HOT STANDBY

LIMITING CONDITION FOR OPERATION

3.4.1.2 All three Reactor Coolant Loops listed below shall be OPERABLE and in operation when the rod control system is operational or at least two Reactor Coolant Loops listed below shall be OPERABLE with one Reactor Coolant Loop in operation when the rod control system is disabled by opening the Reactor Trip Breakers or shutting down the rod drive motor/generator sets:*

1. Reactor Coolant Loop A and its associated steam generator and Reactor Coolant pump,
2. Reactor Coolant Loop B and its associated steam generator and Reactor Coolant pump,
3. Reactor Coolant Loop C and its associated steam generator and Reactor Coolant pump.

APPLICABILITY: MODE 3

ACTION:

a. With less than the above required Reactor Coolant loops OPERABLE, restore the required loops to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.

b. With less than three Reactor Coolant loops in operation and the rod control system operational, within 1 hour open the Reactor Trip Breakers or shut down the rod drive motor/generator sets.

c. With no Reactor Coolant loops in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.2.1 At least the above required Reactor Coolant pumps, if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.2.2 The required Reactor Coolant loop(s) shall be verified to be in operation and circulating Reactor Coolant at least once per 12 hours.

4.4.1.2.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side water level to be greater than or equal to 10% of wide range indication at least once per 12 hours.

*All Reactor Coolant pumps may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with all Reactor Coolant loops in operation, and maintain DNBR above 1.30 during all normal operations and anticipated transients. In MODES 1 and 2 with one Reactor Coolant loop not in operation this specification requires that the plant be in at least HOT STANDBY within 1 hour.

In MODE 3, three reactor coolant loops provide sufficient heat removal capability for removing core heat even in the event of a bank withdrawal accident; however, a single reactor coolant loop provides sufficient decay heat removal capacity if a bank withdrawal accident can be prevented; i.e., by opening the Reactor Trip Breakers or shutting down the rod drive motor/generator sets. When a bank withdrawal accident can be prevented, single failure considerations require that two loops be OPERABLE at all times.

In MODE 4, a single reactor coolant or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

In MODE 5, single failure considerations require two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more Reactor Coolant System cold legs less than or equal to 310°F are provided to prevent Reactor Coolant System pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10CFR Part 50. The Reactor Coolant System will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the Reactor Coolant Pumps to when the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures.

LIMITING CONDITION FOR OPERATION

3.4.1.2 All three Reactor Coolant Loops listed below shall be OPERABLE and in operation when the rod control system is operational or at least two Reactor Coolant Loops listed below shall be OPERABLE with one Reactor Coolant Loop in operation when the rod control system is disabled by opening the Reactor Trip Breakers or shutting down the rod drive motor/generator sets:*

1. Reactor Coolant Loop A and its associated steam generator and Reactor Coolant pump,
2. Reactor Coolant Loop B and its associated steam generator and Reactor Coolant pump,
3. Reactor Coolant Loop C and its associated steam generator and Reactor Coolant pump.

APPLICABILITY: MODE 3

ACTION:

a. With less than the above required Reactor Coolant loops OPERABLE, restore the required loops to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.

b. With less than three Reactor Coolant loops in operation and the rod control system operational, within 1 hour open the Reactor Trip Breakers or shut down the rod drive motor/generator sets.

c. With no Reactor Coolant loops in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required coolant loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.2.1 At least the above required Reactor Coolant pumps, if not in operation, shall be determined to be OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.2.2 The required Reactor Coolant loop(s) shall be verified to be in operation and circulating Reactor Coolant at least once per 12 hours.

4.4.1.2.3 The required steam generator(s) shall be determined OPERABLE by verifying secondary side water level to be greater than or equal to 10% of wide range indication at least once per 12 hours.

*All Reactor Coolant pumps may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration, and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with all Reactor Coolant loops in operation, and maintain DNBR above 1.30 during all normal operations and anticipated transients. In MODES 1 and 2 with one Reactor Coolant loop not in operation this specification requires that the plant be in at least HOT STANDBY within 1 hour.

In MODE 3, three reactor coolant loops provide sufficient heat removal capability for removing core heat even in the event of a bank withdrawal accident; however, a single reactor coolant loop provides sufficient decay heat removal capacity if a bank withdrawal accident can be prevented; i.e., by opening the Reactor Trip Breakers or shutting down the rod drive motor/generator sets. When a bank withdrawal accident can be prevented, single failure considerations require that two loops be OPERABLE at all times.

