Deficiency

During a December 6 to 9, 1977 audit at the Dravo Plant, Stone and Webster Procurement Quality Control Staff found the following deficiencies:

A. Contrary to 10CFR50 Appendix B Criterion IX, downcomer welds were not liquid penetrant tested correctly. The welds were not being prepared properly for penetrant examination. Also, liquid penetrant test indications which were thought to be non-relevant were not retested.

B. Contrary to 10CFR50 Appendix B Criterion IX, non-destructive examination instructions were not in accordance with the latest edition of the ASME Code (Winter 1975).

C. Contrary to 10CFR50 Appendix B Criterion IX, nondestructive examination procedures were not controlled as required by procedures. Shop inspectors had not been issued nondestructive examination information by appropriate notations on shop procedure sheets.

D. Contrary to 10CFR50 Appendix B Criterion XVII, non-destructive examination rejected work records were not maintained. Also records of examination of cavities were not maintained.

E. Contrary to 10CFR50 Appendix B Criterion XVIII, the authorized inspector approved certain welds before completion of the liquid penetrant test. (Four welds were identified as incorrectly approved.)

Safety Analysis

The downcomers and their function are described in Section 5.0 of the Preliminary Safety Analysis Report. The downcomers form an integral part of the pressure suppression design of the primary containment. This design includes a drywell which houses the reactor pressure vessel and interconnecting piping, the pressure suppression chamber which stores a volume of water and the drywell floor which separates the drywell and suppression chamber.

In the unlikely event of a loss of coolant accident, reactor water and steam would be released within the drywell. The resulting increased drywell pressure would force a mixture of noncondensable gases, steam and water through the downcomers into the suppression chamber. Steam would rapidly condense in the suppression chamber water.

The pressure suppression design is intended to withstand the pressure and temperatures of the postulated loss of coolant accident to maintain primary containment integrity. In conjunction with other engineered safeguards systems, the primary containment is designed to limit leakage during a postulated loss of coolant accident and prevent off-site doses from exceeding the guideline values in 10CFR100.

If the deficiencies identified above (Items A through E) were to have gone undetected, the downcomer design function could have been jeopardized. In the worst case, this could have resulted in the primary containment design pressure being exceeded with a subsequent potential for loss of primary containment integrity.

Corrective Action

The Stone and Webster Procurement Quality Control Audit resulted in a "stop work order" being issued on December 13, 1977. Stone and Webster has directed that:

A. Those welds previously liquid penetrant tested be retested and witnessed by Stone and Webster Procurement Quality Control personnel. These examinations are now underway.

B. Dravo update the nondestruction examination instructions to comply with the Winter 1975 edition of the ASME Code. The update is expected to be complete about January 31, 1978.

C. Dravo utilize and control issuance of nondestructive testing procedures. This has been completed. Stone and Webster plans to perform another audit to assure compliance.

D. Dravo establish and use appropriate procedures for nondestructive examination of rejected work and cavities. These are being prepared and will be complete about March 1, 1978.

E. Dravo ensure that the authorized inspector is the last person to "sign off" inspection sketches. Stone and Webster plans to perform another audit to assure compliance.