

ADDENDUM TO ETC BOQ MAIN SCOPE**BILL OF QUANTITIES FOR ERECTION, TESTING AND COMMISSIONING****PROJECT : 400/132 kV SWITCHYARD PACKAGE FOR BARH SUPER THERMAL POWER PROJECT (3X660MW)****CUSTOMER : NATIONAL THERMAL POWER CORPORATION****A. ADDITION OF NEW ITEM IN MAIN SCOPE**

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
G.	Substation Automation System for 400/132kV Switchyard and GRP				
1	Panel-mounted Bay Control Units(BCUs) for following 400 kV Bays:				
	a) 400 kV BALIA Line # I - Tie - Future Diameter.	Nos.	2		
	b) 400 kV BALIA Line # II - Tie - Future Diameter	Nos.	2		
	c) 400 kV KHALGAON Line # I - Tie - Future Diameter	Nos.	2		
	d) 400 kV KHALGAON Line # II -Tie - PATNA LINE# I Diameter	Nos.	3		
	e) 400 kV PATNA Line # II - Tie - Future Diameter	Nos.	2		
	f) 400 / 132 kV ICT#1 - Tie -GT# I Diameter	Nos.	3		
	g) GT#2 - Tie -Shunt Reactor Diameter	Nos.	3		
	h) GT#3 - Tie - ICT # 2 Diameter	Nos.	3		
	i) BCU FOR 400 KV BUS SECTION BAYS	Nos.	2		
2	Panel-mounted Bay Control Units (BCUs) for following 132 kV Bays:				
	a) 132 kV station Transformer bays	Nos.	3		
	b) 132 kV ICT bays	Nos.	2		
	c) 132 KV MISC TRFR	Nos.	2		
	d) 132 kV Bus coupler bay	Nos.	1		
3	Panel-mounted Bay Protection Units (BPUs) for 400 KV				
	a) 400 kV line Bays (BALIA #1&2, KAHALGAON #1&2,PATNA 1&2) including DISTURBANCE RECORDER	Sets	6		
	b) 400 kV ICT#1 & ICT#2 bays	Sets	2		
	c) 400 kV GT bays (Only for switchyard portion)	Sets	3		
	d) 400 kV tie bays with A/R	sets	5		
	e) 400 kV tie bays without A/R	sets	3		
	f) 400 KV BUS SECTION BAY	sets.	2		
	g) 400kV Bus reactor	set	1		
	h) TEE Differential protection to be mounted in respective BPU panels (one set comprises of TEE-Differential 1&2 for each 400kV TEE junction)	sets	12		
	i) LBB protection to be mounted in respective BPU panels (one set comprises of LBB-1& LBB-2 for each 400 kV breaker)	sets	22		
	j) Under frequency based Islanding scheme with 3 independent channels for 400 kV SWYD with trip relay for each breaker including future breakers.	set	1		
4.	Panel-mounted Bay Protection Units (BPUs) for following 132 kV Bays:				
	a) 132 kV station Transformer bays	sets	3		
	b) 132 kV ICT bays	sets	2		
	c) 132 kV Bus coupler bay	set	1		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
	d) 132 kV MISC TRFR BAYS	sets	2		
	e) LBB protection to be mounted in respective BPU panels (one set comprises of LBB-1& LBB-2 for each 132 kV breaker)	sets	8		
5.	a) Panel mounted BPUs for Generator, Gen.trfr and UT (GRP) with numerical relays, networked to a centralized OWS with printer and peripherals.	nos.	3		
	b) Stand alone DR for Generator	nos.	3		
6.	Bus Bar Protection including modules for future bays as shown in SLD for 400kV Bus bar Protection scheme inclusive of a),b),c),d),e),f),g),h)	LS	1		
	a) 400 kV Bus-I Main-I	set	1		
	b) 400 kV Bus-I Main-II	set	1		
	c) 400 kV Bus-II Main-I	set	1		
	d) 400 kV Bus-II Main-II	set	1		
	e) 400 kV Bus-III Main-I	set	1		
	f) 400 kV Bus-III Main-II	set	1		
	g) 400 kV Bus-IV Main - I	set	1		
	h) 400 kV Bus-IV Main-II	set	1		
	132kV Bus bar Protection scheme inclusive of i),j),k)	LS	1		
	l) 132 kV Bus - I Main	set	1		
	j) 132 kV Bus-II Main	set	1		
	k) Common Check zone for BOTH the 132 kV buses.	set	1		
7.	Substation Automation System inclusive of items a),b),c),d),e),f),g),h),l),j),k),l)	LS	1		
	a) Operator's Workstation for Bay Equipment Control including software	Nos.	2		
	b) Engineering Workstation and Fault Recording Station including software	No.	1		
	c) Portable Engineering Workstation.	No.	1		
	d) OWS including software to be located in CCR (for extending SWYD control to CCR)	No.	1		
	e) OWS FOR GRP RELAYS and associated LAN	No.	1		
	f) COMMON EVALUATION UNIT FOR GEN DR	No.	1		
	g) Portable engg work station for main plant(GRP)	No.	1		
	h) Colour Laser Printer (R1)	Nos.	3		
	j) B&W Laser Printer (A3)	No.	1		
	k) Rear Projection Mimic Display in SWYD CR	No.	1		
	l) Inverter	Nos.	2		
8.	Fibre Optic cable including other hardware items required for interconnecting various bay control / protection IEDs for				
	a) GRP	Lot	1		
	b) SWYD	Lot	1		
9(i)	Energy Metering System for the 400 and 132 kV SWYD with Metering Master Station and software, including the following 400 kV/132 kV Bays: ABT-compliant Energy Meters inclusive of items 9(i) a),b),c),d); 9(ii) a),b),c) for	LS	1		
	a) Generator Transformer Bays	Nos.	3		
	b) 400 kV ICT Bays	Nos.	2		
	c) 400 kV Line Bays	Nos.	6		
	d) 400 kV Shunt reactor	No.	1		

Item	Description	Unit	Qty.	Rate	Amount (Rs.)
9. (ii)	0.2 Accuracy Class Energy Meters for				
	a) Station Transformer bays	Nos.	3		
	b) 132 kV ICT bays	Nos.	2		
	c) MISC TRFR BAYS	Nos.	2		
10.	Control Cables required for interconnecting analog / status / control signals between BCUs/Protection Units and field equipment:				
	a) 5C, 2.5mm ² Cu	kms	45		
	b) 7C, 2.5mm ² Cu	kms	30		
	c) 10C, 2.5mm ² Cu	kms	190		
	d) 14C, 2.5mm ² Cu	kms	55		
	e) 19C, 2.5mm ² Cu	kms	50		
11.	Time Synchronization Equipment (GPS Receiver)	set	2		
12.	Relay Test Kit including a laptop	set	1		
13.	Furniture				
	i) Desk (Size for 01 workstation and printer)				
	- for workstations and printers covered under this package	Nos.	6		
	ii) Chairs	Nos.	12		
	iii) Filing Cupboard	Nos.	3		
	TOTAL AMOUNT (Rs.)				