ATTACHMENT 2
TECHNICAL SPECIFICATIONS CHANGES

2. Verifying that each of the following pumps start automatically upon receipt of a safety injection test signal:

   a) Centrifugal charging pump, and

   b) Low head safety injection pump.

f. By verifying that each of the following pumps develops the indicated discharge pressure (after subtracting suction pressure) on recirculation flow when tested pursuant to Specification 4.0.5.

   1. Centrifugal charging pump ≥ 2410 psig.

   2. Low head safety injection pump ≥ 156 psig.

g. By verifying that the following manual valves requiring adjustment to prevent pump "runout" and subsequent component damage are locked and tagged in the proper position for injection:

   1. Within 4 hours following completion of any repositioning or maintenance on the valve when ECCS systems are required to be OPERABLE.

   2. At least once per 18 months.

      1. 1-SI-188 Loop A Cold Leg
      2. 1-SI-191 Loop B Cold Leg
      3. 1-SI-193 Loop C Cold Leg
      4. 1-SI-203 Loop A Hot Leg
      5. 1-SI-204 Loop B Hot Leg
      6. 1-SI-205 Loop C Hot Leg

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

   1. For high head safety injection lines, with a single pump running:

      a) The sum of the injection line flow rates, excluding the highest flow rate, is ≥ 359 gpm,

      b) The total pump flow rate is ≤ 660 gpm, and

      c) For cold leg injection balancing, a value of ≥ 48.3 gpm will be used for simulated seal injection flow during balancing.

SURVEILLANCE REQUIREMENTS (Continued)

f. By verifying that each of the following pumps develop the indicated discharge pressure (after subtracting suction pressure) on recirculation flow when tested pursuant to Specification 4.0.5.

1. Centrifugal charging pump greater than or equal to 2410 psig.

2. Low head safety injection pump greater than or equal to 156 psig.

g. By verifying that the following manual valves requiring adjustment to prevent pump "runout" and subsequent component damage are locked and tagged in the proper position for injection:

1. Within 4 hours following completion of any repositioning or maintenance on the valve when the ECCS systems are required to be OPERABLE.

2. At least once per 18 months.

1. 2-SI-89 Loop A Cold Leg
2. 2-SI-97 Loop B Cold Leg
3. 2-SI-103 Loop C Cold Leg
4. 2-SI-116 Loop A Hot Leg
5. 2-SI-111 Loop B Hot Leg
6. 2-SI-123 Loop C Hot Leg

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

1. For high head safety injection lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is $\geq$ 359 gpm,

b) The total pump flow rate is $\leq$ 660 gpm, and

c) For cold leg injection balancing, a value of $\geq$ 48.3 gpm will be used for simulated seal injection flow during balancing.

ATTACHMENT 3
SIGNIFICANT HAZARDS CONSIDERATION

Significant Hazards Consideration

Technical Specification (TS) 4.5.2.h requires that high head safety injection (HHSI) flow balance tests be performed following the completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics. The successful completion of the HHSI flow balance testing is ensured by two surveillance requirements. These surveillance requirements are for the sum of the flows through the two lowest flow branch lines, and a total HHSI pump flow requirement.

The flow rates currently specified for the sum of the flows through the two lowest flow branch lines and the total HHSI pump flow are conservative with respect to the existing safety analysis values. The flow rates will be revised to remove any instrument inaccuracies. Normal instrument inaccuracies will be factored into the acceptance criteria of the periodic surveillance tests which perform the flow balance testing.

The proposed changes will decrease the sum of the flows through the two lowest flow branch lines from $\geq$ 384 gpm to $\geq$ 359 gpm, and increase the total HHSI pump flow from $\leq$ 650 gpm to $\leq$ 660 gpm. This expanded acceptance range will ensure the system performance remains bounded by the existing safety analysis and will make test failures due to instrument inaccuracies less likely.

In addition, a surveillance requirement will be added to define a value of $\geq$ 48.3 gpm to be used for simulated reactor coolant pump (RCP) seal injection flow during cold leg injection balancing. A simulated RCP seal injection flow has been taken into account during actual surveillance tests. It is added for completeness of the surveillance requirements, but does not change the way the surveillance test is currently being performed.

