Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

February 24, 2010

10 CFR 50.90

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

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NPF-90
NRC Docket No. 50-390

Subject: **Watts Bar Nuclear Plant Unit 1 - Technical Specifications Change - Main Control Room Chiller Completion Time Extension**

Pursuant to 10 CFR 50.90, the Tennessee Valley Authority (TVA) requests a Technical Specifications (TS) change, WBN-TS-09-16, for Watts Bar Nuclear Plant, Unit 1, Operating License NPF-90.

The proposed change will revise TS 3.7.11 "Control Room Emergency Air Temperature Control System (CREATCS)." The proposed change is only applicable during plant modifications to upgrade the CREATCS chillers. This "one-time" TS change is to be implemented during Cycles 10 and 11 beginning December 1, 2010, and ending January 29, 2012.

For TS 3.7.11, the proposed change will add a footnote to the Completion Time for Required Action A.1. The proposed Completion Time change for Required Action A.1 will allow one train of the CREATCS to be inoperable for 60 days while the plant is on-line provided certain conditions are met.

The plant modifications for the CREATCS chillers are necessary due to equipment reliability issues, obsolescence of spare parts, and to allow TVA to comply with future refrigerant availability as defined by 40 CFR 82, "Protection of Stratospheric Ozone."

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Enclosure 1 to this letter provides the technical evaluation for the proposed TS change including TVA's determination that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review.

Enclosure 2 contains annotated version of the appropriate TS page. Included as part of this enclosure are the changes to the TS Bases for the affected action.

Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and attachments to the Tennessee Department of Environment and Conservation.

TVA requests approval of this TS change by December 1, 2010 to support chiller on-line modification activities and that implementation of the revised TS be within 90 days of NRC approval.

Commitments associated with this submittal are identified in Enclosure 3. If you have any questions about this change, please contact Kevin Casey at (423) 751-8523.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 24th day of February, 2010.

Respectfully,

R. M. Krich
Vice President
Nuclear Licensing

Enclosures:

1. TVA Evaluation of Proposed Technical Specifications Change
2. Proposed Technical Specifications Change (Mark-Up)
3. Commitments

cc: See page 3

cc (Enclosures):

NRC Regional Administrator – Region II

NRC Resident Inspector – Watts Bar Nuclear Plant

TN Department of Environment & Conservation - Division of Radiological Health

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY (TVA)
WATTS BAR NUCLEAR PLANT
OPERATING LICENSE NPF-90
UNIT 1 WBN TS-09-16

EVALUATION OF PROPOSED CHANGE

1.0 SUMMARY DESCRIPTION

Due to equipment reliability issues, obsolescence of spare parts, and future refrigerant availability, TVA has initiated a project to replace the Control Room Emergency Air Temperature Control System (CREATCS) chillers and the Shutdown Board Room (SDBR) chillers. For the purposes of this license amendment request, the chiller packages serving the CREATCS will be referred to as the Main Control Room (MCR) chillers. Because the time required replacing the MCR chillers will exceed the current 30 day Completion Time as specified in Required Action A.1 of TS 3.7.11, a proposed Completion Time of 60 days is requested.

The SDBR chillers are non-TS support systems for the safety related 6.9kV and 480V switchgear and associated equipment. To compensate for loss of one SDBR chiller, a risk assessment will be performed in accordance with Section (a)(4) of the Maintenance Rule to determine the appropriate Completion Time as described in Reference 3. To provide a complete description of this project and interaction with the MCR chiller replacement, a description of the SDBR chiller replacement portion of the project is included in this request.

The heating, ventilation and air conditioning (HVAC) systems for the MCR and SDBR each have two redundant 100% capacity subsystems. Each subsystem or train consists of a heating unit, chiller package, chilled water pump, piping, air handling units (AHUs), instrumentation and controls, dampers and ventilation ductwork. The 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. The proposed system modifications for both systems will be limited to replacement of each of the chiller packages with minor modifications to the chilled water piping and no modifications to the existing AHUs, chilled water pumps, dampers or ventilation ductwork. Utilizing the existing AHUs, dampers and ventilation ductwork will ensure that the required air distribution to the affected areas is maintained during replacement activities.

Each MCR chiller train has 100% design capacity, i.e., for all design bases accidents, one MCR chiller train can maintain the ambient temperature in the MCR and its associated spaces below their design bases limit (<104°F). Each MCR train has one chiller package and one AHU.

TVA plans to replace both trains of the SDBR and MCR chiller packages with new chiller packages beginning in October 2010. This effort will be done in three phases.

Phase 1 will remove the train-B SDBR chiller from service and replace it with a new water cooled chiller package of similar design. The opposite train-A SDBR chiller will be used to provide cooling for the supported systems.

Phase 2 will remove train-B MCR chiller from service and replace it with a new water cooled chiller package of similar design. Train-A MCR chiller will be used to provide cooling for the supported systems. The MCR chillers are TS support systems for all safety related equipment located on the MCR elevation.

Phase 3 will replace train-A SDBR chiller and train-A MCR chiller at the same time due to physical restraints (train-A SDBR chiller cannot be removed without first removing train-A MRC chiller). Cooling for the SDBR and MCR areas will be provided by the newly installed train-B chillers described under Phase 1 and 2.

Prior to entering Phase 3, the newly installed train-B SDBR chiller and train-B MCR chiller will have a minimum break-in time of 14 days to ensure equipment reliability.

2.0 DETAILED DESCRIPTION

2.1 Background

Executive Order 13148 (Reference 1) requires Federal Agencies to phase out the procurement of Class I ozone-depleting refrigerants, including R-11, R-12, and R-502, by December 31, 2010. Environmental Protection Agency (EPA) regulations (Reference 2) will phase out the procurement of R-22 refrigerant in 2020. The SDBR chillers utilize R-11, and the MCR chillers utilize R-22. While the MCR chillers do not require immediate action, the train-A MCR chiller will be impacted by the replacement of the train-A SDBR chiller due to space constraints, access issues, and interference. Therefore based on EPA restrictions, the age of the chillers, and the obsolescence of spare parts, TVA determined that both SDBR and the MCR chillers at WBN should be replaced.

