

January 20, 2005

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

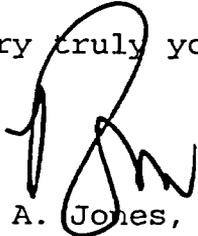
Subject: Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Technical Specification Bases (TSB) Change

Please see attached revisions to Tech Spec Bases 3.5.1 and 3.7.1 which were implemented on January 11, 2005.

Attachment 1 contains the new TSB pages and Attachment 2 contains the marked up version of the Bases pages.

If any additional information is needed, please contact Graham Davenport at 864-885-3044.

Very truly yours,



R. A. Jones, Vice President
Oconee Nuclear Site

U. S. Nuclear Regulatory Commission
January 20, 2005
Page 2

cc: Mr. L. N. Olshan
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. W. D. Travers, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Mel Shannon
Senior Resident Inspector
Oconee Nuclear Station

Mr. Henry Porter Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

Attachment 1

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.1 Core Flood Tanks (CFTs)

BASES

BACKGROUND

The function of the ECCS CFTs is to supply water to the reactor vessel during the blowdown phase of a loss of coolant accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA. Two CFTs are provided for these functions.

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

In the refill phase of a LOCA, which follows immediately, reactor coolant inventory has vacated the core through steam flashing and ejection through the break. The core is essentially in adiabatic heatup. The balance of inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer so as to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of safety injection water.

The CFTs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The CFTs are passive components, since no operator or control actions are required for them to perform their function. Internal tank pressure is sufficient to discharge the contents of the CFTs to the RCS if RCS pressure decreases below the CFT pressure. Each CFT is piped separately into the reactor vessel downcomer. The CFT injection lines are also utilized by the Low Pressure Injection (LPI) System. Each CFT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident.

The CFTs thus form a passive system for injection directly into the reactor vessel. Except for the core flood line break LOCA, a unique accident that also disables a portion of the injection system, both tanks are assumed to operate in the safety analyses for Design Basis Events.

BASES

BACKGROUND
(continued)

Because injection is directly into the reactor vessel downcomer, and because it is a passive system not subject to the single active failure criterion, all fluid injection is credited for core cooling.

The CFT gas/water volumes, gas pressure, and outlet pipe size are selected to provide core cooling for a large break LOCA prior to the injection of coolant by the LPI System.

APPLICABLE
SAFETY ANALYSES

The CFTs are credited in both the large and small break LOCA analyses (Ref. 1). These accident analyses establish the acceptance limits for the CFTs. In performing the LOCA calculations, conservative assumptions are made concerning the availability of emergency injection flow. The assumption of the loss of offsite power is required by regulations. In the early stages of a LOCA with the loss of offsite power, the CFTs provide the sole source of makeup water to the RCS.

This is because the LPI pumps and high pressure injection (HPI) pumps cannot deliver rated flow until the Keowee Hydro Units start and come to rated speed and valves open.

The limiting large break LOCA is a double ended guillotine cold leg break at the discharge of the reactor coolant pump. During this event, the CFTs discharge to the RCS as soon as RCS pressure decreases below CFT pressure. As a conservative estimate, no credit is taken for HPI for large break LOCAs. LPI is not assumed to occur until 38 seconds after loss of offsite power occurs with full LPI flow not occurring until 36 seconds later, or 74 seconds total. No operator action is assumed during the blowdown stage of a large break LOCA.

The small break LOCA analysis also assumes a time delay after Engineered Safeguards actuation before pumped flow reaches the core. For the larger range of small breaks, the rate of blowdown is such that the increase in fuel clad temperature is terminated by the CFTs, with pumped flow then providing continued cooling. As break size decreases, the CFTs and HPI pumps both play a part in terminating the rise in clad temperature. As break size continues to decrease, the role of the CFTs continues to decrease until the tanks are not required and the HPI pumps become responsible for terminating the temperature increase.

This LCO helps to ensure that the following acceptance criteria for the ECCS, established by 10 CFR 50.46 (Ref. 2), will be met following a LOCA:

BASES

**APPLICABLE
SAFETY ANALYSES
(continued)**

- a. Maximum fuel element cladding temperature of 2200°F;
- b. Maximum cladding oxidation of ≤ 0.17 times the total cladding thickness before oxidation;
- c. Maximum hydrogen generation from a zirconium water reaction of ≤ 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react; and
- d. Core maintained in a coolable geometry.

Since the CFTs discharge during the blowdown phase of a LOCA, they do not contribute to the long term cooling requirements of 10 CFR 50.46.

The limits for operation with a CFT that is inoperable for any reason other than the boron concentration not being within limits minimize the time that the unit is exposed to a LOCA event occurring along with failure of a CFT, which might result in unacceptable peak cladding temperatures. If a closed isolation valve cannot be opened, or the proper water volume or nitrogen cover pressure cannot be restored, the full capability of one CFT is not available and prompt action is required to place the reactor in a MODE in which this capability is not required.

