Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-20-012

May 19, 2020

10 CFR 50.90

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

Watts Bar Nuclear Plant, Units 1 and 2
Facility Operating Licenses Nos. NPF-90 and NPF-96
NRC Docket Nos. 50-390 and 50-391

Subject: Application to Modify the Watts Bar Nuclear Plant Unit 1 and Unit 2 Technical Specifications for Main Control Room Chiller Completion Time Extension (WBN-TS-18-16)

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) is submitting a request for an amendment to Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant (WBN) Units 1 and 2, respectively.

The proposed changes are in support of modifications to the WBN Units 1 and 2 Main Control Room (MCR) Control Room Emergency Air Temperature Control System (CREATCS) chillers. The proposed amendment revises WBN Units 1 and 2 Technical Specification (TS) 3.7.11 "Control Room Emergency Air Temperature Control System (CREATCS)," to add a one-time change of a footnote to the Completion Time for Required Action A.1 to allow one CREATCS train to be inoperable for up to 60 days while performing modifications to the CREATCS chillers. The proposed amendment also adds a one-time change of a footnote to the Completion Time for Required Action E.1 to allow delayed entry into TS Limiting Condition for Operation (LCO) 3.0.3 for up to four days in the event that both CREATCS trains are inoperable during the modifications to the CREATCS chillers. These one-time TS changes are limited to the time that the CREATCS modifications are being performed between the timeframe of May 1, 2021 to October 1, 2022.

TVA is replacing the CREATCS chillers to improve their efficiency. Replacement of each CREATCS chiller requires that the associated CREATCS train be taken out of service and declared inoperable. The upgrade of the CREATCS chillers is planned to be performed with both WBN units operating. Performing the CREATCS chillers' upgrade activities with both units at power ensures stable plant conditions with the largest contingent of plant personnel, material, and management oversight resources available to focus on the modifications without the demands of a concurrent unit outage.

The enclosure to this submittal provides a description and technical evaluation of the proposed change, a regulatory evaluation, and a discussion of environmental considerations. Attachment 1 to the enclosure provides the existing WBN Units 1 and 2 TS pages marked up to show the proposed changes. Attachment 2 to the enclosure provides the existing WBN Units 1 and 2 TS pages retyped to show the proposed changes. Attachment 3 to the enclosure provides the existing WBN Units 1 and 2 TS Bases pages marked up to show the proposed changes. Changes to the existing TS Bases are provided for information only and will be implemented under the TS Bases Control Program.

TVA has determined that there are no significant hazards considerations associated with the proposed changes and that the TS changes qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). In accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosure to the Tennessee State Department of Environment and Conservation.

TVA requests approval of the proposed license amendment within one year from the date of this submittal, with implementation within 30 days of issuance of the amendment. There are no regulatory commitments associated with this submittal. Please address any questions regarding this request 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 the 19th day of May 2020.

Respectfully,

James Barstow
Vice President, Nuclear Regulatory Affairs & Support Services

Enclosure: Evaluation of Proposed Change

cc (Enclosure):

NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Watts Bar Nuclear Plant
NRC Project Manager – Watts Bar Nuclear Plant
Director, Division of Radiological Health – Tennessee State Department of Environment and Conservation

Enclosure

Evaluation of Proposed Change

Subject: Application to Modify the Watts Bar Nuclear Plant Unit 1 and Unit 2 Technical Specifications for Main Control Room Chiller Completion Time Extension (WBN-TS-18-16)

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Enclosure

Attachments

1. Proposed TS Changes (Mark-Ups) for WBN Units 1 and 2
2. Proposed TS Changes (Final Typed) for WBN Units 1 and 2
3. Proposed TS Bases Page Changes (Mark-Ups) for WBN Units 1 and 2 (For Information Only)

1.0 SUMMARY DESCRIPTION

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) is requesting a license amendment to Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant (WBN) Units 1 and 2.

This license amendment request (LAR) is in support of the modifications to the WBN Units 1 and 2 Main Control Room (MCR) Control Room Emergency Air Temperature Control System (CREATCS) chillers. Specifically, the LAR proposes a one-time change to the Completion Time of Required Action A.1 of WBN Units 1 and 2 Technical Specifications (TS) 3.7.11, "Control Room Emergency Air Temperature Control System (CREATCS)," to add a footnote to allow one CREATCS train to be inoperable for up to 60 days during upgrades of the CREATCS chillers. As described in Section 3.2 to this enclosure, during the modifications to the CREATCS chillers, a temporary non-safety related chiller system will be installed and available to support MCR cooling. However, the temporary chiller system will not be credited as an operable CREATCS train in accordance with WBN Units 1 and 2 TS 3.7.11.

Also, while performing modifications to one of the two TS required CREATCS trains, if the other CREATCS train is declared inoperable, the LAR also requests a one-time change to the Completion Time of Required Action E.1 of WBN Units 1 and 2 TS 3.7.11 to add a footnote to delay entry into TS Limiting Condition for Operation (LCO) 3.0.3 for up to four days while monitoring the MCR temperature to ensure it does not exceed 90°F. Further justification for this proposed change is provided in Section 3.4.2 to this enclosure.

2.0 DETAILED DESCRIPTION

2.1 Background

In References 1, 2, and 3, TVA submitted a LAR to revise WBN Unit 1 TS 3.7.11 to add a one-time change of a footnote to the Completion Time for Required Action A.1 to allow one train of the CREATCS to be inoperable for up to 60 days while performing modifications to the WBN Unit 1 CREATCS chillers. This LAR was approved by the Nuclear Regulatory Commission (NRC) in Reference 4. However, the modification described in the above LAR was not completed and the footnote was subsequently removed in Reference 5.

This modification was not implemented because the equipment qualification documentation provided for the MCR chillers did not provide sufficient evidence to reasonably conclude the equipment would be able to perform its active safety function of heat control before, during, and after the analyzed safe shutdown earthquake. These issues were documented in an NRC Inspection Report (Reference 6) and entered into TVA's corrective action program. To resolve the discrepancies from the prior project, a certified design specification was written to support procurement of the new MCR chillers. The design specification incorporated lessons learned from the previous MCR chiller replacement project including

specifying more stringent seismic qualification requirements to ensure sufficient qualification and associated documentation; seismic testing will be of particular emphasis in the factory acceptance tests. A qualified vendor was chosen to provide the equipment for the CREATCS chiller, and a verification of the seismic qualification is planned to be performed.

The enclosed LAR reflects information similar to References 1 through 3, with the exception that Reference 1 also addressed planned upgrades to the shutdown board room (SDBR) chillers. The currently planned upgrades to the CREATCS chillers also involve upgrades to the SDBR chillers; however, the SDBR chillers are non-TS support systems for the safety related 6.9kV and 480V switchgear and associated equipment. Therefore, they are not within the scope of this LAR.

2.2 Description of the Proposed Change

The LAR proposes the following changes to the WBN Units 1 and 2 TS 3.7.11.

