ENCLOSURE

HARTSVILLE AND PHIPPS BEND NUCLEAR PLANTS
DEFECTIVE MCGRAW-EDISON TEMPERATURE DETECTION
CONTROLLERS IN THE STANDBY GAS TREATMENT SYSTEM
10 CFR 50.55(e) REPORT NO. 1 (FINAL)
NCR'S HNP-A-100 AND PBNP-091

On May 14, 1980, TVA informed NRC-OIE, Region II, Inspector T. E. Burdette of a reportable deficiency under 10 CFR Part 50.55(e) involving defects in McGraw-Edison electronic temperature detection controllers in the Standby Gas Treatment System (SGTS) for the Hartsville and Phipps Bend Nuclear Plants. This deficiency was also reported under 10 CFR Part 21 to NRC-OIE Region III on April 30, 1980, by CTI-Nuclear, the STRIDE component supplier for the SGTS. This is the final report on the deficiency.

Description of Deficiency

TVA was informed by CTI-Nuclear, Cleveland, Ohio, who was previously informed by Edison Electronics Division of McGraw-Edison (Edison) of Manchester, New Hampshire, that an electronic temperature detection controller (the same type as controllers supplied by Edison to CTI-Nuclear and by CTI-Nuclear to TVA) failed in service and that other similar controllers are potentially defective.

The potentially defective controllers are McGraw-Edison P/N 377-02831 and are integral parts of electronic control circuits for detecting high temperatures in the airstream, both upstream and downstream of vertical deep bed carbon adsorbers in the Hartsville and Phipps Bend SGTS. The controllers are also used as part of a control circuit for high temperature thermal cutout of electric air heaters in the same system. These controllers are used on CTI-Nuclear part numbers D-31441 and D-31250.

TVA SGTS housings (two per nuclear unit at Hartsville and Phipps Bend) each contain five potentially defective controllers (two each in the upstream and downstream high temperature detection panels, No. D-31441, and one in the high temperature cutout panel, No. D-31250). This represents a total of 60 potentially defective controllers, 40 at Hartsville and 20 at Phipps Bend, in the SGTS equipment delivered to TVA.

Edison attributes the only known failure to use of an acid flux solder in sealing some of the controls during manufacture. Edison has concluded that there is no convenient method of determining in the field if the control was sealed with acid flux solder. The acid flux reportedly could cause corrosion in the controller and result in failure. The mode of a failure is unpredictable; a failure could cause the controller to give erroneous indication such as (1) failing to open and not closing at an alarm point, (2) failing closed and giving a false alarm, or (3) failing at some intermediate step and functioning inaccurately.

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Safety Implications

Failure of a controller in one of the manners described above could possibly cause or prevent detection of, through a number of ways depending on which controller failed and how it failed, loss of charcoal effectiveness through introduction of moisture or fire in the bed, thereby disabling at least one train of the SGTS. However, since other means are available to detect unusual conditions in the SGTS system (e.g., radiation monitors and moisture detectors downstream of the charcoal beds) loss of one of the controllers may not lead to undesirable consequences. TVA concludes that this deficiency could have jeapordized the safety of operation of the plant.

Corrective Action

CTI-Nuclear has requested that TVA remove the 60 potentially defective controllers and ship them back to CTI-Nuclear, 1922 E. 107th Street, Cleveland, Ohio 44106. CTI-Nuclear will then forward the controllers back to Edison. All 60 controllers will be replaced with controllers which have been verified to have been sealed or soldered properly. The controllers will be shipped from TVA sites back to CTI-Nuclear by July 31, 1980.

Means Taken to Prevent Recurrence

Edison has verbally indicated that they have informed all of their employees who assemble electronic components of the harmful effects of acid flux on electronic circuits. These individuals have also been instructed not to use acid flux in any operation.