

**LOUISIANA
POWER & LIGHT**

142 DELARONDE STREET
P O. BOX 6008 • NEW ORLEANS, LOUISIANA 70174 • (504) 366-2345

L. V. MAURIN

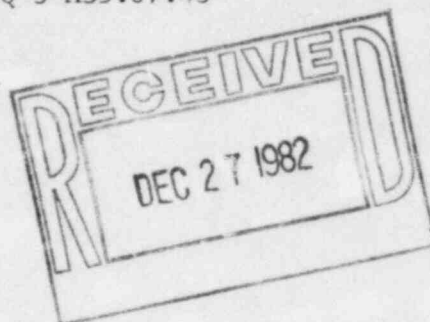
December 21, 1982

Vice President Nuclear Operations

W3I82-0141

Q-3-A35.07.43

Mr. John T. Collins, Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76012



SUBJECT: Waterford SES Unit No. 3
Docket No. 50-382
Significant Construction Deficiency No. 43
"Main/Emergency Feedwater System"
Final Report

REFERENCE: LP&L letter W3I82-0050 dated September 30, 1982

Dear Mr. Collins:

In accordance with the requirements of 10CFR50.55(e), we are hereby providing two copies of the Final Report of Significant Construction Deficiency No. 43, "Main/Emergency Feedwater System."

If you have any questions, please advise.

Very truly yours,

L. V. Maurin

IE-27

LVM/MAL:keh

Attachment

- cc: 1) Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
(with 15 copies of report)
- 2) Director
Office of Management
Information and Program Control
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
(with 1 copy of report)
- 3) E. Blake
- 4) W. Stevenson

8212300219 821221
PDR ADOCK 05000382
S PDR

FINAL REPORT OF
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 43
"MAIN/EMERGENCY FEEDWATER SYSTEM"

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e). It describes a design deficiency regarding the ability of the plant protection system to detect and to respond adequately to a break in the feedwater system piping inside containment. The problem is considered reportable under the requirements of 10CFR50.55(e).

To the best of our knowledge, this problem has not been identified to the Nuclear Regulatory Commission pursuant to 10CFR21.

DESCRIPTION

A review of the Main and Emergency Feedwater System has revealed that if a pipe break occurs in the feedwater line, inside containment, between the containment penetration and either check valve 2FW-V825A and 2FW-V826B, the Emergency Feedwater System (EFWS) may not perform as intended.

Upon a feedwater line break at the steam generator nozzle, the Emergency Feedwater Actuation Signal (EFAS) is actuated on low steam generator level in the intact unit. A Main Steam Isolation Signal (MSIS) is generated upon low steam generator pressure. A "feed good generator only" logic is actuated by steam generator differential pressure. However, due to the presence of the check valves (discussed in the previous paragraph), there will be no large difference in pressure between the faulted unit and the intact unit when a break occurs upstream of the check valves. This will prevent generation of the necessary signal required to isolate Emergency Feedwater (EFW) flow to the faulted unit. As a result, there could be excessive loss of emergency feedwater and an inability to maintain the secondary side heat sink.

SAFETY IMPLICATIONS

Failure to achieve a pressure differential between the faulted and the intact steam generators results in a failure of the Emergency Feedwater System to perform as intended. This loss of this system could adversely affect the safety of the plant. Therefore, the present design of the feedwater system, if left uncorrected, could present a safety hazard.

CORRECTIVE ACTION TAKEN

The corrective action for this significant construction deficiency involved removing the internals of check valves 2FW-V825A and 2FW-V826B and adding two 6"-900# check valves downstream of each EFW flow transmitter.

- 1) Design Change Notice, DCN-MP-573, was issued on February 17, 1982 to implement the revisions necessary to perform the above modifications to the design and construction drawing, as noted on the DCN.
- 2) Nonconformance Report W3-3444 was issued on February 4, 1982 to provide tracking of this deficiency.
- 3) All design changes and corrective action are completed. Nonconformance Report W3-3444 has been reviewed, accepted and closed on October 21, 1982.

A telephone conference call was held on July 8, 1982 between LP&L, Ebasco and the NRC Auxiliary Systems Branch. Four specific areas of concern were raised by the NRC as a result of this corrective action. LP&L was then requested to document our responses to these concerns upon submittal of this Final Report. These are discussed below:

A. Containment Isolation

The Main Feedwater System is neither connected to the reactor coolant pressure boundary nor connected directly to the containment atmosphere and is a closed Seismic Category I system inside containment. It, therefore, is required by General Design Criteria 57 to be provided with at least one containment isolation valve outside containment which shall be either automatic or locked closed, or capable of remote manual operation. The Feedwater lines are provided with an automatic isolation valve outside containment and GDC57 is therefore still met after removal of these check valves.

