ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION

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3/4.5 EMERGENCY CORE COOLING SYSTEMS

3/4.5.1 ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each Reactor Coolant System (RCS) accumulator shall be OPERABLE with:

a. The isolation valve open and its circuit breaker open,

b. An indicated borated water volume of between ~~6545~~ 6520 and ~~6685~~ 6820 gallons,

c. A boron concentration of between 1950 and 2350 ppm,

d. A nitrogen cover-pressure of between 600 and 675 psig, and

e. A water level and pressure channel OPERABLE.

APPLICABILITY: MODES 1, 2, and 3*.

ACTION:

a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within 4 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.

b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in at least HOT STANDBY within 6 hours and reduce pressurizer pressure to less than 1000 psig within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.1.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1) Verifying the indicated borated water volume and nitrogen cover-pressure in the tanks, and

2) Verifying that each accumulator isolation valve is open by control room indication (power may be restored to the valve operator to perform this surveillance if redundant indicator is inoperable).

*Pressurizer pressure above 1000 psig.

Attachment 2

Safety Evaluation

Introduction

This request revises Technical Specification 3/4.5.1, "Accumulators, Limiting Condition for Operation". The proposed license amendment will revise item 3.5.1.b of Specification 3/4.5.1. The existing specification requires that the indicated borated water volume in the accumulators be between 6545 and 6665 gallons. The proposed change increases the operating band of the indicated borated water volume to between 6520 gallons and 6820 gallons providing additional margin in the allowable accumulator water volume.

Impact of the Proposed Technical Specification Change on the Final Safety Analysis Report

A review of the FSAR safety analyses was performed to assess the effects of the proposed Technical Specification change and determine the need for re-analysis. Based on the review performed, re-analysis is not required. An evaluation of the events which could be potentially impacted by the proposed Technical Specification change was performed and is presented below.

Large Break Loss of Coolant Accident
FSAR Chapter 14.3.2

The Turkey Point Units 3 and 4 FSAR large break LOCA analyses of record, which forms the licensing basis for the Turkey Point Units, was performed with the 1981 Large Break LOCA Evaluation Model using the Best Estimate Analysis of Reflood Transients (BART) model. This analysis was performed assuming that each accumulator tank contained a minimum water volume of 6545 gallons (875 ft^3). The analysis did not take credit for the accumulator water stored in the piping run between the accumulator tank and the first check valve. The as-built data of the Turkey Point Units indicates the minimum line volume of the accumulator line (tank to first check valve) is approximately 10 ft^3 (~ 74.8 gallons). Explicitly accounting for this additional volume would allow for a reduction in the Technical Specification minimum volume to 6520 gallons (872 ft^3) in each of the accumulator tanks.

The ratio of accumulator water volume to total tank volume is proportional to the amount of force (per volume of water) necessary to expel the accumulator water. The effects of increasing the technical specification maximum accumulator water volume from 6665 gallons (891 ft^3) to a value of 6820 gallons (912 ft^3) can be compensated for by considering the ability of the accumulator cover gas pressure to provide for the increased force necessary to discharge the increased accumulator contents. The cover gas pressure of the accumulators assumed in the large break (LOCA) analysis of the Turkey Point Units was 600 psig, which is determined to be sufficient pressure to discharge the additional water. Additionally, even though not required, Turkey Point Procedure 3(4)-OP-064 specifies the operating pressure to be maintained at a minimum of 625 psig. This increased cover gas pressure allows for a more rapid discharge of the accumulators resulting in earlier filling of the downcomer thereby providing an additional driving head to reflood the core. Since the downcomers of the Turkey Point Units as analyzed do not fill completely during the accumulator injection phase of the large break transient, an additional water volume in the accumulator would contribute to an additional driving head in the downcomer. This additional downcomer water volume would provide better core reflood and an expected unquantified small benefit in reducing peak clad temperatures. Therefore, the conclusions regarding the consequences of the large break LOCA as reported in Chapter 14.3.2 of the Turkey Point Units 3 and 4 FSAR remain valid for the proposed Technical Specification change.

