Open transition sequence of operations

Interlocking

1. In "manual" and "automatic" mode of operation, main and tie breakers may not be closed simultaneously.
2. All "manual" operations of main and tie breakers are performed using operator interface or breaker control switch. When in manual mode, control of breakers is in the hands of the operator and no automatic transfers will occur.

Lock-out

Overcurrent trip switch (OTS) on main and tie breakers are incorporated in the control scheme such that there will be no closure of any breaker onto a fault. Scheme cannot be defeated and is active except during emergency operations (inoperative controls). Trip unit and OTS switch must be reset to resume automatic operations.

Device definitions

- 43-A device is the auto/manual switch
- HMI retransfer mode is selectable on the HMI ①

① This feature can be a hardwired switch designated 43-1.

Manual operations

"Manual mode"

43-A = manual, HMI retransfer = auto or manual

Control of breakers can be accessed through the HMI or the breaker control switch. To operate a breaker on the HMI tap the breaker you wish to operate. Automatic operation will not occur when in manual mode. However, if in closed transition and all three breakers are closed for 5 seconds (adjustable), then the tie breaker will open.

Initial startup

1. Place device 43-A in "manual" operation.
2. Verify all transfer related circuit breakers are in the fully connected position in their cells.
3. Open and close breakers (using operator interface or breaker control switch) to obtain normal operating conditions.
4. Configure settings as required on HMI.
5. Place device 43-A in "automatic" operation.

Normal conditions

1. Main breakers 52-1 and 52-2 are closed.
2. Tie breaker 52-T is open.
3. Device 43-A in "automatic" position.

Emergency operation

If controls are inoperative or no control power is available, all breakers may be manually operated.

⚠ CAUTION

UNDER THESE CONDITIONS, NO INTERLOCKING WILL BE ACTIVE. OPERATOR MUST NOT PARALLEL ANY SOURCES.

Test mode

The system may be tested by operating in test mode on the HMI.

Note: This is a live test, and the system will respond as if a real failure had occurred. Test function will self-cancel if a real failure should take place while testing.

Settings

All user-settable time delays are set using the timer settings page on the HMI. Delay times may be changed at any time.

Sequence of automatic operations "Open transition switching"

43-A = auto, HMI retransfer = auto

See normal conditions for initial configuration.

Note: Open-transition transfers between live sources are time-delayed in neutral, to prevent back-emf damage.

A. Loss of utility power at main 52-1
   1. Device 27/47-1 detects loss of normal voltage.
   2. Time delay 5 seconds (adjustable 0–60 seconds).
   3. Main 52-1 opens.
   4. Time delay 2 seconds (adjustable 0–10 seconds), and then tie breaker 52-T closes.

B. Loss of utility power at main 52-2
   1. Device 27/47-2 detects loss of normal voltage.
   2. Time delay 5 seconds (adjustable 0–60 seconds).
   3. Main 52-2 opens.
   4. Time delay 2 seconds (adjustable 0–10 seconds), and then tie breaker 52-T closes.

C. Loss of utility power at main 52-1 and 52-2

   No action is taken.

D. Return of normal voltage to main 52-1 (following sequence "A" above)
   1. Device 27/47-1 detects normal voltage.
   2. Time delay 10 seconds (adjustable 0–60 seconds).
   3. Tie breaker 52-T opens.
   4. Time delay 2 seconds (adjustable 0–10 seconds), and then main 52-1 closes.

E. Return of normal voltage to main 52-2 (following sequence "B" above)
   1. Device 27/47-2 detects normal voltage.
   2. Time delay 10 seconds (adjustable 0–60 seconds).
   3. Tie breaker 52-T opens.
   4. Time delay 2 seconds (adjustable 0–10 seconds), and then main 52-1 closes.

Sequence of automatic operations "Manual re-transfer"

43-A = auto, HMI retransfer = manual

See normal conditions for initial configuration.

Note: Retransfer following return of a failed source is initiated by operator. However, if second source fails, followed by return of the first-failed source, the system will transfer to the live source and remain single-ended.

A. Loss of utility power at main 52-1
   1. Device 27/47-1 detects loss of normal voltage.
   2. Time delay 5 seconds (adjustable 0–60 seconds).
   3. Main 52-1 opens.
   4. Time delay 2 seconds (adjustable 0–10 seconds), and then tie breaker 52-T closes.

B. Loss of utility power at main 52-2
   1. Device 27/47-2 detects loss of normal voltage.
   2. Time delay 5 seconds (adjustable 0–60 seconds).
   3. Main 52-2 opens.
   4. Time delay 2 seconds (adjustable 0–10 seconds), and then tie breaker 52-T closes.

C. Loss of utility power at main 52-1 and 52-2

   No action is taken.

D. Return of normal voltage to main 52-1 (following sequence "A" above)
   No action is taken, requires manual transfer by operator:
   1. Set 43-A switch to manual.
   2. Use breaker control switches.

   Or

   1. Navigate to one-line screen on HMI.
   2. Press "initiate retransfer" button on HMI screen.

E. Return of normal voltage to main 52-2 (following sequence "B" above)
   No action is taken, requires manual transfer by operator:
   1. Set 43-A switch to manual.
   2. Use breaker control switches.

   Or

   1. Navigate to one-line screen on HMI.
   2. Press "initiate retransfer" button on HMI screen.

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