TVA plans to replace both trains of the SDBR and MCR chiller packages located on Elevation 737.0 of the Auxiliary Building with new chiller packages beginning in October, 2010. The modifications will be performed in three phases with Unit 1 at power. While one train is being replaced the opposite safety related 100% redundant train will be used to provide cooling for the supported systems. To accomplish this task, the TS 3.7.11 Required Action A.1 Completion Time for restoration of one inoperable CREATCS train needs to be extended from 30 days to 60 days. The additional risk of operating the plant beyond the current Completion Time of 30 days is compensated by the addition of a temporary, non-safety related cooling system with a diesel generator backup. This system will be installed in accordance with the Temporary Alteration (TA) procedure. If during this 60 day period the OPERABLE qualified MCR chiller train fails, the plant will enter LCO 3.0.3 immediately.

The three phases needed to complete this task are described below.

2.1.1 Phase 1 - SDBR Chiller B Replacement

Phase 1 will remove train-B SDBR chiller from service and replace it with a new chiller package. The SDBR chillers are non-TS support systems for the supported systems

located in the following areas (Note: 125V Vital Batteries and 120V Vital AC buses with the same channel designation share the same room):

1. Auxiliary Control Room (EL 757.0-A1)
2. 6.9KV and 480V Shutdown Board Room A (EL 757.0-A2)
3. 125V Vital Battery Board Room II (EL 757.0-A3)
4. 125V Vital Battery Board Room I (EL 757.0-A4)
5. 120V Vital AC Board Room II (EL 757.0-A3)
6. 120V Vital AC Board Room I (EL 757.0-A4)
7. 480V Shutdown Board Room 1B (EL 757.0-A5)
8. 480V Shutdown Board Room 2A (EL 757.0-A21)
9. 125V Vital Battery Board Room IV (EL 757.0-A22)
10. 125V Vital Battery Board Room III (EL 757.0-A23)
11. 120V Vital AC Board Room IV (EL 757.0-A22)
12. 120V Vital AC Board Room III (EL 757.0-A23)
13. 6.9KV and 480V Shutdown Board Room B (EL 757.0-A24)
14. Aux Control Instrument Room 1A (EL 757.0-A25)
15. Aux Control Instrument Room 1B (EL 757.0-A26)
16. Aux Control Instrument Room 2A (EL 757.0-A27)
17. Aux Control Instrument Room 2B (EL 757.0-A28)

The equipment located in the rooms listed above contain safety related 6.9kV/480V transformers, motor control centers, switchgear, cables, distribution panels, bus instrumentation (i.e., voltage, current, watt meters, etc), protective and control relays including the 6.9kV under voltage and degraded voltage relays, and the emergency diesel generator load sequencing relay cabinets.

The above listed rooms on elevation 757.0 are all served by the SDBR chillers. Environmental control is provided by four fan-coil air-handling units (AHUs) supplied with chilled water from two 100% redundant water chillers. The four SDBR air-handling units are arranged so that each shutdown board room, vital battery/AC board room, and auxiliary control instrument room is cooled by either of two redundant (train A or B) air handling units. Each pair of Train A and Train B AHUs is located in its respective reactor unit's mechanical equipment room. The air distribution system is arranged such that the auxiliary control room is cooled by two of the four fan-coil units from different equipment rooms. One of the two redundant chillers is normally operating and the other is in standby.

SDBR Temporary Air Conditioning Equipment Description - Reference Sketch A

As shown in Sketch-A, the temporary chilled water system is to be installed and maintained in "standby status" in order to maintain the temperature of the spaces listed above below their design basis limit of 104°F in the event the OPERABLE chiller fails during replacement activities concurrent with a DBA. The design bases temperature for the SDBR elevation is defined by WBN Environmental Data Drawings (EDDs) which list the temperature, humidity, pressure, and dose limits for various operational conditions and post-LOCA conditions. The major components of the temporary chilled water system include:

1. Air cooled chilled water package
2. Chilled water pump

3. Power supplies, cables, and connections
4. Chilled water pump supply and return hoses
5. Demineralized water source
6. Manual isolation valves
7. Backup diesel generator (DG)

These components are on standalone skid mounted packages, designed and manufactured by reputable vendors of reliable commercial grade industrial equipment. These packages are self contained, completely assembled and will require minimal installation time.

The temporary chiller has a nominal cooling capacity of 150 tons, whereas, the currently installed SDBR chiller capacity is 174 tons. The design basis LOCA heat load for the SDBR is 116 tons.

With a nominal cooling capacity of 150 tons, the SDBR temporary cooling system has more than adequate capacity or capability to maintain the SDBR ambient temperatures within their design limits as described in Section 3.1.4.

The air cooled chilled water package and chilled water pump will be stationed in the yard area. The chiller package and chilled water pump will be powered from non-safety related 480 Volt ac sources located within the area. A non-safety related diesel generator will be provided as a backup power source if needed (see Section 2.1.4).

The supply and return hoses from the temporary chiller will be routed through qualified Auxiliary Building Secondary Containment Enclosure (ABSCE) penetrations to the Auxiliary Building common equipment areas. On the Auxiliary Building side of the penetrations, two manual isolation ball valves, one for each penetration, will be installed for isolation purposes. From the Auxiliary Building common equipment areas the chilled water supply and return hoses will be routed to Shutdown Board Room B through a qualified ABSCE penetration. From Shutdown Board Room B, the temporary chilled water supply and return hoses split into two supply and two return hoses using four manual isolation valves. One set of supply and return hoses will be routed to Mechanical Equipment Room B and the other set of supply and return hoses will be routed to Mechanical Equipment Room A both located on Elevation 757.0. Mechanical Equipment Room A and B each contain two SDBR AHUs, one designated train-A, the other designated train-B. For Phase 1, the temporary chilled water supply and return hoses will be routed to the train-B SDBR AHUs in both Mechanical Equipment Rooms. 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.

The temporary cooling system and train-B AHUs in the two Mechanical Equipment Rooms along with the existing ductwork, dampers, instrumentations and controls will be used to cool the 6.9kV and 480V SDBR spaces located on elevation 757.0 in the event the OPERABLE train-A SDBR chiller fails during replacement activities concurrent with a DBA. Thus, the normal design air flow rates to all areas served by the 6.9kV SDBR HVAC system will be maintained.

All temporary or modified support equipment located in the Auxiliary Building will meet TVA WBN Seismic I(L)-B (position retention) requirements with the exception that the piping and manual isolation valves located at the boundary of the ABSCE penetrations will be qualified to Seismic I(L)-A (pressure boundary and position retention) requirements.