Small Break Loss of Coolant Accident
FSAR Chapter 14.3.2

The FSAR small break LOCA analysis for the Turkey Point Units was performed using the NRC approved October 1975 Westinghouse Small Break LOCA Evaluation Model with the WFLASH computer code.

Similar to the large break LOCA analysis, the licensing basis small break LOCA analysis was performed assuming that each accumulator tank contained a minimum water volume of 6545 gallons (875 ft^3). The small break analysis does not take credit for the accumulator water stored in the piping run between the accumulator tank and the first check valve. As such, the argument supplied above with respect to a reduction in the minimum Technical Specification water volume applies to the small break LOCA evaluation as well. Furthermore, it is given that at the time at which the small break peak clad temperature occurs, there is substantially more than 10.0 ft^3 remaining in the tanks such that the accumulator injection rate remains unaffected during the small break LOCA transient. Thus, more than enough water volume is available in the analysis to account for the proposed reduction in the accumulator water volume Technical Specification.

The effect of having more water in the accumulator tanks than the current Technical Specification maximum can be evaluated by noting that the accumulators do not empty during the small break transient. Thus the addition of 180 gallons (~ 24 ft^3) to the inventory of the accumulators will have an insignificant effect on the small break transient peak clad temperature. The conclusions regarding the consequences of the small break LOCA as reported in Chapter 14.3.2 of the Turkey Point Units 3 and 4 FSAR remain valid for the proposed Technical Specification change.

Post-LOCA Long Term Core Cooling
FSAR Chapter 14.3.2

The Westinghouse licensing position for satisfying the requirements of 10CFR Part 50, Section 50.46, Paragraph (b), Item (5); "Long Term Cooling", is defined in WCAP-8339 (pp. 4-22). The Westinghouse commitment is that the reactor will remain shutdown by borated Emergency Core Cooling System (ECCS) water residing in the sump post-LOCA (Westinghouse Technical Bulletin NSID-TB-86-08, "Post-LOCA Long Term Cooling: Boron Requirements", October 31, 1986). Since credit for the control rods is not taken for large break LOCA the borated ECCS water provided by the accumulators and the Refueling Water Storage Tank (RWST) must have a concentration that, when mixed with other sources of borated and non-borated water, will result in the reactor core remaining subcritical assuming all control rods out.

The proposed reduction in volume (mass) of highly borated accumulator water will reduce the overall boron concentration in the containment sump following a postulated large break LOCA. Conversely, the proposed increase in the water volume (mass) of highly borated accumulator water will increase the overall boron concentration in the containment sump following a postulated large break LOCA. As the evaluation performed to assess the long term core cooling capability of the ECCS is based upon a minimum value of 875 ft^3, an evaluation of the previous cycle's reactivity and criticality requirements in consideration of a reduction in the accumulator volume to 865 ft^3, has shown that the effect of the proposed volume reduction on boron concentration is not significant. The sump boron concentration would still be sufficient to ensure that the core could be maintained subcritical during long term recirculation. Thus the proposed change in the Technical Specification range of allowable accumulator water volume results in a negligible change (<0.1%) in the margin to the limits. Therefore, the requirement for Post-LOCA long term core cooling remains satisfied for the proposed change in the Technical Specifications accumulator water level band.

LOCA Hydraulic Forcing Functions
FSAR Chapter 14.3.3

The blowdown hydraulic forcing functions resulting from a postulated loss-of-coolant accident are considered in Chapter 14.3.3 of the Turkey Point Units 3 and 4 FSAR. This section addresses the postulated dynamic effects of a pipe rupture on the reactor coolant system and serves as a basis for the dynamic analysis of the reactor pressure vessel for postulated loss-of-coolant accidents and of the reactor internals under faulted conditions. At the time at which the peak hydraulic forcing functions are calculated, the Reactor Coolant System (RCS) pressure is still substantially higher than the accumulator injection pressure. Thus the proposed changes in the accumulator water volume at the Turkey Point Units will not affect the results of the blowdown hydraulic forcing function analysis as given in the Turkey Point Units 3 and 4 FSAR.

