR 480 V RMOV Board 2B inoperable.	NOTE Enter Condition C when Condition B results in no power source to 480 volt RMOV board 2D or 2E. B.1 Restore Board to OPERABLE status., for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	8 hours AND 12 days from discovery of failure to meet LCO
C. Unit 2 480 V RMOV Board 2D inoperable. OR Unit 2 480 V RMOV Board 2E inoperable.	C.1 Declare the affected RHR subsystem inoperable., for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	Immediately
D. One Unit 1 and 2 DG Auxiliary Board inoperable.	D.1 Restore Unit 1 and 2 DG Auxiliary Board to OPERABLE status.	5 days AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One Unit DC Board inoperable. OR One Unit 1 and 2 Shutdown Board DC Distribution Panel inoperable. OR 250 V DC RMOV Board 2A inoperable. OR 250 V DC RMOV Board 2B inoperable. OR 250 V DC RMOV Board 2C inoperable.	E.1 Restore required Board or Shutdown Board DC Distribution Panel to OPERABLE status. , for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	7 days AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Unit 1 and 2 4.16 kV Shutdown Board A and B inoperable. OR Unit 1 and 2 4.16 kV Shutdown Board C and D inoperable.	----------NOTE---------- Enter applicable conditions and required actions of Condition B, C, D, and G when Condition F results in no power source to a required 480 volt board. ---------- F.1 Restore one 4.16 kV Shutdown Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
G. One or more required Unit 1 or 3 AC or DC Boards inoperable.	G.1 Declare the affected SGT or CREV subsystem inoperable.	Immediately
H. Required Action and associated Completion Time of Condition A, B, D, E, or F not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	I.1 Enter LCO 3.0.3.	Immediately

, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

F, or J not met.

, for reasons other than installation of the U3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.

Insert 2

INSERT 2

----------NOTE---------- Only applicable on a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie. ---------- J. Two or more electrical power distribution subsystems inoperable due to installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	J.1 Restore affected electrical power distribution subsystems to OPERABLE status.	9 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Unit 3 4.16 kV Shutdown Board 3EA and 3EB inoperable. OR Unit 3 4.16 kV Shutdown Board 3EC and 3ED inoperable. , for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	~~NOTE~~ Enter applicable ~~conditions~~ and required actions of Condition B, C, D, and G when Condition F results in no power source to a required 480 volt board. F.1 Restore one 4.16 kV Shutdown Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
G. One or more required Unit 1 or 2 AC or DC Boards inoperable.	G.1 Declare the affected SGT or CREV subsystem inoperable.	Immediately
H. Required Action and associated Completion Time of Condition A, B, D, E, ~~or F not met.~~ F, or J not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	I.1 Enter LCO 3.0.3.	Immediately

INSERT 3

INSERT 3

----------NOTE---------- Only applicable on a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie. ---------- J. Two or more electrical power distribution subsystems inoperable due to installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	J.1 Restore affected electrical power distribution subsystems to OPERABLE status.	9 days

Attachment 3

Technical Specification Pages (Retyped)

(3) 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;

(4) 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 equipment and instrument calibration or associated with radioactive apparatus or components;

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

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3952 megawatts thermal.

(2) Technical Specifications

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

For Surveillance Requirements (SRs) that are new in Amendment 234 to Facility Operating License DPR-33, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 234. For SRs that existed prior to Amendment 234, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 234.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Unit 1 and 2 4.16 kV Shutdown Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	----------NOTE---------- Enter applicable Conditions and Required Actions of Condition B, C, and F when Condition A results in no power source to a required 480 volt board. ----------	
	A.1 Restore the Unit 1 and 2 4.16 kV Shutdown Board to OPERABLE status.	5 days AND 12 days from discovery of failure to meet LCO
	AND	
	A.2 Declare associated diesel generator inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Unit 1 480 V Shutdown Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 480 V RMOV Board 1A inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 480 V RMOV Board 1B inoperable, for reasons other than installation ofthe Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	B.1 Restore Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
C. One Unit 1 and 2 DG Auxiliary Board inoperable.	C.1 Restore Unit 1 and 2 DG Auxiliary Board to OPERABLE status.	5 days AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One Unit DC Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR One Unit 1 and 2 Shutdown Board DC Distribution Panel inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 250 V DC RMOV Board 1A inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 250 V DC RMOV Board 1B inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 250 V DC RMOV Board 1C inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	D.1 Restore required Board or Shutdown Board DC Distribution Panel to OPERABLE status.	7 days AND 12 days from discovery of failure to meet LCO

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Unit 1 and 2 4.16 kV Shutdown Board A and B inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR Unit 1 and 2 4.16 kV Shutdown Board C and D inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	----------NOTE---------- Enter applicable conditions and required actions of Condition B, C, and F when Condition E results in no power source to a required 480 volt board. ---------- E.1 Restore one 4.16 kV Shutdown Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
F. One or more required Unit 2 or 3 AC or DC Boards inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	F.1 Declare the affected SGT or CREV subsystem inoperable.	Immediately
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or I not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Two or more electrical power distribution subsystems inoperable that result in a loss of function, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	H.1 Enter LCO 3.0.3.	Immediately
----------NOTE---------- Only applicable one a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie. ----------		
I. Two or more electrical power distribution subsystems inoperable due to installation of the Unit 3 Control bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	I.1 Restore affected electrical power distribution subsystems to OPERABLE status.	9 days

sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(4) 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 equipment and instrument calibration or associated with radioactive apparatus or components;

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

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3952 megawatts thermal.

