

ANNEXURE-IX

BOM FOR SCAP PROJECT:RFCL, RAMAGUNDAM

S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
A	220KV GRID OUTGOING BREAKER	1	2	
1	Annunciation window	6	12	Bkr trip, Trip circuit unhealthy, PT sec MCB off, Line undervoltage, spare, spare
2	Voltmeter	1	2	
3	Voltmeter Selector switch	1	2	OFF. RY-YB-BR
4	Frequency meter	1	2	
5	MW meter	1	2	
6	LED based semaphor indicator for 220KV isolators & earth switches and circuit breakers	4	8	
7	Aux relays shall be suitable for make/break/continuous carry rating of 5A at 220V DC for brk contact multiplication	1	2	
8	Aux. contactors for brk close & open command	2	4	
9	Discrepancy switches (Illuminated type) for breaker control	1	2	
10	Indicating Lamps	8	16	For ON/OFF/RTC indication, ISO-1,ISO-2 & ES ON, OFF
B	220kV Switchyard Incoming breakers	1	2	
1	Annunciation window	6	12	Bkr trip, Trip circuit unhealthy, PT sec MCB off, Line undervoltage, spare, spare
2	Voltmeter	1	2	(0-240KV)
3	Voltmeter Selector switch	1	2	OFF-RY-YB-BR
4	Semaphor indicator for 220KV isolators & earth switches	4	8	
5	Aux relays shall be suitable for make/break/continuous carry rating of 5A at 220V DC for brk contact multiplication	1	2	
6	Aux. contactors for brk close & open command	2	4	
7	Discrepancy switches (Illuminated type) for breaker control	1	2	
8	Indicating Lamps	8	16	

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
C	220kV Bus-coupler/Bus section	1	1	
1	Annunciation	6	6	Bkr trip, Trip circuit unhealthy, PT sec MCB off,-Bus A PT sec MCB off-Bus B, spare, spare
2	Voltmeter	2	2	
3	Voltmeter Selector switch	2	2	
4	Aux relays shall be suitable for make/break/continuous carry rating of 5A at 220V DC for brk contact multiplication	1	1	
5	Aux.Contactors	2	2	
6	Discrepancy switches (Illuminated type) for breaker control	1	1	
7	Indicating lamps	8	8	
D	GT GENERATOR	1	2	
1	Annunciation windows	72	144	
2	Generator Voltmeter	1	2	(0 - 15KV)
3	Voltmeter Selector switch	1	2	OFF. RY-YB-BR
4	Stator current Ammeter	3	6	(0 - 3000A)
5	MW meter	1	2	(0 - 50MW)
6	MVAR meter	1	2	50MVAR lag to 50MVAR lead
7	MVA meter	1	2	0 - 50MVA
8	PF meter	1	2	0.5 lag - 0.5 lead
9	Frequency meter,	1	2	45Hz - 55Hz
10	Generator field current meter(Input: Shunt 0-60mV /20Amp)	1	2	(0 - 1500A) DC
11	Exciter field current meter (input 4-20mA)	1	2	(0 - 30A) DC
12	Exciter field voltmeter (Input 4-20mA)	1	2	(0 - 100V) DC
13	Null voltmeter (input 4-12-20mA)	1	2	-15V -0- +15V
14	Trivector meter (with RS484port/pulse o/p)	1	2	Acc 0.2S
15	Test Terminal Block for Trivector meter	1	2	
16	Recorders(3 Ch.) for MW,voltage and frequency	1	2	

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
18	Voltage transducer dual o/p	3	6	
19	Current transducer dual o/p	3	6	
20	Frequency transducer dual o/p	1	2	
21	PF transducer dual o/p	1	2	
22	MW transducer dual o/p	4	8	
23	MVAR transducer dual o/p	2	4	
24	Push Buttons	24	48	Volt Raise, Volt Lower, Speed Raise, Low, Exciter field breaker, PF, MVAR Regulation, ISO/Droop mode, AVR Auto/AVR Manual & AVR reset, etc.
25	Discrepancy switches (Illuminated type) for breaker control switches exciter field breaker control and gen. circuit breaker control	2	4	
26	Emergency PB with flap (Lockable)	2	4	Generator Emg Trip, CO2 release
27	Signal Lamps	45	90	
E	GENERATOR TRANSFORMER (2No GTGTR)	1	2	
1	Annunciation window	12	24	Transformer diff operted, REF operated, SEF operated, Bucholz alarm, Bucholoz Trip, Oil temp high alarm, Oil temp. high trip, Windg temp. high alarm, Windg temp. high trip, PRV trip, MOG alarm, OSD relay operated
2	Digital Tap Position Indicator (Inspu - 25 Nos of hardwired contact inputs)	1	2	
3	Push Buttons	2	4	Tap Raise/Lower Push buttons
4	Indicating Lamps	5	10	
F	GRID TRANSFORMER	1	2	
1	Annunciation window	12	24	Transformer diff operted, REF operated, SEF operated, Bucholz alarm, Bucholoz Trip, Oil temp high alarm, Oil temp. high trip, Windg temp. high alarm, Windg temp. high trip, PRV trip, MOG alarm, OSD relay operated
2	Digital Tap Position Indicator (Input: 4-20mA)	1	2	
3	Push Buttons	2	4	Tap Raise/Lower Push buttons
4	Indicating Lamps	5	10	