- The following footnote is added to the Completion Time for Required Action A.1:

  ** An allowance is permitted for one CREATCS train to be inoperable for up to 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.*

- The following footnote is added to the Completion Time of Required Action E.1 of WBN Units 1 and 2 TS 3.7.11:

  *** An allowance to monitor the main control room temperature every hour and verify the main control room temperature is less than or equal to 90 degrees Fahrenheit (°F) is permitted for up to four days in lieu of the immediate entry into LCO 3.0.3. If the main control room temperature exceeds 90°F, or the duration without a train of CREATCS being OPERABLE exceeds four days, immediate entry into LCO 3.0.3 is required. This provision is only applicable during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022.*

Attachment 1 to the enclosure provides the existing WBN Units 1 and 2 TS pages marked up to show the proposed changes. Attachment 2 to the enclosure provides the existing WBN Units 1 and 2 TS pages retyped to show the proposed changes. Attachment 3 to the enclosure provides the existing WBN Units 1 and 2 TS Bases pages marked up to show the proposed changes. Changes to the existing TS Bases are provided for information only and will be implemented under the TS Bases Control Program.

2.3 Reason for the Proposed Change

TVA is replacing the CREATCS chillers to improve their efficiency. Replacement of each CREATCS chiller requires that the associated CREATCS train be taken out of service and declared inoperable. The upgrades to the CREATCS chillers are

planned to be performed while the Units are operating to ensure stable plant conditions with the largest contingent of plant personnel, material, and management oversight resources available to focus on the modifications without the demands of a concurrent unit outage. As described in Section 3.4.1 to this enclosure, the timeframe needed to complete the modifications to the CREATCS chillers is expected to exceed the 30-day Completion Time of TS 3.7.11, Required Action A.1. Therefore, without this proposed change, TVA would not be able to perform the planned upgrades to the CREATCS chillers within the current TS required timeframes.

3.0 TECHNICAL EVALUATION

3.1 System Description

The CREATCS provides temperature control for the MCR following isolation of the MCR. The CREATCS consists of two independent and redundant trains that provide cooling of recirculated MCR air. Each train consists of an air-handling unit (AHU), water chiller, chilled water pump, and associated piping, ductwork, instrumentation, and controls to provide for MCR temperature control. The CREATCS is a subsystem providing air temperature control for the MCR.

WBN has a common MCR for Units 1 and 2 located in the Control Building. The Control Building heating, ventilating, air-conditioning (HVAC) system is described in Section 9.4.1 of the WBN dual unit Updated Final Safety Analysis Report (UFSAR). The design basis of the CREATCS is to maintain the control room temperature for 30 days of continuous occupancy.

The Control Building HVAC and air cleanup systems are designed to maintain temperature and humidity conditions throughout the building for the protection, operation, and maintenance and testing of plant controls, and for the safe, uninterrupted occupancy of the MCR habitability system area during an accident and the subsequent recovery period. The CREATCS has two redundant 100% capacity subsystems including two 100% capacity package water chillers, two 100% capacity fan-coil type AHUs, and associated pumps, piping, ductwork, and controls. The CREATCS chillers provide cooling water to the AHU coils, and the AHUs distribute the conditioned air through ventilation ductwork to cool spaces where safety related equipment is located. Each CREATCS chiller train has 100% design capacity (i.e., for all design bases accidents, one CREATCS chiller train can maintain the ambient temperature in the MCR and its associated spaces below their design bases limit).

The MCR is maintained in the range of 60°F minimum to 104°F maximum temperature during all modes of operation. Adequate environmental conditions are provided for equipment operation and protection, and personnel comfort in the MCR during normal, accident, and post-accident recovery conditions.

Each CREATCS train is served from a separate train of the emergency power system and from a coordinated separate loop of the essential raw cooling water system. Upon loss of offsite power, emergency power to the CREATCS chiller packages is automatically reestablished by the associated diesel generator (DG).

The proposed permanent modifications are limited to replacement of each of the CREATCS chiller packages. The chilled water piping inlet and outlet to the AHU is removed and replaced with temporary piping for the temporary chiller system. No HVAC operating parameters are changed due to the operating arrangement of the temporary chiller system. The CREATCS AHUs will not be changed during this modification. Using either the temporary, full capacity chiller system or the operable CREATCS train will ensure that the required air distribution to the affected areas is maintained during replacement activities.

3.2 MCR Temporary Chilled Water Equipment Description

A temporary non-safety related chiller system (see Figure 1) will be installed and used to support MCR cooling during the CREATCS chiller replacements. This temporary system is capable of providing adequate cooling to maintain the MCR within its normal temperature band. The major components of the temporary chiller system include the following.

- Air cooled chilled water package
- Chilled water pump
- Power supply, cables, and connections
- Chilled water supply and return hoses
- Demineralized water source
- Engineered penetrations with isolation valves
- Backup DG with fuel tank

3.2.1 MCR Temporary Air Conditioning Equipment Description

The temporary chiller system will utilize a 150-ton (minimum) capacity portable air-cooled chiller, a 500 gallons per minute (gpm) chilled water pump or pumps, temporary chilled water supply and return hoses, temporary penetration configurations and associated isolation valves, temporary chilled water connections to the appropriate AHU, and a 320 kilowatt (kW) DG. These components are on stand-alone skid mounted packages.

Supply and return hoses will be used for routing the chilled water from the temporary chilled water package to the AHUs in the Control Building. The hoses are routed as appropriate to the AHU (Figure 1). Existing sleeves located on Elevation 755.0 feet which are part of the control room envelope (CRE) boundary will be used for routing the chilled water supply and return hoses to the appropriate MCR AHU located in the mechanical equipment room. Two manual isolation valves, one for each penetration through the CRE boundary will be provided for isolation purposes. Connection to the AHU coils will be made by isolating the chilled water piping, removing the flex hoses between the AHU coils and the chilled water piping and then connecting the temporary chilled water supply and return hoses to the AHU coils using existing flange connections.

To ensure that a suitable environment is maintained for personnel and equipment in the MCR Habitability Zone (MCRHZ), the CRE is maintained at a pressurization of 1/8 inch water gage minimum above atmospheric to minimize infiltration of airborne contaminants which may be present outside the CRE boundary. The penetrations

used for the temporary chilled water system to route the supply and return chilled water lines to the AHU have been sized to use 2-1/2" diameter piping to minimize the potential area of an opening if the hose were lost. Using penetrations of this size will maintain potential exfiltration at a low enough level that the flow of the Control Building emergency air pressurization fans can retain the required positive pressurization required for emergency operation. Breaches will be tracked against the available margin for the CRE during times when the valves are open. Therefore, the CRE will remain established with the sizing of the piping connections used in the penetrations into the Control Building mechanical equipment room to connect the chilled water loop supplied by the temporary chilled water system.

The temporary hoses, pipe, and fittings are qualified for adequate pressure to protect against rupture and pipe whip. The valves at the penetrations are qualified for seismic retention to maintain the integrity of the control room envelope boundary. A combustible loading evaluation has been performed to ensure the materials associated with this temporary modification do not substantially increase fire risks within the Control Building. Spill containment will be provided beneath the chiller skid to contain any spillage from the chiller skid. Personnel will not need to be stationed to take actions to isolate piping in the event of a chilled water line rupture to prevent flooding inside the Control Building areas, as the total volume within the temporary chilled water system is bounded by existing moderate energy line break internal flooding design evaluations.

The temporary chiller equipment is non-safety related, but as described in the following subsections, appropriate measures are being taken to minimize the potential for failure of the temporary chiller system and the CRE.

3.2.2 System Sizing

TVA performed a calculation that considered operational heat loads, the nominal rating of the temporary chiller unit, and nominal temporary chilled water pump ratings. The calculation determined that by providing chilled water with the temporary chiller system using the existing CREATCS AHU, the MCR areas can be adequately cooled using a nominal 150-ton chiller with a 500 gpm capacity chilled water pump or pumps and using 2.5 inch diameter supply and return hoses and that MCR temperatures would conservatively remain below 80°F. All MCR equipment operates normally at an ambient temperature of 75°F.