(2) Technical Specifications

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

For Surveillance Requirements (SRs) that are new in Amendment 253 to Facility Operating License DPR-52, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 253. For SRs that existed prior to Amendment 253, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 253.

(3) The licensee is authorized to relocate certain requirements included in Appendix A and the former Appendix B to licensee-controlled documents. Implementation of this amendment shall include the relocation of these requirements to the appropriate documents, as described in the licensee's

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Unit 1 and 2 4.16 kV Shutdown Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	----------NOTE---------- Enter applicable Conditions and Required Actions of Condition B, C, D, and G when Condition A results in no power source to a required 480 volt board. ----------	
	A.1 Restore the Unit 1 and 2 4.16 kV Shutdown Board to OPERABLE status.	5 days <u>AND</u> 12 days from discovery of failure to meet LCO
	<u>AND</u>	
	A.2 Declare associated diesel generator inoperable.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Unit 2 480 V Shutdown Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 480 V RMOV Board 2A inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 480 V RMOV Board 2B inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	----------NOTE---------- Enter Condition C when Condition B results in no power source to 480 volt RMOV board 2D or 2E. ---------- B.1 Restore Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Unit 2 480 V RMOV Board 2D inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR Unit 2 480 V RMOV Board 2E inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	C.1 Declare the affected RHR subsystem inoperable.	Immediately
D. One Unit 1 and 2 DG Auxiliary Board inoperable.	D.1 Restore Unit 1 and 2 DG Auxiliary Board to OPERABLE status.	5 days AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One Unit DC Board inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR One Unit 1 and 2 Shutdown Board DC Distribution Panel inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR 250 V DC RMOV Board 2A inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR	E.1 Restore required Board or Shutdown Board DC Distribution Panel to OPERABLE status.	7 days AND 12 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. (continued) 250 V DC RMOV Board 2B inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. <u>OR</u> 250 V DC RMOV Board 2C inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.		

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Unit 1 and 2 4.16 kV Shutdown Board A and B inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken. OR Unit 1 and 2 4.16 kV Shutdown Board C and D inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	----------NOTE---------- Enter applicable conditions and required actions of Condition B, C, D, and G when Condition F results in no power source to a required 480 volt board. ---------- F.1 Restore one 4.16 kV Shutdown Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
G. One or more required Unit 1 or 3 AC or DC Boards inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	G.1 Declare the affected SGT or CREV subsystem inoperable.	Immediately
H. Required Action and associated Completion Time of Condition A, B, D, E, F or J not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. Two or more electrical power distribution subsystems inoperable that result in a loss of function, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	I.1 Enter LCO 3.0.3.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
----------NOTE---------- Only applicable on a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie. ----------		
J. Two or more electrical power distribution subsystems inoperable due to installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	J.1 Restore affected electrical power distribution subsystems to OPERABLE status.	9 days

(3) 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;

(4) 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 equipment and instrument calibration or associated with radioactive apparatus or components;

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

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3952 megawatts thermal.

(2) Technical Specifications

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

For Surveillance Requirements (SRs) that are new in Amendment 212 to Facility Operating License DPR-68, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 212. For SRs that existed prior to Amendment 212, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 212.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Unit 3 4.16 kV Shutdown Board 3EA and 3EB inoperable. OR Unit 3 4.16 kV Shutdown Board 3EC and 3ED inoperable.	----------NOTE---------- Enter applicable conditions and required actions of Condition B, C, D, and G when Condition F results in no power source to a required 480 volt board. ---------- F.1 Restore one 4.16 kV Shutdown Board to OPERABLE status.	8 hours AND 12 days from discovery of failure to meet LCO
G. One or more required Unit 1 or 2 AC or DC Boards inoperable, for reasons other than installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	G.1 Declare the affected SGT or CREV subsystem inoperable.	Immediately
H. Required Action and associated Completion Time of Condition A, B, D, E, F, or J not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	I.1 Enter LCO 3.0.3.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
----------NOTE---------- Only applicable on a one-time basis for installation and testing the Unit 3 Control Bay Chiller Cross-tie. ----------		
J. Two or more electrical power distribution subsystems inoperable due to installation of the Unit 3 Control Bay Chiller Cross-tie when the compensatory actions of TVA letter CNL-21-020 are taken.	J.1 Restore affected electrical power distribution subsystems to OPERABLE status.	9 days