

ANNEXURE-A, & B, TO PRODUCT STANDARD SG12927

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BHEL Bhopal	Project Specific Data		
SWE	PI No.: 240902458	Enq. No.:	PO No.:
W.O. Nos. :			

1. Project Data

Work order No	Project	P.I NO.
99015Q47604	FGD SYSTEM PACKAGE FOR BRBCL NABINAGAR	240902458
99022Q47604	FGD SYSTEM PACKAGE FOR NSPCL BHILAI	
99021Q47604	FGD SYSTEM PACKAGE FOR RAMAGUNDAM	
99019Q47604	FGD SYSTEM PACKAGE FOR KORBA	
99011Q47602	FGD SYSTEM PACKAGE FOR NPGCL NABINAGAR	

2. Site Condition

Ambient Temp (min/max/design) deg Celcius	Humidity (%)	Altitude (mtr)	Atmospheric condition	Installation
1.1/55/50	>90	<1000	Highly corrosive	Indoor

3. Miscellaneous inputs (tick (√) / Purchaser to indicate against the requirement)

a.	Auxiliary Supply for Relays	220 DC
b.	Auxiliary Supply for Data Concentrator	NA
c.	Prot. CT Secondary	1A (√) / 5A (√) / Not Applicable ()
d.	Diff./REF CT Secondary	1A (√) / 5A () / Not Applicable ()
e.	Earth Fault CT secondary	1A (√) / 5A () / Not Applicable ()
f.	Open Delta Voltage for Directional	110/3VAC () / Not Applicable (√)
g.	PT Synchronization secondary voltage	63.5VAC (√) / 110VAC () / Not Applicable ()
h.	Relay shall have protection against Harsh Environment	No () / Yes (√)
i.	Motor diff Relay part of main motor Protection Relay	No () / Yes (√)
j.	Trafo diff Relay part of main trafo Protection Relay	No () / Yes (√)
k.	RTD/ BTM Inputs (Nos) (For Motor Protection)	No (√) / Yes () & Nos ()
l.	Protocol for Communication of relays	IEC open Protocol (IEC-61850) (√) / MODBUS-RTU ()
m.	Protocol for Communication of DC with Upper Level system	MODBUS-RTU () / OPC (ETHERNET BASED) / IEC-60870-104 () / Not applicable (NA) (√)
n.	No of rear communication port on numerical relay for	1 (one) (√) / 2 (Two) ()

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	Networking	
o.	Redundancy Protocol	PRP()/ HSRP ()/ Dual Ring w/o PRP ()/Not Applicable (√)
p.	Topology for Communication from Relay to DC/Ethernet switch	Serial (Redundant)/ Star (Non-Redundant)/ Not Applicable (√)
q.	Topology for Communication of DC with HMI	Star (dual redundant link)/ Not Applicable (√)
r.	System Communication Architecture	Enclosed () & DRG NO: ()/ Not Enclosed ()/ Not applicable (√)
s.	Metering Network architecture (if applicable)	Enclosed () & DRG NO ()/ Not Enclosed ()/ Not applicable (√)
t.	Time Synchronization Required	No ()/ Yes (√)
u.	Distance between feeder for cable differential relay and size & type of cable	Not Applicable (√)/ Applicable () & Distance , Type
v.	Switchgear Control thru relay from HMI Required	No ()/ Yes (√)
w.	Project/Switchboard wise Item break-up	Enclosed (√)- Table A / Not Enclosed ()/ Not applicable ()
x.	Location of different Swbd or Switchgear Room Layout drawing	Enclosed () & Drawing No () / Not Enclosed (shall be informed later) / Not applicable (√)
y.	Integration of LT relays	Not Applicable (√) / Applicable (, Nos (200 approx.), Type (shall be informed during detail engineering) & Protocol of LT relays (IEC open Protocol (IEC-61850) ()/ MODBUS-RTU ())
z.	Data concentrator Panel paint shade	Powder coated, semi glossy, shade (shall be informed during detail engineering)/ Not Applicable (√)
	Data concentrator Panel Location	In BTG building control room 500 mtrs from Unit and Station Swbd/ Not Applicable (√)
aa.	HMI Console colour shade	Powder coated, semi glossy, shade (shall be informed during detail engineering) / Not Applicable (√)
	HMI Console Desk Top colour shade	Powder coated, semi glossy, shade (shall be informed during detail engineering) / Not Applicable ()
	HMI Console location	Main control room 100 mtrs from Data Concentrator panel/ Not Applicable (√) (shall be informed during detail engineering)