B. Water Hammer

The hydraulic stability of the Feedwater System is discussed in FSAR Subsection 5.4.2.3.1.3. The effects of the changes reported herein have since been evaluated for water hammer development in the feedwater piping and we have concluded that removal of the feedwater check valves will have no effect.

C. Effects on the Emergency Feedwater (EFW) System Reliability Analysis

FSAR Appendix 10.4.9B provides the EFW reliability analysis required of OL applicants.

After the decision was made to perform the modifications described above, a supplemental analysis was performed that showed their removal will have no significant effect on the results of the analysis documented in the reliability analysis of FSAR Appendix 10.4.9B.

CORRECTIVE ACTION TAKEN (cont'd)

D. Feedwater Line Break Analysis

Deletion of the FWL check valves, as described above, will have no effect on the FSAR analysis, since the limiting break in that analysis is at the nozzle.

This report is submitted as the Final Report.

FINAL REPORT OF
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 43
"MAIN/EMERGENCY FEEDWATER SYSTEM"

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e). It describes a design deficiency regarding the ability of the plant protection system to detect and to respond adequately to a break in the feedwater system piping inside containment. The problem is considered reportable under the requirements of 10CFR50.55(e).

To the best of our knowledge, this problem has not been identified to the Nuclear Regulatory Commission pursuant to 10CFR21.

DESCRIPTION

A review of the Main and Emergency Feedwater System has revealed that if a pipe break occurs in the feedwater line, inside containment, between the containment penetration and either check valve 2FW-V825A and 2FW-V826B, the Emergency Feedwater System (EFWS) may not perform as intended.

Upon a feedwater line break at the steam generator nozzle, the Emergency Feedwater Actuation Signal (EFAS) is actuated on low steam generator level in the intact unit. A Main Steam Isolation Signal (MSIS) is generated upon low steam generator pressure. A "feed good generator only" logic is actuated by steam generator differential pressure. However, due to presence of the check valves (discussed in the previous paragraph), there will be no large difference in pressure between the faulted unit and the intact unit when a break occurs upstream of the check valves. This will prevent generation of the necessary signal required to isolate Emergency Feedwater (EFW) flow to the faulted unit. As a result, there could be excessive loss of emergency feedwater and an inability to maintain the secondary side heat sink.

SAFETY IMPLICATIONS

Failure to achieve a pressure differential between the faulted and the intact steam generators results in a failure of the Emergency Feedwater System to perform as intended. This loss of this system could adversely affect the safety of the plant. Therefore, the present design of the feedwater system, if left uncorrected, could present a safety hazard.

CORRECTIVE ACTION TAKEN

The corrective action for this significant construction deficiency involved removing the internals of check valves 2FW-V825A and 2FW-V826B and adding two 6"-900# check valves downstream of each EFW flow transmitter.

- 1) Design Change Notice, DCN-MP-573, was issued on February 17, 1982 to implement the revisions necessary to perform the above modifications to the design and construction drawing, as noted on the DCN.
- 2) Nonconformance Report W3-3444 was issued on February 4, 1982 to provide tracking of this deficiency.
- 3) All design changes and corrective action are completed. Nonconformance Report W3-3444 has been reviewed, accepted and closed on October 21, 1982.

A telephone conference call was held on July 8, 1982 between LP&L, Ebasco and the NRC Auxiliary Systems Branch. Four specific areas of concern were raised by the NRC as a result of this corrective action. LP&L was then requested to document our responses to these concerns upon submittal of this Final Report. These are discussed below:

A. Containment Isolation

The Main Feedwater System is neither connected to the reactor coolant pressure boundary nor connected directly to the containment atmosphere and is a closed Seismic Category I system inside containment. It, therefore, is required by General Design Criteria 57 to be provided with at least one containment isolation valve outside containment which shall be either automatic or locked closed, or capable of remote manual operation. The Feedwater lines are provided with an automatic isolation valve outside containment and GDC57 is therefore still met after removal of these check valves.

B. Water Hammer

The hydraulic stability of the Feedwater System is discussed in FSAR Subsection 5.4.2.3.1.3. The effects of the changes reported herein have since been evaluated for water hammer development in the feedwater piping and we have concluded that removal of the feedwater check valves will have no effect.

C. Effects on the Emergency Feedwater (EFW) System Reliability Analysis

FSAR Appendix 10.4.9B provides the EFW reliability analysis required of OL applicants.

After the decision was made to perform the modifications described above, a supplemental analysis was performed that showed their removal will have no significant effect on the results of the analysis documented in the reliability analysis of FSAR Appendix 10.4.9B.

CORRECTIVE ACTION TAKEN (cont'd)

D. Feedwater Line Break Analysis

Deletion of the FWL check valves, as described above, will have no effect on the FSAR analysis, since the limiting break in that analysis is at the nozzle.

This report is submitted as the Final Report.