3.2.3 Equipment Staging

The equipment associated with the temporary chiller system will be located in the yard west of the Auxiliary Building and in the Control Building (Elevation 729.0 feet). The temporary chiller system is designed for outside installation. The temporary chiller system will be protected from freezing. The chilled water lines will be run from the temporary chiller system to the AHU. Final connection of the chilled water lines to the AHU will occur when the CREATCS chiller to be replaced is taken out of service. Hardware will be staged at the AHU for rapid deployment to disconnect the permanent water lines, connect the temporary chilled water lines and perform filling and venting operations. This process minimizes the time when the MCR would be without the benefit of the temporary backup cooling system. During this time, one train of CREATCS remains operable and able to provide MCR cooling as needed.

3.2.4 Power Supplies

The temporary chiller system and chilled water pump will be powered from non-safety related 480V alternating current (AC) sources located within the station area. Should the onsite power source for the temporary chiller system be lost, the temporary equipment can be restarted and placed back into service powered by the backup DG. The temporary chilled water system has a 320 kW skid mounted DG dedicated so that it can operate independently of site power. This is sufficient to meet the temporary chiller system load demand (e.g., compressor, chilled water pump, instrumentation and controls).

3.2.5 Testing and Training

Operating procedures will provide the requirements and procedures for equipment startup, operation, and temperature monitoring. Existing control logic will place the operable CREATCS train into service, if required, upon low flow or high intake temperature sensed at the AHU connected to the temporary chiller system. Also, the operable CREATCS train can be manually placed into service prior to any conditions triggering an automatic start, as needed. Qualified personnel will be provided with training to operate the temporary cooling system, including the backup power supply (DG). Post modification testing (PMT) of the newly installed chillers will be performed before declaring the train operable.

3.3 Control Room Habitability

The CREATCS and the MCR Habitability System (MCRHS) provide for the safe uninterrupted occupancy of the MCRHZ during an accident and subsequent recovery period. The MCRHZ includes the rooms on Elevation 755' of the Control Building. As stated in Section 9.4.1 of the UFSAR, the MCRHZ area isolation signal can be generated by a safety injection signal, high radiation, or smoke concentration in the normal outside air intake. Upon the actuation of a MCRHZ area isolation signal, the following conditions occur:

- Automatic isolation valves in the AHU outside air intake ducts close and the emergency air cleanup system operates to recirculate a portion of the MCR air conditioning system return air through high efficiency particulate air (HEPA) filters and charcoal adsorbers.

- The Control Building emergency pressurizing air supply fans operate to supply a reduced quantity of outside air to the MCR to keep the MCRHZ area pressurized. The intake air is routed through the emergency cleanup system. The ventilation fans in the Control Building that could impact the MCR pressurization and leakage characteristics will cease to operate, and the isolation valves and dampers in the ducts communicating with outside close.

During air cleanup system operation, a portion of the MCR air conditioning system return air is continuously routed through one or both of the air cleanup units and then to the system return air plenum. The cleaned air is thus recirculated to the MCR by the air-conditioning system.

The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the units during normal and

accident conditions. This area encompasses the MCR and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations, and equipment that physically form the CRE. The operability of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants.

The CRE will remain established with the sizing of the piping connections used in the penetrations into the Control Building mechanical equipment room to connect the chilled water loop supplied by the temporary chiller. The piping penetrations will be procedurally tracked to ensure that the CRE breach margin is not exceeded. No post-accident missions outside of the MCR would be necessary to start up the operable CREATCS in the event of an accident during the period of installation and use of the temporary chilled water system.

The MCRHZ is unaffected by the temporary chilled water system. There are no changes to the ductwork, AHU characteristics, or the various system air flows serving the MCRHZ. There are no changes to the emergency air cleaning system. There is no impact to post accident dose analysis. The temporary chiller system and associated equipment will have no interface with the MCRHZ isolation, and therefore, will not impact the ability to isolate the MCRHZ or the ability of the emergency air cleanup system to function as designed.

3.3.1 Protection from Hazardous Chemical Releases

Protection from hazards created by accidental release of potentially toxic chemicals is described in Section 6.4.4.2 of the UFSAR. The UFSAR states that no hazard to control room habitability is posed by any of the chemicals stored on site, offsite within a five-mile radius, or transported by the site by barge, rail, or road within a five-mile radius. The guidelines in Regulatory Guide (RG) 1.78 address the in-leakage of hazardous materials. They have no bearing on control room cooling. The modification would not require any new penetrations to the MCRHZ. Therefore, the proposed LAR satisfies the recommendations of RG 1.78.

3.3.2 Main Control Room Cooling During CREATCS Chiller Replacement

During CREATCS chiller replacement, the affected CREATCS train is inoperable. However, train components remain functional with the exception of the chilled water pump and the chiller unit. The temporary chiller system is connected to the inoperable CREATCS train AHU and provides cooling to the air circulating through the inoperable CREATCS train ductwork. The inoperable CREATCS train operates in its normal configuration with the source of the chilled water changed to the temporary chiller unit. The inoperable CREATCS train AHU will be operating during its chiller replacement, using the temporary chiller system to maintain acceptable temperatures in the MCR. The temporary chiller system was sized to accomplish this function (see Section 3.2.2). The operable CREATCS train will be maintained in its standby configuration.

The operable CREATCS train (in standby) is designed to automatically start after a 30-second delay for the following occurrences.

- high air inlet temperature to the operating AHU,
- low discharge airflow from the operating AHU, or
- low differential pressure across the operating chilled water pump.

Failure of the operating train for any of these cases is alarmed in the MCR. In order to avoid an undesirable continuous start signal during the CREATCS chiller replacement modification, the low differential pressure start signal from the inoperable CREATCS train will be defeated because the chilled water pump is out of service. However, automatic starts of the operable CREATCS train will be retained for both high air inlet temperature to the operating AHU and low discharge airflow from the operating AHU. These two automatic start signals adequately support the design function to ensure that a suitable environment is maintained for personnel and equipment in the MCR. Therefore, defeating the low differential pressure start signal from the inoperable CREATCS train will not adversely affect the ability of the operable CREATCS train to provide the necessary cooling of the MCR. Furthermore, the capability exists to manually start the operable CREATCS train.

If preferred power source to the temporary chiller system is lost, the temporary chiller system will shut down and not re-start until its DG is started. The temporary chiller system can then be re-started manually. If the loss of preferred power affects the CREATCS trains, then both the standby operable CREATCS train and the inoperable CREATCS train components are powered from their associated emergency diesel generators (EDGs). The CREATCS trains are sequentially powered by the EDGs 20 minutes after the EDG comes to speed and the output breaker closes. For a loss of the preferred power source (offsite power), the previously operating AHU will re-start when power is restored either from its associated EDG or from the preferred power source. However, it will have no cooling from the temporary chiller system, as it must be manually started. Therefore, the operable CREATCS train will start automatically on a high air inlet temperature or low discharge air flow from the inoperable train AHU. The operable CREATCS train is capable of maintaining the MCR temperature at acceptable levels in this event.

