



**Vogtle Project**

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March 9, 1984

United States Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Region II-Suite 3100  
101 Marietta Street  
Atlanta, Georgia 30303

File: X7BG03-M51  
Log: GN-327

Reference: Vogtle Electric Generating Plant-Units 1 and 2, 50-424, 50-425;  
Pullman Power Products-Fabrication Shop Spool Piece Welds;  
also GN-286, dated 11/21/83.

Attention: Mr. James P. O'Reilly

Gentlemen:

In our previous correspondence to the NRC, Georgia Power Company indicated that the NRC would be notified by March 9, 1984, of the results of our evaluation of visual defects found in pipe spool welds performed in the Pullman Power Products Fabrication Shop. Georgia Power Company has completed its review and evaluation of this event and has concluded that it is reportable as a significant deficiency and a substantial safety hazard. Based upon NRC guidance in NUREG-0302, Revision 1, Georgia Power Company is reporting this event as a significant deficiency pursuant to the requirements of 10 CFR 50.55(e).

An engineering evaluation was performed for weld defects associated with the specific spool pieces and the analysis indicated that, had these defects gone uncorrected, the system functional performance and plant safety could have been adversely affected. A copy of the evaluation of this concern is attached for your information.

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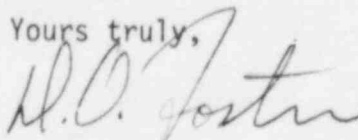
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Yours truly,



D. O. Foster

REF/DOF/sf1

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EVALUATION FOR A SUBSTANTIAL SAFETY HAZARD  
EVALUATION FOR A SIGNIFICANT DEFICIENCY

Pullman Power Products - Fabrication Shop Spool Piece Welds

Initial Report:

On October 21, 1983, Mr. C. W. Hayes, Georgia Power Company's Quality Assurance Manager for the Vogtle Project, reported a potential deficiency to Mr. John Rogge of the USNRC concerning visual weld discrepancies.

Background Information:

This potential deficiency resulted from an Institute of Nuclear Power Operations (INPO) pipe spool visual reinspection program and was initially reported to the Nuclear Regulatory Commission (NRC) on June 17, 1982, by Georgia Power Company. In a letter dated November 11, 1982, a report was submitted by Georgia Power Company to the NRC in which it was concluded that the potential defects identified at that time were not reportable under 10 CFR 50.55(e) or 10 CFR Part 21. Subsequent to that report, additional weld deficiencies were found. This final report includes an evaluation of those potentially reportable weld deficiencies which were not included in the November 11, 1982, evaluation.

All shop fabricated pipe spools which had been shipped by PPP and received on site as of August 1982 were visually reinspected at the site. The visual deficiencies, as identified in the nonconformance/deviation reports, had not been noted nor reported during the final visual inspection in the shop prior to acceptance and shipment. Consequently, potentially defective piping spools could have been installed and subsequently impact plant operations. The weld deficiencies were evaluated to determine whether the condition impacted safe operation of the plant, and if the condition was characteristic of a quality program breakdown.

Basic Component Identification:

The basic components are the piping spools of several plant systems, including safety-related systems. The potentially deficient welds in these pipe spools are tabulated below.

VISUAL DEFICIENCIES IN PIPE SPOOL SHOP WELDS

| <u>NONCONFORMANCE/<br/>DEVIATION REPORT</u>          | <u>SPOOL NO.</u> | <u>WELD<br/>I.D.</u> | <u>DEFICIENCY DESCRIPTION</u>          |
|--|------------------|----------------------|--|
| A. <u>System 1202, Nuclear Service Cooling Water</u> |                  |                      |  |
| MD-2736  | 2-1202-003-S-01  | A                    | Undercut                               |
| MD-3548  | 2-1202-004-S-17  | 90° ELL              | Grind mark in base metal               |
| MD-2800  | 1-1202-084-S-03  | B                    | Excess butt weld offset/<br>root crack |

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NONCONFORMANCE  
 DEVIATION REPORT

SPOOL #

WELD  
 I.D.

