SPECIFICATION FOR VOLTAGE REGULATING RELAYS AND 3 PHASE BREAKER FAIL RELAYS

4.4.19 3 Phase Breaker Failure Protection Relay

The breaker fail protection relay should have the following features:

4.4.19.1 Numeric design, with large LCD screen and HMI.
4.4.19.2 Circuit –breaker failure protection, single or three pole with or without current
4.4.19.3 Three phase overcurrent detectors.
4.4.19.4 Earth fault detector.
4.4.19.5 Using 110VDC Power supply and Binary input voltage
4.4.19.6 Using 1A and/or 5A CT inputs
4.4.19.7 Sufficient number Binary input and Outputs for a 3 Phase BF Scheme. At Least 8 BIs and 10 BOs.
4.4.19.8 2 out of 4 check of current detectors
4.4.19.9 Phase selective for single and three pole operation
4.4.19.10 Fast reset time with no Overshoot
4.4.19.11 Very sensitive current detection
4.4.19.12 Independently settable delay times for operation with and without current
4.4.19.13 "No current" condition control using the circuit-breaker auxiliary contacts
4.4.19.14 Two stage delay, hence two stages of operation
4.4.19.15 Trip command input.
4.4.19.16 Necessary logic to determine breaker fail condition.
4.4.19.17 Operator keypad with display
4.4.19.18 Display of line measured current values
4.4.19.19 Serial Interface
4.4.19.20 Annunciation and storage of previous events.
4.4.19.21 Self monitoring
4.4.19.22 Pole discrepancy
4.4.19.23 Flush mounting
4.4.19.24 LEDs to show phase and stage of operation.
4.4.19.25 A BF Relay with additional Breaker management features like AR, Interlocking, Synch check, Pole discrepancy etc will be an added advantage.

4.4.20 Voltage Regulating Relays.

4.4.20.1 Ratings: AC Inputs: 110Vac, 1 Amp (three phase), Power Supply Voltage range 80-260VDC/AC nominal 110VDC or wider range.
4.4.20.2 The relays shall be of Numeric Design with Keypad HMI
4.4.20.3 The sensing input shall be 110Vac (phase-phase) from VT secondary outputs.
4.4.20.4 Should have buttons for Raise and Lower Commands
4.4.20.5 Should have Selector Switches for Local and Remote.
4.4.20.6 Should have Selector Switches for Auto/Manual operation.
4.4.20.7 Tap-Position Indication on the LCD screen.

4.4.20.8 With functionality for Master/Follower/Independent Operation mode selection.
4.4.20.9 Binary Inputs that can work with 110VDC inputs >8BIs.
4.4.20.10 Binary Outputs that can work with 110VDC or 240VAC, >10BOs.
4.4.20.11 Bandwidth settings of 0.5 to 5%.
4.4.20.12 Voltage Level Setting from 80V to 120V or wider setting range.
4.4.20.13 At least 2 stage Time Delay settings (T1, T2) which are independently settable,
4.4.20.14 Displays should be programmable to display either secondary or primary values.
4.4.20.15 Should be able to display at least TPI, kV, A, MW, MVAR, pf, frequency and Harmonic Distortion.
4.4.20.16 Should be able to use Ethernet or direct Fibre for parallel operation implementation of Master/Follower scheme.
4.4.20.17 Provision of selection of Master/Follower possibility using binary inputs will be an added advantage.
4.4.20.18 Load profile data, voltage profile data availability is required.
4.4.20.19 Display of alarms on the screen and LEDs
4.4.20.20 Event records should be incorporated.
4.4.20.21 At least Ten (10) Binary outputs 4 of which must be of High Speed Power Outputs (HSPO) for controlling tapchanger.
4.4.20.22 Software for Programming the configuration and Relay Settings and also downloading and analysing the Relay Data.
4.4.20.23 Three sets of Installation, Commissioning, Operation and Maintenance manuals shall be provided.
4.4.20.24 Should be IEC61850 compliant.
4.4.20.25 Analogue input of 0….20mA dc for Tap Position indication coming from TPI Transducer
4.4.20.26 Optional BCD input for Tap Position Indication
4.4.20.27 Communication Cable for Relay to PC communication.
4.4.20.28 Should block operation for an Overcurrent, Under-Voltage and extreme Over-voltages.
4.4.20.29 HMI indication of Service or Blocked Operation of Relay
4.4.20.30 Flush mounting construction
4.4.20.31 Provide at least 3 hard copy manual or a manual for each relay.

APPENDIX N

SCHEDULE A: GURANTEED RELAY TECHNICAL SCHEDULES.

