

Florida Power CORPORATION

Cryclai River Unit 3 tue No. 80-302

> May 13, 1997 3F0597-08

U. S. Nuclear Regulatory Commission Attn: Document Control Desk Washington, D. C. 20555-0001

Low Pressure Injection Pump Mission Time, Unresolved Item, Subject: URI-96-201-01

NRC to FPC letter, 3N0896-12, dated August 23, 1996 References: A.

> FPC to NRC letter, 3F1096-22, dated October 28,1996 B.

Dear Sir:

Florida Power Corporation (FPC) is submitting this letter to provide information necessary for NRC closure of Unresolved Item (URI) URI-96-201-01, which was identified in Reference A, and addresses Low Pressure Injection (LPI) Pump This URI stated, "The team identified the single failure Mission Time. vulnerabilities of the decay heat drop line which could lead to a need to operate the DH pump in a low flow condition for an extended period of time." FPC implemented a flow test program of an LPI pump identical in model number to those installed in CR-3 to justify extended periods of operation in a low flow regime. That test is documented in the attached report, "TR-9640 Rev. 00, Hydraulic Evaluation by Ingersoll-Dresser Pump Company for Florida Power Corporation, Crystal River 3 Plant, Decay Heat Pumps, IDP Model 8HN194," which is submitted herewith to document the LPI pump capability. This test demonstrates that the pump can operate at low flow rates for extended periods of Change: Un ence time.

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PDR



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BACKGROUND

During the Integrated Performance Assessment Process (IPAP) inspection, an issue was raised regarding the need to establish flow through the decay heat removal (DH) drop line to the decay heat removal (LPI) pumps as part of small break LOCA mitigation. CR-3 has two redundant, independent LPI trains which can take suction from the Reactor Building (RB) sump during long term recirculation core cooling. However, analyses have shown that certain small break LOCAs could result in elevated RCS pressures such that the LPI pumps would have to operate in the piggyback mode supplying water to the High Pressure Injection pumps at low flow rates (100-1200 gpm) for an extended period of time. As that period of time approaches the current low flow mission time for the LPI pumps, plant procedures direct the operators to trip one pump and open the DH drop line valves (DHV-3, DHV-4, and DHV-41) to establish flow to the RB sump to provide additional flow through the remaining running LPI pump. Since there is only one DH drop line at CR-3 with three motor-operated valves in series, failure of any one of the drop line valves to open would prevent flow through the line. This establishes the need for an LPI pump mission time and was the basis for the NRC identifying this issue as URI-96-201-01 in Reference A.

CURRENT STATUS

Reference B stated this concern and described the actions taken and being taken by FPC to bring the issue to resolution. Restart Issue D-3, LPI Mission Time, was created by FPC to track this item. Among the actions discussed in Reference B was an in-progress low flow endurance test of a pump identical in model number to the CR-3 LPI pumps at the Ingersoll-Dresser Pump Company test facility. This test has now been successfully completed, inspections made, and new vendor qualified operating guidelines for the Decay Heat Removal Pumps were developed by Ingersoll-Dresser Pump Company and accepted by FPC.

The test was conducted according to a plan which was jointly developed by FPC and Ingersoll-Dresser Pump Company. The low flow endurance test consisted of a thorough pre-test inspection with measurements of critical components, a 30-day monitored endurance run at low-flow conditions (nominal 100 gpm), an 8-hour flow rangeability study to determine a new recommendation for minimum continuous stable flow, and a detailed post-test inspection with measurements of critical components. The test was a standard hydraulic design industry practice used to determine pump performance at special flow conditions. With minor differences described in the report, the tested pump is a mechanical duplicate of the CR-3 DH pumps. The tested pump showed little or no wear as a result of the U. S. Nuclear Regulatory Commission 3F0597-08 Page 3 of 4

test. Based on the test, ingersoll-Dresser prepared a report that documents the test program and develops revised pump operating guidelines. FPC has reviewed and concurs with the conduct of the test and the conclusions drawn in the test report.

The attached report describes revised guidelines for CR-3 that provide for operation in the 100-1200 gpm range for periods up to a year and at a flow rate as iow as 1200 gpm indefinitely. The flow range of 100-1200 gpm is the range of interest during a small break LOCA where possible piggyback operation is expected with 100 gpm being the design recirculation flow rate through the unisolable recirculation line. The low-flow testing performed has conclusively demonstrated the ability of the LPI pumps to operate at a flow rate of 100 gpm for an extended period up to a full year.

FPC will revise CR-3 procedures to reflect these revised flow limitations for the LPI pumps. Follow-up review of the pump test final report in accordance with Al-404A, "Review of Technical Information," will identify procedures, Enhanced Design Basis Document, Final Safety Analysis Report, and/or other documents which require revision.

Since the LPI mission time described above is time-dependent, and the time frame (availability of the LPI Pump) is acceptably long after the event initiation, opening of the DH drop line is considered a long-term recovery action as opposed to an emergency core cooling function. A year of operation provides ample time to correct the cause of the single failure, open the drop line, provide other means of cooling, repair the leak, or, as a worst case scenario, maintain one LPI pump on line indefinitely at low flow by swapping pumps at the end of a year and performing an overhaul of the idle pump. Therefore, FPC will revise procedures, prior to startup of CR-3, to characterize opening the DH drop line in this scenario as a long term recovery action rather than an ECCS function.

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The attached test results with new LPI pump operating guidelines and operating procedure enhancements that will be completed prior to startup provide the requested information for resolution of the LPI Mission Time issue raised by the NRC as URI-96-201-01.

Sincerely,

Affolder

J/J. Holden Director Nuclear Engineering and Projects

JJH/jwt/gmv

Attachment

xc: Regional Administrator, Region II Senior Resident Inspector NRR Project Manager