In addition to LOCA analyses, the CFTs have been assumed to operate to provide borated water for reactivity control for severe overcooling events such as a main steam line break (MSLB).

The CFTs are part of the primary success path that functions or actuates to mitigate an accident that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The minimum volume requirement for the CFTs ensures that both CFTs can provide adequate inventory to reflood the core (to the hot spot) and downcomer following a LOCA. The downcomer then remains flooded until the HPI and LPI systems start to deliver flow.

The maximum volume limit is based upon the need to maintain adequate gas volume to ensure proper injection, ensure the ability of the CFTs to fully discharge, and limit the maximum amount of boron inventory in the

CFTs. The specified values (1010 ft³ and 1070 ft³) are allowable values.

BASES

APPLICABLE
SAFETY ANALYSES
(continued)

The corresponding CFT levels are 12.56 ft and 13.44 ft (allowable values).

The minimum nitrogen cover pressure requirement of 575 psig (allowable value) ensures that the contained gas volume will generate discharge flow rates during injection that are consistent with those assumed in the safety analysis.

The maximum nitrogen cover pressure limit of 625 psig (allowable value) ensures that the amount of CFT inventory that is discharged while the RCS depressurizes, and is therefore lost through the break, will not be larger than that predicted by the safety analysis.

The maximum allowable boron concentration specified in the COLR for the CFTs ensures that boron precipitation will not occur following a LOCA.

The minimum boron requirement of the COLR is selected to ensure that the reactor will remain subcritical during the reflood stage of a large break LOCA. During a large break LOCA, all CONTROL RODS are assumed not to insert into the core until reflood, and the initial reactor shutdown is accomplished by void formation during blowdown. Sufficient boron concentration must be maintained in the CFTs to prevent a return to criticality during reflood. After reflood, the analysis assumes one half of the CONTROL ROD worth is available.

The CFT isolation valves are not single failure proof; therefore, whenever these valves are open, power shall be removed from them. This precaution ensures that both CFTs are available during an accident. With power supplied to the valves, operator error could result in a valve closure, which would render one CFT unavailable for injection. Both CFTs are required to function in the event of a large break LOCA.

The CFTs satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

The LCO establishes the minimum conditions required to ensure that the CFTs are available to accomplish their core cooling safety function following a LOCA. Both CFTs are required to function in the event of a large break LOCA. If the entire contents of both tanks are not injected during the blowdown phase of a large break LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 2) could be violated. For a CFT to be considered OPERABLE, the isolation valve must be fully open, power removed when RCS pressure is above 800 psig and the limits established in the SR for contained volume, boron concentration, and nitrogen cover pressure must be met.

BASES (continued)

APPLICABILITY In MODES 1 and 2, and in MODE 3 with RCS pressure > 800 psig, the CFT OPERABILITY requirements are based on full power operation. Although cooling requirements may decrease as power decreases, the CFTs are still required to provide core cooling as long as elevated RCS pressures and temperatures exist.

This LCO is only applicable at pressures > 800 psig. At or below 800 psig, the rate of RCS blowdown is such that the safety injection pumps can provide adequate injection to ensure that peak clad temperature remains below the 10 CFR 50.46 (Ref. 2) limit of 2200°F.

In MODE 3 with RCS pressure \leq 800 psig, and in MODES 4, 5, and 6, the CFT motor operated isolation valves may be closed to isolate the CFTs from the RCS. This allows RCS cooldown and depressurization without discharging the CFTs into the RCS or requiring depressurization of the CFTs.

In addition, LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP)," requires that in MODE 3 when any RCS cold leg temperature is \leq 325°F, MODE 4, MODE 5, and MODE 6 when a vent path capable of mitigating the most limiting LTOP event is not open, each CFT whose pressure is greater than or equal to the maximum RCS pressure for the existing RCS temperature allowed by the pressure and temperature limit curves provided in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," be deactivated.

ACTIONS**A.1**

If the boron concentration of one CFT is not within limits, it must be returned to within the limits within 72 hours. In this condition, ability to maintain subcriticality may be reduced, but the effects of reduced boron concentration on core subcriticality during reflood are minor. Boiling of the ECCS water in the core during reflood concentrates the boron in the saturated liquid that remains in the core. In addition, the volume of the CFT is still available for injection. Since the boron requirements are based on the average boron concentration of the total volume of two CFTs, the consequences are less severe than they would be if the contents of a CFT were not available for injection. Thus, 72 hours is allowed to return the boron concentration to within limits.

BASES

ACTIONS
(continued)

B.1

If one CFT is inoperable for a reason other than boron concentration, the CFT must be returned to OPERABLE status within 1 hour. In this condition it cannot be assumed that the CFT will perform its required function during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 1 hour Completion Time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable CFT to OPERABLE status. The Completion Time minimizes the time the unit is potentially exposed to a LOCA in these conditions.

