ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 BLOWN FUSES IN LOW VOLTAGE SWITCHGEAR NCR 994 10 CFR 50.55(e) SECOND REVISED FINAL REPORT

Description of Deficiency

Upon energizing the main breaker on Westinghouse low voltage (480V) metal enclosed-type DS switchgear, the fuse (three amp - fast acting -Bussman type JKS-3) on the primary side of the main bus potential transformer blows. However, the fuse blows only when the voltmeter used for testing the main bus voltage is switched into the circuit. The fuses originally specified for the switchgear were undersized. There is one fuse affected on each switchgear.

Safety Implications

The problem has occurred on low voltage 480V switchgear supplied to Bellefonte by Westinghouse. This switchgear supplies ac power to safety-related 480V boards for distribution to equipment as well as other boards in the plant. Had the deficiency gone uncorrected, the consequences of the blown fuse would be the incorrect annunciation in the control room that the affected 480V board had lost ac power when it actually had not. Annunciators of equipment and boards fed by the affected 480V board would not be affected by the blown fuse and would not annunciate a low ac power condition. This conflict in signals should alert the operator to a problem in the Status Monitoring System and that power to the 480V boards had not been lost. The blown fuse would not, it itself, cause a condition which would adversely affect plant operation or safety.

Corrective Action

Westinghouse sized the fuses based on a bus voltage of 480, which is the nominal rating. However, at the time of the testing in which the fuses operated, it has been determined that the actual system voltage was approximately 490 volts. By comparing the characteristic curve of a three-amp Bussman JKS-3 fuse with the inrush currents of a magnitude corresponding to a system voltage of 490 volts, it was shown that fuse operation is possible if all worst case tolerances are taken into account (the actual inrush current will be dependent upon the magnitude of the voltage applied, the instant at which it is applied, and the amount and direction of the residual flux in the transformer core). Therefore, the three-amp fuse will be replaced with a six-amp fuse to avoid any possibility of the fuse opening on inrush current. Since the purpose of the fuse is for fault protection (not overcurrent) this design change will not affect the system reliability.