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
G	33kV GT Generator Incomer Feeder	1	4	
1	Annunciation window	5	20	Bkr trip, Trip circuit unhealthy, PT sec MCB off, Line undervoltage, spare, spare
2	Voltmeter	1	4	
3	Voltmeter Selector switch	1	4	OFF-RY-YB-BR
4	Ammeter	1	4	
5	Ammeter Selector switch	1	4	OFF-R-Y-B
6	Frequency meter	1	4	
7	PF meter	1	4	
8	MW meter	1	4	
9	MVA meter	1	4	
10	MVAR meter	1	4	
11	MVARH meter	1	4	
12	MWH meter	1	4	
14	Undervoltage relay	2	8	Incoming and running bus
15	Aux relays shall be suitable for make/break/continuous carry rating of 5A at 220V DC for brk contact multiplication	1	4	
16	Aux. contactors for brk close & open command	2	8	
17	Discrepancy switches (Illuminated type) for breaker control	1	4	
19	Off/Dead Bus/Manual Synch/Auto Synch selector Switch	1	4	
21	Indicating Lamps	4	16	For ON/OFF/RTC indication/spare

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
H	33kV Grid Incomer Feeder	1	4	
1	Annunciation window	5	20	Bkr trip, Trip circuit unhealthy, PT sec MCB off, Line undervoltage
2	Voltmeter	1	4	Bidirectional meter
3	Voltmeter Selector switch	1	4	OFF-RY-YB-BR
4	Ammeter	1	4	Bidirectional meter
5	Ammeter Selector switch	1	4	OFF-R-Y-B
6	Frequency meter	1	4	
7	PF meter	1	4	
8	MW meter	1	4	
9	MVA meter	1	4	
10	MVAR meter	1	4	
11	MVARH meter	1	4	
12	MWH meter	1	4	
14	Undervoltage relay	2	8	
15	Aux relays shall be suitable for make/break/continuous carry rating of 5A at 220V DC for brk contact multiplication	2	8	One for Closing of bkr, One for Tripping of bkr
16	Aux. contactors for brk close & open command	2	8	Multiplication of bkr on/off contacts
17	Discrepancy switches (Illuminated type) for breaker control	1	4	
19	Off/Dead Bus/Manual Synch/Auto Synch selector Switch	1	4	Auto/DB/Manual/OFF selection
21	Indicating Lamps	4	16	For ON/OFF/RTC/switchgear local/Remote

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
I	33kV Buscoupler/Bus Tie Feeder	1	6	
1	Annunciation window	5	30	Bkr trip, Trip circuit unhealthy, DC Supply-1 fail, DC Supply-2 fail/spare
2	Ammeter	1	6	(0-2500)A
3	Ammeter Selector switch	1	6	OFF-R-Y-B
5	Aux relays It shall have a make/break/continuous carry rating of 5A at 110V DC or 5A at 240V AC, with Dinrail mounting	2	12	One for Closing of bkr, One for Tripping of bkr
6	Aux. Contactors	2	12	Multiplication of bkr on/off contacts
7	Discrepancy switches (Illuminated type) for breaker control	1	6	
8	Selector switch 4pos.	1	6	Auto/DB/Manual/OFF selection
10	Indicating Lamps	4	24	For ON/OFF/RTC /spare
J	33kV Bus	1	4	
1	Annunciation window	2	8	Bus PT Sec MCB off, Bus differential relay operated
2	Voltmeter	1	4	(0-69)KV
3	Voltmeter Selector switch	1	4	OFF-RY-YB-BR
4	Frequency	1	4	
5	Voltage and Freq recorder (3 channel)	1	4	
K	33kV Isolation braekers	1	2	
1	Annunciation window	4	8	Bkr trip, Trip circuit unhealthy, Line PT sec MCB Off/spare
	Voltmeter	1	2	
	Voltmeter Selector switch	1	2	
5	Aux relays It shall have a make/break/continuous carry rating of 5A at 110V DC or 5A at 240V AC, with Dinrail mounting	2	4	One for Closing of bkr, One for Tripping of bkr
6	Aux. Contactors	2	4	Multiplication of bkr on/off contacts
7	Discrepancy switches (Illuminated type) for breaker control	1	2	
9	Indicating Lamps	4	8	For ON/OFF/RTC/spare

