Preventing Voltage Feedback in Synchronizing Circuits

October 22, 1990

Many synchronizing schemes use two lamps in series, connected from the incoming voltage source to the running voltage source. This "dark lamp" synchronizing indication can be used by an operator to supplement the meter and synchroscope readings to insure synchronism before closing the incoming circuit breaker.

This scheme, however, can allow energizing of a supposedly dead bus if the synchronizing switch is accidentally left in the "ON" position. The two lamps will be in series with the secondary of the bus voltage transformer, and this circuit will be connected across the energized incoming voltage transformer secondary. The portion of this voltage which appears across the bus voltage transformer will be stepped up by the ratio of the bus voltage transformer, and this higher voltage will be applied to the switchgear bus.

To prevent this voltage feedback, a dead bus relay (27B) should be connected in the circuit as shown in the figure below. For simple synchronizing schemes, where one or more generators are manually synchronized to a common bus, this circuit with its one 27B relay is satisfactory. For more complex schemes, involving automatic synchronizing, machine-to-machine synchronizing, or synchronizing to a utility source, a more complex circuit may be necessary to insure that no voltage feedback circuits exist. All synchronizing circuits should be reviewed carefully to prevent voltage feedback through the synchronizing lamps.

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