Attachment

Revised Technical Specifications Bases Pages

North Anna Units 1 and 2

3/4.1.2 BORATION SYSTEMS (Continued)

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from expected operating conditions of 1.77% Δk/k after xenon decay and cooldown to 200°F. This expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 6,000 gallons of 12,950 ppm borated water from the boric acid storage tanks or 54,200 gallons of 2300 ppm borated water from the refueling water storage tank.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 235°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATION and positive reactivity change in the event the single injection system becomes inoperable.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.77% Δk/k after zenon decay and cooldown from 200°F to 140°F. This condition requires either 1378 gallons of 12,950 ppm borated water from the boric acid storage tanks or 3400 gallons of 2300 ppm borated water from the refueling water storage tank.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics. The OPERABILITY of one boron injection system during REFUELING insures that this system is available for reactivity control while in MODE 6.

ECCS SUBSYSTEMS (Continued)

With the RCS temperature below 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The limitation for a maximum of one charging pump and one low head safety injection pump to be OPERABLE and the Surveillance Requirement to verify that a maximum of one charging pump and one low head safety injection pump is capable of injecting into the RCS below 235°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained.

In the event of modifications to an ECCS subsystem that could alter the subsystem flow characteristics, a flow balance test shall be performed. The flow balance test criteria are established based on the system performance assumed in the safety analysis (minimum flow limit) and on HHSI pump runout protection (maximum flow limit). In performing the flow balance, the effects of flow measurement instrument uncertainties accounting for system configuration and the variability between installed pumps must be properly considered.

Numerical acceptance criteria for the flow balance test are specified in surveillance test procedure. These criteria are established based on the following considerations:

1) The total injected flow to the core (assuming spillage of the branch line with the highest flow) must meet or exceed that assumed in the safety analysis. The limiting safety analysis is the loss of coolant accident (LOCA) analysis. This criterion may vary, particularly since the inputs to the safety analysis controlled by LCO 6.9.1.7 may vary with reload cycle. The safety analysis flow requirements are thus established by the currently applicable LOCA analysis which has demonstrated compliance with the ECCS acceptance limits of 10 CFR 50.46.

2) The total pumped flow must be less than the HHSI pump runout limit. This flow varies with the specific HHSI pump assumed to operate during the accident. Since the HHSI pumps also function as normal charging pumps, their characteristics, including runout limits, will vary over service life.

3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, 5) associated heat tracing systems, and 6) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200°F, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN MARGIN from expected operation conditions of 1.77% delta k/k after xenon decay and cooldown to 200°F. The maximum expected boration capability requirement occurs at EOL from full power equilibrium xenon conditions and requires 6000 gallons of 12,950 ppm borated water from the boric acid storage tanks or 54,200 gallons of 2300 ppm borated water from the refueling water storage tank.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 270°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.77% delta k/k after zenon decay and cooldown from 200°F to 140°F. This condition requires either 1378 gallons of 12,950 ppm borated water from the boric acid storage tanks or 3400 gallons of 2300 ppm borated water from the refueling water storage tank.

ECCS SUBSYSTEMS (Continued)

With the RCS temperature below 350°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The limitation for a maximum of one charging pump and one low head safety injection pump to be OPERABLE and the Surveillance Requirement to verify that a maximum of one charging pump and one low head safety injection pump is capable of injecting into the RCS below 270°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

Having more than one charging pump OPERABLE during pump switching operations is allowed. This is acceptable based on pump switching being a momentary action under the direct administrative control of a licensed operator. Rendering a charging pump inoperable for this requirement may be accomplished by methods such as placing the control switch in the pull-to-lock position, tagging of the power supply breaker, or closing of the pump discharge valve. If the pump discharge valve is used to render a pump inoperable during solid water operation, the valve will be deenergized and tagged in the closed position.

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