



FINAL REPORT

ON

Gulf & Western Preassembled Formations

For

Callaway Plant Unit No. 1 (Union Electric)

And

Wolf Creek (Kansas Gas and Electric)

Bechtel Power Corporation

Gaithersburg

November 28, 1979

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1.0 INTRODUCTION

In compliance with 10CFR50.55(e), this report is being issued due to rejectable indications found in welds in preassembled piping formations manufactured by Gulf & Western (G&W), Paola, Kansas. The scope of this report includes preassembled formations fabricated, delivered, and in some cases, installed at Union Electric's Callaway Unit One and Kansas Gas & Electric's Wolf Creek Jobsite.

2.0 DESCRIPTION OF DEFICIENCY

This reportable deficiency to the NRC is based on an investigation of three piping formations (Formation Numbers A-18-151, A-47-135, and A-52-135) at the Callaway Jobsite. During this investigation the welds for these formations were found to include incomplete penetration, incomplete fusion, and slag inclusions. Radiographs for 22 of 52 welds reviewed on these formations by Bechtel indicate rejectable defects. Additionally, the radiographs for 31 welds were found to be unacceptable due to improper radiographic technique. These 31 welds were reshot and the number of welds rejected for radiographic technique problems was reduced to 16. Similar weld quality and radiographic technique defects have been indicated in other formations previously delivered to Wolf Creek and Callaway Jobsites.

3.0 CHRONOLOGY OF EVENTS

In March, 1979, visual examinations of preassembly Formation A-9-111 at Wolf Creek Site indicated concerns regarding weld quality and radiographic techniques employed by G&W. These initial concerns were followed up in April and May with detailed inspections and audit of preassembly formations delivered to both SNUPPS jobsites. These audits and inspections indicated substantial noncompliances to specification and ASME Code requirements. These noncompliances involved radiographic technique; (i.e., improper film density, multiple penetrameter images, incorrect penetrameter placements and surface indications inhibiting radiographic interpretation) as well as visible weld discrepancies involving incomplete fusion, surface porosity and improper weld profiles. A hold was subsequently placed on installation of safety-related preassembly formations furnished by G&W.

Between May 17, 1979 and June 28, 1979, a series of meetings took place between Bechtel, SNUPPS, KG&E, UE, and G&W to (1) determine the extent of the weld quality and radiographic technique problems and (2) develop a course of remedial and corrective actions. These actions included a 100 percent examination by G&W of all weld radiographs; this examination completed in early June indicated deficiencies in radiographic technique of between 35 and 50 percent. Further discussions with G&W management resulted in project agreement to surface grind and reradiograph, using corrected RT techniques, all preassembly formation welds subject to RT examination; other safety-related formations not requiring radiographic examination; i.e., Class III assemblies

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would also be included in this rework agreement. Selected formations not yet installed were returned to G&W in June for rework under strengthened project surveillance. Formations remaining at the jobsites would be reworked by G&W in the field under site inspection and surveillance. Criteria, procedures, and inspection arrangements governing the rework effort were established over the next several months and actual on-site work initiated at Callaway Site in early October. NRC I/E representatives for the two SNUPPS sites were informed of the preceding investigation and rework plans. The NRC representatives were informed that a determination regarding reportability of these deficiencies under 10CFR50.55(e) regulation would be made upon identification of significant weld defects.

On-site rework; i.e., visual inspection, surface grinding and reradiography of the first three assemblies at Callaway Site were completed in early November. After completion and acceptance of the rework effort by G&W and the G&W Authorized Nuclear Inspector, Bechtel, and Daniel/Union Electric inspection indicated the presence of rejectable weld defects as well as continuing radiographic technique difficulties. The nature of these defects suggest the potential for adverse safety consequences; as a result, these findings were reported on November 2 to the NRC by Union Electric pursuant to 10CFR50.55(e) regulations. Subsequently, G&W has been directed to discontinue all efforts with the exception of five units on the SNUPPS preassemblies located at their Paola, Kansas facility which are in the final stages of completion.

4.0 ANALYSIS OF SAFETY IMPLICATIONS

G&W has fabricated 32 safety-related piping formations for each of the two SNUPPS Sites (Callaway and Wolf Creek). These 32 preassemblies are part of the following safety-related systems:

- A. Auxiliary Feedwater (AL)
- B. Chemical and Volume Control (BG)
- C. Component Cooling Water (EG)
- D. High Pressure Coolant Injection (EM)

Each system relies upon at least one of these preassemblies to effect a safe shutdown of the plant concurrent with either a safe shutdown earthquake or a design basis accident. Failure of the welds in certain of these preassemblies could significantly degrade the functionality of critical systems to the extent that safe shutdown capability is compromised.

Due to the potential safety implications for safe shutdown, the generic welding problems identified in this report are deemed to constitute a significant reportable deficiency pursuant to 10CFR50.55(e).

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5.0 CORRECTIVE ACTION

The cause of the problem was inadequate control by G&W of welding and NDE operations. Due to G&W's inability to perform satisfactorily, the responsibility for rework and reinspection (including NDE) and repairs (where required) of the formations has been transferred to the Constructor (Daniel International Corporation) at both jobsites. The rework will be performed in accordance with the Constructor's Quality Assurance Programs and applicable Codes.

Five preassemblies - four for Callaway (including three preassembled formations previously returned for rework) and one for Wolf Creek, which are at G&W's facility at Paola, Kansas and which require minimal effort to complete, will be finished by G&W. This work will be performed by G&W under increased surveillance by Bechtel and will be receipt inspected at each of the SNUPPS jobsites.

6.0 CONCLUSION

All safety-related preassembly formations for both SNUPPS Sites will be reworked. Rejectable indications in the welds of preassembled formations will be satisfactorily corrected by the Site Constructors.