



Dynamic Rating, Monitoring, Control and Communications

Alarm & Trip Logic

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
TEMPERATURE ALARM	1.1 TRANSFORMER TEMPERATURE	1.1.1 TOP OIL TEMPERATURE					Check that Oil Pumps & Fans are operating, check Oil Level; Check Transf. Load; check that oil valves are open; Consider droppig load; plan maintenance.
		1.1.2 WINDING TEMPERATURE					
	1.2 TRANSFORMER TEMP. TRIP	1.2.1 TOP OIL TEMP. TRIP	Delayed Trip Time Mins (180 Default)	Transformer Trip Relay will activate (if installed)	Top Oil Temp. Delayed Trip		
VOLTAGE ALARM	2.1 VOLTAGE ALARM	1.2.2 HOT SPOT TEMP. TRIP		Delayed Trip Time Mins (180 Default)	Transformer Trip Relay will activate (if installed)	Top Oil Temp. Instant Trip	
					Transformer Trip Relay will activate (if installed)	WTI Delayed Trip	
		2.1.1 UNDER VOLTAGE	OnDelay1 (8 sec Default)	Inhibits OTLC	Vpu Secondary < Under Voltage Setpoint	Check system Voltages (primary & secondary load); Check Tap Changer	
	2.1.2 OVER VOLTAGE	OnDelay1 (8 sec Default)	Inhibits OTLC raise volts	Vpu Secondary > Over Voltage Setpoint	Check Supply Load; Check Tap Changer position and operation		
	2.1.3 VOLTAGE OUT OF TOLERANCE	OnDelayVLimit	Vpu Secondary Out of Tolerance	Vpu Secondary Out of Tolerance	Check Tap changer is in operation & not a Top or Bottom Tap		

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:	
COOLING FAIL ALARM	3.1 COOLING FAIL	3.1.1 PUMP 1 FAIL	3.1.1.1 PUMP 1 CONTACTOR	6 sec	Inhibits Pump 1	Pump 1 Should be ON Pump 1 Contactor is NOT Closed Pump 1 CB NOT Tripped Aux Power has NOT Failed Pump 1 Selected "InService" Pump 1 Contactor Failure is UNAcknowledge	Check electrical system - eg circuit wiring for loose connection, contactor coil failure.	
		3.1.1.2 PUMP 1 CB TRIP	3.1.1.2 PUMP 1 CB TRIP	OnDelay2 (5 sec Default)	Inhibits Pump 1	Pump 1 CB Tripped Pump 1 Selected "InService"	Check cause of Trip eg mechanical (pump shaft 'frozen') or electrical (short circuit or overload)	
		3.1.1.3 PUMP 1 NOT IN SERVICE	3.1.1.3 PUMP 1 NOT IN SERVICE	OnDelay2 (5 sec Default)	Inhibits Pump 1	Pump 1 NOT "InService" Either: Transformer Load > 0.2 pu or Mode Selected AUTO	Check that PUMP SELECTOR SWITCH is in SERVICE POSITION (if not under maintenance or test)	
		3.1.1.4 PUMP 1 OIL FLOW LOW	3.1.1.4 PUMP 1 OIL FLOW LOW OnDelay3	(25 sec Default)	Inhibits Pump 1	Oil Flow Low Pump 1 Contactor Closed Pump 1 CB NOT Tripped Pump 1 Oil Flow Low is UNAcknowledge	Check appropriate valves in oil circuit; Check Pump & Motor; consider maintenance history, plan shutdown to service oil coolers	
		3.1.2 PUMP 2 FAIL	Similar upstream logic to that for Pump 1					
		3.1.3 FAN 1 FAIL	3.1.3.1 FAN 1 CONTACTOR	6 sec			Fan 1 Should be ON Fan 1 Contactor is NOT Closed Fan 1 CB NOT Tripped Aux Power has NOT Failed Fan 1 Selected "InService"	Check electrical system - eg circuit wiring for loose connection, contactor coil failure.
			3.1.3.2 FAN 1 CB TRIP	OnDelay2	(5 sec Default)	Inhibits Fan 1	Fan 1 CB Tripped Fan 1 Selected "InService"	Check cause of Trip eg mechanical (pump shaft 'frozen') or electrical (short circuit or overload)
			3.1.3.3 FAN 1 NOT IN SERVICE	OnDelay2 (5 sec Default)	Inhibits Fan 1	Fan 1 NOT "InService" Either: Transformer Load > 0.2 pu or Mode Selected AUTO	Check that FAN SELECTOR SWITCH is in SERVICE POSITION (if not under maintenance or test)	
			3.1.3.4 FAN 1 VS DRIVE 1 FAIL	OnDelay3	(25 sec Default)	Inhibits Fan 1	Fan 1 Contactor Closed Fan 1 Selected "InService" Fan 1 Var Speed Drive 1 Failure	Check variable speed drive system
			3.1.3.5 FAN 1 VS DRIVE 2 FAIL	OnDelay3	(25 sec Default)	Inhibits Fan 1	Fan 1 Contactor Closed Fan 1 Selected "InService" Fan 1 Var Speed Drive 2 Failure	Check variable speed drive system
			3.1.4 FAN 2 FAIL	Similar upstream logic to that for Fan 1				
			7.1 AUXILIARY POWER FAIL	7.1 AUXILIARY POWER FAIL	OnDelay1 (8 sec Default)	Inhibits OLTC and Cooling	Auxiliary Power/Phase (to 3 Ph power or loss of phase for Transformer Auxiliaries) Failure	Check Power Supply, ie Isolators, Switches, Fuses, Circuit Breakers

