3.5.A BASES (Cont'd)

The allowable repair times are established so that the average risk rate for repair would be no greater than the basic risk rate using the methods described in Reference (1). Using the results developed in this reference, the repair period is found to be 1/2 the test interval. This assumes that the core spray subsystems and LPCI constitute a 1 out of 3 system; however, the combined effect of the two systems to limit excessive clad temperatures must also be considered. The test interval specified in Specification 4.5 is 1 month.

Should one core spray subsystem become inoperable, the remaining core spray and the LPCI system are available should the need for core cooling arise. To assure that the remaining core spray and LPCI subsystems are available, they are verified to be operable (see 4.5 Bases).

Should one LPCI subsystem become unavailable, the two remaining LPCI pumps in conjunction with the core spray system would perform the low pressure core cooling function. However, due to the loss of redundancy in core cooling capability, a seven day LCO repair period was selected for one LPCI subsystem. The remaining required equipment will be verified to be operable (see 4.5 Bases).

Even when one LPCI subsystem (i.e., one division of the LPCI mode of RHR) is not available, at least one pump in that unavailable LPCI subsystem must be available to fulfull the containment cooling function as the two pumps in the other LPCI subsystem are fulfilling the core cooling function. In other words, when one LPCI pump becomes unavailable, redundancy in containment cooling capability is lost. For this reason, a seven day LCO repair period was also selected for one LPCI pump.

(1) Jacobs, I. M., "Guidelines for Determining Safe Test Intervals and Repairs Times for Engineered Safeguards", General Electric Co. A.P.E.D., April, 1969 (APED 5736)

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4.5 BASES

Core and Containment Cooling Systems Surveillance Frequencies

The performance of individual emergency core cooling systems (HPCI, LPCI, Core Spray and ADS) and the integrated performance of the emergency core cooling systems are described in analyses referenced in Section 6.5 of the Updated Final Safety Analysis Report. Periodic surveillance of pumps and valves is performed in accordance with ASME Code, Section XI, to the extent described in the Inservice Testing Plan, to verify that the systems will provide the flow rates required by the respective analyses. HPCI and RCIC flow tests are performed at two pressures so that the systems' capability to provide rated flow over their operating range is verified. HPSW flow tests verify that rated flow can be delivered to the RHR heat exchangers.

The testing interval for the core and containment cooling systems is based on industry practice, sound engineering judgment and practicality. The core cooling systems have not been designed to be fully testable during operation. For example, in the case of the HPCI, automatic initiation during power operation would result in pumping cold water into the reactor vessel which is not desirable. Complete ADS testing during power operation causes an undesirable loss-of-coolant inventory. To increase the availability of the core and containment cooling systems, the components which make up the system; i.e., instrumentation, pumps, valves, etc., are tested frequently. The pumps and motor operated injection valves are also tested each month to assure their operability. A simulated automatic actuation test once each cycle combined with frequent tests of the pumps and injection valves is deemed to be adequate testing of these systems.

When components and subsystems are out-of-service, overall core and containment cooling reliability is maintained by verifying the operability of the remaining redundant cooling systems that the Limiting Conditions for Operation require to be operable during the allowable out-of-service time period. Verifying operability in this context means to administratively ensure that the remaining required systems or subsystems are not known to be inoperable (for example: confirming that equipment necessary for the systems or subsystems to perform their safety functions are not blocked out of service for maintenance, checking the status of selected surveillances on the remaining required systems or subsystems and checking that selected valves are in the correct position as indicated on the control room panels). Performance of operability tests is not required.

4.5 I&J Surveillance Requirements Bases

Average and Local LHGR

The LHGR shall be checked daily to determine if fuel burnup or control rod movement has caused changes in power distribution. Since changes due to burnup are slow and only a few control rods are moved daily, a daily check of power distribution is adequate.

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