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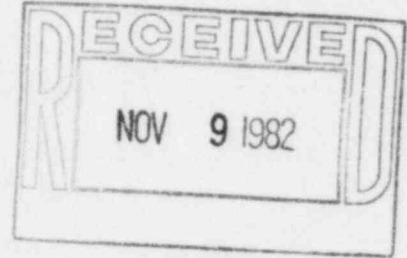
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November 5, 1982

L. V. MAURIN
Vice President Nuclear Operations

W3182-0093
Q-3-A35.07.65

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 Report No. 65
"Orifice Plate Gasket Failures in HPSI System"
Final Report

REFERENCE: Telecon from M. A. Livesay (LP&L) to L. Martin (NRC)
on October 7, 1982

Dear Mr. Collins:

In accordance with 10CFR50.55(e), attached are two copies of the final response to Significant Construction Deficiency No. 65. This item was previously identified as PRD #89.

Very truly yours,

L. V. Maurin

LVM/MAL:keh

- 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

IE-27

FINAL REPORT
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 65
"ORIFICE PLATE GASKETS FAILURE (HPSI)"

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e). It describes a condition relative to the gaskets used for the following four orifice plate assemblies SI-FE-311, 321, 331 and 341. The gaskets had failed at approximately 2700 psig during Cold Hydro. This problem is considered reportable under the requirements of 10CFR50.55(e).

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

DESCRIPTION

During ascension to the desired 3125 psig cold hydro pressure, it was observed that HPSI system started losing pressure at approximately 2700 psig. Upon investigation it was discovered that the gaskets on three of four orifice plate assemblies (as identified above) located downstream of the HPSI pumps had failed. The subject gaskets, supplied by Garlock, were 1/16" thick Graph-Lock wire inserted type. Graph-Lock gaskets have not been generally used on Waterford #3 project.

The piping specification calls for Flexitallic style CG gaskets or equivalent for systems with 250 psig or greater design pressure. For Safety Injection System, Flexitallic gaskets have been used at every plate except the four orifice plate assemblies identified above. This was mainly because of the vendor requirement that for accuracy of flow measurement the distances between the centerline of the flange taps and the face of the orifice plates be $1" \pm 1/64"$. Use of Flexitallic gaskets (thickness = 0.175") would not have satisfied this requirement. Therefore, 1/16" thick Graph-Lock wire inserted type gaskets were used for the subject orifice plates.

Investigation of the failure of these gaskets revealed that it was due to a combination of deficiencies in both design and construction. The design of gaskets used was not suitable for this application, primarily due to lack of sufficient test data. The tolerances used in the installation of the flanges were not appropriate for this 1/16" gasket. After the failure, these gaskets were replaced with Flexitallic gaskets and the cold hydro test was successfully completed.

SAFETY IMPLICATIONS

The subject orifice plate assemblies are installed in the main headers of the Safety Injection System, injecting borated water into the reactor coolant loop cold leg. This system is required to inject borated water into the Reactor Coolant System (RCS) to flood and cool the reactor core after a loss of coolant accident (LOCA) or main steam line break (MSLB) accident. A gasket failure could result in a sufficient fluid leakage so as to impair the safety related function of the high pressure safety injection system. This condition could have adversely affected the safe operation of the plant had it remained uncorrected.

CORRECTIVE ACTION

The following corrective action was taken to correct the deficiency:

- 1) An investigation by Ebasco Engineering determined the effect on the flow measurement accuracy from using 0.175" thick Flexitallic gaskets instead of 1/16" Graph-Lock gaskets was insignificant (0.1% to 0.2%).
- 2) Original design type Flexitallic gaskets were installed at the four orifice plate assemblies and the cold hydro test was successfully completed.
- 3) NCR-W3-4768 was written and dispositioned to document same.