Duke Power Company
Oconee Nuclear Station
Attachment 1
Proposed Technical Specification Revision

Pages

3.3.2 Low Pressure Injection (LPI) System

a. Prior to initiating maintenance on any component of the LPI system, the redundant component shall be tested to assure operability.

b. When the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F:

(1) Two independent LPI trains, each comprised of an LPI pump and a flowpath capable of taking suction from the borated water storage tank and discharging into the RCS automatically upon ESPS actuation (LPI segment), together with two LPI coolers and two reactor building emergency sump isolation valves (manual or remote-manual) shall be operable.

(2) Tests or maintenance shall be allowed on any component of the LPI system provided the redundant train of the LPI system is operable. If the LPI system is not restored to meet the requirements of Specification 3.3.2.b(1) above within 24 hours, the reactor shall be placed in a hot shutdown condition within 12 hours. If the requirements of Specification 3.3.2.b(1) are not met within 24 hours following hot shutdown, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

3.3.3 Core Flood Tank (CFT) System

When the RCS pressure is above 800 psig:

(a) Both CFT's shall be operable with the electrically operated discharge valves open and breakers locked open and tagged.

(b) Both CFT's shall have a level of 13 ± 0.44 feet (1040 ± 30 ft^3) with one level instrument channel per tank.

(c) Both CFT's shall have a pressure of 600 ± 25 psig with one pressure instrument per tank.

(d) The boron concentration in each CFT shall be greater than 1835 ppm.

(1) If the concentration in one CFT is less than 1835 ppm then the concentration must be restored to 1835 ppm within 48 hours. If the concentration has not been restored within 48 hours then the reactor shall be placed in hot shutdown within an additional 12 hours and in cold shutdown within the following 24 hours.

(2) If the concentration in both CFT's is less than 1835 ppm then the reactor shall be placed in hot shutdown within 12 hours and in cold shutdown within an additional 24 hours.

3.3.4 Borated Water Storage Tank (BWST)

When the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F:

a. The BWST shall have operable two level instrument channels.

   (1) Tests or maintenance shall be allowed on one channel of BWST level instrumentation provided the other channel is operable.

   (2) If the BWST level instrumentation is not restored to meet the requirements of Specification 3.3.4.a above within 24 hours, the reactor shall be placed in a hot shutdown condition within 12 hours. If the requirements of Specification 3.3.4.a are not met within 24 hours following hot shutdown, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

b. The BWST shall contain a minimum level of 46 feet of water having a minimum concentration of 1835 ppm boron at a minimum temperature of 50°F. The manual valve, LP-28, on the discharge line shall be locked open. If these requirements are not met, the BWST shall be considered unavailable and action initiated in accordance with Specification 3.2.

3.3.5 Reactor Building Cooling (RBC) System

a. Prior to initiating maintenance on any component of the RBC system. the redundant component shall be tested to assure operability.

b. When the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F and subcritical:

   (1) Two independent RBC trains, each comprised of an RBC fan, associated cooling unit, and associated ESF valves shall be operable.

   (2) Tests are maintenance shall be allowed on any component of the RBC system provided one train of the RBC and one train of the RBS are operable. If the RBC system is not restored to meet the requirements of Specification 3.3.5.b(1) above within 24 hours, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

c. When the reactor is critical:

   (1) In addition to the requirements of Specifications 3.3.5.b(1) above, the remaining RBC fan, associated cooling unit, and associated ESF valves shall be operable.

(2) Tests or maintenance shall be allowed on one RBC train under either of the following conditions:

(a) One RBC train may be out of service for 24 hours.

(b) One RBC train may be out of service for 7 days provided both RBS trains are operable.

(c) If the inoperable RBC train is not restored to meet the requirements of Specification 3.3.5.c(1) within the time permitted by Specification 3.3.5.c(2) (a) or (b), the reactor shall be placed in a hot shutdown condition within 12 hours. If the requirements of Specification 3.3.5.c(1) are not met within an additional 24 hours following hot shutdown, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

3.3.6 Reactor Building Spray (RBS) System

a. Prior to initiating maintenance on any component of the RBS system, the redundant component shall be tested to assure operability.

b. When the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F and subcritical:

(1) One RBS train, comprised of an RBS pump and a flowpath capable of taking suction from the LPI system and discharging through the spray nozzle header automatically upon ESPS actuation (RBS segment) shall be operable.

(2) Tests or maintenance shall be allowed on any component of the RBS system under the following conditions:

(a) One RBS train may be out of service for 24 hours provided two RBC train are operable.

(b) If the inoperable RBS train is not restored to meet the requirements of Specification 3.3.6.b(1) within 24 hours, the reactor shall be placed in a condition with the RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

c. When the reactor is critical:

(1) In addition to the requirements of Specifications 3.3.6.b(1) above, the other RBS train comprised of an RBS pump and a flowpath capable to taking suction of the LPI system and discharging through the spray nozzle header automatically upon ESPS actuation (RBS segment) shall be operable.

