

SAFETY EVALUATION
TURKEY POINT UNIT 4
ONE RHR LOOP INOPERABLE

INTRODUCTION

During routine testing at Turkey Point Unit 4 on October 11, 1983, the 4B Residual Heat Removal (RHR) pump failed. The failure was such that a major repair effort of the motor is required. Florida Power and Light has contacted the motor vendor, and other utilities utilizing similar equipment and have determined that due to the unique design, and age of the component, no replacements or spares are available. The motor vendor has service people on-site and repairs are in progress; however, it appears that the repair may take four to five days.

The current technical specifications require that the unit be placed in hot shutdown within 24 hours of the RHR pump being out of service, and in cold shutdown within an additional 48 hours. The licensee has requested emergency relief from the existing technical specifications, to permit an additional thirty days of operation in the hot shutdown mode with the average reactor coolant temperature less than 350°F prior to proceeding to cold shutdown. Their basis for this request is that operation in hot shutdown rather than cold shutdown while the RHR pump is being repaired is safer. The licensee has indicated in their letter of October 12, 1983, that with operation in the hot shutdown mode the reactor coolant pumps could be in operation, thereby giving the plant four operable loops for decay heat removal (three reactor coolant loops and one RHR loop). In cold shutdown only the single remaining RHR loop would be operable. Should the single operable RHR loop fail while in cold shutdown, plant operation to return to hot shutdown and bring reactor coolant loops into operation, would have to be performed without the normally available RHR system.

EVALUATION

The staff has reviewed proposed plant operations with the licensee and agrees from a safety point of view that it would be wiser to maintain the plant in hot shutdown while the inoperable RHR pump is being repaired. The licensee has indicated in telephone conversations that during repair of the RHR pump the plant will be maintained in hot shutdown with a reactor coolant temperature near 350°F and a reactor coolant system pressure of approximately 425 psi. Under these conditions, decay heat removal will be accomplished with the reactor coolant loops or the remaining RHR loop. Should the remaining RHR loop become inoperable during this mode of operation, normal reactor coolant loops (i.e., steam generators) would remain available to remove decay heat.

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The staff has considered the case of losing the remaining RHR loop while operating in cold shutdown and concluded that operational problems could arise while attempting to leave this mode and return normal coolant loops to operation without the use of the RHR system. The RHR system is normally used to control RCS temperature and assist in controlling RCS pressure when bringing the RCS from the cold water-solid condition to hot shutdown. Inadequate control of pressure and temperature during RCS heat-up would increase the potential for low temperature overpressurization of the RCS, formation of steam voids in the RCS and challenges to the pressurize PORV or safety valves.

The staff has also reviewed the Standard Technical Specifications (STS) for Westinghouse PWRs and found that the standard specification permits indefinite operation in hot shutdown while one RHR loop is inoperable. The licensee's proposal regarding RHR system operability is similar to the Standard Technical Specifications; and in fact, more restrictive in that only a 30-day period is allowed.

SUMMARY

The licensee has requested emergency relief from the Turkey Point Unit 4 technical specifications, to permit extended operation in mode 4 (hot shutdown) on a one time basis while the inoperable Unit 4 RHR pump is being repaired. The staff has considered the consequences of going to cold shutdown and the potential loss of the remaining RHR loop. We have concluded that operation in hot shutdown with the RCS average temperature less than 350°F, while the inoperable pump is being repaired, would be more prudent.

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5. TWO residual heat removal pumps shall be operable.
 6. TWO residual heat exchangers shall be operable.
 7. All valves, interlocks and piping associated with the above components and required for post accident operation, shall be operable except valves that are positioned and locked. Valves 864-A, B; 862-A, B; 865-A, B, C; 866-A, B shall have power removed from their motor operators by locking open the circuit breakers at the Motor Control Centers. The air supply to valve 758 shall be shut off to the valve operator.
- b. During power operation, the requirements of 3.4.1a may be modified to allow one of the following components to be inoperable (including associated valves and piping) at any one time except for the bases stated in 3.4.1.b.2. If the system is not restored to meet the requirements of 3.4.1a within the time period specified, the reactor shall be placed in the hot shutdown condition. If the requirements of 3.4.1a are not satisfied within an additional 48 hours the reactor shall be placed in the cold shutdown condition**. Specification 3.0.1 applies to 3.4.1.b.
1. ONE accumulator may be out of service for a period of up to 4 hours.
 2. ONE of FOUR safety injection pumps may be out of service for 30 days. A second safety injection pump may be out of service, provided the pump is restored to operable status within 24 hours. TWO of the FOUR safety injection pumps shall be tested to demonstrate operability before initiating maintenance of the inoperable pumps.
 3. ONE channel of heat tracing on the flow path may be out of service for 24 hours*.
 4. ONE residual heat removal pump may be out of service, provided the pump is restored to operable status within 24 hours. In addition the other residual heat removal pump shall be tested to demonstrate operability prior to initiating maintenance of the inoperable pump.

*See reference (11) on page B.3.4-2

**For the 30 day period ending at midnight November 12, 1983, placing the plant in cold shutdown due to one RHR pump being inoperable is not required provided that Tavg is between 350°F and 200°F.

Amendments ~~87~~ & ~~81~~
Order dated October 14, 1983