C.1 and C.2

If the Required Actions and associated Completion Times of Condition A or B are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and RCS pressure reduced to ≤ 800 psig within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

If more than one CFT is inoperable, the unit is in a condition outside the accident analysis; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE
REQUIREMENTS

SR 3.5.1.1

Verification every 12 hours that each CFT isolation valve is fully open ensures that the CFTs are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in accident analysis assumptions not being met. A 12 hour Frequency is considered reasonable in view of administrative controls that ensure that a mispositioned isolation valve is unlikely.

BASES

**SURVEILLANCE
REQUIREMENTS
(continued)**SR 3.5.1.2 and SR 3.5.1.3

Verification every 12 hours of each CFT's nitrogen cover pressure (≥ 575 psig and ≤ 625 psig) and the borated water volume (≥ 1010 ft³ and ≤ 1070 ft³) is sufficient to ensure adequate injection during a LOCA. A CFT level of ≥ 12.56 ft and ≤ 13.44 ft corresponds to the specified borated water volume. Due to the static design of the CFTs, a 12 hour Frequency usually allows the operator to identify changes before the limits are reached. Operating experience has shown that this Frequency is appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

Surveillance once every 31 days is reasonable to verify that the CFT boron concentration is within the required limits, because the static design of the CFT limits the ways in which the concentration can be changed. The Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Verifying CFT boron concentration within 12 hours after an 80 gallon volume increase will identify whether inleakage from the RCS has caused a reduction in boron concentration to below the required limit. The 80 gallon increase represents approximately 1% increase in volume. It is not necessary to verify boron concentration if the added water inventory is from a borated water source that meets CFT boron concentration requirements, such as the boric acid mix tank or the borated water storage tank (BWST). This is consistent with the recommendations of NUREG-1366 (Ref. 4).

SR 3.5.1.5

Verification every 31 days that power is removed from each CFT isolation valve operator ensures that an active failure could not result in the undetected closure of a CFT motor operated isolation valve coincident with a LOCA. Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that the power is removed.

BASES (continued)

- REFERENCES**
1. UFSAR, Section 15.14.
 2. 10 CFR 50.46.
 3. 10 CFR 50.36.
 4. NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," December 1992.
-

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Relief Valves (MSRVs)

BASES

BACKGROUND

The primary purpose of the MSRVs is to provide overpressure protection for the secondary system. The MSRVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing a heat sink for removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available.

Eight MSRVs are located on each main steam header, outside containment as described in the UFSAR, Section 10.3 (Ref. 1). The MSRV rated capacity passes the full steam flow at 114% RTP with the valves full open. This meets the requirements of the ASME Code, Section III (Ref. 2). The MSRV design includes staggered setpoints, (Ref. 1) so that only the needed number of valves will actuate. Staggered setpoints reduce the potential for valve chattering because of insufficient steam pressure to fully open the valves.

APPLICABLE SAFETY ANALYSES

The design basis of the MSRVs (Ref. 2) is to limit secondary system pressure to $\leq 110\%$ of design pressure when passing 105% of design steam flow. This design basis is sufficient to cope with any anticipated transient or accident considered in the accident and transient analysis.

The events that challenge the relieving capacity of the MSRVs, and thus RCS pressure, are those characterized as decreased heat removal or increased heat addition events. MSRV relief capacity is utilized in the UFSAR (Ref. 3 and Ref. 4) for mitigation of the following events:

- a. Loss of main feedwater;
- b. Steam line break;
- c. Steam generator tube rupture;
- d. Rod withdrawal at rated power; and
- e. Loss of Electric Load.

BASES

**APPLICABLE
SAFETY ANALYSIS
(continued)**

The MSRVs satisfy Criterion 3 of 10 CFR 50.36, (Ref. 5).

LCO

The MSRVs are provided to prevent overpressurization as discussed in the Applicable Safety Analysis section of these Bases. The LCO requires sixteen MSRVs, eight on each main steam line, to be OPERABLE to ensure compliance with the ASME Code following accidents and transients initiated at full power. Operation with less than a full complement of MSRVs is not permitted. To be OPERABLE, lift setpoints must remain within limits, specified in the UFSAR.

The safety function of the MSRVs is to open, relieve steam generator overpressure, and reseal when pressure has been reduced.

OPERABILITY of the MSRVs requires periodic surveillance testing in accordance with the Inservice Testing Program.

The lift settings correspond to ambient conditions of the valve at nominal operating temperature and pressure.

This LCO provides assurance that the MSRVs will perform the design safety function.

APPLICABILITY

In MODES 1, 2, and 3, the MSRVs must be OPERABLE to prevent overpressurization of the main steam system.