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
L	COMMON FOR SCAP			
1	Push Buttons		10	For Annunciation
2	DC fail monitoring relay for source-1 and source-2 Type:VAA11		4	
3	Electronic Hooter		2	
4	Electronic Bell (for DC fail)		2	
5	Digital Clock		1	
6	Flasher Relay		2	
7	2 pos selector switch		4	
8	3 pos .selector switch		4	OFF/SCAP/ECS ,Exitation auto/off/manual
9	4pos. Selector switch		4	
10	8pos. Selector switch		2	
M	Synchronization with trolley		1	
1	Communicable type auto synchroniser (M/s Areva/ABB model)		1	
2	Dual frequency meter (Analog)		1	
3	Dual Voltmeter (Analog)		1	
4	Check sync relay(Type SKE:11, Preset 10 degree)		1	
5	Guard relay		1	
6	synchroscope on/off switch		1	
7	Microprocessor based synchroscope		1	
8	phase reversing transformer		2	
9	Isolation transformer		2	
10	Push Buttons		4	
11	Signal Lamps		3	
12	Multiplication contactors		3	
13	Auto/Manual/Off Selector switch		1	
14	Synchronization sockets		2	
15	Cable for Synchronising trolley (meters)		5	

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
N	MISCELLANEOUS			
1	Aux relays It shall have a make/break/continuous carry rating of 5A at 110V DC or 5A at 240V AC, with Dinrail mounting		30	
2	Multiplication contactors		30	
3	Cable Lugs - 1.5 Sqmm		18000	
4	Cable Glands - 5C X 1.5 Sqmm		200	
5	Cable Glands - 7C X 1.5 Sqmm		150	
6	Cable Glands - 10C X 1.5 Sqmm		150	
7	Cable Glands - 12C X 1.5 Sqmm		200	
8	Cable Glands - 16C X 1.5 Sqmm		200	
9	Cable Glands - 19C X 1.5 Sqmm		150	
10	Cable Glands - 24C X 1.5 Sqmm		80	
11	SCAP Shipping sections(without mosiac tiles)		7	
12	Mosiac tiles -2000 Nos - 20 sets		20	
13	MCB	4	28	
	<u>1. ABOVE LIST IS FOR INDICATIVE/QUOTING PURPOSE ONLY WHICH COVERS NAMELY FRONT FACIA COMPONENTS. ALL OTHER ITEMS/COMPONENTS TO RELAIZE THE SCHEMES/FUNCTIONALITY/SAFETY SHALL BE CONSIDERED BY VENDOR TO MEET THE FUNCTIONAL REQUIREMENTS OF THE SCAP.</u> <u>2. Apart from the above list vendor shall also consider other items mentioned in the Technical specification which are not explicitly mentioned in the above list.</u>			
	NOTES			
1	Makes of the above equipments shall be as per customer approved vendor list which will be standard EIL projects approved vendor and subjected to approval by BHEL.			
2	Meter Ranges shall be as per SLDs enclosed as Various Annexures along with this specification.			
3	Vendor shall quote unit rates as per the format enclosed with this specification			
4	240V single ph AC, 110V DC supply will be provided for SCAP at one point. Further distribution to all the equipments of SCAP shall be in vendor's scope.			
5	DC supply in the panel shall be provided with auto changeover facility and DC fail monitoring relays.			
6	All control and selector switches mentioned above shall be suitable for mosaic mounting (miniature type).			
7	Input to all the above meters is CT/PT input unless mentioned otherwise.			
8	CT and PT signals for each equipment are provided at one point only. Further distribution to all the equipments of SCAP shall be in vendor's scope.			
9	All PT signals shall be provided with fuses.			
10	All Descrepancy switches shall be wired to Flasher relay. Flashing descrepancy shall be shown on SCAP, if tripping/closing operation is failed at switchboard.			

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S.No.	Description	Unit Quantity in Nos.	Total Quantity in Nos.	Remarks
11	All recorders shall be provided with dual type transducers			
12	All transducers shall be dual output type			
13	Aux. Supply for meters, transducers, lamps, control ckt,annunciation windows,recorders,TPI, switches etc shall be DC.			