DEFICIENCY DESCRIPTION

A. System 1202, Nuclear Service Cooling Water (Continued)

|         |                 |   |                               |
|---------|-----------------|---|-------------------------------|
| MD-3245 | 2-1202-099-S-01 | M | Incomplete Penetration        |
| MD-2823 | 1-1202-151-S-10 | B | Excess weld/linear indication |
| MD-2913 | 2-1202-151-S-10 | D | Lack of fusion                |

B. System 1206, Containment Spray

|         |                 |       |                        |
|---------|-----------------|-------|------------------------|
| MD-2767 | 2-1206-005-S-14 | G     | Lack of fusion         |
| MD-3032 | 1-1206-007-S-10 | A,E   | Incomplete penetration |
| MD-3034 | 1-1206-007-S-11 | D,J   | Incomplete penetration |
| MD-2402 | 1-1206-007-S-13 | E,G   | Incomplete penetration |
| MD-3035 | 1-1206-007-S-13 | F     | Incomplete penetration |
| MD-3036 | 1-1206-008-S-10 | J     | Incomplete penetration |
| MD-3051 | 1-1206-008-S-13 | C     | Porosity               |
| MD-3076 | 1-1206-009-S-03 | K     | Incomplete penetration |
| MD-2393 | 1-1206-009-S-04 | B     | Grind mark             |
| MD-3077 | 1-1206-009-S-04 | H     | Undercut/porosity      |
| MD-3081 | 1-1206-012-S-01 | E,F   | Incomplete penetration |
| MD-2401 | 1-1206-013-S-05 | D     | Crater crack           |
| MD-3080 | 1-1206-013-S-05 | G     | Incomplete penetration |
| MD-3709 | 2-1206-013-S-06 | G     | Incomplete penetration |
| MD-3027 | 1-1206-054-S-01 | D     | Incomplete penetration |
| MD-3033 | 1-1206-054-S-02 | C,F,H | Incomplete penetration |
| MD-4092 | 2-1206-054-S-05 | C     | Undercut               |
| MD-3804 | 2-1206-054-S-06 | D,F,H | Undercut               |
| MD-2815 | 1-1206-054-S-10 | E     | Weld crack             |
| MD-3988 | 2-1206-054-S-10 | G     | Undercut               |

C. System 1208, Chemical and Volume Control

|         |                 |   |                        |
|---------|-----------------|---|------------------------|
| MD-3102 | 2-1208-003-S-07 | B | Undercut               |
| MD-3104 | 2-1208-003-S-18 | A | Undercut               |
| MD-2279 | 1-1208-003-S-20 | L | Incomplete penetration |
| MD-2768 | 1-1208-078-S-04 | B | Crater crack           |
| MD-3356 | 1-1208-085-S-03 | F | Slag                   |
| MD-2366 | 1-1208-090-S-02 | F | Incomplete penetration |
| MD-2809 | 2-1208-123-S-10 | C | Crack                  |

D. System 1210, Boron Recycle

|         |                 |   |                        |
|---------|-----------------|---|------------------------|
| MD-2432 | A-1210-002-S-03 | K | Incomplete penetration |
|---------|-----------------|---|------------------------|

E. System 1213, Spent Fuel Pool Cooling and Purification

|         |                 |   |                |
|---------|-----------------|---|----------------|
| MD-2635 | 1-1213-002-S-03 | C | Weld underfill |
|---------|-----------------|---|----------------|

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| <u>NONCONFORMANCE<br/>DEVIATION REPORT</u>                                  | <u>SPOOL #</u>  | <u>WELD<br/>I.D.</u> | <u>DEFICIENCY DESCRIPTION</u> |
|---|-----------------|----------------------|-------------------------------|
| E. <u>System 1213, Spent Fuel Pool Cooling and Purification (Continued)</u> |                 |                      |                               |
| MD-2862   | 2-1213-002-S-05 | C                    | Incomplete penetration        |
| MD-2634   | 1-1213-003-S-02 | G                    | Incomplete penetration        |
| MD-2781   | 2-1213-006-S-09 | C                    | Incomplete penetration        |
| F. <u>System 1217, Auxiliary Component Cooling Water</u>                    |                 |                      |                               |
| MD-3395   | 1-1217-011-S-23 | E                    | Porosity                      |
| G. <u>System 1591, Normal Chilled Water</u>                                 |                 |                      |                               |
| MD-3239   | 1-1591-083-S-01 | D                    | Incomplete penetration        |
| MD-3240   | 1-1591-084-S-01 | D                    | Incomplete penetration        |
| H. <u>System 1592, Essential Chilled Water</u>                              |                 |                      |                               |
| MD-3407   | 1-1592-007-S-09 | A, B                 | Incomplete penetration        |
| MD-2706   | 1-1592-044-S-01 |                      | Underfill                     |
| I. <u>System 1901, Liquid Waste Processing</u>                              |                 |                      |                               |
| MD-2278   | 2-1901-102-S-09 | B                    | Slag                          |
| J. <u>System 2303, Seismic Category 1 Fire Protection Water</u>             |                 |                      |                               |
| MD-2813   | 2-2303-022-S-05 | A                    | Hole in weld surface          |

Engineering Evaluation:

An evaluation of each weld defect was conducted to determine if the defect could potentially propagate into a through-wall-crack and/or complete weld failure. Defects demonstrating a propensity of propagation were analyzed further to determine the impact on plant safety. A summary of this analysis is provided as follows:

- A. All of the potentially deficient welds were located in moderate energy systems. Consequently, it was unnecessary to consider the dynamic effects of pipe breaks (pipe whip and jet impingement) at the location of the welds.