(2) Tests or maintenance shall be allowed on one RBS train under either of the following conditions:

(a) One RBS train may be out of service for 24 hours.

(b) One RBS train may be out of service for 7 days provided all three RBC trains are operable.

(c) If the inoperable RBS train is not restored to meet the requirements of Specification 3.3.6.c(1) above within the time permitted by Specification 3.3.5.c(2) (a) or (b), the reactor shall be placed in a hot shutdown condition within 12 hours. If the requirements of Specification 3.3.6.c(1) are not met within an additional 24 hours following hot shutdown, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250°F within an additional 24 hours.

3.3.7 Low Pressure Service Water (LPSW)

a. Prior to initiating maintenance on any component of the LPSW system, the redundant component shall be tested to assure operability.

b. When the RCS, with fuel in the core, is in a condition with pressure equal to or greater than 350 psig or temperature equal to or greater than 250°F:

(1) Two LPSW pumps for the shared Unit 1, 2 LPSW system and two LPSW pumps for the Unit 3 LPSW system shall be operable with valves LPSW-108, 2LPSW-108, and 3LPSW-108 locked open.

(2) Tests or maintenance shall be allowed on any component of the LPSW system provided the redundant train of the LPSW system is operable. If the LPSW system is not restored to meet the requirements of Specification 3.3.7.b(1) above within 24 hours, the reactor shall be placed in a hot shutdown condition within 12 hours. If the requirements of Specification 3.3.7.b(1) are not met within 24 hours following hot shutdown, the reactor shall be placed in a condition with RCS pressure below 350 psig and RCS temperature below 250° within an additional 24 hours.

Bases

Specification 3.3 assures that, for whatever condition the reactor coolant system is in, adequate engineered safety feature equipment is operable.

For operation up to 60% FP, two high pressure injection pumps are specified. Also, two low pressure injection pumps and both core flood tanks are required. In the event that the need for emergency core cooling should occur, functioning of one high pressure injection pump, one low pressure injection pump, and both core flood tanks will protect the core, and in the event of a main coolant loop severence, limit the peak clad temperature to less than 2,200°F and the metal-water reaction to that representing less than 1 percent of the clad. (1) Both core flooding tanks are required as a single core flood tank has insufficient inventory to reflood the core.

The requirement to have three HPI pumps and two HPI flowpaths operable during power operation above 60% FP is based on considerations of potential small breaks at the reactor coolant pump discharge piping for which two HPI trains (two pumps and two flow paths) are required to assure adequate core cooling.(2) The analysis of these breaks indicates that for operation at or below 60% FP only a single train of the HPI system is needed to provide the necessary core cooling.

The function of the core flood tanks is to complement the HPI and LPI system during a loss of coolant accident by injecting borated water into the reactor vessel. The limits on core flood tank level and pressure ensure that the assumptions used for CFT injection in the safety analysis are met. The CFT boron concentration is set to maintain it the same as the BWST concentration.

The borated water storage tanks are used for two purposes:

(a) As a supply of borated water for accident conditions.

(b) As a supply of borated water for flooding the fuel transfer canal during refueling operation.(3)

Three-hundred and fifty thousand (350,000) gallons of borated water (a level of 46 feet in the BWST) are required to supply emergency core cooling and reactor building spray in the event of a loss-of-core cooling accident. This amount fulfills requirements for emergency core cooling. The borated water storage tank capacity of 388,000 gallons is based on refueling volume requirements. Heaters maintain the borated water supply at a temperature above 50°F to lessen the potential for thermal shock of the reactor vessel during high pressure injection system operation. The boron concentration is set at the amount of boron required to maintain the core 1 percent subcritical at 70°F without any control rods in the core. The minimum value specified in the tanks is 1835 ppm boron.

It has been shown for the worst design basis loss-of-coolant accident (a 14.1 ft^2 hot leg break) that the Reactor Building design pressure will not be exceeded with one spray and two coolers operable.(4) Therefore, a maintenance period of seven days is accpetable for one Reactor Building cooling fan and its associated cooling unit provided two Reactor Building spray systems are operable for seven days or one Reactor Building spray system provided all three Reactor Building cooling units are operable.

Three low pressure service water pumps serve Oconee Units 1 and 2 and two low pressure service water pumps serve Oconee Unit 3. There is a manual cross-connection on the supply headers for Unit 1, 2, and 3. One low pressure service water pump per unit is required for normal operation. The normal operating requirements are greater than the emergency requirements following a loss-of-coolant accident.