For a design basis accident with a loss of offsite power (LOOP), or a tornado or seismic event with a LOOP, the temporary chiller system and the operable CREATCS train will respond as described above, assuming the temporary chiller system and its associated DG survive the event. No credit is taken for operation of the temporary chiller system during a design basis accident or a tornado or seismic event. The operable CREATCS train provides MCR temperature control following these events.

3.4 Justification for Proposed Technical Specification Changes

3.4.1 Technical Specification 3.7.11, Condition A

As noted in Section 2.2 to this enclosure, the LAR proposes a change to WBN Units 1 and 2 TS 3.7.11, Required Action A.1, to extend the completion time for up to 60 days for an inoperable CREATCS train during the planned upgrade of the MCR chillers. The basis for the 60 days is provided below.

The replacement of the CREATCS chillers is expected to be done in two phases as described below.

Train A CREATCS

The Train A CREATCS chiller will be removed from service and replaced with a new chiller system of similar design. Both the CREATCS chiller and the SDBR chiller will be replaced concurrently. Concurrent replacement is necessary due to the existing plant configuration on elevation 737 feet of the Auxiliary Building (see Figure 2). The existing CREATCS chiller must be removed first, followed by the existing SDBR chiller. Installation will be in reverse order with the new SDBR chiller being installed, followed by the new CREATCS chiller. Once the new CREATCS chiller is in place, work will concentrate on completion and testing of the CREATCS chiller prior to completion of the SDBR chiller.

While this CREATCS chiller is being replaced, the associated AHU remains functional and the temporary, non-safety related, full-capacity chilled water system (chiller and pump) will be connected to the Train A AHU. The temporary chilled water system will be placed in service to provide cooling for the MCR. The operable CREATCS Train B is in standby and can provide cooling should the temporary chilled water system become unavailable.

The estimated time needed to replace the Train A CREATCS chiller is provided in Table 1.

Table 1
Train A CREATCS Replacement Schedule

Activity	Duration (hours)
Shut down, clear equipment and drain the CREATCS chiller train under replacement	12
Connect temporary chilled water system to MCR AHU for the CREATCS chiller train under replacement	20*
Perform testing on temporary chilled water system and place in service	11*
Remove pipe supports, evacuate chiller, disconnect electrical equipment and remove piping and valves for the CREATCS chiller train under replacement	96
Remove old CREATCS chiller unit	180
Remove old SDBR chiller unit	170
Install and assemble new SDBR chiller unit	110
Install and assemble new CREATCS chiller unit	178
Reinstall piping, valves and electrical equipment for new CREATCS chiller unit	240
Reinstall supports for new CREATCS chiller unit	240**
Leak test, charge, pre-operational inspection	132

Table 1 Train A CREATCS Replacement Schedule	
Activity	**Duration (hours)**
Remove temporary chilled water system/ restore MCR AHU for the CREATCS chiller train	31*
Perform PMT on MCR HVAC system and declare CREATCS equipment operable	218
Total time for Train A chiller replacement	1336 Hours or 55.7 days

* Activity performed in parallel with chiller replacement activities and are not included in the total activity time

** Activity performed in parallel with piping re-installation activities and are not included in the total activity time

Train B CREATCS

The Train B CREATCS chiller will be removed from service and replaced with a new chiller system of similar design. Due to the physical configuration, removal of the Train B CREATCS chiller is not impacted by the Train B SDBR chiller. While the Train B CREATCS chiller is being replaced, the associated AHU remains functional and the temporary chilled water system (chiller and pump) will be connected to the Train B AHU. The temporary chilled water system will be placed in service to provide cooling for the MCR. The operable CREATCS Train A is in standby and can provide cooling should the temporary chilled water system become unavailable.

The estimated time needed to replace the Train B CREATCS chiller is provided in Table 2.

Table 2 Train B CREATCS Replacement Schedule	
Activity	**Duration (hours)**
Shut down, clear equipment and drain the CREATCS chiller train under replacement	12
Connect temporary chilled water system to MCR AHU for the CREATCS chiller train under replacement	20*
Perform testing on temporary chilled water system and place in service	11*
Remove pipe supports, evacuate chiller, disconnect electrical equipment and remove piping and valves for the CREATCS chiller train under replacement	72
Remove old CREATCS chiller unit	142
Install and assemble new CREATCS chiller unit	178
Reinstall piping, valves and electrical equipment for new CREATCS chiller unit	168

Table 2 Train B CREATCS Replacement Schedule	
Activity	**Duration (hours)**
Reinstall supports for new CREATCS chiller unit	168**
Leak test, charge, pre-operational inspection	132
Remove temporary chilled water system/ restore MCR AHU for the CREATCS chiller train	31*
Perform PMT on MCR HVAC system and declare CREATCS equipment operable	218
Total time for Train B chiller replacement	922 hours or 38.4 Days

* Activity performed in parallel with chiller replacement activities and are not included in the total activity time

** Activity performed in parallel with piping re-installation activities and are not included in the total activity time

Based on the above information, a 60-day Completion Time is considered reasonable for restoration of an inoperable CREATCS train during the planned upgrade of the MCR chillers.

A period of 18 months, from May 1, 2021 to October 1, 2022, is requested for the performance of the CREATCS chiller replacements. This duration provides scheduling flexibility to consider refueling outages, weather conditions and scheduled plant maintenance.

3.4.2 Technical Specification 3.7.11, Condition E

WBN Units 1 and 2 TS 3.7.11, Condition E states that if two CREATCS trains are inoperable in Modes 1, 2, 3, or 4, then the unit immediately enters TS LCO 3.0.3. Technical Specification LCO 3.0.3 requires that the Unit be placed in Mode 3 within six hours and Mode 5 within 36 hours. This required shutdown would apply to both Units, because they share a common MCR.

While performing the upgrades to one of the CREATCS chillers, the affected train is declared inoperable and TS 3.7.11, Condition A has been entered. During this time, if the opposite CREATCS train were declared inoperable, a proposed extension of four days is requested prior to entering LCO 3.0.3. Four days is a reasonable timeframe to perform maintenance to restore a CREATCS train to operable status based on a review of previous maintenance history as shown in Table 3.

Table 3 Maintenance History of the CREATCS			
Date	**Corrective Maintenance Issue**	**Unavailability Time (Hours:Mins)**	**Unavailability Time (Days)**
11/8/19	MCR Chiller A temperature control valve (TCV) failed	51:19	2.14
11/5/19	MCR Chiller A TCV failed	49:11	2.05
3/31/19	MCR Chiller B AHU motor failure	144:55	6.04
7/13/18	MCR Chiller B not cooling	88:00	3.67
4/16/17	MCR Chiller A oil temperature issue	77:20	3.22
3/11/16	MCR Chiller A oil cooler TCV failure	64:43	2.70
10/09/15	MCR Chiller B Essential Raw Cooling Water (ERCW) leak on oil return line (rework from repair made during week)	25:29	1.06
9/30/15	MCR Chiller B ERCW copper pipe rupture	64:52	2.70
3/2/15	MCR Chiller A ERCW TCV failed	31:00	1.29

Table 3 is a compilation of Maintenance Rule unplanned unavailability data for the MCR chillers from March 2015 to March 2020. Thus, four days is expected to be sufficient time to restore at least one CREATCS train to operable status while minimizing the length of time in which the CREATCS is inoperable and potentially avoiding unnecessary impact to plant operations.