In MODES 4 and 5, there is no credible transient requiring the MSRVs.

The steam generators are not normally used for heat removal in MODES 5 and 6, and thus cannot be overpressurized. There is no requirement for the MSRVs to be OPERABLE in these MODES.

ACTIONS

A.1 and A.2

With one or more MSRVs inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours, and in MODE 4 within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES (continued)

**SURVEILLANCE
REQUIREMENTS**

SR 3.7.1.1

This SR verifies the OPERABILITY of the MSRVs by the verification of MSRv lift setpoints in accordance with the Inservice Testing Program. The safety and relief valve tests are performed in accordance with ANSI/ASME Code (Ref. 6) and include the following for MSRVs:

- a. Visual examination;
- b. Seat tightness determination;
- c. Setpoint pressure determination (lift setting);
- d. Compliance with owner's seat tightness criteria; and
- e. Verification of the balancing device integrity on balanced valves.

The ANSI/ASME Standard requires the testing of all valves every 5 years, with a minimum of 20% of the valves tested every 24 months. Reference 4 provides the activities and frequencies necessary to satisfy the requirements.

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSRVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSRVs are not tested at hot conditions, the lift setting pressure must be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. UFSAR, Section 10.3.
 2. ASME, Boiler and Pressure Vessel Code, Section III, Article NC-7000, Class 2 Components.
 3. UFSAR, Chapter 15.
 4. UFSAR, Section 10.3.3.
 5. 10 CFR 50.36.
 6. ANSI/ASME Boiler And Pressure Vessel Code, Section XI.
-

Attachment 2

BASES

BACKGROUND
(continued)

operate in the safety analyses for Design Basis Events. Because injection is directly into the reactor vessel downcomer, and because it is a passive system not subject to the single active failure criterion, all fluid injection is credited for core cooling.

The CFT gas/water volumes, gas pressure, and outlet pipe size are selected to provide core cooling for a large break LOCA prior to the injection of coolant by the LPI System.

APPLICABLE SAFETY ANALYSES

The CFTs are credited in both the large and small break LOCA analyses (Ref. 1). These accident analyses establish the acceptance limits for the CFTs. In performing the LOCA calculations, conservative assumptions are made concerning the availability of emergency injection flow. The assumption of the loss of offsite power is required by regulations. In the early stages of a LOCA with the loss of offsite power, the CFTs provide the sole source of makeup water to the RCS.

This is because the LPI pumps and high pressure injection (HPI) pumps cannot deliver rated flow until the Keowee Hydro Units start and come to rated speed and valves open.

The limiting large break LOCA is a double ended guillotine cold leg break at the discharge of the reactor coolant pump. During this event, the CFTs discharge to the RCS as soon as RCS pressure decreases below CFT pressure. As a conservative estimate, no credit is taken for HPI for large break LOCAs. LPI is not assumed to occur until 38 seconds after loss of offsite power occurs with full LPI flow not occurring until 18 seconds later, or 56 seconds total. No operator action is assumed during the blowdown stage of a large break LOCA.

The small break LOCA analysis also assumes a time delay after Engineered Safeguards actuation before pumped flow reaches the core. For the larger range of small breaks, the rate of blowdown is such that the increase in fuel clad temperature is terminated by the CFTs, with pumped flow then providing continued cooling. As break size decreases, the CFTs and HPI pumps both play a part in terminating the rise in clad temperature. As break size continues to decrease, the role of the CFTs continues to decrease until the tanks are not required and the HPI pumps become responsible for terminating the temperature increase.

BASES (continued)

SURVEILLANCE REQUIREMENTS SR 3.7.1.1

This SR verifies the OPERABILITY of the MSRVs by the verification of MSRv lift setpoints in accordance with the Inservice Testing Program. The safety and relief valve tests are performed in accordance with ANSI/ASME ~~OM-1-1987~~ (Ref. ~~8~~) and include the following for MSRVs:

- Code 6*
- a. Visual examination;
 - b. Seat tightness determination;
 - c. Setpoint pressure determination (lift setting);
 - d. Compliance with owner's seat tightness criteria; and
 - e. Verification of the balancing device integrity on balanced valves.

The ANSI/ASME Standard requires the testing of all valves every 5 years, with a minimum of 20% of the valves tested every 24 months. Reference 4 provides the activities and frequencies necessary to satisfy the requirements.

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSRVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSRVs are not tested at hot conditions, the lift setting pressure must be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

- 1. UFSAR, Section 10.3.
- 2. ASME, Boiler and Pressure Vessel Code, Section III, Article NC-7000, Class 2 Components.
- 3. UFSAR, Chapter 15.
- 4. UFSAR, Section 10.3.3.
- 5. 10 CFR 50.36.
- 6. ~~ANSI/ASME OM-1-1987.~~

*Boiler and Pressure Vessel Code
Section XI.*