- B. A flooding review was performed to determine whether the existing plant analysis enveloped the effects of piping spool failure at the location of the potentially deficient welds. In all cases, the existing plant analysis postulated failures in other piping spools resulting in larger flooding flow-rates than those associated with the subject piping spools.
- C. A facility response analysis was conducted to determine if weld deficiencies in systems required to place the plant in a safe shutdown condition or mitigate the consequences of an event could result in unacceptable system functional performance and adversely affect plant safety. The analysis conservatively assumed the preexistence of a weld defect in one train, which renders that train inoperable (due to defect propagation and weld failure), concurrent with the most limiting single active failure following the onset of an event (transient or accident condition) requiring a response from that system. The results of the analysis indicated that the following deficiencies, had they gone uncorrected could have unacceptably compromised system functional performance and adversely affected plant safety.

NONCONFORMANCE OR  
 DEVIATION REPORT NO.

SPOOL NO.

DEFICIENCY DESCRIPTION

|              |                 |                                    |
|--------------|-----------------|------------------------------------|
| MD-2800      | 1-1202-084-S-03 | Excess butt weld offset/root crack |
| MD-3245      | 2-1202-099-S-01 | Incomplete penetration             |
| MD-3032      | 1-1206-007-S-10 | Incomplete penetration             |
| MD-3034      | 1-1206-007-S-11 | Incomplete penetration             |
| MD-2402/3035 | 1-1206-007-S-13 | Incomplete penetration             |
| MD-3036      | 1-1206-008-S-10 | Incomplete penetration             |
| MD-3076      | 1-1206-009-S-03 | Incomplete penetration             |
| MD-3081      | 1-1206-013-S-01 | Incomplete penetration             |
| MD-3709      | 2-1206-013-S-06 | Incomplete penetration             |
| MD-3027      | 1-1206-054-S-01 | Incomplete penetration             |
| MD-3033      | 1-1206-054-S-02 | Incomplete penetration             |
| MD-2815      | 1-1206-054-S-10 | Weld crack                         |
| MD-2279      | 1-1208-003-S-20 | Incomplete penetration             |
| MD-2862      | 2-1213-002-S-05 | Incomplete penetration             |
| MD-2634      | 1-1213-003-S-02 | Incomplete penetration             |
| MD-2781      | 2-1213-006-S-09 | Incomplete penetration             |
| MD-3407      | 1-1592-007-S-09 | Incomplete penetration             |

Analysis of Quality Assurance Program:

It was determined that there was not a significant breakdown in the quality assurance program at Pullman Power Products. Since the 17 defects identified by Bechtel represent a minute fraction of total welds made by Pullman and inspected; this indicates occasional incomplete execution of procedures and not an inadequate system.

Also, a special Quality Assurance audit of Pullman's applicable processes and controls was conducted on June 21-23, 1982, with a follow-up on June 29, 1982. A full-scope Quality Assurance audit was conducted August 25-27, 1982. These



audits were conducted in response to the initial identification of these problems. Results of these audits did not indicate a significant breakdown in the structure or implementation of the Pullman Quality Assurance program. Subsequent monitoring of the Pullman shop by an SCS shop surveillance representative indicates that Pullman is continuing to implement their Quality Assurance program.

Conclusion:

The engineering evaluation performed for the weld defects associated with the pipe spools listed in the engineering evaluation section has indicated that, had they gone uncorrected, the system functional performance and plant safety could have been adversely affected.

It has also been determined that a significant breakdown of the quality assurance program at Pullman Power Products did not occur.

It has been concluded that the failure of these pipe spools to meet the visual weld requirements of the specification represents a deviation from performance specifications that requires extensive repair to establish the adequacy of the system to meet the criteria and basis as stated in the Safety Analysis Report. This event is therefore reportable as a significant deficiency and as a substantial safety hazard. Based upon NRC guidance in NUREG-0302, Revision 1, Georgia Power Company is reporting this event as a significant deficiency pursuant to the requirements of 10 CFR 50.55(e).

Corrective Action:

The spools containing the reported deficiencies have been reworked or repaired and are presently in an acceptable condition.