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LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
TC FAIL ALARM	4.1 TAP CHANGER	4.1.1 TC TOO LONG	OnDelay β (25 sec Default)	Inhibits OTLC	Tap change fails to occur in the specified time period	TC Motor Circuit Breaker Tripped, and TC in "Remote"	Check mechanical & electrical system of Tap changer before resetting Circuit Breaker; could be short circuit of motor overload.
		4.1.2 TC MOTOR CB TRIP					
		4.1.3 TC OUT OF STEP				Tap change fails to occur in the specified time period	
		4.1.4 CIRCULATING CURRENT				Tap changer out of step alarm - follower mode only	
		7.1 AUXILIARY POWER FAIL	OnDelay γ (8 sec Default)	Inhibits OLTC and Cooling	Auxiliary Power/Phase (ie 3 Ph power or loss of phase for Transformer Auxiliaries) Failure		

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LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
GENERAL ALARM	5.1 GENERAL ALARM						
		5.1.1 TC PRESSURE SUREGE		OnDelay1 (8 sec Default)			Check visual Level Gauge & for leaks; plan oil top-up next shutdown
		5.1.2 TAP CHANGER OIL LOW		OnDelay1 (8 sec Default)			Take Gas Sample, Test, Plan Maintenance
		5.1.3 HYDRAN GAS HIGH		OnDelay1 (8 sec Default)			Conser gas history, advance maintenance plan for shutdown/service
		5.1.4 HYDRAN GAS HIGH HIGH		OnDelay1 (8 sec Default)			Review Operating Conditions & Gas Sample
		5.1.5 BUCHHOLZ GAS ALARM		OnDelay1 (8 sec Default)			
		5.1.6 BUCHHOLZ SURGE TRIP		OnDelay1 (8 sec Default)			
		5.1.7 GAS PRESSURE HIGH		OnDelay1 (8 sec Default)			
		5.1.8 TX PRESSURE RELIEF DEVICE		OnDelay1 (8 sec Default)			
		5.1.9 TRANSFORMER OIL LOW		OnDelay1 (8 sec Default)			Check visual Level Gauge & for leaks; plan oil top-up next shutdown
		5.1.10 VOLTAGE 1 OUT OF BALANCE		OnDelay1 (8 sec Default)			Check Load Currents and downstream or upstream system
		5.1.11 VOLTAGE 2 OUT OF BALANCE		OnDelay1 (8 sec Default)			
		5.1.12 VOLTAGE 3 OUT OF BALANCE		OnDelay1 (8 sec Default)			
		5.1.13 CURRENT 1 OUT OF BALANCE		OnDelay1 (8 sec Default)			Check transformer Load; Action accordingly
		5.1.14 CURRENT 2 OUT OF BALANCE		OnDelay1 (8 sec Default)			
		5.1.15 CURRENT 3 OUT OF BALANCE		OnDelay1 (8 sec Default)			
		5.1.16 CURRENT 4 OUT OF BALANCE		OnDelay1 (8 sec Default)			
		5.1.17 NOT CONFIGURED 0		OnDelay1 (8 sec Default)			User Defined Alarm
		5.1.18 NOT CONFIGURED 1		OnDelay1 (8 sec Default)			
		5.1.19 NOT CONFIGURED 2		OnDelay1 (8 sec Default)			
		5.1.20 NOT CONFIGURED 3		OnDelay1 (8 sec Default)			
		5.1.21 NOT CONFIGURED 4		OnDelay1 (8 sec Default)			
		5.1.22 NOT CONFIGURED 5		OnDelay1 (8 sec Default)			
		5.1.23 NOT CONFIGURED 6		OnDelay1 (8 sec Default)			

