



ODISHA POWER TRANSMISSION CORPORATION LIMITED

GUARANTEED TECHNICAL PARTICULARS

FOR

CONTROL & RELAY PANEL

**NOTICE INVITING TENDER-NIT NO. "70 / 2014-15"
TENDER SPECIFICATION NO Sr.G.M- CPC-TENDER-PACKAGE- 70/2014-15.**

TECHNICAL DATA REQUIREMENTS

CONTROL AND RELAY PANELS

(Bidder's Name)-----

1. Name and address of Manufacturer of panels 1.
2. Manufacturer's type and designation 2.
3. Type of construction (Simplex /duplex) 3.
4. Thickness of sheet steel 4.
 - (i) Front i)
 - (ii) Back ii)
 - (iii) Sides iii)
5. Degree of protection 5.
6. Name of the manufacturer of relays. 6.
7. DC voltage of the relays 7.
8. Make and Model of static (o.2 accuracy 8.
classType) energy meters
9. Confirm whether offered manufacturer of 9.....
C&R Panels and protective relays have tested
Commissioned & they are in successful operation
For at least two years in 400 /220/132/33 kV system.
For 400/220/132 KV Sub-Station

1).

(A) TRANSMISSION LINE PROTECTION

Numerical Distance protection Scheme (Main-1)

1. Name and address of Manufacturer of Relay/panels 1.
2. Manufacturer's type and designation 2.
3. Switched or Non-switched type (is 3.
It with separate measurements for
Single/three phase faults)
4. Setting range of off set feature 4.....
5. Whether the relay is having self 5.
Monitoring feature.
6. Whether relays is compatible for 6.
PLCC equipment and can be used
for Permissive Under reach/over
reach /Blocking scheme etc.
7. Suitable for single and three phase Trip??7.

8. Type of shaped characteristic 8.
9. Whether it is communicable to other relays 9.....
of different manufacturer. Also mention the
communicating protocol.
10. Features like broken conductor, SOTF, Distance 10.....
to fault locator & other features as per Tech Spec
are available or not.
11. No of tripping contacts with making Capacity of 30 amp for 0.2 seconds. 11.
12. In case 16 contacts as per above Clause are not available with the distance relay
Offered, type tripping relays being offered. 12.
13. Maximum operating time for at 50% of the Reach setting of 2 ohms and 10/20 ohms
(with CVT) including all trip relays, if any (Bidder is required to enclose isochronic
Curve with CVT on line) 13.
a) at SIR=4 a)
b) at SIR=15, (3 phase faults) b)
c) at SIR=15 (other faults) c)
14. IDMT earthy fault relay meeting Normal Inverse Characteristics as per IEC 60253
Is being offered as built in feature for 400/220/132 KV lines. 14.....
15. If no, type of IDMT relay being offered 15.....
16. Built in feature offered with the relay (YES/NO) 16.....
a) Disturbance recorder a)
b) Fault locator b)
c) Over voltage (one stage only) c)
d) Auto reclose along with Dead line d)
e) Charging and check synchronizing. e)
17. Indicate the no. of Binary Input & Out put contacts 17.....

(B) Numerical Distance protection Scheme (Main-2)

1. Name and address of Manufacturer 1.
2. Manufacturer's type and designation 2.
3. Switched or Non-switched type (is it with separate measurements for
Single/three phase faults) 3.
4. Setting range of off set feature. 4.....
5. Whether the relay is compatible for PLCC Equipment and can be used for permissive
Under reach/over reach/Blocking scheme etc. 5.

6. Suitable for single and three phase Trip 6.
7. Type of shaped characteristic 7.
8. No of tripping contacts with making Capacity of 30 amp for 0.2 seconds. 8.
9. In case 16 contacts as per above Clause are not Available with the distance relay Offered, type of tripping relays being offered. 9.
10. Maximum operating time for at 50% of the Reach setting of 2 ohms and 10/20 ohms (with CVT) including all trip relays, if any (Bidder is required to enclose isochronic Curve with CVT on line) 10.
 - a) at SIR=4 a)
 - b) at SIR=15, (3 phase faults) b)
 - c) at SIR=15 (other faults) c)
11. Built in feature offered with the relay (YES/NO)
 - a) Disturbance recorder a)
 - b) Fault locator b)
 - c) Over voltage (one stage only) c)
 - d) Auto recluse along with Dead line d)
Charging and check synchronizing.