2.1.2 Phase 2 - MCR Chiller B Replacement

Phase 2 will remove train-B MCR chiller from service and replace it with a new chiller package. The temporary chilled water package including the backup diesel generator used in Phase 1 will be used in Phase 2 to maintain the temperature in the main control room habitability zone (MCRHZ) below the design basis limit of 104°F in the event the OPERABLE train-A MCR chiller fails during replacement activities concurrent with a DBA. The design basis temperatures for the MCRHZ are defined by WBN EDDs which list the temperature, humidity, pressure, and dose limits for various operational conditions and post-LOCA conditions. The temporary chilled water package will also maintain the personnel comfort temperature less than or equal to 90°F. The personnel comfort temperature was determined using the TVA Safety Manual, Procedure 806, "Heat Stress," based on no stay time limits for areas with a Wet Bulb Globe Temperature Index of 90°F if the physical effort level is low and in consideration of work clothes.

The MCRHZ consists of the following areas:

1. Main Control Room
2. Relay Room
3. DPSO Engineers Shop
4. Operation's Office
5. Assistant Shift Engineer's Office
6. Technical Support Center
7. NRC Office
8. Conference Rooms
9. Mechanical Equipment Rooms
10. Kitchen, toilet, and locker rooms

The MCR HVAC System is designed such that air is taken from the MCRHZ, filtered and cooled by the operating AHU, and then returned to the MCRHZ.

The electrical equipment located specifically in the MCR includes all instrumentation and controls required to operate the nuclear power plant safely under normal and accident conditions. Equipment operability and personnel comfort is assured by maintaining the MCR ambient temperature at or below the maximum normal temperature limit specified in the EDDs.

As mentioned before, the temporary chiller has a nominal cooling capacity of 150 tons, whereas, the currently installed MCR chiller capacity is 127 tons. With a nominal cooling capacity of 150 tons, the MCR temporary cooling system has more than adequate capacity or capability to maintain the MCRHZ ambient temperatures within their design limits as described in Section 3.1.4.

All temporary support equipment stationed in the Auxiliary Building and Control Building will meet TVA WBN Seismic I(L)-B requirements with the exception that the piping and

manual isolation valves located at the MCRHZ boundary will be qualified to Seismic I(L)-A requirements.

MCR Equipment Description - Reference Sketch B

As mentioned above a temporary air-cooled chiller package and chilled water pump will be stationed in the yard area (Elevation 729). The non-safety related chiller package and chilled water pump will be powered from non-safety related 480 Volt ac sources within the area. A backup diesel generator will be provided as a backup power source if needed (see Section 2.1.4).

Supply and return hoses will be utilized for routing the chilled water from the temporary chilled water package to the AHUs in the Control Building. Existing sleeves located on elevation 755.0 which are part of the MCRHZ boundary will be utilized for routing the chilled water supply and return hoses to the train-B MCR AHU located in the Mechanical Equipment Room. Two manual isolation ball valves, one for each penetration through the MCRHZ 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.

The temporary cooling system and the train-A AHU along with the existing ductwork, dampers, instrumentation and controls will be used to cool the Control Room spaces on Elevation 755.0 in the event the OPERABLE MCR train-A chiller fails during replacement activities concurrent with a DBA.

2.1.3 Phase 3 – SDBR Chiller A and MCR Chiller A Replacement

TVA plans to replace both train-A SDBR and train-A MCR chillers at the same time due to physical restraints (train-A SDBR chiller cannot be removed without first removing train-A MCR chiller). Cooling for all supported systems will be provided by the newly installed train-B SDBR and train-B MCR chillers which were installed during Phases 1 and 2. The newly installed train-B chiller packages for both HVAC systems will be operated for a minimum of two weeks prior to entering Phase 3 to ensure equipment reliability.

Because two qualified chillers will be replaced at the same time, an additional nominal 150 ton capacity air cooled chiller and chilled water pump will be provided. The two temporary cooling systems will provide backup cooling with one system dedicated to train-A SDBR HVAC system, and the other dedicated to train-A MCR HVAC system. A backup DG will be provided for each temporary cooling system.

If train-B SDBR chiller were to fail during installation of the new train-A SDBR chiller package, the plant will evaluate the impact and enter the appropriate TS action if required. If the train-B MCR chiller were to fail during installation of the new train-A MCR chiller package, the plant will enter LCO 3.0.3 immediately.

2.1.4 Backup Diesel Generator

Two non-safety related DGs will be provided as backup power sources for the temporary cooling systems described in Sections 2.1.1, 2.1.2, and 2.1.3 of this application. The

minimum KVA rating for each DG will be sufficient to meet the temporary cooling system load demand (compressor, chilled water pump, instrumentation and controls, etc.). The DG fuel oil tank capacity is 366 gallons which is sufficient to allow the DG to operate for approximately 12 hours while the DG is supplying maximum steady state load. The DG fuel oil capacity is sufficient to operate the DG longer than the time required to replenish the DG fuel oil tanks using either a separate 2300 gallon offload tank or fuel oil tankers located onsite. Procedures will be provided to include instructions for startup, operation, and shutdown of the backup DG and fuel oil transfer from onsite sources to the DG fuel oil tank. Test procedures will also be provided to test the backup DG under actual load conditions to ensure equipment reliability.

2.2 Technical Specifications Change

2.2.1 TS 3.7.11 CREATCS

The current requirement for TS 3.7.11, Condition A is:

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREATCS train inoperable	A.1 Restore CREATCS train to OPERABLE status.	30 days

The Completion Time for Condition A will be modified by the following proposed Note:

"An allowance is permitted for one CREATCS train to be inoperable for 60 days. This TS provision is only applicable provided compensatory measures are implemented during modification activities planned for the upgrade of the MCR chillers beginning December 1, 2010 and ending January 29, 2012."

The proposed change to TS 3.7.11 and corresponding changes to the associated TS Bases are provided in Enclosure 2.

3.0 TECHNICAL EVALUATION

3.1 Deterministic Evaluation

3.1.1 MCR Chiller Completion Time

The CREATCS is a TS support system used during normal and emergency operating conditions to maintain an acceptable environment for both personnel and main control room equipment.

The MCR chillers which are part of the CREATCS have two redundant 100% capacity subsystems. Loss of one CREATCS train will require that the plant enter TS 3.7.11, Condition A. TS 3.7.11 Condition A, Required Action A.1 requires the inoperable CREATCS train to be restore to OPERABLE status within 30 days. The proposed "one-time" TS change will add a footnote to LCO TS 3.7.11 Condition A to allow one train of the CREATCS to be inoperable for 60 days provided that the compensatory measures described in Section 3.1.3 are met.

