

ENCLOSURE 1

PROPOSED TECHNICAL SPECIFICATION CHANGE

BROWNS FERRY NUCLEAR PLANT

TVA BFN TS-321

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LIST OF EFFECTIVE PAGES

BFN TS-321

UNIT 1

3.6/4.6-12

UNIT 2

3.6/4.6-12

UNIT 3

3.6/4.6-12



3.6.F Recirculation Pump Operation

1. The reactor shall not be operated with one recirculation loop out of service for more than 24 hours. With the reactor operating, if one recirculation loop is out of service, the plant shall be placed in a HOT SHUTDOWN CONDITION within 24 hours unless the loop is sooner returned to service.
2. Following one pump operation, the discharge valve of the low speed pump may not be opened unless the speed of the faster pump is less than 50% of its rated speed.
3. Steady-state operation with both recirculation pumps out-of-service for up to 12 hours is permitted. During such interval restart of the recirculation pumps is permitted, provided the loop discharge temperature is within 75°F of the saturation temperature of

4.6.E. Jet Pumps

2. Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating, the diffuser to lower plenum differential pressure shall be checked daily and the differential pressure of an individual jet pump in a loop shall not vary from the mean of all jet pump differential pressures in that loop by more than 10%.

4.6.F Recirculation Pump Operation

1. Recirculation pump speeds shall be checked and logged at least once per day.
2. No additional surveillance required.
3. Before starting either recirculation pump during steady-state operation, check and log the loop discharge temperature and dome saturation temperature.



LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.6.F Recirculation Pump Operation

1. The reactor shall not be operated with one recirculation loop out of service for more than 24 hours. With the reactor operating, if one recirculation loop is out of service, the plant shall be placed in a HOT SHUTDOWN CONDITION within 24 hours unless the loop is sooner returned to service.
2. Following one pump operation, the discharge valve of the low speed pump may not be opened unless the speed of the faster pump is less than 50% of its rated speed.
3. When the reactor is not in the RUN mode, REACTOR POWER OPERATION with both recirculation pumps out-of-service for up to 12 hours is permitted. During such interval, restart of the recirculation pumps is permitted, provided the loop discharge temperature is within 75°F of the saturation temperature of the reactor

4.6.E. Jet Pumps

2. Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating, the diffuser to lower plenum differential pressure shall be checked daily and the differential pressure of an individual jet pump in a loop shall not vary from the mean of all jet pump differential pressures in that loop by more than 10%.

4.6.F. Recirculation Pump Operation

1. Recirculation pump speeds shall be checked and logged at least once per day.
2. No additional surveillance required.
3. Before starting either recirculation pump during REACTOR POWER OPERATION, check and log the loop discharge temperature and dome saturation temperature.



LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.6.F Recirculation Pump Operation

1. The reactor shall not be operated with one recirculation loop out of service for more than 24 hours. With the reactor operating, if one recirculation loop is out of service, the plant shall be placed in a HOT SHUTDOWN CONDITION within 24 hours unless the loop is sooner returned to service.
2. Following one-pump operation, the discharge valve of the low speed pump may not be opened unless the speed of the faster pump is less than 50% of its rated speed.
3. Steady-state operation with both recirculation pumps out-of-service for up to 12 hours is permitted. During such interval restart of the recirculation pumps is permitted, provided the loop discharge temperature is within 75°F of the saturation temperature of

4.6.E. Jet Pumps

2. Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating, the diffuser to lower plenum differential pressure shall be checked daily and the differential pressure of an individual jet pump in a loop shall not vary from the mean of all jet pump differential pressures in that loop by more than 10%.

4.6.F Recirculation Pump Operation

1. Recirculation pump speeds shall be checked and logged at least once per day.
2. No additional surveillance required.
3. Before starting either pump during steady-state operation, check and log the loop discharge temperature and dome saturation temperature.



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## ENCLOSURE 2

## BROWNS FERRY NUCLEAR PLANT

## DESCRIPTION AND JUSTIFICATION FOR THE PROPOSED CHANGES

Summary of Changes for Units 1, 2 and 3

Change existing Surveillance Requirement 4.6.E.2 for Jet Pumps as follows:

Existing 4.6.E.2 reads:

"Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating with the equalizer valve closed, the diffuser to lower plenum differential pressure shall . . . "

Proposed 4.6.E.2 reads:

"Whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump is operating, the diffuser to lower plenum differential pressure shall . . . "

Reason for the Changes

The phrase "with the equalizer valve closed" is not needed in Surveillance Requirement 4.6.E.2. One of the equalizer valves is closed at all times and motive power to the valves is disconnected. The effect of deleting this phrase will require the jet pump surveillance to be performed whenever there is recirculation flow with the reactor in the STARTUP or RUN Mode and one recirculation pump operating. The performance of Surveillance Requirement 4.6.E.2 on the Jet Pumps will no longer be connected to equalizer valve position.

Also, due to cracking problems in the weld zones of the original recirculation piping, the original recirculation ring headers and riser piping are being replaced with new piping on Unit 3 and plans are for replacement on Unit 1 prior to its restart. Unit 2 welds are being monitored and replacement of recirc piping will be performed, if necessary. The existing two equalizer valves and connecting piping between the two recirculation loops will be removed as a part of this piping replacement program for the units that are affected. With the removal of the recirculation equalizer valves from the plant, reference to these valves in the technical specifications will not be required.