(C) BACKUP DIRECTIONAL OVER CURRENT AND EARTH FAULT PROTECTION SCHEME(Numerical)

1. Name and address of Manufacturer 1.
2. Manufacturer's type and designation 2.
3. Three over current and one E/F elements 3.
Are whether independent or composite unit
4. Type of relay (Numerical) 4.
5. Directional sensitivity. 5.
6. Whether characteristics conform to IEC 255-3 6.
7. Over current unit setting range inverse time 7.....
8. Earth fault unit setting range inverse time 8.
9. VT Fuse failure relay/ feature included For alarm. 9.
10. Whether it is communicable to other relays of different manufacturer. Also mention the communicating protocol. 10.....

(D) LINE OVER VOLOTAGE PROTECTION RELAY

1. Name and address of Manufacturer. 1.

2. Manufacturer's type and designation 2.
3. Type of relay (Electromechanical/static/Numerical)3.
4. Operation indicator provided? 4.
5. Operating time 5.
6. Resetting time 6.
7. Whether monitors all three phases? 7.
8. Built in feature of Main/Main 2 distance Relay is offered. If so, which stage is Offered as built in 8.

(E) DISTANCE TO FAULT LOCATOR

1. Name and address of Manufacturer of panels 1.
2. Manufacturer's type and designation 2.
3. Built in feature of Main/Main 2 distance Relay is offered 3.
4. Maximum registering time 4.
5. Whether direct display unit provided? 5.
6. Whether both phase to phase fault and Phase to earth fault measuring units included? 6.
7. Whether-On-Line type 7.
8. Accuracy for the typical conditions defined Under technical specification. 8.

(F) DISTURBANCE RECORDER

a. Acquisition unit.

1. Name and address of Manufacturer . 1.
2. Manufacturer's type and designation 2.
3. No. of analogue channels 3.
4. No. of digital recording channels. 4.
5. Built in feature of Main 1/ Main 2 distances. Relay is offered. 5.
6. Pre-fault memory (milli seconds) 6.
7. Post fault memory (seconds) 7.
8. Total storage memory is seconds. 8.
9. Sampling Frequency. 9.
10. Resolution of the event channels (ms) 10.
11. Time display present? 11.

12. Data out put in COMTRADE is available. 12.

b. Evaluation Unit.

- 1. Name and address of Manufacturer 1.
- 2. Manufacturer's type and designation 2.....
- 3. No. of acquisition unit that can be connected To one evaluation unit. 3.
- 4. Technical parameters of evaluation unit 4.
 - A. Processor and speed. A.
 - B. RAM and hard disk capacity. B.
 - C. Additional facilities. C.
 - D. Details of printer. D.
- 5. Details of power supply arrangement for Acquisition unit (including printer). 5.

(G) AUTO RECLOSE RELAY

- 1. Name and address of Manufacturer. 1.....
 - 2. Manufacturer's type and designation. 2.
 - 3. Electromechanical/ static /numerical. 3.....
 - 4. Auto re closure relay along with Dead line charging And check synchronizing relay (For 132 KV Lines) offered as a part of distance relay. 4.
 - 5. Built in feature of Main 1/ Main 2 distances. Relay is offered. 5.
 - 6. Suitable for single and three phase? 5.
 - 7. Single phase dead time setting Range. 6.
 - 8. Three phase dead time setting range. 7.
 - 9. Reclaim time setting range. 8.....
- 2.)

TRANSFORMER PROTECTION

a) Differential relay.

- 1. Name and address of Manufacturer 1.
- 2. Manufacturer's type and designation 2.....
- 3. Second harmonic restraint provided. 3.
- 4. Whether three instantaneous units provided 4.
- 5. Operating current setting range. 5.....
- 6. Bias setting range,. 6.

- | | | |
|-----|---|---------|
| 7. | Operating time at 5X setting current. | 7. |
| 8. | Resetting time. | 8. |
| 9. | How ratio / phase angle corrections are being done (inter posting transformer/ internal feature in the relay) | 9. |
| 10. | Whether numerical or not | 10..... |
| 11. | Fifth Harmonic restraint feature. | 11..... |
| 12. | Communication protocol | 12..... |

b)Restricted Earth Fault Protection

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|----|---|---------|
| 1. | Name and address of Manufacturer | 1. |
| 2. | Manufacturer's type and designation | 2..... |
| 3. | Operating time at 2 x setting. | 3. |
| 4. | Whether numerical | 4..... |
| 5. | Whether suitable for all type of transformer windings or not. | 5..... |

c) Over Fluxing relays.