Prior to initiating maintenance on any of the components, the redundant component(s) shall be tested to assure operability. Operability shall be based on the results of testing as required by Technical Specification 4.5.

The maintenance period of up to 24 hours is acceptable if the operability of equipment redundant to that removed from service is demonstrated within 24 hours prior to removal. The 24 hour period prior to removal is adequate to permit efficient scheduling of manpower and equipment testing while ensuring that the testing is performed directly prior to removal. The basis of acceptability is the low likelihood of failure within a clearly defined 48 hours following redundant component testing.

REFERENCES

(1) ECCS Analysis of B&W's 177-FA Lowered-Loop NSS, BAW-10103, Babcock & Wilcox, Lynchburg, Virginia, June 1975.

(2) Duke Power Company to NRC letter, July 14, 1978, "Proposed Modifications of High Pressure Injection System".

(3) FSAR, Section 9.5.2

(4) FSAR, Supplement 13

Duke Power Company
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Attachment 2

No Significant Hazards Consideration Evaluation

No Significant Hazards Consideration Evaluation

Duke Power Company (Duke) has made the determination that this amendment request involves a No Significant Hazards Consideration by applying the standards established by the Commission's regulations in 10 CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

As part of the emergency core cooling system (ECCS), the function of core flood tank (CFT) is to complement the high pressure injection (HPI) and low pressure injection (LPI) systems during a loss of coolant accident by injecting borated water into the reactor vessel. The proposed amendment allows to establish, for a short period of time, a degraded mode of operation if one CFT boron concentration decreases below the current minimum of 1835 ppm.

The following evaluation demonstrates that when measured against the standards provided in 10 CFR 50.92, this amendment request does not constitute a significant safety hazards consideration.

First Standard

Involve a significant increase in the probability or consequences of an accident previously evaluated.

All accident analyses addressed in the Oconee Final Safety Analysis Report (FSAR) have been reviewed with respect to the requested specification change. Only one previously evaluated accident, the steam line break analysis (FSAR Section 15.13), is affected by the CFT boron concentration. This evaluation takes credit for the boron in the CFT to limit a return to power.

This amendment will not affect the probability that the CFT boron concentration will decrease below the technical specifications limit. Under the current technical specifications a reactor shutdown will be initiated upon the discovery of low CFT boron concentration and the boron concentration will be restored to the techncial specifications limit. With the proposed amendment, the normal reactor operation will continue for 48 hours while the boron concentration is restored to the acceptable limit. If the concentration can not be restored within the 48 hours time limit, a reactor shutdown will be performed.

The probability of a main steam line break is likely to be higher under the current technical specifications than the proposed amendment. Under the current technical specifications the unit would begin a transient immediately after the discovery of low boron concentration. During such a transient, with the associated changes in steam line pressures and temperatures, the probability of a main steam line failure may increase. Under the proposed change out the probability of a steam line break will not change compared to normal operation.

The consequences of a main steam line break would also be greater under the current technical specifications. During a steam line break the RCS temperature and pressure decrease rapidly. The increase in moderator density due to the lower temperatures results in a possitive reactivity addition to the core. If the steam line break were to occur at reduced or no core power (following an immediate shutdown under the current technical specifications) the decay heat power during the transient would be lower than the decay heat power from a steam line break at full power. The lower decay heat power (current technical specifications) would lead to lower RCS temperature, more possitive reactivity addition, and a more severe return to power. Therefore, the consequences of a main steam line break will be reduced in severity by the amended technical specification.

Second Standard

> Create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed amendment does not in any way create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed revision to the technical specifications would allow, for a short period of time, a degraded mode of operation with the boron concentration in one CFT less than 1835 ppm. Continued power operation with a low boron concentration in one CFT does not create the possibility of a new or different kind of accident.

Third Standard

> Involve a significant reduction in a margin of safety.

The proposed revision would increase the margin of safety by decreasing the number of unnecessary reactor shutdowns and transients which are required by the current technical specifications but which do not enhance plant safety.

In summary, Duke has determined and submits that the proposed amendment does not involve a significant safety hazards.

Duke Power Company
Oconee Nuclear Station

Attachment 3
Technical Justification

Attachment 3

Technical Justification

The effect of the revision of Technical Specification 3.3.3 is to establish a degraded mode of operation if a core flood tank (CFT) boron concentration decreases below 1835 ppm. This would enable timely restoration of the boron concentration and prevent imposing a forced shutdown transient on the plant.

The core flood tanks are required to help mitigate loss of coolant accidents. They are not used in normal operation of the plant. Allowing temporary continued operation if the boron concentration in one CFT falls below 1835 ppm will not violate any of the assumptions used in the safety analysis because the necessary core cooling capability is still assured. Therefore this revision to the Technical Specifications increases operational flexibility while involving no additional safety hazard.