

TENDER SPECIFICATION BHEL: PSSR: SCT: 2175

FOR

Erection, Testing & Commissioning of Electrical works, Control and Instrumentation (C&I) works and Illumination works including Handling of materials at site BHEL stores / storage yard, transporting to site of erection and supply & application of final painting, including obtaining statutory clearances if any, for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steamcum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion at Damanjodi, Odisha of M/s NALCO.

VOLUME –II

PRICE BID

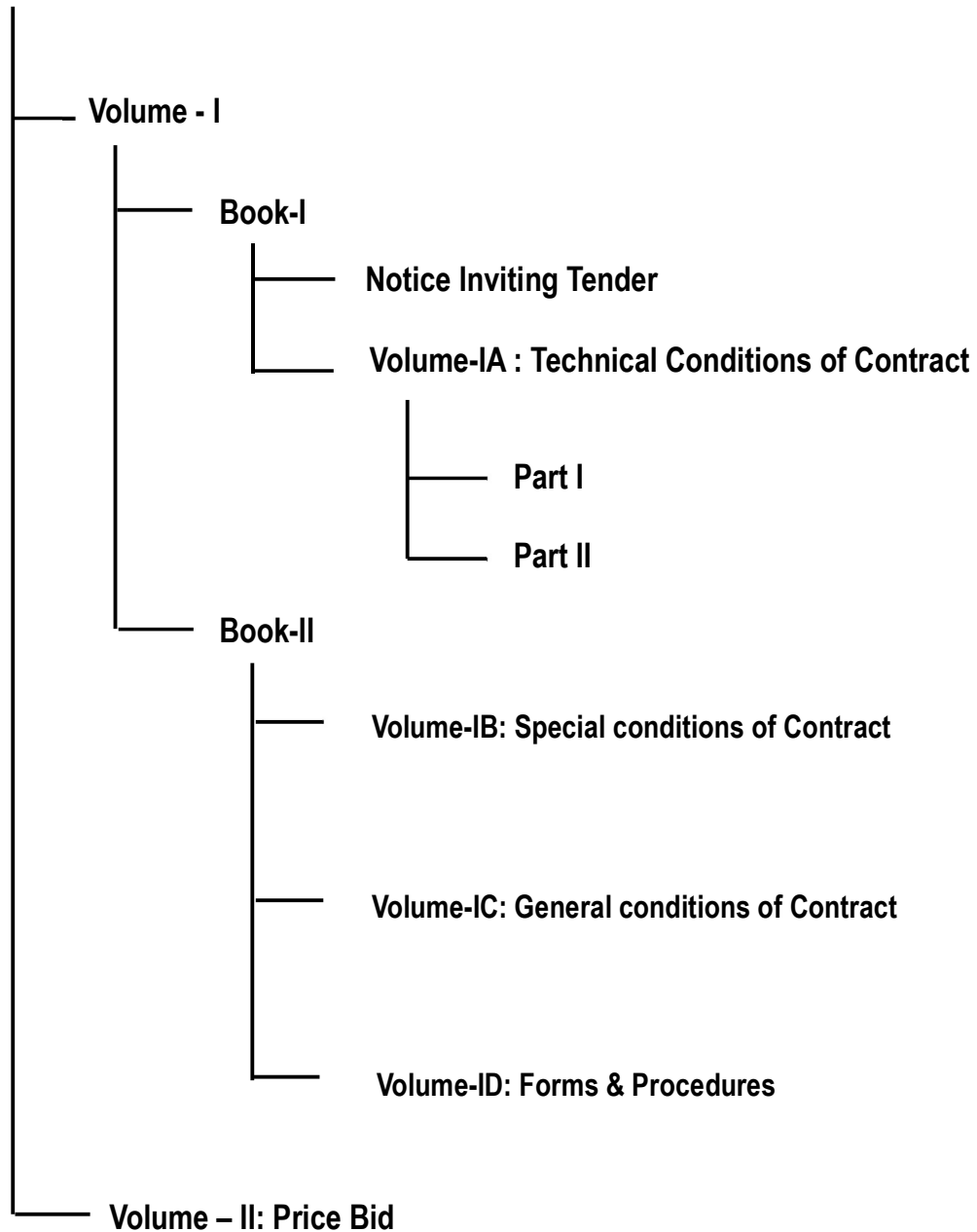


BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)