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bb.	Customer approved sub-vendor List for communication Network items	Enclosed () & Annexure (E) / Not Enclosed () / Not Applicable (√) (shall be informed during detail engineering),
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4.0 Following clauses of SG12927 Rev 05 not applicable for the project:

Clauses	3.01- b to k, B 2.00.00 for Relay Network System & Items
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5.0 This Enquiry is common for following four Projects:

1. FGD SYSTEM PACKAGE FOR BRBCL NABINAGAR
2. FGD SYSTEM PACKAGE FOR NSPCL BHILLAI
3. FGD SYSTEM PACKAGE FOR RAMAGUNDAM
4. FGD SYSTEM PACKAGE FOR KORBA
5. FGD SYSTEM PACKAGE FOR NPGCL NABINAGAR

6.0 The Projects mentioned above belongs to the same customer i.e. M/s NTPC.

Therefore, all five projects has been made as one package to reduce engineering & manufacturing cycle time. All the items covered in this enquiry for all five projects shall be procured from one source, package wise from technically clear L1 approved source.

7.0 Relays shall be supplied in Lot quantity for each projects.

Services (Clause B4.03.00) & Training (Clause B4.04.00) required for each projects separately.

Quantity of Relays schedule for each Project is as shown below, however in case of ambiguity PO / enquiry qty shall be final:

TABLE -1

Project	Item 01	Item 02	Item 03	Item 04	Item 05	Item 06	Item 07
FGD SYSTEM PACKAGE FOR BRBCL NABINAGAR	12	21	0	42	0	21	21
FGD SYSTEM PACKAGE FOR NSPCL BHILLAI	7	11	0	24	0	11	11
FGD SYSTEM PACKAGE FOR RAMAGUNDAM	16	33	16	35	13	72	72
FGD SYSTEM PACKAGE FOR KORBA	20	29	9	39	14	71	71
NPGCL NABINAGAR	14	22	6	40	0	22	22

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8.0 Protection & metering features required in relay (In addition to specified in SG12927 rev 05)

KEY FEATURES ↓	Item- 001 (Tick the reqmnt √)	Item- 002 (Tick the reqmnt √)	Item- 003(Tick the reqmnt √)	Item-004 (Tick the reqmnt √)	Item- 005 (Tick the reqmnt √)
SHORT DESCRIPTION →	O/C+ E/F (SUITABLE FOR DC/DE/DD)	O/C+ E/F (SUITABL E FOR DB)	TRAFO WITH DIFF (SUITABL E FOR DBF)	MOTOR PROTN (SUITABL E FOR DA)	MOTOR PROT WITH DIFF (SUITABLE FOR DAF)
3-Ph Directional Over current (67) with low set, high set and high set instantaneous					
Directional Earth Fault (67N) with low set, high set and high set instantaneous					
Stand By Earth Fault (64S)					
3-Ph inrush current detector					
Neutral Displacement (64NDR)					
Under Frequency with time delay(81U)	√				
Over Freq with time delay (81O)					
df/dt element(4 Stages)					
Max. start time				√	√
Motor Over Load pre-alarm				√	√
Motor Re-acceleration					
Loss of load (37)				√	√
Single Phasing (46)				√	√
Under current				√	√
Phase Reversal Protection (46R)				√	√
Motor Stall protection				√	√
Earth Fault thru CBCT (50N)	√	√	√	√	√
Transformer Diff (87T) 3-winding					