The "one time" 60 day Completion Time for loss of one train is based on the low probability of a loss of all off site power, the consideration that the remaining train can provide the require protection and that alternate non-safety related cooling means are available.

3.1.2 Completion Time Estimate for Each Phase

A brief description of the modification activity and the estimated time needed to replace the SDBR and MCR chillers are given below.

Phase 1 - Shut Down Board Room "B" Chiller

Shut down and clear equipment (Hold Order) - 4 hours
Drain system and connect Temporary Chiller - 12 hours
Perform Post Modification Testing (PMT) on temporary cooling system – 24 hours
Remove pipe supports, evacuate chiller, disconnect electrical equipment and remove piping and valves - 96 hours
Remove old chiller unit - 40 hours
Install and assembly new chiller unit - 144 hours
Reinstall piping, valves and electrical equipment - 240 hours
Reinstall supports - 218 hours
Perform PMT on Train-B SDBR HVAC system and declare equipment Operable - 192 hours

Total hours for this chiller replacement is 970 hours (or 40.42 days)

Phase 2 - Main Control Room "B" Chiller

Shut down and clear equipment (Hold Order) - 4 hours
Drain system and connect Temporary Chiller - 12 hours
Perform PMT on temporary cooling system – 24 hours
Remove pipe supports, evacuate chiller, disconnect electrical equipment and remove piping and valves - 124 hours
Remove old chiller unit - 60 hours
Install and assembly new chiller unit -144 hours
Reinstall piping, valves and electrical equipment - 312 hours
Reinstall supports - 272 hours
Perform PMT on Train-B MCR HVAC system and declare equipment Operable - 192 hours

Total hours for this chiller replacement is 1144 hours (or 47.67 days)

Phase 3 - Shut Down Board Room "A" Chiller and Main Control Room "A" Chiller

Shut down and clear equipment (Hold Order) - 4 hours
Drain systems and connect Temporary Chiller - 12 hours
Perform PMT on temporary cooling systems – 24 hours
Remove pipe supports, evacuate chillers, disconnect electrical equipment and remove piping and valves - 104 hours
Remove both chiller units - 89 hours

Install and assembly new chiller units - 168 hours
Reinstall piping, valves and electrical equipment - 352 hours
Reinstall supports - 320 hours
Perform PMT on Train-A MCR and SDBR HVAC system and declare equipment Operable - 216 hours

Total hours for both chiller replacements is 1289 hours (or 53.71 days)

For all three Phases, Post Modification Testing (PMT) will not only verify that the new chillers and associated AHUs are OPERABLE but will also verify that the temporary cooling system is fully functional. To accomplish this task, the unit being replaced will be shut down, tagged and drained as described above. Afterwards, temporary chilled water hoses will be connected to the AHU associated with the unit being replaced and the lines filled and vented. Once everything is in place the temporary cooling system will be placed in service using procedures developed for the standby chiller. Chilled water flow and inlet temperature to the associated AHU will be measured to determine if design requirements are met. During this time the temporary cooling system will also be powered by the backup DG to provide assurance that the backup DG is fully functional.

TVA plans to begin Phase 1 on October 1, 2010, and Phase 2 is scheduled to follow on December 1, 2010. Upon completion of Phase 2, work on the chiller project will stop due to the Cycle 10 Refueling Outage. The Refueling Outage is currently scheduled to begin March 20, 2011 and end April 24, 2011. However, planning of work activities for Unit 2 required to be performed during the Cycle 10 Refueling Outage are expected to increase the outage duration, which will move the end date into May, 2011. Regardless of the Refueling Outage end date, the train-A chiller units will not be removed from service due to the need to provide cooling during the summer high temperature months. Work on Phase 3 is planned to begin late September/early October, 2011.

3.1.3 Compensatory Measures

In order to mitigate the potential consequences of the loss of the remaining OPERABLE MCR or SDBR chiller during replacement activities concurrent with a DBA, TVA will provide temporary cooling using non-safety related equipment as described in Sections 2.1.1, 2.1.2, and 2.1.3. The compensatory measures that would also be taken are described below.

The temporary chilled water package will be installed and maintained in a "standby" condition. During the initial installation, the chiller skids and chilled water pumps will be stationed in the yard with the chilled water lines filled and vented at the manifolds in the Control Building Mechanical Equipment Room located on Elevation 755.0 and the Shutdown Board Room Mechanical Equipment Rooms located on Elevation 757.0. Final connection of the chilled water hoses to the SDBR or MCR AHUs will not occur until that particular HVAC train is taken out of service for chiller replacement. All necessary hardware, hoses, and fittings will be stationed at the AHUs for rapid deployment in order to connect, fill and vent the temporary chilled water hoses to the AHUs. Procedures will be provided to include instructions for startup, operation, preventative maintenance, and shutdown of the temporary cooling equipment. Qualified personnel will be provided informal training on these instructions. Furthermore, to provide additional defense-in-depth, the following requirements would also be implemented:

1. If a temporary chilled water system hose breaks in the Control Building during the timeframe that the temporary equipment is installed, the two manual isolation ball valves located at the MCRHZ boundary will be closed immediately. Qualified personnel will be capable of closing the valves and will be stationed in the area whenever the valves are in the "Open" position and the temporary cooling system is in service.

2. If a temporary chilled water system hose breaks in the Auxiliary Building or Shutdown Board Room during the timeframe that the temporary equipment is installed, the four manual isolation ball valves located at the ABSCE penetrations will be closed immediately. Qualified personnel will be capable of closing the valves and will be stationed in the area whenever the valves are in the "Open" position and the temporary cooling system is in service.

3. Due to lack of operating data, the availability or reliability of the new MCR chiller packages are unknown. To compensate for this uncertainty the new train-B chiller packages will be operated for a minimum of 2 weeks prior to removing the train-A MCR chillers from service for replacement.

4. During replacement of the MCR chillers, no planned maintenance activity, except for SRs 3.8.1.2, 3.8.1.3, and 3.8.1.7, that could impact the operability of the DG's that provide emergency power to the operable MCR chiller train will be performed.

These actions will provide adequate defense-in-depth and reduce the risk associated with loss of the OPERABLE chiller during an accident, Loss of Offsite Power (LOOP), and station blackout, by providing adequate cooling to allow the plant to reach stable conditions.

3.1.4 Deterministic Analyses

Heat Load Calculations

In order to adequately cool the MCR spaces with a reliable, temporary cooling system (complete with a backup diesel generator for the chiller and chilled water pump), the temporary equipment (chiller, pump and hoses) was sized using heat load calculation (in consideration of LOCA conditions) for the MCR Elevation 755.0 (reference NPG Calculation EPM-LCP-090889).