Power Sector – Southern Region
BHEL Integrated Office Complex, TNEB Road
Pallikaranai, Chennai - 600100

TENDER SPECIFICATION CONSISTS OF

Tender Specification



NOTICE INVITING TENDER

CONTENTS	
Description	No. of pages
Part A: Instructions to the Bidders	01
Part B : Format for total amount (Enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender)	(Separate Excel File)
Part C: Bill of quantities with weightage for amount of each items with respect to the total quoted price	40

NOTICE INVITING TENDER

PART A

Instruction to Bidders:

1. The quantity indicated in the BOQ / Price bid (Part C) is approximate only and is liable for variation. Payment will be as per actual quantity executed as certified by BHEL Engineer.
2. Tenderers are requested to affix their company seal and authorized signature in all pages.
3. Bidders shall quote 'Total Amount' in the format enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender and upload the same under 'Packet details - > Tender covers -> Finance '(Cover Type Description – Price Bid)'' and same shall be taken into account for evaluation and awarding and hence, shall be complete in all respect for the full scope of work defined in specification and in accordance with terms & conditions of the tender. Any other entry elsewhere in the price bid shall be treated as Null and Void. Quoting of rates in any other form/ formats will not be entertained.
4. The above mentioned 'Total amount' is for the entire Bill of Quantity (BOQ) given in Part -C of the Price Bid. Total amount shall be excluding taxes.
5. BHEL has pre-fixed the weightages for the amount of individual items of Bill of Quantity with respect to the 'Total Amount' in Part-C.
6. Based on the pre-fixed weightages, the amount for the individual items of the Bill of Quantity shall be arrived at. This amount shall be rounded off to the nearest rupee.
7. Based on the quantities of individual item and the amount arrived in SI No: 6 above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
8. Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per SI No.7 above.

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
I	ERECTION AND COMMISSIONING OF TRANSFORMERS	--		
B.1,	25/ 18.5 MVA 11.5/11 KV 3 phase ONAN cooled, YNd1, Generator Transformer	SET	1	.0104048
B.3, B.2,	Cast Resin Dry Type Transformer Weight of Shipment: 6000/7000/8000 kg approx each.	SET	4	.0127638
II	ERECTION AND COMMISSIONING OF HT SWITCHGEAR	--		
--	11 kV Switchgear	--		
A.1,	11KV, HT Isolation Panel/Switchboard	SET	4	.0022251
III	ERECTION AND COMMISSIONING OF CONTROL PANEL SYSTEM	--		
C.2,	Generator Protection Relay Panel- with associated loose supplied items	SET	1	.0003125
D.4,	11 kV Neutral Ground Resistor (NGR) with Isolator and Supporting Structures	SET	1	.000841
K.1.8,	Desk Package Unit Control Panel	Nos.	1	.0004129
K.1.9,	DAVR Panel	SET	1	.0006982
IV	LAYING OF HT CABLES 11KV (UE) ARMoured; ALUMINIUM CONDUCTOR ,XLPE INSULATED PVC/FRLS OUTER SHEATHED CABLE.	--		
D.5.1,	1C x 500 sqmm (AL)	Mtrs	3,600	.0047495
D.5.2,	3C x 185 sqmm (AL)	Mtrs	3,050	.0051736
V	LAYING OF HT CABLES 6.6KV (UE) ARMoured; ALUMINIUM CONDUCTOR ,XLPE INSULATED PVC/FRLS OUTER SHEATHED CABLE.	--		