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|----|--|---------|
| 1. | Name and address of Manufacturer | 1. |
| 2. | Manufacturer's type and designation | 2..... |
| 3. | Whether inverse time operating characteristics | 5. |
| 4. | Maximum operating time. | 6. |
| 5. | Accuracy of operating time. | 7. |
| 6. | Resetting time. | 8. |

d) Directional O/C and E/F relays.

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|----|--|----------|
| 1. | Name and address of Manufacturer | 1. |
| 2. | Manufacturer's type and designation | 2..... |
| 3. | Whether Characteristic will confirm to IEC 255-3 | 3..... |
| 4. | Directional sensitivity. | 4..... |
| 5. | Over current unit setting range | 5. |
| | a) Inverse time | a) |
| | b) High set | b) |
| 6. | Earth fault unit setting range. | 7. |
| | a) Inverse time | a) |
| | b) High set | b) |
| 7. | Whether numerical | 7..... |
| 8. | Features of disturbance recording | 8..... |

3)

GENERAL PROTECTION / MONITORING EQUIPMENT

a) Trip Circuit Supervision relay.

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|----|--|---------|
| 1. | Name and address of Manufacturer | 1. |
| 2. | Manufacturer's type and designation | 2..... |
| 3. | Whether pre-closing and post closing Supervision provided? | 3. |
| 4. | Time delay. | 4. |

b) High Speed Trip Relays.

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|----|---|-----------|
| 1. | Name and address of Manufacturer | 1. |
| 2. | Manufacturer's type and designation | 2..... |
| 3. | Contact rating. | 3. |
| | a) Making and carry continuously | a) |
| | b) Make and carry for 0.5 sec. | b)..... |
| | c) Break. | c) |
| | i) Resistive load. | l) |
| | ii) Inductive load.
(With L/R= 40 milli sec.). | li) |
| 4. | Operating time at rated voltage (maximum) | 4. |
| 5. | Resetting time .. | 5. |
| 6. | Whether supervisory relays included. | 6. |

c) Local breaker back-up protection.

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|----|-------------------------------------|----------|
| 1. | Name and address of Manufacturer | 1. |
| 2. | Manufacturer's type and designation | 2..... |
| 3. | Operating time | 3. |
| 4. | Resetting time. | 4. |
| 5. | Setting ranges | 5. |
| | a) Current | a) |
| | b) Time. | b) |

4)

BUS BAR PROTECTION

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|----|----------------------------------|---------|
| 1. | Name and address of Manufacturer | 1. |
|----|----------------------------------|---------|

2.	Manufacturer's type and designation	2.....
3.	Type of relay (Numerical)	3.
4.	Principle of operation (Biased.High/Low impedance)	4.
5.	Operating time	5.
6.	Resetting time.	6.
7.	Resetting ranges.	7.
	(i) Current.	(i)
	(ii) Time.	(ii)
8.	Whether will it cause tripping for the differential Current below the load current of heavily Loaded feeder (Bidder shall submit application Check of the same).	8.
9.	Whether LBB protection features available.	9.....
10.	Features of disturbance recording	10.....
11.	Communication protocol	11.....

5)

Meters and Instruments Indicating meters.

1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....
3.	Operating principle or type of movement.	3.
4.	Range:	4.
	(i) Voltage.	(i)
	(ii) Current	(ii)
	(iii) Frequency	(iii)
	iv) Megawatt	(iv)
	v) Megavar	(v)
5.	Accuracy class.	5.
6.	Total deflection angle	6.
7.	Overall dimensions in mm.	7.
8.	Burden	8.
	(i) Current coil	(i)
	(ii) Voltage coil.	(ii)