Hot Leg Switchover to Prevent Potential Boron Precipitation
FSAR Chapter 6.2

Post-LOCA hot leg recirculation switchover time is determined for inclusion in the emergency operating procedures and is calculated to ensure that no boron precipitation occurs in the reactor vessel following the initiation of boiling in the core. The time at which switchover occurs is dependent upon the core power history, the RCS, RWST, and accumulator water volumes and boron concentrations. This input is similar to that used in the calculation of the sump boron concentration except that the boron concentrations and water volumes are assumed to be at a maximum. A review of the calculations supporting this analysis reveals that the proposed increase in the Technical Specification limits of the accumulator water volume does not significantly affect the hot leg switchover time.

Steam Generator Tube Rupture
FSAR Chapter 14.2.4

The FSAR analysis of the steam generator tube rupture (SGTR) accident is performed to ensure that the off-site radiation doses remain below the limits established in 10 CFR 100.

A design basis steam generator tube rupture accident assumes that the safety injection (SI) signal is initiated automatically on a low pressurizer pressure signal. Since the observed equilibrium RCS pressure is above the set pressure for accumulator injection, flow from the accumulators does not occur in the SGTR accident analysis. Therefore, the proposed changes in the accumulator water volume Technical Specifications at the Turkey Point Units will not affect the results of the steam generator tube rupture analysis as given in the Turkey Point Units 3 and 4 FSAR.

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Conclusion

The evaluations presented above address the proposed operation of the Turkey Point Units with the accumulator water volume between 6520 gallons and 6820 gallons as defined by the proposed technical specification change for Turkey Point Units 3 and 4. The evaluations presented here have demonstrated that the results and conclusions of the safety analyses used to license the current operation of the Turkey Point Units will remain valid in consideration of the proposed change in the Technical Specification band on accumulator water volume.

ATTACHMENT 3

Determination of No Significant Hazards Consideration

The standards used to arrive at a determination that a request for amendment involves no significant hazards consideration are included in the Commission's regulation 10 CFR 50.92, which states that no significant hazards considerations are involved if the operation of the facility in accordance with the proposed change 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 form any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. Each standard is discussed as follows:

1. The effect of increasing and decreasing the water volume of the accumulator does not increase the probability or consequence of an accident previously evaluated in the FSAR. No new performance requirements are being imposed on any system or component such that any design criteria will be exceeded. The accumulator volume is not an initiator for any of the postulated FSAR accidents analyzed. As such, increasing the band on the accumulator water volume will have no effect on the probability of occurrence of any accident.

   With respect to the LOCA accidents, the mass/energy analyses are unaffected by the change to the band on the accumulator water volume. The evaluations to determine the effects of changing the band on the accumulator water volume have shown that the design basis conclusions are met. The proposed change to the accumulator water volume will not change, degrade or prevent actions described in, or assumed to occur in, the mitigation of any FSAR accident. As such, the conclusion presented in the FSAR remain valid such that no more severe radiological consequences will result.

2. The change to the accumulator water volume does not create the possibility of an accident which is different than any already evaluated in the FSAR. The proposed change does not result in any physical change to the plant or method of operating the plant from that allowed by the Technical Specifications. No new failure modes have been defined for any system or component nor has any new limiting single failure been identified. Therefore, the proposed change to the accumulator water volume does not create the possibility of a new or different kind of accident.

3. The evaluation for changing the accumulator water volume has taken into account the applicable technical specifications and has bounded the conditions under which the specifications permit operation. It has been determined that the acceptance criteria are still met for the safety analyses. The results, as presented in the FSAR, remain bounding. Therefore, the margin of safety, as defined in the basis to the Technical Specifications, is not reduced.

Conclusion

Based on the above, it has been determined that the proposed change to the band on the accumulator water volume at Turkey Point Units 3 and 4 does 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. Therefore, it is concluded that the proposed changes meet the requirements of 10 CFR 50.92 (c) and do not involve a significant hazards consideration.