



Louisiana Power & Light Company
317 Baronne Street
P. O. Box 60340
New Orleans, LA 70160-0340
Tel. 504 595 2805

R. F. Burski
Nuclear Safety & Regulatory Affairs
Manager

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QA

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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 88-08, Supplement 3

Gentlemen:

NRC Bulletin 88-08, Supplement 3 was issued to alert licensees of an event at a foreign reactor relating to thermal stratification in piping connected to the reactor coolant system (RCS). As discussed in Supplement 3, thermal stratification in the RHR piping at the foreign reactor induced thermal stress in the piping between the isolation valve and the RCS hot leg. The stress was significant enough to promote a circumferential crack extending through the wall of the RHR piping resulting in an unisolatable leak.

Investigation of the event attributed the thermal stratification to a cyclical process in which stagnant fluid upstream of the RHR isolation valve cooled due to heat loss to the environment. The cool fluid resulted in the thermal contraction of the valve disk. The upstream pressure pressed the disk leaving a small gap between the valve seat and the disk on the upstream side. Fluid flowed through the gap and up to the leaking packing gland and out via the leak-off piping. The leakage drew hot fluid from the hot leg. The hot fluid layer rode on the cool fluid upstream of the valve resulting in thermal stratification. Subsequently, the hot fluid resulted in the thermal expansion of the valve disk closing the gap between the valve seat and the disk stopping the leakage. Then, the fluid upstream of the valve cooled due to heat loss to the environment. The process was repeated continuously, drawing hot fluid from the hot leg and resulting in fatigue due to thermal stratification.

A review of the piping layout for the shutdown cooling (SDC) system was conducted by LP&L. While the system design at Waterford 3 is somewhat similar to that described in NRC Bulletin 88-08, Supplement 3, the piping arrangement at Waterford 3 is such that the isolation valves (SI-401A&B) is

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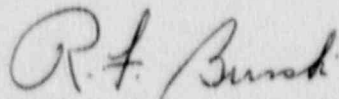
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located approximately 100 feet downstream of the RCS hot leg as opposed to approximately 12 feet as discussed in Supplement 3. The SDC piping at Waterford 3 is also configured with three vertical rises within the 100 foot piping run. This particular arrangement minimizes the potential for thermal stratification.

Furthermore, it is also important to note that LP&L has taken steps to reduce leakage from the subject isolation valves. During refuel 2 the leak-off line was cut and capped in addition to live loading the valve's packing gland to prevent leakage.

Based on the information provided above, the concerns raised in NRC Bulletin 88-08, Supplement 3 would not subject the SDC piping at Waterford 3 to unacceptable thermal stratification. Should you have any questions or require additional information, please contact me or L.W. Laughlin at (504) 464-3499.

Very truly yours,



RFB/LWL/ssf

cc: Messrs. 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