Transmission Line

Internal protection trip signals, external trigger input, analog triggering (any phase current exceeding 1.5 pu of CT secondary current or any phase voltage below 0.8pu, neutral/residual overcurrent greater than 0.25pu of CT secondary current).

Triggering criteria for DR : Any Start

DR time window : minimum 3 seconds. minimum 2 seconds.

Pre-fault time window (S): 0.5 -

Post fault time window (S): 2.5 0.3

Minimum sampling frequency: 1000 Hz 64 Samples Per Cycle

Analog signals as per priority

A. Mandatory signals:

1. Three phase voltage	1. Three phase-to-neutral voltages
2. Neutral voltage	2. Three phase currents and neutral currents.
3. Three phase current	3. Neutral Currents
4. Neutral current	4. Frequency

B. Optional signals:

1. Mutual current	1. Polarizing currents and voltages, if used.
2. Check Sync	2. Real and reactive power
	The Minimum parameters to be monitored in the Fault record shall be specified by the
3. Open Delta	respective RPC.

Digital signals as per priority

A. Mandatory signals:

1. Any Start
2. Any trip
3. Z1, Z2, Z3, Z4 pick up
4. Over current and Earth fault pick up
5. Over voltage stage I & II pick up
6. DT send & reverse
7. Carrier send & Receive
8. Main three phase CB open signal
9. Tie three phase CB open signal (where applicable)
10. Power Swing
11. SOTF/TOR
12. LBB
13. A/R L/O
14. Main-1/2 operated
15. Bus Bar trip
16. VT failure
17. Distance Forward & Reverse
18. T1, T2, T3, T4
19. Broken conductor
20. 86A & 86B
21. A/R 1P In Prog
22. A/R Fail
23. STUB/TEED (where applicable)

B. Optional signals:

1. Any External input
2. Any Binary Input

TRANSFORMER

Guide Lines

Internal protection trip signals, external trigger input, analog triggering (any phase current exceeding 1.5 pu of CT secondary current or any phase voltage below 0.8pu, neutral/residual overcurrent greater than 0.25pu of CT secondary current).

Triggering criteria for DR : Any Start

DR time window : minimum 3 seconds. minimum 2 seconds.

Pre-fault time window (S): 0.5 -

Post fault time window (S): 2.5 0.3

Minimum sampling frequency: 3200Hz 64 Samples Per Cycle

Analog signals as per priority

A. Mandatory signals:

1. Three Phase Currents & Neutral Currents of HV
2. Three Phase Currents & Neutral Currents of LV
3. Three Phase Currents & Neutral Currents of MV
4. I_REF HV
5. I_REF LV
6. I_REF MV
7. Voltages
8. Frequency
9. Differential Currents
10. Restraining Currents
11. Low Impedence REF-DIFF - of all windings
12. Low Impedence REF-Restraining - of all windings

Digital signals as per priority

1. Any Start
2. Any trip
3. Differential Trip
3. REF Trip HV, MV & LV
4. Over-current Trip
5. Earth Fault Trip
6. Over Flux
7. Over Voltage
8. Under Voltage
9. 2nd Harmonic
10. 5th Harmonic
11. Frequency Protection
12. External Trip Signals

BUSBAR

Triggering criteria for DR :   Any Start
DR time window :   minimum 3 seconds.   minimum 2 seconds.
Pre-fault time window (S):   0.5 -
Post fault time window (S):   2.5   0.3
Minimum sampling frequency: 3200Hz   64 Samples Per Cycle
Analog signals as per priority
A. Mandatory signals: 1. 3Phase Diff Current
2. 3Phase Bias Current
3. Neutral Differential Current
4. Neutral Bias Current
B. Optional Signals: 1. Individual Feeder Currenrts if available
2. Zone wise Differential and Bias Currents

Digital signals as per priority

1. Any Start
2. Any trip
3. R-Phase Fault
4. Y-Phase Fault
5. B-Phase Fault
6. Earth Fault
7. Check Zone Operated
8. Zone 1 BB Fault
9. Zone 2 BB Fault
10. Trip Bus bar Zone 1
11. Trip Bus bar Zone 2
12. Trip Breaker Failure Zone 1
13. Trip Breaker Failure Zone 2
14. Bus bar Differential Blocked