Attachment 2

Mark-up of Technical Specifications Changes

Surry Power Station
Units 1 and 2
Virginia Electric and Power Company

b. Before opening the hot leg loop stop valve.

1) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration in the active loops. Verification of this condition shall be completed within 2 hours prior to opening the hot leg stop valve in the isolated loop.

c. Before opening the cold leg loop stop valve.

1) The hot leg loop stop valve shall be open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm.

2) The cold leg temperature of the isolated loop shall be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. Verification of this condition shall be completed within 30 minutes prior to opening the cold leg stop valve in the isolated loop.

3) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration in the active loops. Verification of this condition shall be completed after relief line flow for at least 90 minutes at greater than or equal to 125 gpm and within 2 hours prior to opening the cold leg stop valve in the isolated loop.

5. Whenever an isolated and drained reactor coolant loop is filled from the active volume of the RCS, the following conditions shall be met:

a. The isolated loop shall be drained. Verification of this condition shall be completed within (4) hours prior to partially opening the hot or cold leg stop valve in the isolated loop.

b. The Reactor Coolant System level shall be at least 18 ft. during opening of the loop stop valves and during the filling of the isolated loop. If Reactor Coolant System level is not maintained at 18 ft. or above, the loop stop valves shall be closed.

The limiting conditions for returning an isolated and filled loop to service are as follows:

a. A hot leg loop stop valve may not be opened unless the boron concentration in the isolated loop is greater than or equal to the boron concentration in the active portion of the Reactor Coolant System.

b. A cold leg loop stop valve can not be opened unless the hot leg loop stop valve is open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm. In addition, the cold leg temperature of the isolated loop must be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. The boron concentration in the isolated loop must be verified to be greater than or equal to the boron concentration in the active portion of the Reactor Coolant System.

c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition during hot or cold leg stop valve opening and during relief line flow.

If an isolated loop is initially drained, the above requirements are not applicable. An initially isolated and drained loop may be returned to service by partially opening the loop stop valves and filling the loop in a controlled manner from the Reactor Coolant System. ~~Prior to partially opening the loop stop valves,~~ the following measures are required to ensure that no sudden positive reactivity addition or loss of Reactor Coolant System inventory occurs during the backfill evolution:

INSERT 'A'

a. The isolated loop is verified to be drained, thus preventing dilution of Reactor Coolant System boron concentration by liquid present in the loop.

b. Reactor Coolant System level is verified to be ≥18' elevation to ensure Reactor Coolant System inventory is maintained for decay heat removal. Reactor Coolant System inventory is required to be maintained at ≥18' elevation during the backfill evolution. In addition, the filling evolution is limited to one isolated loop at a time.

c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition.

Insert A – insert as noted in TS 3.17 Basis and UFSAR Section 4.2.2.8

If using blended flow as the makeup source, the blended makeup flow from the Boric Acid Storage Tank and Primary Grade Water Storage Tank is periodically sampled during the backfill evolution to ensure its boron concentration meets the minimum refueling water boron concentration requirement established by Technical Specification 3.10.A.9. Makeup to the Reactor Coolant System solely through auxiliary spray during the backfill evolution is prohibited to ensure that a sufficient fraction of makeup flow is mixed with coolant in the active Reactor Coolant System volume and flows through the core, where the source range instrumentation is available to provide secondary indication of improperly blended makeup flow. The vacuum-assisted backfill evolution involves initiation of reactor coolant pump seal injection in the isolated and drained loop to allow establishment of a partial vacuum prior to partially opening the loop stop valve.

Attachment 3

Proposed Technical Specifications Changes

Surry Power Station
Units 1 and 2
Virginia Electric and Power Company

b. Before opening the hot leg loop stop valve.

1) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration in the active loops. Verification of this condition shall be completed within 2 hours prior to opening the hot leg stop valve in the isolated loop.

c. Before opening the cold leg loop stop valve.

1) The hot leg loop stop valve shall be open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm.

2) The cold leg temperature of the isolated loop shall be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. Verification of this condition shall be completed within 30 minutes prior to opening the cold leg stop valve in the isolated loop.

3) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration in the active loops. Verification of this condition shall be completed after relief line flow for at least 90 minutes at greater than or equal to 125 gpm and within 2 hours prior to opening the cold leg stop valve in the isolated loop.

5. Whenever an isolated and drained reactor coolant loop is filled from the active volume of the RCS, the following conditions shall be met:

a. The isolated loop shall be drained. Verification of this condition shall be completed within 4 hours prior to partially opening the hot or cold leg stop valve in the isolated loop.

b. The Reactor Coolant System level shall be at least 18 ft. during opening of the loop stop valves and during the filling of the isolated loop. If Reactor Coolant System level is not maintained at 18 ft. or above, the loop stop valves shall be closed.