The bidder is required to complete this schedule by indicating the offer details against each requirement and to give a reference in the attached Manuals/Publications where the details entered can be verified.

NB: Failure to complete this schedules will result in the rejection of the bid.

Tender No……

ELECTRICAL PROTECTION RELAYS		
KPLC REQUIREMENTS		**BIDDER/MANUFACTURER'S RESPONSE**
4.4.19 3 Phase Circuit Breaker Failure Protection Relay		
	Relay Manufacturer	
	Relay model, offered	
	Country of Origin	
4.4.19.1	Numeric design, with large LCD screen and HMI.	
4.4.19.2	Single or three pole with or without current	
4.4.19.3	Three Phase Overcurrent Detectors 2 out of 4 check of current detectors	
4.4.19.4	Earth Fault Detector	
4.4.19.5	Using 110VDC Power supply and Binary input voltage	
4.4.19.6	Using 1A and/or 5A CT inputs	
4.4.19.7	Binary input and Outputs for a 3 Phase BF Scheme. At Least 8 BIs and 10 BOs	
4.4.19.8	2 out of 4 check of current detectors	
4.4.19.9	Phase selective for single and three pole operation. Two Stage time delay, hence two stages of operation	
4.4.19.10	Fast reset time with no Overshoot	
4.4.19.11	Very sensitive current detection. Indicate sensitivity	
4.4.19.12	Flush Mounting Independently settable delay times for operation with and without current	
4.4.19.13	"No current" condition control using the circuit-breaker auxiliary contacts	
4.4.19.14	Two stage delay, hence two stages of operation	
4.4.19.15	Trip command input.	
4.4.19.16	Necessary logic to determine breaker fail condition	
4.4.19.17	Operator keypad with display	
4.4.19.18	Display of line measured current values	
4.4.19.19	Serial Interface provision	
4.4.19.20	Annunciation and storage of previous events	
4.4.19.21	Self -Monitoring Watchdog	

4.4.19.22	Pole discrepancy Feature	
4.4.19.23	Suitable for Flush mounting	
4.4.19.24	LEDs to show phase and stage of operation	
4.4.19.25	Additional Breaker management features like AR, Interlocking, Synch check, SF6 Gas monitoring	
4.4.20	**Voltage Regulating Relay**	
	Relay Manufacturer	
	Relay model, offered	
	Country of Origin	
4.4.20.1	Ratings: AC Inputs: 110Vac, 1A (three phase)	
4.4.20.2	Power Supply Voltage range 80-260VDC/AC nominal 110VDC or wider range.	
4.4.20.3	The relays shall be of Numeric Design with Keypad HMI	
4.4.20.4	Buttons for Raise and Lower Commands	
4.4.20.5	Selector Switches for Local and Remote	
4.4.20.6	Selector Switches for Auto/Manual operation	
4.4.20.7	Master/Follower/Independent Operation mode selection.	
4.4.20.8	Binary Inputs that can work with 110VDC inputs >8BIs.	
4.4.20.9	Binary Outputs that can work with 110VDC or 240VAC, >10BOs.	
4.4.20.10	Bandwidth settings of 0.5 to 5%.	
4.4.20.11	Voltage Level Setting from 80V to 120V or wider setting range.	
4.4.20.12	2 stage Time Delay settings (T1, T2	
4.4.20.13	Displays should be programmable to display either secondary or primary values	
4.4.20.14	Display at least TPI, kV, A, MW, MVAR, pf, frequency and Harmonic Distortion.	
4.4.20.15	Ethernet or direct Fibre for parallel operation implementation of Master/Follower scheme.	
4.4.20.16	Master/Follower Selection possibility	

	using binary inputs	
4.4.20.17	Display of alarms on the screen and LEDs	
4.4.20.18	Event records should be incorporated.	
4.4.20.19	At least 4 High Speed Power Outputs (HSPO) for controlling tapchanger 2 for Raise and 2 for Lower).	
4.4.20.20	Software for Programming the configuration and Relay Settings	
4.4.20.21	Should be IEC61850 compliant.	
4.4.20.22	Analogue input of 0….20mA dc for TPI	
4.4.20.23	BCD input for Tap Position Indication	
4.4.20.24	Communication Cable for Relay to PC communication.	
4.4.20.25	Block operation for an Overcurrent, Under-Voltage and extreme Over-voltages	
4.4.20.26	HMI indication of Service or Blocked Operation of Relay	
4.4.20.27	Flush mounting construction	
4.4.20.28	Provide at least 3 Hard copy operating manual or manual per Relay	