There is also regulatory precedence for delayed entry into TS 3.0.3 when performing maintenance activities on the CREATCS or similar HVAC equipment. For example, a license amendment was issued by the NRC for the Sequoyah Nuclear Plant (SQN) for the control room air-conditioning system (CRACS) (Reference 7). In Reference 7, NRC approved a one-time change to the Completion Time for LCO 3.7.15.b, which allowed both trains of the CRACS to be inoperable for up to seven days, provided control room temperatures were verified every four hours to be less than or equal to 90°F.

Therefore, the four-day delay provides a reasonable time to address operating problems with the CREATCS.

The proposed footnote to WBN Units 1 and 2 TS 3.7.11, Condition E, is also based on verifying that the MCR temperature is less than or equal to 90°F. The temperature limit for MCR equipment operability is 104°F. The 90°F temperature limit provides adequate margin between the normal MCR operating temperature of 75°F and a limit that ensures that the equipment operability limit of 104°F is not exceeded. By maintaining the MCR temperature at or below 90°F, the operability requirements for safety-related functions provided by equipment and instrumentation in the MCR, as well as habitability needs for operating personnel, is satisfied.

The one-hour frequency for temperature monitoring is adequate given the indications available in the MCR. Operators will have awareness of temperature trending relative to the 90°F limit. With hourly temperature monitoring, a degraded condition would be identified before temperature limits were reached and Unit shutdown activities would be initiated. Additionally, with operators continually stationed in the MCR, temperature increases of this magnitude would most likely be identified before the hourly monitoring requirement. This provides time for MCR conditions to be assessed if the operable CREATCS train is declared inoperable.

To support the one-hour frequency for temperature monitoring TVA evaluated the effect of a loss of cooling on the MCR temperature by performing an analysis of the heatup of the MCR and surrounding areas. The analysis assumed normal operating heat loads, normal average initial room temperatures, summertime maximum outdoor temperatures, one AHU operating, and no chillers in operation. The calculation demonstrates that the temperature increase from 75°F (normal MCR operating temperature) to 104°F takes approximately 5.3 hours. This temperature response does not credit the temporary chiller system cooling.

Maintaining MCR temperatures at or below 104°F will ensure that the safety-related functions are operable. Because this proposed change maintains the CREATCS function for a limited period and supports plant safety functions, there is no adverse impact to nuclear safety. By maintaining MCR temperatures in this manner, the consequence of the loss of alternate cooling is no more severe than a total loss of CREATCS. The proposed change will allow both Units to continue power operation and not be subjected to an unnecessary shutdown when sufficient cooling is available to maintain an acceptable MCR environment.

Following replacement of a CREATCS chiller, the PMT is performed, during which the modified CREATCS train remains inoperable. During the PMT, the operable CREATCS train handswitch (located in the MCR) may be placed in pull to lock, rendering the operable CREATCS train inoperable. This is to prevent the modified CREATCS train PMT steps from adversely affecting the operable train. This impact is due to the automatic start signals from the modified train requiring the operable train to start inappropriately and repeatedly. For example, during testing of the modified train, there may be cooling water flow and/or air flow anomalies that would signal the operable train to start unnecessarily. During the time the operable CREATCS train is placed in pull to lock, the train is inoperable due to the inability to automatically start based on a signal from the modified CREATCS train being tested. However, while in TS 3.7.11, Condition E for this condition, operators in the MCR are able to restore the non-modified CREATCS train quickly by changing a single handswitch position. Delayed entry into LCO 3.0.3 is needed to allow stabilization of the water and air flow from the modified CREATCS train during PMT. This type of entry into TS 3.7.11, Condition E may be used more than once, but would only be used in direct support of PMT and only when the potential for anomalous water and/or air flow in the modified CREATCS train is possible.

Therefore, the proposed four-day extension prior to entering TS 3.0.3 is considered acceptable given the mitigating actions and the low probability of an accident that would require the CREATCS as described in section 3.5.

3.5 Risk Insights

The TVA Probabilistic Risk Assessment does not model the WBN MCR chillers. Furthermore, the MCR is continuously occupied and a loss of HVAC would be observed and corrected rapidly. If the HVAC systems cannot be restored and environmental conditions warranted abandoning the MCR, operators would be able to maintain control from the auxiliary control room.

The compensatory measures described in this LAR (Section 3.6) provide further assurance that MCR envelope temperatures remain within design limits during the planned modifications to the CREATCS trains. Therefore, any increase in core damage risk (ICCDP) and large early release risk (ICLERP) associated with this LAR is expected to be negligible.

3.6 Compensatory Measures

The following compensatory measures provide an additional defense-in-depth during the replacement activities when only one operable CREATCS train is available.

- A temporary, non-safety related chiller system with a temporary DG to provide power to the temporary chiller system will be installed and operated as described in the LAR.
- Instructions for operation of the temporary cooling equipment will be provided to plant personnel.
- During replacement of the CREATCS chillers, TVA will employ a graded approach to defense-in-depth and protected equipment strategies based on the operating status of the affected unit. The risk of the activity will be assessed and managed, including the use of physical barriers as needed. Additionally, TVA procedures preclude work on or near protected equipment and limit access to the area to emergency situations and non-intrusive monitoring of running equipment per operator rounds.
- During replacement of the CREATCS chillers, no elective maintenance will be performed on TS related support equipment for the operable CREATCS chiller except for any required TS SRs.

3.7 Conclusion

The proposed one-time LAR in support of the modifications to the CREATCS trains is acceptable based on the compensatory measures and the low probability of an event requiring MCR isolation, the consideration that the remaining train can provide the required protection, and that alternate non-safety related cooling means are available.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements and Criteria

General Design Criteria

WBN Units 1 and 2 were designed to meet the intent of the "Proposed General Design Criteria for Nuclear Power Plant Construction Permits" published in July 1967. The WBN construction permit was issued in January 1973. The dual-unit UFSAR, however, addresses the NRC General Design Criteria (GDC) published as Appendix A to 10 CFR 50 in July 1971, including Criterion 4 as amended October 27, 1987. Each relevant criterion listed below is followed by a discussion of the design features and procedures that meet the intent of the criteria.

GDC 5 - Sharing of Structures, Systems, and Components

Structures, systems, and components important to safety shall not be shared among nuclear power units unless it is shown that such sharing will not impair significantly 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.

One of the shared safety-related systems at WBN includes the Control Building (which includes the MCR) ventilation system. Compliance with GDC 5 is described in UFSAR Section 3.1.2.1.

During the proposed modification, appropriate actions will be implemented to ensure the CREATCS will be available to provide adequate environmental conditions for equipment operation and protection, and personnel comfort in the common MCR during normal, accident, and post- accident recovery conditions. The use of compensatory actions includes the installation of a temporary chiller system able to maintain MCR conditions in addition to the remaining operable CREATCS train.

GDC 19 – Control Room

A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions including loss of coolant accidents (LOCAs). Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of five rem whole body, or its equivalent to any part of the body, for the duration of the accident.

Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor using suitable procedures.

Compliance with GDC 19 is described in UFSAR Section 3.1.2.1. The proposed change has no effect on the design of the MCR or on operator radiation dose, as that protection is provided by other systems required by the TS. The proposed change also has no effect on alternate control locations outside of the MCR. Therefore, the

only aspect of GDC 19 applicable to the proposed change is the criterion to design the MCR from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. The CRE will remain established with the sizing of the piping connections used in the penetrations into the control building mechanical equipment room to connect the chilled water loop supplied by the temporary chiller. No post-accident missions outside of the control would be necessary to start up the permanently-installed MCR air conditioning system in the event of an accident during the period of installation and use of this T-Mod. The proposed change has no effect on the design of the MCR and the proposed actions will ensure that the MCR temperature is maintained such that the Units may be operated safely from the MCR.

