LOUISIANA POWER & LIGHT / 317 BARONNE STREET • P. O. BOX 60340
NEW ORLEANS, LOUISIANA 70160 • (504) 595-3100
MIDDLE SOUTH UTILITIES SYSTEM

W3P89-2100
A4.05
QA

October 31, 1989

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
NRC Bulletin No. 88-04

Gentlemen:

NRC Bulletin 88-04 issued May 5, 1988 requested holders of operating licenses for nuclear power reactors to investigate and correct as applicable two mini-flow design concerns. The first concern involved the potential for dead-heading of one or more pumps in safety-related systems that have a mini-flow line common to two or more pumps or other configurations that do not preclude pump-to-pump interaction during mini-flow operation. A second concern involved determining whether or not the installed mini-flow capacity was adequate for a single pump in operation.

LP&L's initial response (LP&L Letter No. W3P88-1247, dated July 12, 1988) identified thirty-four (34) safety-related centrifugal pumps for evaluation in regards to the concerns of the Bulletin. The non-Combustion Engineering supplied pumps were evaluated in that response for the two mini-flow concerns. The evaluation concluded that there were no piping configurations that could result in the dead-heading of one or more of the non-Combustion Engineering supplied pumps. Additionally, the calculated mini-flow capacity was adequate for the non-Combustion Engineering supplied pumps with the exception of the Containment Spray, Component Cooling Water Make-up, Diesel Oil Transfer, and Auxiliary Component Cooling Water pumps. These pumps required field testing to determine the actual mini-flow rates which calculations showed were below the suppliers mini-flow requirements. Also, at the time of the initial response, the supplier of the Auxiliary Component Cooling Water (ACCW) and Containment Spray (CS) pumps, Hayward Tyler, Inc. (formerly Babcock and Wilcox, Canada), would not respond to the questions raised by LP&L regarding verification of the mini-flow rates. In this situation, the Bulletin required the licensee to evaluate the acceptability of the pump mini-flow rates.

IE37
1/0

LP&L's follow-up response (LP&L Letter No. W3P89-1840, dated November 1, 1988) provided the field test results and evaluations that concluded that the non-Combustion Engineering supplied pumps identified in the initial response, which had lower calculated mini-flow rates than the supplier's requirements, have adequate mini-flow recirculation necessary for pump operation.

In addition, the follow-up response addressed the Combustion Engineering supplied pumps in regards to the concerns of the Bulletin. The letter stated that the dead-heading issue raised by the Bulletin was not a concern for the Combustion Engineering supplied pumps. Also, calculations demonstrated that the mini-flow rates for the Combustion Engineering supplied pumps were acceptable and no further action was required regarding the mini-flow issue. However, at the time of the follow-up submittal, LP&L had not yet received the evaluation from the supplier (Ingersoll-Rand) of the High Pressure Safety Injection (HPSI) and Low Pressure Safety Injection (LPSI) pumps regarding the original mini-flow rates for those pumps.

This correspondence addresses LP&L's evaluation of the mini-flow rates of the Auxiliary Component Cooling Water and Containment Spray pumps which were not provided as requested from Hayward Tyler, Inc., and review of Ingersoll-Rand's evaluation of the mini-flow requirements of the HPSI and LPSI pumps which was received following the follow-up response.

Because Hayward Tyler, Inc. did not respond to the questions raised by LP&L, LP&L evaluated the mini-flow capacities originally specified by the manufacturer for the ACCW and CS pumps. The evaluation considered pump mini-flow rate calculations, operation and performance. For the ACCW and CS pumps the longest run-time in the mini-flow mode is during initial pump start up and pump testing, respectively. The data collected during the quarterly tests and the Nuclear Plant Reliability Data System (NPRDS) failure reports over the past four years were then evaluated. This evaluation indicated that the pumps have operated satisfactorily and that no failures have occurred that can be traced to inadequate mini-flow capacity. Furthermore, failure of the pumps to perform their intended function is not anticipated since the quarterly tests would identify any problems that would affect pump operability and performance. Maintenance activities would be performed on a particular pump when surveillance test data indicates a loss in pump performance or unusual operating conditions.

This evaluation, therefore, demonstrated that the mini-flow rates originally specified by the manufacturer, are adequate and that no mini-flow capacity modifications are necessary.

For the HPSI and LPSI pumps, LP&L requested Ingersoll-Rand to evaluate the pump mini-flow requirements and provide recommendations in accordance with Item 3 of Action Requested Section of the Bulletin. Ingersoll-Rand stated that the original mini-flow recommendations of 25 GPM for the HPSI pump and 100 GPM for the LPSI pump were still valid. However, they stated that the 25 GPM flow rate for the HPSI pumps was for operation of 15 minutes or less. For operation exceeding 15 minutes and continuing up to three hours, a mini-flow rate of 75 GPM was recommended. The LPSI pumps did not have the time restriction imposed on them.

The stipulation of 15 minutes or less for mini-flow of the HPSI pumps posed a problem to LP&L. These pumps run for up to 60 minutes or longer during in-service testing. This testing is required once a year and after major pump maintenance to monitor and record bearing temperature. As a result, LP&L requested Ingersoll-Rand to re-evaluate how long the HPSI pumps can run at a mini-flow rate of 25 GPM. Historical data on the operation of the HPSI pumps was sent to Ingersoll-Rand to assist in the re-evaluation.

Ingersoll-Rand revised their evaluation based on LP&L's historical data. They stated that the HPSI pumps could be operated for up to two hours at the 25 GPM mini-flow rate without pump damage. Additionally, the pumps can run up to three hours at 25 GPM provided the inlet fluid temperature does not exceed 120°F. As a result, testing procedure OP-903-030, "Safety Injection Operability Verification" has been revised to provide corrective action if the mini-flow rates are not met. Procedure OP-100-011, "Section XI Pump and Valve Reference Data/Acceptance Criteria" provides the mini-flow requirements.

Should you have any questions, please feel free to contact me or Larry W. Laughlin at (504) 464-3499.

Very truly yours,

R F Burski

R.F. Burski
Manager
Nuclear Safety & Regulatory Affairs

RFB/DDG/pi
cc R.D. Martin, NRC Region IV
F.J. Hebdon, NRC-NRR
D.L. Wigginton, NRC-NRR
E.L. Blake
W.M. Stevenson
NRC Resident Inspectors Office