PT Secondary Voltage Transfer Scheme for the F60

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DESCRIPTION

This technical note describes the PT secondary voltage transfer scheme for loss of metering voltage due to switching or a blown fuse.

The system described is a multiple bus substation with main breakers on each transformer secondary and PTs located on the transformer secondary. F60 relays are applied on each feeder. Bus segments will be referred to as X, Y, and Z.

BASIC SCHEME

This scheme uses a single DSP module with one three-phase voltage input.

An F60 on bus X is programmed to have source X as its default source of potential. The physical connection to the phase A input on DSP-1 is through the 'B' contact of the F60 Form-C relay No. 1 (see Figure 1).

1. If any of the individual Phase Undervoltage No. 1 comparators detects an undervoltage, the relay logic energizes (and latches) output relay No. 1, disconnecting the relay voltage input from source X and connecting it to source Y through the 'A' contact of Form-C relay No. 1 in series with the 'B' contact of Form-C relay No. 2.

2. If after some interval any of the individual Phase Undervoltage No. 1 comparators detects an undervoltage, the relay logic energizes (and latches) output relay No. 2 (No. 1 is still energized via the latch), disconnecting the relay voltage input from source Y and connecting it to source Z through the 'A' contact of Form-C relay No. 2.

3. If after some interval any of the individual Phase Undervoltage No. 1 comparators detects an undervoltage, logic resets the latch of output relay No. 2, disconnecting the relay voltage input from source Z and connecting this input to source Y through the 'A' contact of Form-C relay No. 1 and the 'B' contact of Form-C relay No. 2.

4. If after some interval any of the individual Phase Undervoltage No. 1 comparators detects an undervoltage, the relay logic resets the latch of output relay No.1, disconnecting the relay voltage input from source Y and connecting this input to source X through the 'B' contact of Form-C relay No. 1. The scheme has returned to its starting point and the sequence can be aborted or attempted again after some interval. This scheme has no method of automatically returning to a designated 'preferred' source.

ENHANCED SCHEME

This scheme uses two DSP modules each with one three-phase voltage input. The enhancement in this scheme is that source X is designated as a 'preferred' source, and the input is returned to source X after a transfer, if source X is re-energized. An F60 on bus X is programmed to have source X connected to the phase A input on DSP-1 is through the 'B' contact of Form-C relay No. 1. Source X is also directly connected to the phase A input on DSP-2. Undervoltage unit No. 1 uses the voltage from DSP-1 and undervoltage unit No. 2 uses the voltage from DSP-2.

1. If any one of the individual Phase Undervoltage No. 1 comparators and the same phase individual Phase Undervoltage No. 2 comparators detects an undervoltage, logic energizes (and latches) output relay No. 1, disconnecting the relay voltage input from source X and connecting this input to source Y through the 'A' contact of the F60 Form-C relay No. 1 in series with the 'B' contact of the F60 Form-C relay No. 2.

2. If, while DSP-1 is connected to source Y, the undervoltage No. 2 element (still connected to source X) resets, the latch for output relay No. 1 is reset and DSP-1 is reconnected to source X.

3. If, however, after some interval any one of the individual phase undervoltage No. 1 comparators detects an undervoltage, the relay logic energizes (and latches) output relay No. 2 (No. 1 is still energized via the latch), disconnecting the DSP-1 voltage input from source Y and connecting this input to source "Z" through the 'a' contact of Form-C relay No. 2.

4. If, while DSP-1 is connected to source Z the undervoltage No. 2 element (still connected to source X) resets, the latches for output relays No. 1 and No. 2 are reset and DSP-1 is reconnected to source X.

5. If, however after some interval any of the individual Phase Undervoltage No. 1 comparators detects an undervoltage, the latch of output relay No. 1 resets, disconnecting the relay voltage input from source Y and connecting it to source X through the 'b' contact of Form-C relay No. 1. The scheme has returned to its starting point and the sequence can begin again, be aborted, or attempted again after some interval.
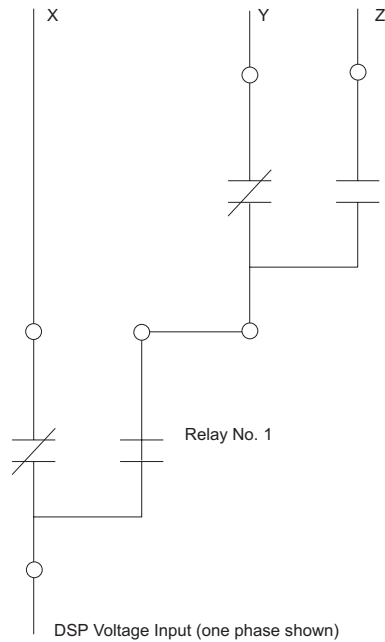

X   Y   Z

Relay No. 1

DSP Voltage Input (one phase shown)

FIGURE 1. PT Transfer Scheme Example

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