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D.5.3,	3C x 185 sqmm (AL)	Mtrs	3,000	.0061065
VI	Installation of Cable termination and joint kits for 11/11 KV (UE) GRADE, XLPE Insulated aluminium conductor armoured cables for the following sizes.	--		
D.6.1,	Termination/Joint kit for 1C x 500 sqmm (AL)	Nos.	45	.0034451
D.7.1, D.6.2,	Termination/Joint kit for 3C x 185 sqmm (AL)	Nos.	22	.0020421
VII	Installation of Cable termination kits and joint kit for 6.6 KV (UE) GRADE, XLPE Insulated aluminium conductor armoured cables for the following sizes.	--		
D.6.3,	Termination KIT/Joint KIT 6.6 KV 3C-185 sqmm AL ARM (indoor) AL LUG	Nos	45	.004937
VIII	FABRICATION AND INSTALLATION OF STRUCTURAL STEEL	--		
J.9, G.8.2, D.21, D.12,	STRUCTURAL STEEL (ISMC/ISMB/ANGLE/FLATS etc)	MT	187	.0740241
IX	COMMISSIONING OF THE FOLLOWING ERECTED BY MECHANICAL CONTRACTOR	--		
C.6.1,	Generator 18.5 MW - H.V. testing, meggering of Bushings and Accessories, resistance measurement, meggering including dry out of Generator and as per field quality plan.	SET	1	.0017527
E.8.1,	HT Drives (11KV)	Nos.	7	.0019047
J.1.2,	HT Drives (6.6KV)	Nos.	8	.0010092
X	ERECTION OF MISCELLANEOUS ITEMS	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.11.9 , D.11.8 ,	Treated Earth pit of CI Pipe 4200 mm/Copper Pipe 3000mm long with funnel and accessories including all civil works, filling of earth pit with alternate layer of charcoal and salt as per IE specification and making of brick /PCC1:2:4 chamber, with both side plastering, supply and fixing of manhole CI cover plate/RCC Slab etc. complete as per IS 3043 (only CI Pipe / Copper Pipe shall be supplied by BHEL). If desired resistivity is not achieved then Bentonite mix to be used by the contractor. Supply of Bentonite mix is in the scope of bidder.	Nos.	85	.0187373
XI	ERECTION AND COMMISSIONING OF LT SWITCHGEAR -- ACDB/DCDB/MCC/PMCC/WDB, etc.	--		
F.2.1,	415V FGD PCC, Approximate Overall Weight (in kg) 10675, Approximate Dimension in mm (LxDxH): 10460X1754X2495 mm, No. of Panels: 14 and No. of Shipping Sections: 6	SET	1	.0044263
F.2.2,	415V AMMONIA PCC, Approximate Overall Weight (in kg) 13365, Approximate Dimension in mm (LxDxH): 12720X1754X2495 mm, No. of Panels: 16 and No. of Shipping Sections: 8	SET	1	.0050769
F.2.3,	415V BOILER MCC, Approximate Overall Weight (in kg) 19920, Approximate Dimension in mm (LxDxH): 28380x1254x2495 mm, No. of Panels: 36 and No. of Shipping Sections: 13	SET	1	.0088315
F.2.4,	415V STG MCC, Approximate Overall Weight (in kg) 6170, Approximate Dimension in mm (LxDxH): 8380X1254X2495 mm, No. of Panels: 11 and No. of Shipping Sections: 5	SET	1	.0025293
F.2.5,	415V MOV DB, Approximate Overall Weight (in kg) 19870, Approximate Dimension in mm (LxDxH): 28860X644X2495, No. of Panels: 36 and No. of Shipping Sections: 13	SET	1	.0078104
F.2.6,	415V BOP MCC, Approximate Overall Weight (in kg) 7820, Approximate Dimension in mm (LxDxH): 10780X1254X2495 mm, No. of Panels: 14 and No. of Shipping Sections: 6	SET	1	.0045617

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
F.2.7,	415V EMERGENCY MCC-STG, Approximate Overall Weight (in kg) 16070, Approximate Dimension in mm (LxDxH): 22780X1254X2495 mm, No. of Panels: 29 and No. of Shipping Sections: 11	SET	1	.0068544
F.2.8,	415V AC VENT MCC STG, Approximate Overall Weight (in kg) 7270, Approximate Dimension in mm (LxDxH): 9980X1254X2495 mm, No. of Panels: 13 and No. of Shipping Sections: 6	SET	1	.0031057
F.2.9,	415V AC VENT MCC ESP, Approximate Overall Weight (in kg) 7270, Approximate Dimension in mm (LxDxH): 9980X1254X2495 mm, No. of Panels: 13 and No. of Shipping Sections: 6	SET	1	.0031057
F.2.10 ,	415V FLAMEPROOF DB, FUEL OIL AREA, Approximate Overall Weight (in kg) 1500, Approximate Dimension in mm (LxDxH): 4705X900X2150 mm, No. of Panels: 4 and No. of Shipping Sections: 2	SET	1	.0015273
F.2.11 ,	415V FGD MCC, Approximate Overall Weight (in kg) 8370, Approximate Dimension in mm (LxDxH): 11580X1254X2495 mm, No. of Panels: 15 and No. of Shipping Sections: 6	SET	1	.0047928
F.2.12 ,	415V EMERGENCY MCC-FGD, Approximate Overall Weight (in kg) 13270, Approximate Dimension in mm (LxDxH): 19260X644X2495 mm, No. of Panels: 24 and No. of Shipping Sections: 9	SET	1	.0050465
F.2.13 ,	415V GYPSUM MCC, Approximate Overall Weight (in kg) 11420, Approximate Dimension in mm (LxDxH): 15180X1254X2495 mm, No. of Panels: 20 and No. of Shipping Sections: 8	SET	1	.0047238
F.2.14 ,	415V LHP MCC-1, Approximate Overall Weight (in kg) 10570, Approximate Dimension in mm (LxDxH): 14780X1254X2495 mm, No. of Panels: 19 and No. of Shipping Sections: 8	SET	1	.0045994
F.2.15 ,	415V LHP MCC-2, Approximate Overall Weight (in kg) 14770, Approximate Dimension in mm (LxDxH): 21180X1254X2495 mm, No. of Panels: 27 and No. of Shipping Sections: 10	SET	1	.006591