In MODE 4, a single reactor coolant or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

In MODE 5, single failure considerations require two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more Reactor Coolant System cold legs less than or equal to 310°F are provided to prevent Reactor Coolant System pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10CFR Part 50. The Reactor Coolant System will be protected against overpressure transients and will not exceed the limits of Appendix G by either (1) restricting the water volume in the pressurizer and thereby providing a volume for the primary coolant to expand into, or (2) by restricting starting of the Reactor Coolant Pumps to when the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold leg temperatures.

Attachment 2

SIGNIFICANT HAZARDS EVALUATION PURSUANT TO 10CFR50.92 FOR THE PROPOSED CHANGE TO THE REACTOR COOLANT LOOP OPERABILITY TECHNICAL SPECIFICATIONS

Proposed Change

Revise Technical Specification 3.4.1.2 to require all three reactor coolant loops to be operating in Mode 3 if the rod control system is operational or at least two reactor coolant loops to be operable with one reactor coolant loop in operation when the rod control system is disabled by opening the reactor trip breakers or shutting down the rod drive motor generator sets.

Background

The Technical Specifications for Farley Nuclear Plant (FNP) Units 1 and 2 currently require only a single reactor coolant loop to be operating while the plant is in Mode 3. This requirement ensures adequate capability for decay heat removal. In addition, a second reactor coolant loop is required to be operable for single failure considerations. However, the FNP FSAR safety analyses assumed that the Mode 2 analysis for the rod bank withdrawal accident enveloped the Mode 3 conditions. The FNP FSAR safety analysis and Technical Specifications are based on all three reactor coolant loops operating in Mode 2 for this accident. As a result, since all three reactor coolant loops are required to be operating in Mode 2, all three loops must be operating in Mode 3 to satisfy the analysis for the rod bank withdrawal accident or the rod control system must be disabled to ensure that this accident cannot occur.

In order to preclude the possibility of a Mode 3 rod bank withdrawal accident with less than three reactor coolant loops operating, Alabama Power Company has implemented FNP procedures which require the operator to disable the rod control system for rod withdrawal when less than three reactor coolant loops are operating in Mode 3. The disabling of the rod control system may be accomplished by opening the reactor trip breakers or shutting down the rod drive motor/generator sets. These procedural requirements ensure that the plant is operated in a manner that is bounded by the FNP FSAR safety analysis.

The FNP Mode 3 safety analyses for the rod ejection and steamline break events require only one reactor coolant loop to be operating. Therefore, if the occurrence of a rod bank withdrawal accident can be prevented, current Technical Specification requirements are adequate. This proposed Technical Specification change will prevent the occurrence of a rod bank withdrawal with less than three reactor coolant loops operating by requiring that the rod control system be disabled when less than three reactor coolant loops are operating. When the rod control system is operational and the plant is in Mode 3, all three reactor coolant loops will be required to be operating. This will ensure that the DNB design basis for the rod bank withdrawal accident from subcritical conditions will be met.

References:

(1) Joseph M. Farley Nuclear Plant - Unit 1 and Unit 2 FSAR Update
(2) Joseph M. Farley Nuclear Plant - Unit 1 Technical Specifications
(3) Joseph M. Farley Nuclear Plant - Unit 2 Technical Specifications

Analysis:

Alabama Power Company has reviewed the requirements of 10CFR50.92 as they relate to the proposed change to the reactor coolant loop operability requirements for Mode 3 operation and considers the proposed change not to involve a significant hazards consideration. In support of this conclusion the following analysis is provided:

(1) The proposed change will not significantly increase the probability or consequences of an accident previously evaluated because the change will ensure that the FSAR analysis for the rod bank withdrawal accident in Mode 2 will envelope the Mode 3 conditions as assumed in the FSAR safety analysis.

(2) The proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated because the change will ensure that plant operation is consistent with the FSAR safety analyses.

(3) The proposed change will not involve a significant reduction to the margin of safety because the change will ensure that the conservatisms assumed in the FSAR safety analyses are maintained.

Conclusion:

Based upon the analysis provided herewith, Alabama Power Company has determined that the proposed Technical Specification change will not significantly increase the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety. Therefore, Alabama Power Company has determined that the proposed change meets the requirements of 10CFR50.92(c) and does not involve a significant hazards consideration.

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