UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Enclosure

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PUMP AND VALVE TESTING PROGRAM RELIEF REQUESTS

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated May 25, 1990, Nebraska Public Power District submitted two relief requests concerning the inservice pump and valve testing program for Cooper Nuclear Station. Relief Requests RV-47 and RV-50 requested relief from the requirement of Section XI of the American Society of Mechanical Engineers (ASME) Code relating to exercising check valves.

2.0 DESCRIPTION AND DISCUSSION

2.1 Relief Request Number RV-47

The licensee has requested relief in RV-47 from exercising Standby Liquid Control System (SLC) valves SLC-CV-10CV and SLC-CV-11CV, in accordance with the requirements of ASME Code Section XI, IWV-3521 and IWV-3522 and proposed to perform radiography on each valve during refueling outages.

2.1.1 Basis for Relief

These check valves are the SLC pump discharge checks. The piping segment between the pump and the check valve is a solid system with no venting mechanism, and the pump design does not allow for any appreciable back flow. Disassembly is not practical since the check valves are seal welded. The only practical method of verifying valve closure is by radiography (RT). An RT of these valves requires a radioactive source to be present. Performing radiography on a quarterly basis (in lieu of once per refueling outage) increases radiation exposure by a magnitude of three. Although exposure is low, this is an undesirable ALARA practice. Furthermore, the primary purpose of these valves (closed position) is to provide redundancy of the SLC pumps in the event the relief valve at the discharge of the idle pump should prematurely open. Since the setpoints of the relief valves are tested once each refueling outage and an open relief would be noted during quarterly surveillance testing, a less frequent closure verification of the check valves would not reduce the level of reliability. The burden of performing a quarterly RT on these valves is not justified based on the previous statements.

9103190138 910311
PDR ADOCK 05000298
P PDR

2.1.2 Evaluation

These check valves are the SLC pump discharge checks and are seal welded. It is impractical to verify valve closure by fluid flow testing because the piping segment between the pump and the check valve is a solid system with no venting mechanism and the SLC positive displacement pump design does not allow for any appreciable back flow. Disassembly is not practical since the check valves are seal welded. The licensee indicated that the only practical method of verifying valve closure is by radiography. Performing radiography on a quarterly basis in lieu of once per refueling outage increases radiation exposure by a magnitude of five for an 18 month operating cycle and is an undesirable ALARA practice. It would be burdensome to require the licensee to comply with the ASME Code requirement due to potential safety hazards to test personnel.

The primary purpose of these valves is to provide redundancy of the SLC pumps in the event the relief valve at the discharge of the idle pump should prematurely open. The licensee stated that the setpoints of the relief valves are tested once each refueling outage and an open relief would be noted during quarterly surveillance testing. The licensee's proposal to verify each valve closure by radiography during refueling outages provides reasonable assurance of operational readiness of these valves.

Based on the impracticality of testing these valves in accordance with the ASME Code requirements, the determination that the licensee's proposed testing provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements were imposed, relief may be granted pursuant to 10 CFR 50.55(g)(6)(i).

2.2 Relief Request Number RV-50

The licensee has requested relief in RV-50 from exercising Residual Heat Removal System valves CS-CV-18CV, CS-CV-19CV, RHR-CV-26CV, and RHR-CV-27CV, in accordance with the requirements of ASME Code Section XI, IWV-3522 and proposed to exercise these valves during cold shutdown periods when the drywell is de-inerted.

2.2.1 Basis for Relief

For the reasons stated in Technical Justification TJV-05, these valves can only be exercised during cold shutdowns. TJV-05 also contains a caveat such that cold shutdown testing can only be performed when the drywell is de-inerted. Since these valves are located in the drywell, access is limited. Therefore, the only time these are accessible is when the plant is in a shutdown and the drywell is de-inerted. The drywell is not always de-inerted when reaching the cold shutdown condition. In fact, de-inerting is undesirable since de-inerting/re-inerting is costly and takes a considerable amount of time. If required to de-inert for check valve testing only, this would cause a considerable startup delay. Furthermore, this is only an issue if the plant goes to cold shutdown. Except for refueling outages, cold shutdowns are usually not planned and if a shutdown occurs, down time is kept at a minimum.

2.2.2 Evaluation

These check valves are located in the drywell of the Cooper Nuclear Station Mark I containment. During reactor operation these valves are normally closed to isolate the related low pressure portions of the Core Spray and Residual Heat Removal systems from the high pressure of the primary coolant system. Opening these valves during plant power operation would bypass one level of protection against the accidental overpressurization of the Core Spray and Residual Heat Removal Systems. Accordingly, the ASME Code Section IX, Paragraph IWV 3522, permits licensees to extend the surveillance interval from quarterly to once per operating cycle for valves that cannot be exercised with the reactor at power. The ASME Code does require that these valves be exercised if the plant is brought to a cold shutdown condition for a period long enough to exercise the valves.

During reactor operation the drywell atmosphere must remain inerted with nitrogen to preclude the possibility of an explosion caused by the postulated generation of hydrogen gas following a design basis Loss of Coolant Accident. Cooper Nuclear Station operates on an 18 month fuel cycle with no cold shutdowns scheduled during the cycle. If the plant is brought to cold shutdown during the operating cycle because of an unscheduled shutdown the drywell atmosphere is not routinely vented and because of the nitrogen inerting, a breathable atmosphere is absent and it is not possible to enter the drywell to exercise these check valves. The ASME Code already permits the licensee to exclude these valves from testing for the entire operating cycle; therefore, the health and safety of the public will not be endangered by not exercising these valves during an unscheduled cold shutdown that may occur during the 18 month fuel cycle.

Requiring the licensee to de-inert the drywell during all cold shutdowns could delay startup, which could be costly and burdensome. The licensee's proposal to exercise these valves during cold shutdown only when the drywell is de-inerted during refueling outages provides reasonable assurance of operational readiness as required by the Code.

Based on the impracticality of testing these valves in accordance with the ASME Code requirements, the determination that the licensee's proposed testing provides a reasonable alternative to the Code requirements, and considering the burden on the licensee if the Code requirements were imposed, relief may be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Principal Contributor: Y. C. Li

Date: March 11, 1991