

EMERGENCY CORE COOLING SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

1. With the HPCI system inoperable, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to  $\leq 200$  psig within the following 24 hours.
- d. For the ADS:
  1. With one of the above required ADS valves inoperable, provided the HPCI system, the core system and the LPCI system are OPERABLE, restore the inoperable ADS valve to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to  $\leq 100$  psig within the next 24 hours.
  2. With two or more of the above required ADS valves inoperable, be in at least HOT SHUTDOWN within 12 hours and reduce reactor steam dome pressure to  $\leq 100$  psig within the next 24 hours.
- e. With a CSS and/or LPCI header  $\Delta P$  instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 7 days or determine the ECCS header  $\Delta P$  locally at least once per 12 hours; otherwise, declare the associated ECCS subsystem inoperable.
- f. The discharge line "keep filled" alarm instrumentation associated with a LPCI and/or CSS subsystem(s) may be in an inoperable status for up to 6 hours for required surveillance testing\* provided that the "keep filled" alarm instrumentation associated with at least one LPCI or CSS subsystem serviced by the affected "keep filled" system remains OPERABLE; otherwise, perform Surveillance Requirement 4.5.1.a.1.a.
- g. In the event an ECCS system is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected safety injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

Action C.2. With the HPCI system inoperable and either one LPCI subsystem or one CS subsystem inoperable, restore the HPCI system to operable status within 72 hours OR restore the LPCI subsystem/CS subsystem to operable status within 72 hours. Otherwise, be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to  $\leq 200$  psig in the next 24 hours.

\*This includes testing of the "Reactor Coolant System Interface Valves Leakage Pressure Monitors" associated with LPCI and CSS in accordance with Surveillance 4.4.3.2.3

9404110252 940331  
PDR ADDCK 05000354  
P PDR

\* The allowed out-of-service time of 72 hours for HPCI inoperable and one low pressure ECCS injection/spray subsystem inoperable coincidentally is based upon NUREG-1433, BWR/4 STS.

## EMERGENCY CORE COOLING SYSTEM

### BASES

#### ECCS-OPERATING and SHUTDOWN (Continued)

With the HPCI system inoperable, adequate core cooling is assured by the OPERABILITY of the redundant and diversified automatic depressurization system and both the CSS and LPCI systems. In addition, the reactor core isolation cooling (RCIC) system, a system for which no credit is taken in the safety analysis, will automatically provide makeup at reactor operating pressures on a reactor low water level condition. The HPCI out-of-service period of 14 days is based on the demonstrated OPERABILITY of redundant and diversified low pressure core cooling systems and the RCIC system. \*

The surveillance requirements provide adequate assurance that the HPCI system will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation through a test loop during reactor operation, a complete functional test with reactor vessel injection requires reactor to be in HOT SHUTDOWN with vessel pressure not less than 200 psig. The pump discharge piping is maintained full to prevent water hammer damage and to provide cooling at the earliest moment.

Upon failure of the HPCI system to function properly after a small break loss-of-coolant accident, the automatic depressurization system (ADS) automatically causes selected safety-relief valves to open, depressurizing the reactor so that flow from the low pressure core cooling systems can enter the core in time to limit fuel cladding temperature to less than 2200°F. ADS is conservatively required to be OPERABLE whenever reactor vessel pressure exceeds 100 psig. This pressure is substantially below that for which the low pressure core cooling systems can provide adequate core cooling for events requiring ADS.

ADS automatically controls five selected safety-relief valves although the safety analysis only takes credit for four valves. It is therefore appropriate to permit one valve to be out-of-service for up to 14 days without materially reducing system reliability.

#### 3/4.5.3 SUPPRESSION CHAMBER

The suppression chamber is required to be OPERABLE as part of the ECCS to ensure that a sufficient supply of water is available to the HPCI, CSS and LPCI systems in the event of a LOCA. This limit on suppression chamber minimum water volume ensures that sufficient water is available to permit recirculation cooling flow to the core. The OPERABILITY of the suppression chamber in OPERATIONAL CONDITIONS 1, 2 or 3 is also required by Specification 3.6.2.1.

Repair work might require making the suppression chamber inoperable. This specification will permit those repairs to be made and at the same time give assurance that the irradiated fuel has an adequate cooling water supply when the suppression chamber must be made inoperable, including draining, in OPERATIONAL CONDITION 4 or 5.

In OPERATIONAL CONDITION 4 and 5 the suppression chamber minimum required water volume is reduced because the reactor coolant is maintained at or below 200°F. Since pressure suppression is not required below 212°F, the minimum water volume is based on NPSH, recirculation volume and vortex prevention plus a safety margin for conservatism.