Evaluations determined that by connecting the temporary chiller, pump and hoses to the existing air handlers (AHUs), the MCR areas can be cooled using a nominal 150 ton chiller connected to a 500 gpm chilled water pump and 4" diameter supply and return hoses.

Table 1 Temporary Equipment Capacity Requirements			
Main Control Room			
LOCA Heat Load Note 1	Temporary Chiller Rating (Nominal)	Temporary Chiller Water Pump Rating (Nominal)	Calculated Room Temperature
86 TONS	150 TONS	500 GPM	<85°F

Note 1 - NPG Calculation EPM-LCP-090889

Moderate Energy Line Break (MELB) Evaluation

The TA will specify requirements for trained personnel to monitor both the chilled water supply and return hoses in all areas of the plant whenever the isolation valves described in Section 2.1.1 and 2.1.2 are in the "Open" position and the temporary cooling system is in service. If a MELB were to occur due to a hose leak or break, operating instructions will require the isolation valves to be immediately closed. This will ensure that flood levels specified in the EDDs will not be exceeded.

3.2 Qualitative Risk Assessment

For Phase 2 and 3 of this modification one train of the MCR chillers will be out of service. WBN Calculation MDQ00003120090157 analyzed the temperature response in the MCR if both MCR chillers are lost. The calculation concluded that with the initial ambient temperature at 75°F, it would take at least 7 hours upon the loss of cooling before the maximum environmental design temperature of 104°F would be exceed in the MCR.

Main Control Room Cooling

Since this could occur before stable plant conditions could be established after an accident or transient, the temporary cooling system previously described would be provided during this modification to minimize this risk. As previously discussed, the MCR temporary cooling system could be placed in service within a 2 hour period, and will provide sufficient cooling to maintain the MCR below the environmental design temperature of 104°F until stable plant conditions could be established. This would minimize the risk to CDF and LERF from a loss of the remaining MCR chiller during this modification. Also, AOI-27, "Main Control Room Inaccessibility" provides the procedural controls to maintain control of a unit from the auxiliary control room should the main control room have to be abandoned for any reason except for fire. A separate procedure is used in the event of a fire. If environmental conditions warranted abandoning the main control room the operators would execute AOI-27. This provides additional reduction to risk upon an accident or plant transient coupled with a loss of all MCR cooling.

Loss of Offsite Power (LOOP)

The temporary cooling system provided to reduce the risk of the loss of the operable chillers in the MCR and SDBR will be provided with diesel fueled backup power source to reduce the risk of having a loss of all cooling to these areas during a LOOP. Also, during replacement of the chillers, no planned maintenance activity, except for SRs 3.8.1.2, 3.8.1.3, and 3.8.1.7, that could impact the operability of the DG's that provide emergency power to the operable chiller train will be performed. These compensatory actions will reduce the risk associated with the loss of an OPERABLE chiller during an accident, LOOP, and station blackout, by providing adequate cooling to these areas to allow the plant to reach stable conditions.

With the above compensatory actions in place the increase in risk associated with CDF and LERF would be very small and manageable.

3.3 Configuration Risk Management Program

The Watts Bar Configuration Risk Management Program (CRMP) which is aided by the Sentinel software is intended to fulfill the requirements of Section 10 CFR 50.65a(4). The risk associated with planned work activities is controlled through the following procedures:

- Standard Programs and Processes (SPP) 7.1, "Work Control Process"
- Technical Instruction (TI) 124, "Equipment to Plant Risk Matrix"

SPP-7.1 specifies the general responsibilities and standard programmatic controls for the work control process during plant operation. This procedure applies to all work activities that affect or have the potential to affect a plant component, system, or unit configuration. Work performed during a planned or forced outage is controlled by SPP-7.2, "Outage Management."

WBN's long-term maintenance plan is a product of the preventive and surveillance process and specifies the frequency for implementation of maintenance and surveillance activities necessary for the reliability of critical components in each system. An established 12-week rolling schedule includes the preliminary defense-in-depth assessment, which documents the allowable combinations of system and functional equipment groups (FEGs) that may be simultaneously worked online or during shutdown conditions. FEGs are sets of equipment that have been evaluated for acceptable out-of-service combinations. They are used to schedule planned maintenance and establish equipment clearances.

Predetermined FEG work windows are established for online maintenance and outage periods. The work windows are based on recommended maintenance frequencies and sequenced to minimize the risk of online maintenance. Work windows are defined by week and repeat at 12-week intervals. The work windows ensure required surveillances are performed within their required frequency and that division/train/loop/channel interferences are minimized. The WBN Scheduling organization maintains a long range schedule based on required surveillance testing of online activities and plant conditions.

The surveillance testing schedule provides the "backbone" for the long-term maintenance plan. Other periodic activities (preventive maintenance items) are

scheduled with related surveillance tests to maximize component availability. FEGs are used to ensure work on related components is evaluated for inclusion in the work window. Related corrective maintenance (CM) activities are also evaluated for inclusion in the work window provided by surveillance and preventive maintenance performance. The inclusion of identified work in the FEG work window with the surveillance tests and preventive maintenance items maximizes component availability and operability.

The TI-124 risk assessment methodology is used for online maintenance activities. For online maintenance a probabilistic risk assessment (PRA) is performed prior to work window implementation and emergent work is evaluated against the assessed scope. The Work Week Manager (WWM) selects the work to be performed for the appropriate work week and reviews it against Sentinel, the risk matrix, or consults the PRA knowledgeable risk engineer to reduce plant risks for Mode 1 and 2 operations. The Shift Manager is responsible for risk assessment of emergent work if work occurs on back shifts, on weekends, when the WWM is not available to perform the risk review, or when conditions have changed from the time of the initial assessment such that the need for additional assessment is indicated.

Other safety considerations, such as Technical Specifications, are also used to determine which system, component, and FEG combinations may be worked online. In addition, an assessment of scheduled activities is performed before implementation of a work window. The assessment includes reviews for the following:

- The schedule is evaluated against the risk bases outlined in the WBN Probabilistic Safety Analysis (PSA).
- Maximizing safety (reduce risk) when performing online work.
- Avoid recurrent entry into a specific limiting condition for operation (LCO) for multiple activities. Activities that require entering the same LCO are combined to limit the number of times an LCO must be established, thus maximizing the equipment's availability.
- If the risk associated with a particular activity cannot be determined, Nuclear Engineering is requested to perform a risk assessment.