The proposed change continues to ensure that acceptable temperatures are maintained whenever one train of the CREATCS is inoperable due to modifications.

Regulatory Guidance

RG 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room during a Postulated Hazardous Chemical Release" provides guidance on methods for maintaining the habitability of control rooms. These guidelines do not include any provisions for control room cooling as they focus solely on potential in-leakage of hazardous materials. Because this regulatory guide does not address control room temperatures and the proposed change does not affect the integrity of the control room boundary, the recommendations of RG 1.78 are not altered by this request.

4.2 Precedent

This LAR is similar to the following precedents:

- In Reference 4, the NRC issued a license amendment for WBN Unit 1, which allowed a 60-day extension to the TS 3.7.11, Required Action A.1 Completion Time for the CREATCS modifications.
- In Reference 7, NRC issued a license amendment for SQN Units 1 and 2 which allowed both trains of the CRACS to be inoperable for up to seven days, provided control room temperatures were verified every four hours to be less than or equal to 90°F during maintenance activities for the upgrade of the CRACS compressors.
- In Reference 8, the NRC issued a license amendment for the Surry Power Station to permit a one-time change to the TS to permit the use of temporary 45-day and 14-day allowed outage times to allow replacement of MCR and emergency switchgear room air-conditioning system chilled water piping.
- In Reference 9, the NRC issued a license amendment for the Seabrook Station to revise the TS to increase the allowable outage time for the Control Room Air Conditioning Subsystem from 30 days to 60 days, on a one-time basis for each train, during the implementation of the modifications to the Control Room Air Conditioning Subsystem.

4.3 Significant Hazard Consideration

Tennessee Valley Authority (TVA) is requesting an amendment to Facility Operating Licenses NPF-90 and NPF-96 for the Watts Bar Nuclear Plant (WBN) Units 1 and 2, respectively. The proposed amendment revises the WBN Units 1 and 2 Technical Specification (TS) 3.7.11, “Control Room Emergency Air Temperature Control System (CREATCS).” The proposed license amendment request (LAR) provides a temporary change to the completion time for WBN Units 1 and 2 TS 3.7.11, Required Actions A.1 and E.1 to support modifications to the CREATCS Trains A and B.

TVA evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

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

   Response: No.

   The CREATCS is used to maintain an acceptable temperature environment for control room personnel and equipment during normal and emergency conditions. The CREATCS is not an initiator of any accident previously evaluated. As a result, the probability of an accident previously evaluated is not increased.

   Safety functions that are necessary to maintain acceptable offsite dose limits will not be degraded by the proposed change. Alternate and permanent cooling methods that will maintain the main control room (MCR) well within the equipment temperature limits will ensure these safety functions. With the MCR cooling requirements satisfied, the offsite dose limits are not affected. Therefore, the proposed one-time TS change to extend the Completion Time for loss of one train from 30 days to 60 days in TS 3.7.11, Required Action A.1 does not increase the consequences of an accident previously evaluated. The potential additional risk of operating the plant beyond the current Completion Time of 30 days with one train of CREATCS inoperable is mitigated by the use of a temporary, non-safety related, full capacity chiller system with diesel generator backup and other compensatory measures.

   The consequences of an accident during the one-time proposed four day Completion Time for TS 3.7.11 Required Action E.1 are no different from the consequences of an accident in Modes 1, 2, 3, and 4 during the existing one-hour Completion Time provided in Limiting Condition for Operation (LCO) 3.0.3 to prepare for a shutdown.

   Based on the above, it is concluded that the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No.

   The proposed one-time Completion Time extensions for Required Actions A.1 and E.1 will continue to ensure that the MCR ambient temperatures will not exceed the design temperature limit of 104°F. The temperature control functions for the MCR are not postulated to create an accident and because the proposed change continues to maintain acceptable temperatures, no new accident initiators are created.

   The plant equipment controlled from the MCR and operator response actions in response to a design basis accident will be maintained as currently designed and applied. No new equipment or operator responses are required in response to a design basis accident as part of this proposed change. The proposed change will not alter the design or function of the MCR or the operable CREATCS train.

   Should the proposed actions in the footnotes not be met, the existing Required Actions require preparation for an orderly plant shutdown. Implementation of temporary cooling methods to mitigate one CREATCS safety related train being inoperable will be designed such that safety related features of the CREATCS will not be prevented from performing their safety functions.

   Based on the above, it is concluded that the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No.

   The proposed one-time Completion Time extensions for Required Actions A.1 and E.1 will continue to maintain MCR temperatures at acceptable levels to ensure the availability of equipment necessary for safety functions. Sufficient margin to temperature limits will be maintained to ensure response to accident conditions can be managed adequately and temperatures will remain at acceptable levels to complete necessary accident mitigation actions. Plant components and their setpoints will not be altered by the proposed change that would impact the ability to respond to accident conditions. The installation of a temporary chiller system will be designed such that safety-related features would not be prevented from performing their safety function.

   The proposed one-time change provides a limited period to restore an inoperable CREATCS train instead of interrupting plant operations, possibly requiring an orderly plant shutdown of both units. A plant transient may be avoided with mitigating actions taken and the MCR area temperature maintained. The potential to avoid a plant transient in conjunction with maintaining the MCR temperature offsets any risk associated with the limited Completion Time. The proposed change does not impact a design basis, TS LCO, limiting safety system setting, or safety limit specified in TS.

Therefore, the proposed change does not involve a significant reduction in a 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.

4.4 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. TVA letter to NRC, “Watts Bar Nuclear Plant Unit 1 - Technical Specifications Change - Main Control Room Chiller Completion Time Extension,” dated February 24, 2010 (ML100570414)
2. TVA letter to NRC, “Watts Bar Nuclear Plant Unit 1 - Technical Specifications Change - Main Control Room Chiller Completion Time Extension Supplemental Information,” dated September 20, 2010 (ML102650043)
3. TVA letter to NRC, “Response to Request for Additional Information Concerning - Technical Specifications Change WBN-TS-09-16 - Main Control Room Chiller Completion Time Extension (TAC No. ME3429),” dated November 5, 2010 (ML103120455)
4. NRC letter to TVA, “Watts Bar Nuclear Plant, Unit 1 -Issuance of Amendment Regarding the Main Control Room Chiller Completion Time Extension (TAC No. ME3429),” dated February 8, 2011 (ML110190280)
5. NRC letter to TVA, “Watts Bar Nuclear Plant, Units 1 and 2 - Issuance of Amendment Regarding Modification to Technical Specification 3.7.10 Discrepancies in Control Room Ventilation and Other Editorial Changes to the Technical Specifications (CAC Nos. MF7993 AND MF7994),” dated February 9, 2015 (ML16330A347)
6. NRC letter to TVA, “Watts Bar Nuclear Plant - NRC Integrated Inspection Report 05000390/2014005 and 05000390/2014501,” dated February 9, 2015 (ML15040A425)
7. NRC letter to TVA, Sequoyah Nuclear Plant, Units 1 and 2, Issuance of Amendments Regarding One-Time Temporary Revision of Control Room Air-Conditioning System, dated May 21, 2004 (ML041460534).
8. NRC letter to Virginia Electric and Power Co, Surry Power Station, Unit Nos. 1 and 2, Issuance of Amendments Regarding Replacement of Main Control Room and Emergency Switchgear Room Air-Conditioning System Chilled Water Piping, dated January 23, 2008 (ML0734800287)
9. NRC letter to North Atlantic Energy Service Corp, Seabrook Station, Unit No. 1 – Issuance of Amendment re: Control Room Air Conditioning Allowed Outage Time Extension, dated September 17, 1999 (ML011920184)