The following existing TS ensure that HHSI flow is available as required by the current safety analysis:

- TS 4.5.2.h.1.a requires the sum of the two lowest branch line flows to be $\geq$ 384 gpm with the RCS depressurized (this means the third branch line flow must be $\geq$ 192 gpm and total flow of the three branch lines must be $\geq$ 576 gpm).

- TS 4.5.2.h.1.b requires total HHSI pump flow rate to be $\leq$ 650 gpm with the RCS depressurized.

- TS 3.4.6.2.e and TS 4.4.6.2.1 require RCP seal injection to be throttled to $\leq$ 30 gpm and controlled leakage measured once every 31 days with the RCS at 2235 $\pm$ 20 psig (this ensures that seal injection will be less than or equal to the 48.3 gpm value assumed in the safety analysis if the RCS suddenly depressurizes).

Based on the TS requirements above, total HHSI pump flow must be $\geq$ 624.3 gpm (576 gpm + 48.3 gpm) and $\leq$ 650 gpm during cold leg injection. These requirements provide a specified acceptance range of only 4%, which is too narrow to consistently be met during the tests. This is due to the sensitivity of throttle valve positioning and the uncertainty of flow measurements caused by instrument inaccuracies.

The manufacturer for the HHSI pumps was contacted to obtain the maximum flow rate allowed for these pumps. The manufacturer stated that the maximum flow rate for these pumps was 675 gpm. An engineering study was performed to determine the required NPSH for the HHSI pumps at the manufacturer's maximum flow rate. The study has determined that

under all circumstances the NPSH available exceeds the NPSH required. However, to prevent HHSI flow from exceeding 675 gpm during the safety injection recirculation mode of operation, the engineering study recommended the maximum flow of the HHSI pump be ≤ 660 gpm when flowing from the refueling water storage tank to the RCS. The effect of this change on LHSI flow and NPSH during the safety injection recirculation mode was also evaluated and found to be acceptable.

Although not specifically delineated in TS 4.5.2.h.1, during the HHSI cold leg injection flow balancing performed to meet this specification, a simulated RCP seal injection flow has been accounted for to support the basis of TS 3.4.6.2.e. This is part of the original design basis and has been taken into account during actual surveillance tests. It is added for completeness of the surveillance requirements. A simulated RCP seal injection flow is not required for hot leg injection flow balancing due to the system configuration at the time of switchover to hot leg injection.

The criteria for performing HHSI flow balance testing is established to ensure that the minimum required ECCS flow rates are obtainable and maximum flow rates, based on NPSH considerations, are not exceeded. These changes will not affect the capability of the ECCS to perform its design function. The system performance will remain bounded by the existing safety analysis. The probability or consequences of HHSI pump runout is not increased because by limiting the HHSI pump flow to 660 gpm, the maximum flow allowed by the manufacturer (675 gpm) will not be exceeded during worse case conditions.

Virginia Electric and Power Company has reviewed the proposed changes against the criteria of 10 CFR 50.92 and has concluded that the changes as proposed do not pose a significant hazards consideration. Specifically, operation of North Anna Power Station in accordance with the proposed changes will not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed changes revise TS 4.5.2.h.1.a and b such that with one HHSI pump running, the sum of the flows through the two lowest flow branch lines shall be ≥ 359 gpm and the total HHSI pump flow rate shall be ≤ 660 gpm. Changes to the branch line and pump flow rates do not affect the probability of an accident.

   Likewise, the consequences of the accidents previously evaluated will not increase as a result of the proposed TS changes. The system performance will remain bounded by the existing safety analysis at the revised flow rates, and adequate NPSH is available at the increased maximum flow rate for all postulated accident conditions.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated. These changes will not affect the capability of the ECCS to perform its design function. The changes proposed herein are bounded by the existing safety analysis and do not involve operation of plant equipment in a different manner from which it was designed to operate. Since a new failure mode is not created, a new or different type of accident is not created.

3. Involve a significant reduction in a margin of safety. The system performance will remain bounded by the existing safety analysis at the revised flow rates, and adequate NPSH is available at the increased maximum flow rate for all postulated accident conditions, therefore, safety margins are not reduced.

Virginia Electric and Power Company concludes that the activities associated with these proposed TS changes satisfy the no significant hazards consideration criteria of 10 CFR 50.92 and, accordingly, a no significant hazards consideration finding is justified.