Design changes are evaluated for impact to the PRA in accordance with SPP 9.3, "Plant Modifications and Engineering Change Control." PRA updates are to be completed, in accordance with SPP 9.11, "Probabilistic Risk Assessment Program," and NEDP 26, "Probabilistic Risk Assessment," at least once every other fuel cycle or sooner if estimated cumulative impact of plant configuration changes exceeds +10% of CDF.

3.4 Safety Function Determination Program

The Safety Function Determination Program (SFDP) ensures that any concurrent inoperabilities that result in a loss of safety function are identified, and appropriate actions taken. This program is required by TS LCO 3.0.6 and TS 5.7.2.18. The SFDP contains the following:

a. Provisions for cross division checks to ensure a loss of the capability to perform the safety function assumed in the accident analysis does not go undetected,

b. Provisions for ensuring the plant is maintained in a safe condition if a loss of function condition exists,

c. Provisions to ensure that an inoperable supported system's Completion Time is not inappropriately extended as a result of multiple support system inoperabilities, and

d. Other appropriate limitations and remedial or compensatory actions.

A loss of safety function exists when, assuming no concurrent single failure, a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

a. A required system redundant to the system(s) supported by the inoperable support system is also inoperable, or

b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable, or

c. A required system redundant to the support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The Commission's regulatory requirements related to the content of the TSs are contained in Title 10, Code of Federal Regulations (10 CFR), Section 50.36. The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and control settings, (2) limiting conditions for operation (LCO), (3) surveillance requirements, (4) design features, and (5) administrative controls. The requirements for the CREATCS and the 6.9 kV SDBR are included in the TSs in accordance with 10 CFR 50.36(c)(2), "Limiting Conditions for Operation." As stated in 10 CFR 50.59(c)(1)(i), a licensee is required to submit a license amendment pursuant to 10 CFR 50.90 if a change to the TSs is required. Furthermore, the requirements of 10 CFR 50.59 necessitate that the U.S. Nuclear Regulatory Commission (NRC) approve the TS changes before the TS changes are implemented. TVA's submittal meets the requirements of 10 CFR 50.59(c)(1)(i) and 10 CFR 50.90.

GDC-19, "Control Room" provides requirements for a control room that supports the ability to perform controlled shutdowns of the nuclear units and the ability to maintain safe shutdown conditions. The CREATCS is applicable to this GDC by providing cooling of the control room to ensure that equipment and personnel can perform the required

functions. The proposed change continues to ensure that acceptable temperatures are maintained whenever one train of the CREATCS is inoperable for an interim period of time. If such temperatures cannot be maintained then an immediate unit shutdown in accordance with TS 3.0.3 will be required. By providing requirements that ensure suitable environmental conditions for the control room equipment and personnel, the requirements of GDC-19 continue to be satisfied.

Regulatory Guide 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. Since 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 Regulatory Guide 1.78 are not altered by this request.

4.2 Precedent

A similar TS change to increase the allowable outage time for the Control Room Air Conditioning Subsystem from 30 days to 60 days, on a one-time basis, to allow adequate time to replace portions of the existing system was reviewed and approved by the NRC for the Seabrook Station, Unit 1 (see Reference 4).

4.3 Significant Hazard Consideration

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

Response: No.

The Control Room Emergency Air Treatment System (CREATCS) is used to maintain an acceptable environment for control room personnel and equipment during normal and emergency conditions. The proposed "one-time" Technical Specification (TS) to extend the Completion Time for loss of one train from 30 days to 60 days is justified because the additional risk of operating the plant beyond the current Completion Time of 30 days is compensated by the addition of a temporary, non-safety related cooling system with a diesel generator backup.

The CREATCS system does not have the potential to create a design basis accident as it only provides MCRHZ cooling and do not directly mitigate postulated accidents. Temporary cooling equipment will be designed in accordance with appropriate design controls, sized to ensure adequate cooling capacity, and located such that safety-related features would not be prevented from performing their safety function. Since the MCR chillers do not contribute to the initiators of postulated accidents, the probability of an accident is not significantly increased by the proposed change.

The MCR HVAC Systems do ensure a suitable environment for safety-related equipment and personnel during an accident. The temperature limits placed on the temporary cooling system ensure that the control room areas will remain at

acceptable levels to support plant evolutions in response to postulated accidents. Safety functions that are necessary to maintain acceptable offsite dose limits will not be degraded by the proposed change. Alternate cooling methods that will maintain the control room areas well within the equipment temperature limits will ensure these safety functions. With the control room cooling requirements satisfied, the offsite dose limits are not affected.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

The proposed "one-time" Completion Time extension will continue to ensure that the control room ambient temperatures will not exceed 90°F. The temperature control functions for the control room are not postulated to create an accident and since the proposed change continues to maintain acceptable temperatures, no new accident initiators are created.

Implementation of temporary cooling methods will be designed such that safety-related features will not be prevented from performing their safety functions and will be in compliance with 10 CFR 50.59 requirements. Plant operation during the use of such alternate cooling methods will continue to comply with applicable Technical Specification (TS) requirements. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No.

The proposed "one-time" Completion Time extension will continue to maintain control room 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 temporary cooling devices will be designed such that safety-related features would not be prevented from performing their safety function. Therefore, the proposed change does not involve a significant reduction in the margin of safety.

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 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. Executive Order 13148, "Greening the Government Through Leadership in Environmental Management," issued April, 2000