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KEY FEATURES	Item- 001 (Tick the reqmnt √)	Item- 002 (Tick the reqmnt √)	Item- 003 (Tick the reqmnt √)	Item-004 (Tick the reqmnt √)	Item- 005 (Tick the reqmnt √)
SHORT DESCRIPTION → ↓	O/C+ E/F (SUITABLE FOR DC/DE/DD)	O/C+ E/F (SUITABL E FOR DB)	TRAFO WITH DIFF (SUITABL E FOR DBF)	MOTOR PROTN (SUITABL E FOR DA)	MOTOR PROT WITH DIFF (SUITABLE FOR DAF)
High Impedance Motor Diff. (87M)					√**
Low impedance Motor diff. (87M)					
Bus Differential (87B)					
Check bus differential					
Cable Diff. prot. scheme (87F)					
Converter/Modem/Isolation Trf for cable differential (if reqd)					
Restricted Earth fault (REF1)		√	√		
Restricted Earth fault (REF2)					
Breaker monitoring					
Synch-check (25)	√				
Metrosil		√	√		
Stabilizing resistance		√	√		
<u>Metering /Event Recording</u>					
3-Ph MVA	√	√	√	√	√
3-Ph MVAR	√	√	√	√	√
3-Ph MVAH	√	√	√	√	√
Hour Run Meter				√	√
BINARY INPUT/BINARY OUTPUT BESIDES RELAY FAIL W/D CONTACT	14/10	14/7	14/7	10/7	10/7
<u>No of CT/PT and their purpose</u>	4/4	5/3	9/3	4/3	7/3
<u>OFFERED RELAY MODEL</u>					

** Low Impedance protection in Motor diff relay Item 005 is also acceptable.

ITEM-006	Metrosil suitable for 1 A rating
ITEM-007	Stabilizing Resistor (0-4000ohms)

Note: DC—Incomer, DE- Tie, DD—Bus Coupler, DB- Trafo feeder, DBF- Trafo with Diff., DA – Motor Feeder, DAF – Motor With Diff.

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9.0 Set of Documents Required (For each project)

ITEMS	Sets (along with the offer)	Sets (along with the supplies)	Sets (within 2 weeks of P.O placement)
Technical Leaflet/ literature, panel cutout, overall dimension drawing, complete model no, wiring diagram of Each item.	1	–	–
User manual/Guide of Each item.	–	1	8
Routine test certificate	–	1	–
Scheme, datasheet, FDS, System architecture, bill of material, OGA of data concentrator panel, OGA of furniture & HMI etc for approval	–	1	8
QAP (Quality Approval Plan)	–	–	8
SAT (Site Acceptance test procedure)	–	–	8
FAT (Factory acceptance test procedure)	–	–	8

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ANNEXURE-B: VENDOR TO CONFIRM PROJECT SPECIFIC OTHER TECHNICAL REQUIREMENT

CLAUSE NO	SPECIFIC TECHNICAL REQUIREMENT	COMPLIED YES/NO	REMARKS
1.0	Relays shall be suitable for both residually connected neutral CT input as well as CBCT input. Relays for transformer feeders without differential shall have 5 CT inputs (3 – Phase, 1 – CBCT, 1 – REF). Relays for transformer feeders with differential protection shall have 9 CT inputs (6 – Phase, 1 – CBCT, 1 – REF, 1 – Standby Earth Fault). Motor relays shall have 4 & 7 CT inputs for nondifferential & differential application respectively. Relays for Incomers, Bus-couplers & Ties shall have 4 CT inputs.		
2.0	Training Workshop at Site Workshop Training at site shall aim for familiarization of Site Engineers for commissioning and day-to-day O & M of Numerical Relays and trouble shooting. The scope shall include one no of Numerical Relay workshops and Training for a batch of 20 Engineers for 2 days at Project Site. One day shall be classroom training and one day shall be for hands on training on numerical relays. The Workshop shall be organized before the commissioning of First MV Switchboard Owner shall provide the required Infrastructure such as Training Conference room, Projection systems etc.		
3.0	All techno-commercial compliances shall be applicable for all five projects and all terms & conditions of specification & enquiry shall be followed project wise.		
4.0	Any deviation in any project shall lead to rejection of offer for all the projects.		
5.0	Price bid of technically acceptable customer approved make & their acceptable models shall only be opened.		
6.0	Vendor to confirm in case vendor's offered relays / network are not acceptable to customer /NTPC, vendor to supply suitable alternate relays acceptable to customer / NTPC without any price implication to BHEL.		