

### Primary Interest Groups

Generator Owners (GO), Generator Operators (GOP)

### Overview

A close-in line fault caused a generating station to run back and trip due to low voltage on the station auxiliary bus.

### Details

A generating station experienced a close-in 345 kV fault that resulted in a depressed voltage condition on station auxiliary power buses. The voltage on the station auxiliary power buses during the fault was reduced to approximately 0.8 per unit; the 120 V system used for plant control equipment dropped as low as 82.5 V. The 120 V system supplied power to programmable logic controllers (PLCs) within the plant, which had a minimum input detection voltage of 88 V. These PLCs controlled various critical functions within the plant. The depressed power supply voltage to the PLCs caused these systems to improperly position control dampers, and resulted in excessive negative boiler duct pressures on both units. The units experienced the loss of induced draft (ID) fans, as a result of excessive negative duct pressures. The first unit experienced the loss of an induced draft (ID) fan, as a result of excessive negative duct pressures. The loss of the ID fan initiated a unit runback that failed due to high water wall temperatures, and caused the unit to trip due to a master fuel trip. The second unit also experienced the loss of an ID fan due to excessive negative duct pressure. The ID fan trip caused an excessive rate-of-change in the main steam temperatures and resulted in a unit trip.

### Corrective Actions

The Entity provided a UPS power source to the programmable logic controllers during the next available plant outage.

### Lessons Learned

Critical power plant control components must be on UPS power. Power plant control system design should consider providing proper voltage support to vital plant control systems during disturbances on station auxiliary power buses. If properly designed, a UPS or battery system can provide the proper isolation between plant control systems and the station auxiliary power system. Providing a constant voltage supply to control system processors and their related input/output devices is essential to ensuring proper operation of these systems. If the power source to these systems is allowed to fluctuate, unintended results can occur.

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