Enclosure

Figure 1

Temporary Non-Safety Related Chiller System

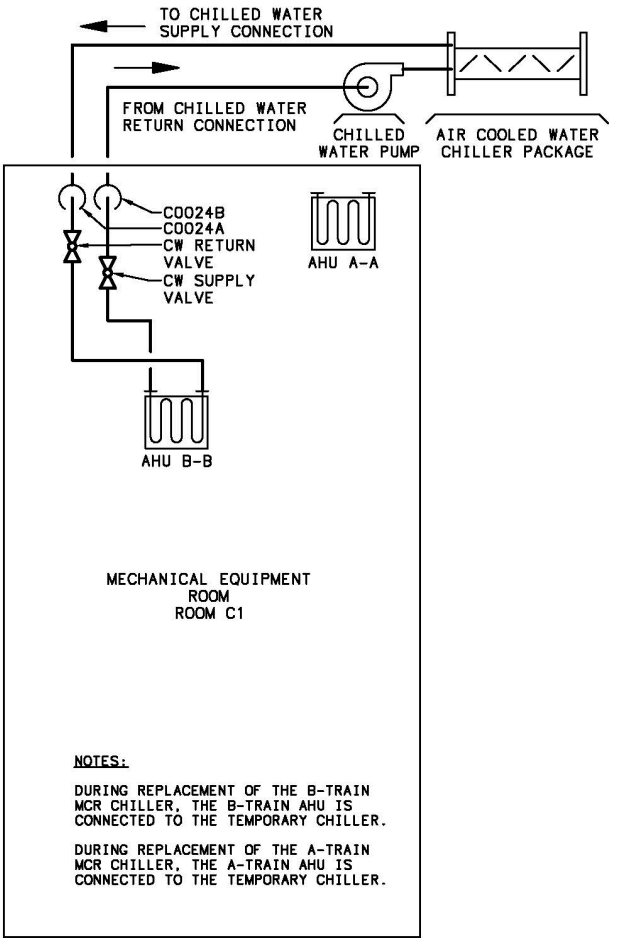
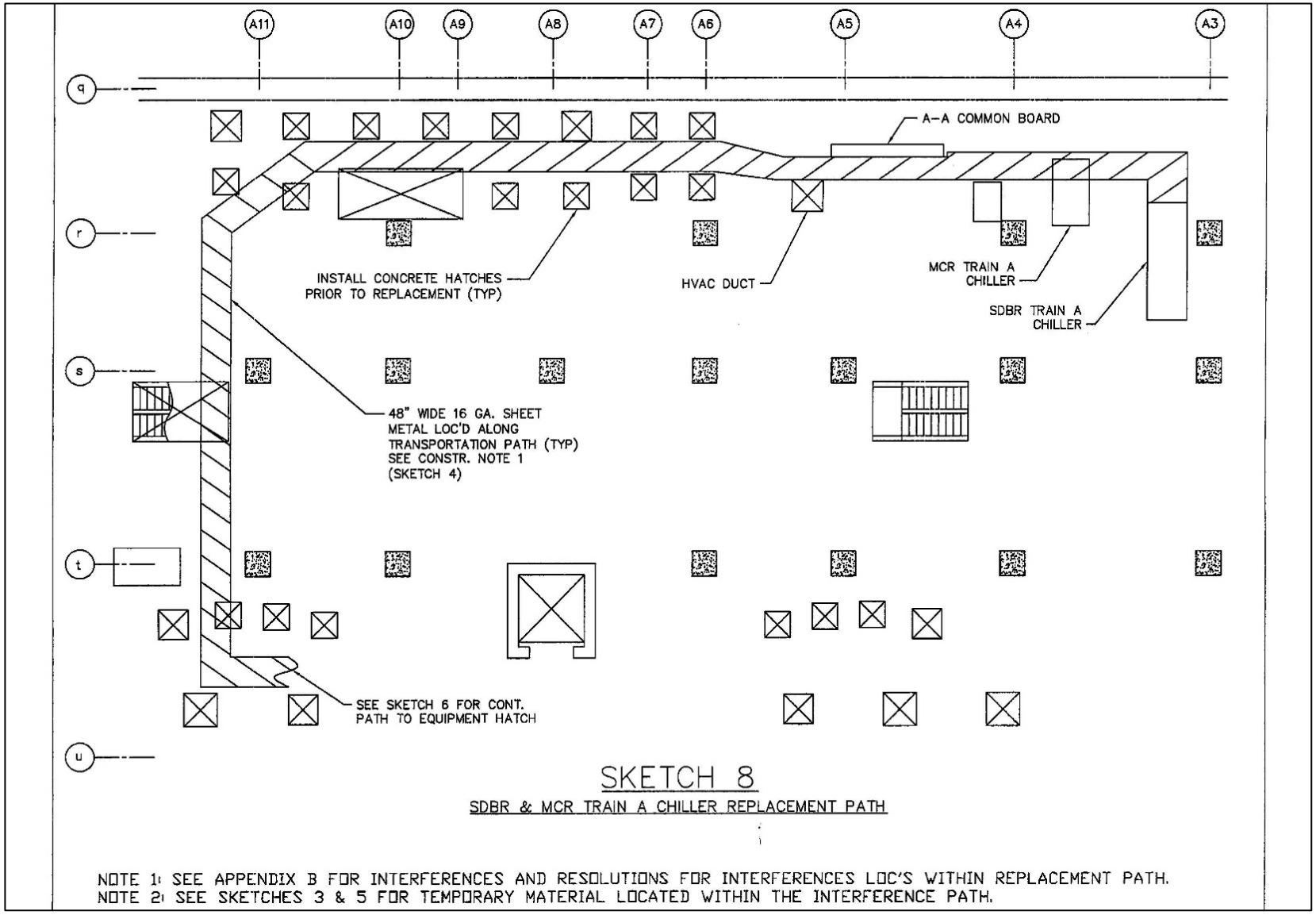


Figure 2


A11
A10
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A-A COMMON BOARD
INSTALL CONCRETE HATCHES PRIOR TO REPLACEMENT (TYP)
HVAC DUCT
MCR TRAIN A CHILLER
SDBR TRAIN A CHILLER
48" WIDE 16 GA. SHEET METAL LOC'D ALONG TRANSPORTATION PATH (TYP) SEE CONSTR. NOTE 1 (SKETCH 4)
SEE SKETCH 6 FOR CONT. PATH TO EQUIPMENT HATCH
SKETCH 8
SDBR & MCR TRAIN A CHILLER REPLACEMENT PATH
NOTE 1: SEE APPENDIX B FOR INTERFERENCES AND RESOLUTIONS FOR INTERFERENCES LOC'S WITHIN REPLACEMENT PATH.
NOTE 2: SEE SKETCHES 3 & 5 FOR TEMPORARY MATERIAL LOCATED WITHIN THE INTERFERENCE PATH.