2. Code of Federal Regulations, Title 40, Part 82, "Protection of Stratospheric Ozone"

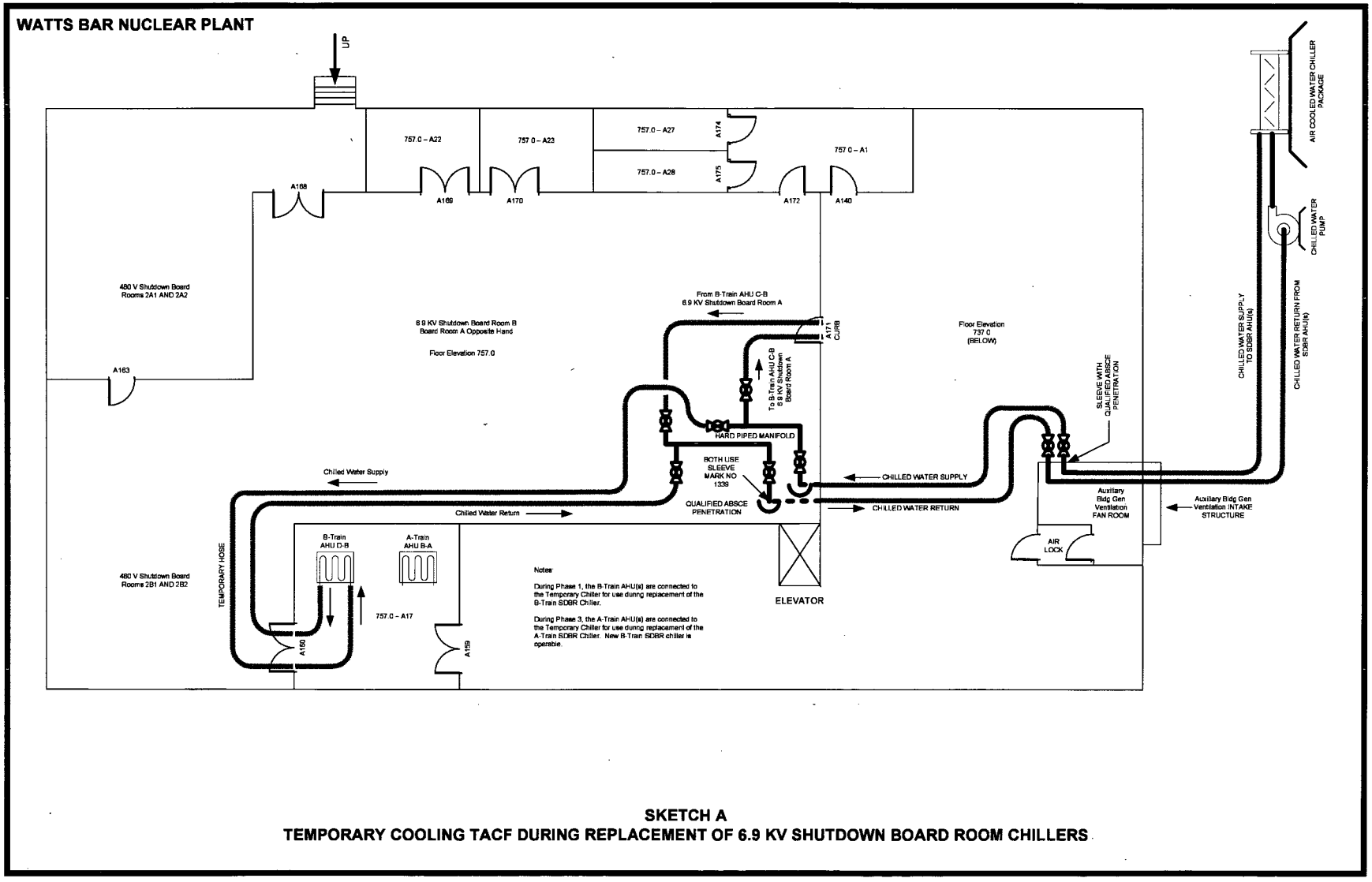
3. NRC letter dated April 5, 2002, "Application of Generic Letter 80-30 Guidance to an Inoperable Non-Technical Specification Support Subsystem."

4. NRC letter dated September 17, 1999, "Seabrook Station, Unit No. 1 – Issuance of Amendment Re: Control Room Air Conditioning Allowed Outage Time Extension (TAC NO. MA5937)."

7.0 DRAWINGS

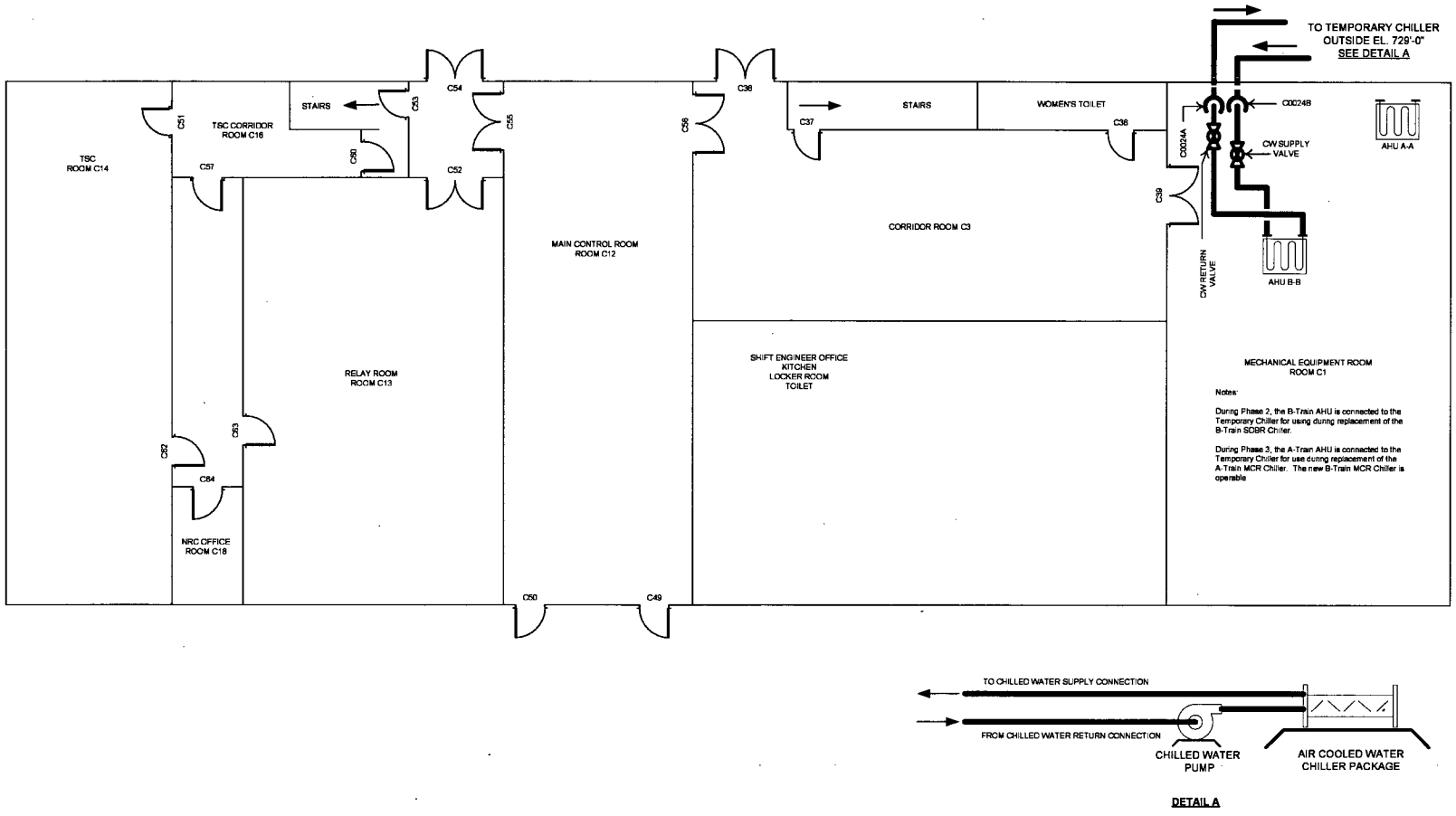
1. Sketch A, "Temporary Cooling TA During Replacement of 6.9 kV Shutdown Board Room Chillers"