The limiting conditions for returning an isolated and filled loop to service are as follows:

a. A hot leg loop stop valve may not be opened unless the boron concentration in the isolated loop is greater than or equal to the boron concentration in the active portion of the Reactor Coolant System.

b. A cold leg loop stop valve can not be opened unless the hot leg loop stop valve is open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm. In addition, the cold leg temperature of the isolated loop must be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. The boron concentration in the isolated loop must be verified to be greater than or equal to the boron concentration in the active portion of the Reactor Coolant System.

c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition during hot or cold leg stop valve opening and during relief line flow.

If an isolated loop is initially drained, the above requirements are not applicable. An initially isolated and drained loop may be returned to service by partially opening the loop stop valves and filling the loop in a controlled manner from the Reactor Coolant System. If using blended flow as the makeup source, the blended makeup flow from the Boric Acid Storage Tank and Primary Grade Water Storage Tank is periodically sampled during the backfill evolution to ensure its boron concentration meets the minimum refueling water boron concentration requirement established by Technical Specification 3.10.A.9. Makeup to the Reactor Coolant System solely through auxiliary spray during the backfill evolution is prohibited to ensure that a sufficient fraction of makeup flow is mixed with coolant in the active Reactor Coolant System volume and flows through the core, where the source range instrumentation is available to provide secondary indication of improperly blended makeup flow. The vacuum-assisted backfill evolution involves initiation of reactor coolant pump seal injection in the isolated and drained loop to allow establishment of a partial vacuum prior to partially opening the loop stop valve. The following measures are required to ensure that no sudden positive reactivity addition or loss of Reactor Coolant System inventory occurs during the backfill evolution:

a. The isolated loop is verified to be drained, thus preventing dilution of Reactor Coolant System boron concentration by liquid present in the loop.

b. Reactor Coolant System level is verified to be ≥18' elevation to ensure Reactor Coolant System inventory is maintained for decay heat removal. Reactor Coolant System inventory is required to be maintained at ≥18' elevation during the backfill evolution. In addition, the filling evolution is limited to one isolated loop at a time.

c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition.

After an initially drained loop is filled from the Reactor Coolant System by partially opening the loop stop valves, the loop is no longer considered to be isolated. Thus, the requirements for returning an isolated and filled loop to service are not applicable and the loop stop valves may be fully opened without restriction within two hours of completing the loop fill evolution.

The initial Reactor Coolant System level requirement has been established such that, even if the three cold leg stop valves are suddenly opened and no makeup is available, the Reactor Coolant System water level will not drop below mid-nozzle level. This ensures continued adequate suction conditions for the residual heat removal pumps.

The safety analyses assume a minimum shutdown margin as an initial condition. Violation of these limiting conditions could result in the shutdown margin being reduced to less than that assumed in the safety analyses. In addition, violation of these limiting conditions could also cause a loss of shutdown decay heat removal.

Reference

(1) UFSAR Section 4.2

(2) UFSAR Section 14.2.5

Attachment 4

Significant Hazards Consideration Determination

Surry Power Station
Units 1 and 2
Virginia Electric and Power Company

SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Virginia Electric and Power Company has reviewed the requirements of 10 CFR 50.92 as they relate to the proposed changes for Surry Units 1 and 2 and determined that a significant hazards consideration is not involved. These changes modify the Basis for Technical Specifications 3.17 to acknowledge that RCP seal injection is initiated into the isolated and drained loop as a prerequisite for the vacuum-assisted back-fill technique. Since establishment of a partial vacuum in the isolated and drained loop may require longer than two hours, the change also relaxes the drained-loop verification time in TS 3.17.5.a from two hours to four before backfilling operations are initiated. The following is provided to support this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated.

   Administrative procedures ensure that the initiation of seal injection in order to establish a partial vacuum in an isolated and drained loop will not create the potential for an inadvertent and undetected introduction of under-borated water into an isolated loop prior to returning the isolated loop to service. Additionally, extension of the drained loop verification time from two hours to four hours prior to backfill operations will not significantly diminish confidence that the isolated and drained loop will, in fact, be drained at the time the back-fill evolution is initiated. Therefore, there is no measurable increase in the probability or consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated.

   There are no modifications to the plant as a result of the changes. No new accident or event initiators are created by the initiation of seal injection in order to establish a partial vacuum in an isolated and drained loop, or by the extension of the drained loop verification time requirement from two hours to four hours prior to backfill operations. Therefore, the proposed changes do not create the possibility of any accident or malfunction of a different type previously evaluated.

3. Does the change involve a significant reduction in the margin of safety.

   The proposed changes have no effect on the safety analyses assumptions. Rather, the proposed changes acknowledge the establishment of seal injection for the Reactor Coolant Pump in the isolated and drained loop as a prerequisite for the vacuum-assisted back-fill technique and extends the drained-loop

verification time from two hours to four hours prior to backfill operations. The two hour interval was established to ensure that the drained loop is verified to be drained at a point in time sufficiently close to the initiation of the back-fill evolution such that no intervening event should occur that would render the loop no longer drained. Relaxation of the drained loop verification time from two hours to four hours will not significantly diminish confidence that the isolated and drained loop will be drained at the time the back-fill evolution is initiated. Therefore, the proposed changes do not result in a reduction in a margin of safety.