Enclosure

Attachment 1

Proposed TS Changes (Mark-Ups) for WBN Units 1 and 2

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.11 Two CREATCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREATCS train inoperable.	A.1 Restore CREATCS train to OPERABLE status.	30 days*
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	C.1 Place OPERABLE CREATCS train in operation. OR C.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately

(continued)

* An allowance is permitted for one CREATCS train to be inoperable for up to 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two CREATCS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREATCS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CREATCS train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

** An allowance to monitor the main control room temperature every hour and verify the main control room temperature is less than or equal to 90°F is permitted for up to four days in lieu of the immediate entry into LCO 3.0.3. If the main control room temperature exceeds 90°F, or the duration without a train of CREATCS being OPERABLE exceeds four days, immediate entry into LCO 3.0.3 is required. This provision is only applicable during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022.

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.11 Two CREATCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREATCS train inoperable.	A.1	Restore CREATCS train to OPERABLE status.	30 days*
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	C.1	Place OPERABLE CREATCS train in operation.	Immediately
	OR		
	C.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CREATCS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1	Suspend movement of irradiated fuel assemblies	Immediately

* An allowance is permitted for one CREATCS train to be inoperable for up to 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two CREATCS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CREATCS train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

** An allowance to monitor the main control room temperature every hour and verify the main control room temperature is less than or equal to 90°F is permitted for up to four days in lieu of the immediate entry into LCO 3.0.3. If the main control room temperature exceeds 90°F, or the duration without a train of CREATCS being OPERABLE exceeds four days, immediate entry into LCO 3.0.3 is required. This provision is only applicable during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022.

Enclosure

Attachment 2

Proposed TS Changes (Final Typed) for WBN Units 1 and 2

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.11 Two CREATCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREATCS train inoperable.	A.1 Restore CREATCS train to OPERABLE status.	30 days*
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	C.1 Place OPERABLE CREATCS train in operation. OR C.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately

(continued)

* An allowance is permitted for one CREATCS train to be inoperable for up to 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two CREATCS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREATCS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CREATCS train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

** An allowance to monitor the main control room temperature every hour and verify the main control room temperature is less than or equal to 90°F is permitted for up to four days in lieu of the immediate entry into LCO 3.0.3. If the main control room temperature exceeds 90°F, or the duration without a train of CREATCS being OPERABLE exceeds four days, immediate entry into LCO 3.0.3 is required. This provision is only applicable during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022.

3.7 PLANT SYSTEMS

3.7.11 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.11 Two CREATCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREATCS train inoperable.	A.1	Restore CREATCS train to OPERABLE status.	30 days*
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	C.1	Place OPERABLE CREATCS train in operation.	Immediately
	OR		
	C.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CREATCS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1	Suspend movement of irradiated fuel assemblies	Immediately

* An allowance is permitted for one CREATCS train to be inoperable for up to 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two CREATCS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each CREATCS train has the capability to remove the assumed heat load.	In accordance with the Surveillance Frequency Control Program

** An allowance to monitor the main control room temperature every hour and verify the main control room temperature is less than or equal to 90°F is permitted for up to four days in lieu of the immediate entry into LCO 3.0.3. If the main control room temperature exceeds 90°F, or the duration without a train of CREATCS being OPERABLE exceeds four days, immediate entry into LCO 3.0.3 is required. This provision is only applicable during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022.

Enclosure

Attachment 3

Proposed TS Bases Page Changes (Mark-Ups) for WBN Units 1 and 2 (For Information Only)

BASES

ACTIONS
(continued)

A1 (continued)

The Completion Time is modified by a footnote that states an allowance is permitted for one CREATCS train to be inoperable for 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided the following compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.

- A temporary, non-safety related chiller system with a temporary DG to provide power to the temporary chiller system will be installed and operated as described in the LAR.
- Instructions for operation of the temporary cooling equipment will be provided.
- During replacement of the CREATCS chillers, TVA will employ a graded approach to defense-in-depth and protected equipment strategies based on the operating status of the affected unit. The risk of the activity will be assessed and managed, including the use of physical barriers as needed. Additionally, TVA procedures preclude work on or near protected equipment and limit access to the area to emergency situations and non-intrusive monitoring of running equipment per operator rounds.
- During replacement of the CREATCS chillers, no elective maintenance will be performed on TS related support equipment for the Operable CREATCS chiller except for any required TS SRs.

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable CREATCS train cannot be restored to OPERABLE status within the required Completion Time, the plant must be placed in a MODE that minimizes the risk. To achieve this status, the plant 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 plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS (continued)

C.1 and C.2

In MODE 5 or 6, or during movement of irradiated fuel, if the inoperable CREATCS train cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CREATCS train must be placed in operation immediately. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that active failures will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

D.1

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CREATCS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

E.1

If both CREATCS trains are inoperable in MODE 1, 2, 3, or 4 the CREATCS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately. The Completion Time is modified by a footnote that states an allowance to monitor the main control room temperature every hour and verify the main control room temperature is less than or equal to 90°F is permitted for up to four days in lieu of the immediate entry into LCO 3.0.3. If the main control room temperature exceeds 90°F, or the duration without a train of CREATCS being OPERABLE exceeds four days, immediate entry into LCO 3.0.3 is required. This provision is only applicable during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022.

The purpose of the footnote is to ensure the MCR temperature is being controlled. The specified temperature limit of 90°F is above the normal operating temperature of the MCR (approximately 75°F), providing operational flexibility when implementing the mitigating actions. This temperature does not impact the operability of equipment or habitability of the MCR. The limit of 90°F maintains margin below the lowest specification for the MCR equipment cabinets of 104°F. Subsequent to immediate MCR temperature verification, the one-hour frequency is adequate given the indications available in the MCR. Main control room temperature data is measured and displayed from a centralized location and operators will have awareness of temperature trending relative to the 90°F limit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of the system is sufficient to remove the heat load assumed in the sizing calculations in the control room. This SR consists of a combination of testing and calculations. This is accomplished by verifying that the system has not degraded. The only measurable parameters that could degrade undetected during normal operation are the system air flow and chilled water flow rate. Verification of these two flow rates will provide assurance that the heat removal capacity of the system is still adequate. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Watts Bar FSAR, Section 9.4.1, "Control Room Area Ventilation System."

2. Watts Bar FSAR, Section 3.7.3.18, “Seismic Qualification of Main Control Room Suspended Ceiling and Air Delivery Components.”

3. NRC Safety Evaluation dated February 12, 2004, for License Amendment 50.

(continued)

BASES

ACTIONS (continued)

A1 (continued)

The Completion Time is modified by a footnote that states an allowance is permitted for one CREATCS train to be inoperable for 60 days. This TS provision is only authorized for one entry per train during modification activities planned for the upgrade of the main control room chillers beginning no earlier than May 1, 2021 and ending no later than October 1, 2022, provided the following compensatory measures are implemented as described in TVA letter CNL-20-012, dated May 19, 2020.

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(continued)

BASES

ACTIONS (continued)

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable CREATCS train cannot be restored to OPERABLE status within the required Completion Time, the plant must be placed in a MODE that minimizes the risk. To achieve this status, the plant 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 plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

In MODE 5 or 6, or during movement of irradiated fuel, if the inoperable CREATCS train cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CREATCS train must be placed in operation immediately. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that active failures will be readily detected.

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BASES

ACTIONS (continued)

E.1

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SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

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