2. Sketch B, "Temporary Cooling TA During Replacement of Main Control Room Chillers"



SKETCH A
TEMPORARY COOLING TACF DURING REPLACEMENT OF 6.9 KV SHUTDOWN BOARD ROOM CHILLERS

WATTS BAR NUCLEAR PLANT



SKETCH B
TEMPORARY COOLING TACF DURING REPLACEMENT OF MAIN CONTROL ROOM CHILLERS

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY (TVA)
WATTS BAR NUCLEAR PLANT
OPERATING LICENSE NP-90
UNIT 1 WBN TS-09-16

PROPOSED TS CHANGES (MARKED-UP)

I. AFFECTED PAGE LIST

TS Page 3.7-25

Bases Pages B 3.7-59 and B 3.7-59a

II. MARKED PAGES

See attached.

Note: Additions are shown in bold italics.

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 60 days. This TS provision is only applicable provided compensatory measures are implemented during modification activities planned for the upgrade of the MCR chillers beginning December 1, 2010 and ending January 29, 2012.

BASES

APPLICABLE SAFETY ANALYSES (continued)

heat loads from the control room, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY (Ref. 3).

The CREATCS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the CREATCS are required to be OPERABLE to ensure that at least one is available, assuming a single failure disabling the other train. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

The CREATCS is considered to be OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in both trains. These components include the chillers, AHUs, and associated temperature control instrumentation. In addition, the CREATCS must be operable to the extent that air circulation can be maintained.

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CREATCS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements following isolation of the control room.

In MODE 5 or 6, CREATCS is required during a control room isolation following a waste gas decay tank rupture.

ACTIONS

A.1

With one CREATCS train inoperable, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE CREATCS train is adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CREATCS train could result in loss of CREATCS function. The 30 day Completion Time is based on the low probability of an event requiring control room isolation, the consideration that the remaining train can provide the required protection, and that alternate safety or nonsafety related cooling means are available.

(continued)

ACTIONS (continued)

A.1

During modification activities to replace the CREATCS chillers, an allowance is permitted for one CREATCS train to be inoperable for 60 days provided the following compensatory measures are in place:

A temporary chilled water package will be installed and maintained in a "standby" condition. During the initial installation, the chiller skids and chilled water pumps will be stationed in the yard with the chilled water lines filled and vented at the manifolds in the Control Building Mechanical Equipment Room located on Elevation 755.0 and the Shutdown Board Room Mechanical Equipment Rooms located on Elevation 757.0. Final connection of the chilled water hoses to the SDBR or MCR AHUs will not occur until that particular HVAC train is taken out of service for chiller replacement. All necessary hardware, hoses, and fittings will be stationed at the AHUs for rapid deployment in order to connect, fill and vent the temporary chilled water hoses to the AHUs. Procedures will be provided to include instructions for startup, operation, preventative maintenance, and shutdown of the temporary cooling equipment. Qualified personnel will be provided training on these procedures. Furthermore, to provide additional defense-in-depth, the following requirements would also be implemented:

1. ***If a temporary chilled water system hose breaks in the Control Building during the timeframe that the temporary equipment is installed, the two manual isolation ball valves located at the MCRHZ boundary will be closed immediately. Qualified personnel will be capable of closing the valves and will be stationed in the area whenever the valves are in the "Open" position and the temporary cooling system is in service.***
2. ***If a temporary chilled water system hose breaks in the Auxiliary Building or Shutdown Board Room during the timeframe that the temporary equipment is installed, the four manual isolation ball valves located at the ABSCE penetrations will be closed immediately. Qualified personnel will be capable of closing the valves and will be stationed in the area whenever the valves are in the "Open" position and the temporary cooling system is in service.***
3. ***Due to lack of operating data, the availability or reliability of the new MCR chiller packages are unknown. To compensate for this uncertainty the new train-B chiller packages will be operated for a minimum of 2 weeks prior to removing the train-A MCR chillers form service for replacement.***
4. ***During replacement of the MCR chillers, no planned maintenance activity, except for SRs 3.8.1.2, 3.8.1.3, and 3.8.1.7, that could impact the OPERABILITY of the DG's that provide emergency power to the OPERABLE MCR chiller train will be performed.***

This provision is only applicable during modification activities planned for the upgrade of the MCR chillers beginning in December 1, 2010 and ending January 29, 2012.

(continued)

ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY (TVA)
WATTS BAR NUCLEAR PLANT
OPERATING LICENSE NP-90
UNIT 1 WBN TS-09-16

COMMITMENTS

1. If a temporary chilled water system hose breaks in the Control Building during the timeframe that the temporary equipment is installed, the two manual isolation ball valves located at the MCRHZ boundary will be closed immediately. Qualified personnel will be capable of closing the valves and will be stationed in the area whenever the valves are in the "Open" position and the temporary cooling system is in service.

2. If a temporary chilled water system hose breaks in the Auxiliary Building or Shutdown Board Room during the timeframe that the temporary equipment is installed, the four manual isolation ball valves located at the ABSCE penetrations will be closed immediately. Qualified personnel will be capable of closing the valves and will be stationed in the area whenever the valves are in the "Open" position and the temporary cooling system is in service.

3. Due to lack of operating data, the availability or reliability of the new MCR chiller packages are unknown. To compensate for this uncertainty the new train-B chiller packages will be operated for a minimum of 2 weeks prior to removing the train-A MCR chillers from service for replacement.

4. During replacement of the MCR chillers, no planned maintenance activity, except for SRs 3.8.1.2, 3.8.1.3, and 3.8.1.7, that could impact the operability of the DG's that provide emergency power to the operable MCR chiller train will be performed.