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LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
DRMCC ALARM	6.1 DRMCC SYSTEM PROBLEM	6.1.1 TRANSDUCER TEMP. AMBIENT	6.1.2 TRANSDUCER TEMP. TANK OIL	OnDelay1 (3 sec Default)	Ambient Temp Transducer Input Out of Range	Ambient Temp Transducer Input Out of Range	Check displayed quantities in EXTRA screen, the sensor, and associated circuit/wiring
		6.1.3 TRANSDUCER TEMP. FO 1	6.1.4 TRANSDUCER TEMP. FO 2	OnDelay1 (3 sec Default)	Top Oil Temp Transducer Input Out of Range	Top Oil Temp Transducer Input Out of Range	
		6.1.5 TRANSDUCER TEMP. FO 3	6.1.6 TRANSDUCER TEMP. FO 4	OnDelay1 (3 sec Default)	FO Winding Temp Transducer Input Out of Range	FO Winding Temp Transducer Input Out of Range	
		6.1.7 TRANSDUCER TEMP. IM		OnDelay1 (3 sec Default)	UIM Temp Transducer Input Out of Range	UIM Temp Transducer Input Out of Range	
		6.1.8 TRANSDUCER TEMP. SICM2		OnDelay1 (3 sec Default)	SICM2 Temp Transducer Input Out of Range	SICM2 Temp Transducer Input Out of Range	
		6.1.9 TRANSDUCER TEMP. SICM3		OnDelay1 (3 sec Default)	SICM3 Temp Transducer Input Out of Range	SICM3 Temp Transducer Input Out of Range	
		6.1.10 TRANSDUCER TPI		OnDelay1 (3 sec Default)	TPI Transducer Input Out of Range	TPI Transducer Input Out of Range	
		6.1.11 TRANSDUCER CURRENT	6.1.11.1 TRANSDUCER CT1 PHa 6.1.11.2 TRANSDUCER CT1 PHb 6.1.11.3 TRANSDUCER CT1 PHc 6.1.11.4 TRANSDUCER CT2 PHa 6.1.11.5 TRANSDUCER CT2 PHb 6.1.11.6 TRANSDUCER CT2 PHc 6.1.11.7 TRANSDUCER CT3 PHa 6.1.11.8 TRANSDUCER CT3 PHb 6.1.11.9 TRANSDUCER CT3 PHc 6.1.11.10 TRANSDUCER CT4 PHa 6.1.11.11 TRANSDUCER CT4 PHb 6.1.11.12 TRANSDUCER CT4 PHc	OnDelay1 (3 sec Default)	Inhibits LDC	Current Transducer Input(s) Out of Range	
		6.1.12 TRANSDUCER VOLTAGE	6.1.12.1 TRANSDUCER VT1 PHa 6.1.12.2 TRANSDUCER VT1 PHb 6.1.12.3 TRANSDUCER VT1 PHc 6.1.12.4 TRANSDUCER VT2 PHa 6.1.12.5 TRANSDUCER VT2 PHb 6.1.12.6 TRANSDUCER VT2 PHc 6.1.12.7 TRANSDUCER VT3 PHa 6.1.12.8 TRANSDUCER VT3 PHb 6.1.12.9 TRANSDUCER VT3 PHc	OnDelay1 (3 sec Default)	Inhibits AVR	Voltage Transducer Input(s) Out of Range	
		6.1.13 TRANSDUCER Watts 1	6.1.14 TRANSDUCER Watts 2	OnDelay1 (3 sec Default)	Inhibits LDC	WATTS Transducer Input Out of Range	
		6.1.15 TRANSDUCER Watts 3	6.1.16 TRANSDUCER VARS 1	OnDelay1 (3 sec Default)		VARS Transducer Input Out of Range	
		6.1.17 TRANSDUCER VARS 2	6.1.18 TRANSDUCER VARS 3	OnDelay1 (3 sec Default)			
		6.1.19 TRANSDUCER FREQUENCY		OnDelay1 (3 sec Default)		Frequency Transducer Input Out of Range	
		6.1.20 TRANSDUCER HYDRAN		OnDelay1 (3 sec Default)		Hydran Transducer Input Out of Range	
		6.1.21 TRANSDUCER TEMP. COOLER TOP OIL		OnDelay1 (3 sec Default)		Cooler Top Oil Transducer Input Out of Range	
		6.1.22 TRANSDUCER TEMP. COOLER BOT OIL		OnDelay1 (3 sec Default)		Cooler Bottom Oil Transducer Input Out of Range	

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LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
		6.1.23 HYDRAN FAIL		OnDelay1 (8 sec Default)		Hydran Unit Failure	Check / plan replace unit
		6.1.24 UIM TEMP. HIGH				UIM Temperature > 75.0 deg C	
		6.1.25 SICM2 TEMP. HIGH				SICM2 Temperature > 75.0 deg C	
		6.1.26 SICM3 TEMP. HIGH				SICM3 Temperature > 75.0 deg C	
		6.1.27 SICM COMMS FAULT				No Communications to SICMs	
		6.1.28 MODBUS COMMS FAULT		11 sec		Modbus error count is rapidly increasing	Check communications link between UIM and Modbus slaves.
		6.1.29 UIM SELF TEST FAIL				UnAvailable	
		6.1.30 UIM RTC BATTERY LOW		OnDelay1 (8 sec Default)		UIM	Advance maintenance plan shutdown/service and replace battery
		6.1.31 MF SLAVE NOT RESPONDING		11 sec		Master/Follower Modbus slave error count is rapidly increasing	Check communications link between UIM master and followers.
		6.1.32 MF MASTER NOT POLLING		10 sec		Master/Follower Modbus slave is not being polled by a master	Ensure a Master is present on the network; Check communications link between UIM master and followers.
		7.1 AUXILIARY POWER FAIL		OnDelay1 (8 sec Default)		Auxiliary Power/Phase (ie 3 Ph power or loss of phase for Transformer Auxiliaries) Failure	

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