## ENCLOSURE 2

## BROWNS FERRY NUCLEAR PLANT

## DESCRIPTION AND JUSTIFICATION FOR THE PROPOSED CHANGES

Justification for the Proposed Changes

The reactor recirculation system consists of two recirculation pump loops external to the reactor vessel which provide the driving flow of water to the reactor vessel jet pumps. The equalizer valves are installed in the crosstie line between the two recirculation loops. During normal operations, one of the two valves is closed and the other is open, with valve operator power removed from both valves. This valve arrangement prevents pressure buildup between the valves due to ambient and conductive heating of the water. The equalizer valves were incorporated into the original recirculation system design to address concerns associated with the loss of a recirculation pump. The loss of a recirculation pump would lead to reduced flow through the reactor core. The original design of the recirculation system would allow the opening of the equalizer valves to permit one recirculation pump to supply water to both loops and thereby increase the reactor power by providing greater core flow. However, it later turned out that for plants having Byron Jackson recirculation pumps (like Browns Ferry), the pumps could not reliably operate under the increased flow conditions because of load limitations of the hydrostatic bearings. Since the recirculation equalizing line cannot be used at Browns Ferry, it is being deleted during the planned replacement of the original recirculation ring header and riser piping on Units 1 and 3. Due to cracking problems in the weld zones of the original recirculation piping, the original ring header and riser piping are being replaced on Unit 3 and plans are for replacement on Unit 1 prior to its restart. For Unit 2, replacement of the recirculation piping is dependent on the condition of the piping welds which are being monitored. The new ringheader and riser pipes incorporate fewer welds than the existing piping and are made from nuclear grade 316 stainless steel instead of the 304 stainless steel used in the original piping. The nuclear grade 316 stainless steel is more resistant to inter-granular stress corrosion cracking than the 304 stainless steel.

## ENCLOSURE 3

## BROWNS FERRY NUCLEAR PLANT (BFN)

PROPOSED DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONDescription of Proposed Technical Specification Amendment

The proposed technical specification change applies to BFN Units 1, 2 and 3. The proposed change will delete reference to the recirculation system equalizer valves in Surveillance Requirement 4.6.E.2.

Basis For Proposed No Significant Hazards Consideration Determination

The NRC has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92(c). A proposed amendment to an operating license involves no significant hazards consideration if 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.

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The deletion of the Technical Specification reference to the recirculation equalizer valves will clarify present requirements by removing an unnecessary restriction on performance of Surveillance Requirement 4.6.E.2 on jet pump differential pressure. This restriction is unnecessary since BFN does not use the equalizer lines or valves, one valve of the two stays closed, and motive power to the valves is removed. The frequency of performance of Surveillance Requirement 4.6.E.2 is not modified by the proposed change.

During normal plant operation, one equalizer valve between the two recirculation loops is closed and the other redundant valve is open with no power supply to operate the valves. As such, the deletion of the equalizer valves does not change system function during normal plant operation. These valves do not provide a safe shutdown function other than reactor coolant pressure boundary integrity.



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## ENCLOSURE 3

## BROWNS FERRY NUCLEAR PLANT (BFN)

PROPOSED DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONBasis For Proposed No Significant Hazards Consideration Determination (Continued)

When the new recirculation system ringheaders and risers are installed on Units 1 and 3 (and potentially on Unit 2), the hydraulic characteristics of the system will change. A calculation was performed to analyze the thermal and hydraulic effects of the new recirculation system configuration. The analysis concludes that the new design produces no change to the overall external loop resistance and slightly changes the flow distribution to the jet pumps. The lower plenum provides mixing such that the small change in flow distribution to the jet pumps has no effect on core flow distribution and therefore will not affect reactor core parameters. Since the new design does not change the external loop flow resistance, the recirculation flow capability is not affected by this design change. There are also no affects on the other modes of cooling provided through the recirculation system, i.e., Low Pressure Coolant Injection and Residual Heat Removal shutdown cooling.

2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The existing recirculation equalizer valves and equalizer line are not assumed to function during an accident and do not perform any accident mitigation functions. The deletion of these components will not affect normal system operation or operation during accident conditions, since the equalizer line is normally closed with motive power removed from the equalizer valves. The proposed change to the technical specifications clarifies system configuration without changing system operability or surveillance requirements from the provisions currently in use at BFN. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed change does not involve a significant reduction in a margin of safety.

The proposed change to the technical specifications will not change the method or reduce the frequency of performance of Surveillance Requirement 4.6.E.2.



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## ENCLOSURE 3

## BROWNS FERRY NUCLEAR PLANT (BFN)

PROPOSED DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONBasis For Proposed No Significant Hazards Consideration Determination (Continued)

The proposed change to the technical specifications will reflect system configuration after removal of the equalizer line and replacement of the recirculation system ringheaders and risers on Units 1 and 3 (and potentially on Unit 2). The present operating configuration has one equalizer valve closed on each unit, with motive power removed. Since the equalizer line is not presently used, the deletion of the equalizer lines during the ringheader replacement does not change system lineup or intended use.

The replacement recirculation system piping for the affected BFN Units does change the hydraulic characteristics of the system. Analysis concludes that the new design produces no change to the overall external loop resistance and slightly changes the flow distribution to the jet pumps. The small change in flow distribution to the jet pumps has no effect on core flow distribution and does not affect reactor core parameters.

Since present technical specification requirements for operability are maintained by the proposed change, there is no significant reduction in any margin of safety.