9.	Digital type	9.....
a) Recording Meter for voltage		
1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....
3.	Accuracy class.	3.
4.	Full span response time	4.
5.	Is it strip type recorder/ digital type	5.
6.	If it is digital type	6.....
	i) No of channels beings used.	l)
	ii) Whether time tagged information is available	ii)
	iii) Whether EMNC./EMI compatibility is tested	iii)
b) Recording Meter for Current		
1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....
3.	Accuracy class.	3.
4.	Full span response time	4.
5.	Is it strip type recorder/ digital type	5.
6.	If it is digital type	6.....
	i) No of channels beings used.	l)
	ii) Whether time tagged information is available	ii)
	iii) Whether EMNC./EMI compatibility is tested	iii)
c) Recording Meter for MW		
1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....
3.	Accuracy class.	3.
4.	Full span response time	4.
5.	Is it strip type recorder/ digital type	5.
6.	If it is digital type	6.....
	i) No of channels beings used.	l)
	ii) Whether time tagged information is available	ii)
	iii)Whether EMC./EMI compatibility is tested	iiii).....
d) Recording Meter for MVAR		
1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....

3. Accuracy class. 3.
4. Full span response time 4.
5. Is it strip type recorder/ digital type 5.
6. If it is digital type 6.....
 - i) No of channels beings used. l)
 - ii) Whether time tagged information is available ii)
 - iii)Whether EMC./EMI compatibility is tested iii)**

e) Recording Meter for frequency.

1. Name and address of Manufacturer 1.
2. Manufacturer's type and designation 2.....
3. Accuracy class 3.
4. Full span response time. 4.
5. Is it strip type recorder/ digital type 5.
6. If it is digital type 6.....
 - i) No of channels beings used. l)
 - ii) Whether time tagged information is available ii)
 - iii) Whether EMC./EMI compatibility is tested iii)

6) OTHERS:

a) Terminal Block

1. Name and address of Manufacturer 1.
2. Manufacturer's type and designation 2.....
3. Rated current. 3.
4. Rated voltage. 4.
5. Minimum no. of conductors of area 2.5mm² suitable for connection. 5.
 - (i) All circuits except CT./P.TCircuits. (i).....
 - (ii) C.T. Circuits. (ii)

b) Switches.

i) Control Switches.

1. Name and address of Manufacturer 1.
2. Manufacturer's type and designation 2.....
3. No.of contacts. 3.
4. Type of handle. 4.
5. Rating of handle. 5.

6.	Rating of contacts.	6.
	a) Make and carry continuously.	a)
	b) Make & carry for 0.5 sec.	b)
	c) Break resistive load, in Amps (d.c)	c)
	d) Break inductive load with L/R=40 m.sec inn Amps. (d.c)	d)
7.	Life of switch in terms of million mechanical operations	7.....
	ii) Synchronizing switch	
1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....
3.	Contact ratings.	3.
4.	No.of positions.	4.
5.	Removable handle type?	5.
6.	No.of contacts	6.
	iii) Indicating Lamps.	
1.	Name and address of Manufacturer	1.
2.	Manufacturer's type and designation	2.....
3.	Ratings	
	(i) Current	(i)
	(ii) Voltage	(ii)
	(iii) Wattage	(iii)
4.	Whether series resistors are provided?	4.
5.	If series resistors provided, give	5.
	(i) Ohmic value	(i)
	(ii) Wattage	(ii)
6.	Life of Lamps in burning hours.	6.
7.	Permissible voltage variation	7.
8.	Whether LED type	8.....
	iv) Push Buttons.	
1.	Name of Manufacturer.	1.
2.	Manufacturer's type and designation	2.....
3.	Contact ratings.	3.
4.	No.of contacts	4.

v) Semaphore Indicators.

1. Name and address of Manufacturer 1.
2. Manufacturer's type and designation 2.....
3. Is colour similar to mimic? 3.
4. No.of positions 4.
5. Burden DC 5.
6. Is the coil continuously rated? 6.

vi) Trransducers.

1. Make 1.
2. type& Model No. 2.
3. Nominal AC input voltage. 3.
4. Frequency. 4.
5. Input measuring Range 5.
6. Output current range. 6.
7. Accuracy range. 7.....
8. Response time. 8.....
9. A.C. ripple on output 9.
10. Load Resistance (Maxm.) 10.
11. Auxiliary supply voltage.. 11.

vii) Annunciators.

1. Make 1.
2. Type & Model No. 2.
3. Static/electromechanical 3.
4. No. of lamps per window 4.
5. Lamps 5.
 - a) Voltage a)
 - b) Wattage. b)
6. Minimum duration of impulse for initiating. Contact in millisecond 6.
7. Type of reset self/manual. 7.....