

## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

- a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power lockout switches in the lockout position:

<u>Valve Number</u>	<u>Valve Function</u>	<u>Valve Position</u>
HV-8835	SI Pump Cold Leg. Inj.	OPEN
HV-8840	RHR Pump Hot Leg. Inj.	CLOSED
HV-8813	SI Pump Mini. Flow Isol.	OPEN
HV-8806	SI Pump Suction from RWST	OPEN
HV-8802A, B	SI Pump Hot Leg Inj.	CLOSED
HV-8809A, B	RHR Pump Cold Leg Inj.	OPEN*

- b. At least once per 31 days by:

- 1) Verifying that the ECCS piping is full of water by venting the ECCS pump casings and accessible discharge piping high points, and
- 2) Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

- c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the Containment Emergency Sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

- 1) For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and
- 2) Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.

- d. At least once per 18 months by:

- 1) Verifying automatic isolation and interlock action of the RHR system from the Reactor Coolant System by ensuring that:
  - a) With a simulated or actual Reactor Coolant System pressure signal greater than or equal to 377 psig the interlocks prevent the valves from being opened, and
  - b) With a simulated or actual Reactor Coolant System pressure signal less than or equal to 750 psig the interlocks will cause the valves to automatically close.
- 2) A visual inspection of the Containment Emergency Sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.

\*Either valve may be realigned in MODE 3 for testing pursuant to Specification 4.4.6.2.2

8808230006  
05000424  
ADOCK  
PDR  
PP

## EMERGENCY CORE COOLING SYSTEMS

### BASES

#### ECCS SUBSYSTEMS (Continued)

The limitation for all safety injection pumps to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

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. Surveillance Requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses and (4) to ensure that centrifugal charging pump injection flow which is directed through the seal injection path is less than or equal to the amount assumed in the safety analysis. The surveillance requirements for leakage testing of ECCS check valves ensure that a failure of one valve will not cause an intersystem LOCA. In MODE 3, with either HV-8809 A or B closed for ECCS check valve leak testing, adequate ECCS flow for core cooling in the event of a LOCA is assured.

#### 3/4.5.4 REFUELING WATER STORAGE TANK

The OPERABILITY of the Refueling Water Storage Tank (RWST) as part of the ECCS ensures that sufficient negative reactivity is injected into the core to counteract any positive increase in reactivity caused by RCS cooldown. RCS cooldown can be caused by inadvertent depressurization, a loss-of-coolant accident, or a steam line rupture.

The limits on RWST minimum volume and boron concentration ensure that 1) sufficient water is available within containment to permit recirculation cooling flow to the core, 2) the reactor will remain subcritical in the cold condition following a small LOCA or steamline break, assuming complete mixing of the RWST, RCS, and ECCS water volumes with all control rods inserted except the most reactive control assembly (ARI-1), and 3) the reactor will remain subcritical in the cold condition following a large break LOCA (break flow  $\geq 3.0 \text{ ft}^3$ ) assuming complete mixing of the RWST, RCS, ECCS water and other sources of water that may eventually reside in the sump, post-LOCA with all control rods assumed to be cut.

The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 8.5 and 10.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.