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the southern electric system  
NED-84-189

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U. S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Washington, D. C. 20555

REFERENCE:  
Wash.: RCD  
50-321, 50-366  
Crane Valve Disc Defect

ATTENTION: Mr. Richard C. DeYoung

GENTLEMEN:

On August 19, 1982, while performing an initial receipt inspection at Plant Hatch on four Crane Company 10-inch gate valve replacement discs, several material defects were discovered. In addition, several discrepancies were identified in the documentation which accompanied this shipment. Consequently, Georgia Power Company (GPC) refused to take delivery of these items and all four were returned to the vendor (Crane Company). Crane allegedly attempted to repair the defective discs and reshipped them to Plant Hatch. These allegedly repaired parts were rejected again by the subsequent receipt inspection performed by the GPC on February 10, 1983, and were again returned to Crane.

GPC conducted an evaluation to determine if these defects were reportable under 10 CFR 21. An "Evaluation of a Substantial Safety Hazard" is enclosed with this submittal. It was determined that had the defective discs been installed in their intended locations at Plant Hatch, they could have created a substantial safety hazard. However, since the deficiencies were discovered during the receipt inspections and the valve discs were then returned promptly to the vendor, "delivery" did not occur per NUREG 0302. Therefore, NRC notification by GPC under the requirements of 10 CFR 21 is not required.

GPC informed the vendor of these determinations, in a letter dated March 10, 1983, and recommended that Crane notify the NRC of these defects. On March 23, 1984, Crane informed GPC that they did not consider the defects to be a potential substantial safety hazard, and that they would not be notifying the NRC. GPC has therefore decided to report these events so that other NRC licensees might be informed of these problems, as appropriate.

Sincerely yours,

*L. T. Gucwa*

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EVALUATION OF A SUBSTANTIAL SAFETY HAZARD  
DEFECTIVE CRANE GATE VALVE DISCS  
April 13, 1984

Background:

On August 19, 1982, the Quality Control (QC) Department at Plant Hatch issued a Nonconformance Report (82-118) regarding material defects in a shipment of 10" gate valve discs from the Crane Company. These defects were discovered during an initial receipt inspection.

Georgia Power Company (GPC) had ordered these four (4) replacement valve discs from Crane. Upon their arrival at Plant Hatch they were inspected by site QC. Visual inspection, per plant procedure HNP-822, revealed unacceptable cracking in the stellite surface on the seat area of two of these discs. In addition, there were three discrepancies noted in the documentation package supplied by the vendor. All four discs were returned to the vendor for repair or replacement, along with a letter requesting that the documentation discrepancies be corrected. Repairs and corrections were allegedly effected by Crane and these four discs were reshipped to Plant Hatch where they were again subjected to a visual receipt inspection. This inspection rejected the valves for cracking similar to that found during the first inspection.

Engineering Evaluation:

These valves were ordered as replacements and were intended for use in two specific gate valves on each unit. One such disc is used in the High Pressure Coolant Injection (HPCI) inboard steamline isolation valve inside the drywell and one is used in the outboard HPCI steamline isolation valve. The valve discs had stellite hard surfacing in the seating area. Hard surfacing is used to prevent the steam flow from cutting into the base metal and wearing away the seat.

The hard surfacing contained cracks on two of the four valve discs. Several of these cracks had penetrated the surfacing and had extended into the base metal of the disc. With these discs installed, steam would follow these cracks and, over a period of time, cut channels into the disc seat area. As seating surfaces become worn, the valve could not seal properly upon closure. This would allow steam to escape around the disc.

If both HPCI steamline isolation valves were to seal improperly in conjunction with a downstream pipe break, then this could constitute an unanalyzed and uncontrollable pathway for a loss of coolant accident outside of the primary containment.

Evaluation of Breakdown in Quality Program:

The condition in which these four discs arrived at GPC represents a disregard of quality control. Crane's internal welding procedure states, "No cracks, lack of fusion, or any other linear defects will be allowed in the deposit or base metal." Also, ASME hard surfacing specifications for safety classes 1, 2, and 3 state that any linear indications greater than 1/16 inch long are unacceptable. Two of these discs had cracks significantly longer than 1/16 inch. One disc had four cracks that involved the base metal, with one of these cracks extending across the full width of the seat area.

During the course of the first receipt inspection, three discrepancies were noted in the documentation package which accompanied the shipment. While these discrepancies appear to be more typographical and bookkeeping-related than anything else, they do indicate that perhaps enough care was not taken in certifying the acceptability of these parts for service in a nuclear plant.

Conclusions:

The stellite cracking and the documentation deficiencies associated with the four gate valve discs were discovered during receipt inspections at Plant Hatch. However, the defects were of such magnitude that they should have been discovered before they were shipped by the Crane Company.

If two of the defective discs had been installed in the HPCI steamline isolation valves, steam flow would have eroded the cracked seats over a period of time. Following the postulated occurrence of a HPCI steamline break outside the drywell, these two valves would have been called upon to close. With defective seats, the valves might have been unable to seal properly, thus allowing high pressure steam from the reactor to leak out of the break. This scenario would constitute "a deficiency which seriously compromised the ability of a confinement system to perform its designated function." According to NUREG-0302, Rev. 1, this would be considered a "major reduction in the degree of protection provided to public health and safety," and would therefore be defined as a substantial safety hazard and should be reported by GPC or the vendor. But since these parts were rejected and returned to Crane upon completion of the receipt inspection, delivery did not occur (per NUREG-0302, Section 21.3(d), question 1), and, therefore, no notification of the NRC by the licensee is required. This situation does require that the vendor evaluate the deviation and report this issue to the NRC if similar components with similar defects had been delivered to any other facilities subject to the requirements of 10 CFR 21.

GPC has fulfilled its obligations as an NRC licensee with regard to this issue by promptly rejecting the defective components and returning them to Crane with a report on the deficiencies found. However, GPC is reporting the problem to the NRC, since the vendor has declined to do so, so that other nuclear plant operators can be appropriately informed about these defects.