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
F.2.16 ,	415V PDB-STG, Approximate Overall Weight (in kg) 7220, Approximate Dimension in mm (LxDxH): 10460X644X2495 mm, No. of Panels: 13 and No. of Shipping Sections: 5	SET	1	.0028308
F.2.17 ,	415V PDB-FGD, Approximate Overall Weight (in kg) 10520, Approximate Dimension in mm (LxDxH): 15260X644X2495 mm, No. of Panels: 19 and No. of Shipping Sections: 7	SET	1	.0041298
F.2.18 ,	415V PDB-AMMONIA, Approximate Overall Weight (in kg) 6670, Approximate Dimension in mm (LxDxH): 9660X644X2495 mm, No. of Panels: 12 and No. of Shipping Sections: 5	SET	1	.0026143
F.2.19 ,	110V DCDB-1, Approximate Overall Weight (in kg) 9720, Approximate Dimension in mm (LxDxH): 13660X944X2495 mm, No. of Panels: 17 and No. of Shipping Sections: 6	SET	1	.0034215
F.2.20 ,	110V DCDB-2, Approximate Overall Weight (in kg) 3920, Approximate Dimension in mm (LxDxH): 5660X644X2495 mm, No. of Panels: 7 and No. of Shipping Sections: 3	SET	1	.0009671
F.2.21 ,	110V DCDB-3, Approximate Overall Weight (in kg) 2270, Approximate Dimension in mm (LxDxH): 3260X644X2495 mm, No. of Panels: 4 and No. of Shipping Sections: 2	SET	1	.0005571
F.2.22 ,	415V WALL MOUNTED DB, Approximate Overall Weight (in kg) 200, Approximate Dimension in mm (LxDxH): 900X400X1000 mm	SET	4	.0005436
F.2.23 ,	415V ESP ACP/MCC, Approximate Overall Weight (in kg) 13270, Approximate Dimension in mm (LxDxH): 19260X644X2495 mm, No. of Panels: 24 and No. of Shipping Sections: 9	SET	1	.0050465
F.2.24 ,	415V MOV DB-(FGD AND GYPSUM), Approximate Overall Weight (in kg) 16070, Approximate Dimension in mm (LxDxH): 22780X1254X2495 mm, No. of Panels: 29 and No. of Shipping Sections: 11	SET	1	.0117663

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
F.2.25 ,	240V WALL MOUNTED ACDB, Approximate Overall Weight (in kg) 200, Approximate Dimension in mm (LxDxH): 900X400X1000 mm, No. of Panels: 1 and No. of Shipping Sections: 1	SET	2	.0002718
F.2.26 ,	415V SOOT BLOWER MCC, Approximate Overall Weight (in kg) 9420, Approximate Dimension in mm (LxDxH): 13660X644X2495 mm, No. of Panels: 17 and No. of Shipping Sections: 6	SET	1	.0036419
F.4.3,	415V WDB-AMMONIA (415V MOV DB-FGD AND GYPSUM), Approximate Overall Weight (in kg) 7340, Approximate Dimension in mm (LxDxH): 7820X1444X2495 mm, No. of Panels: 9 and No. of Shipping Sections: 5	SET	1	.0046773
E.1.1,	LT SWITCH BOARD/ESP SWITCHGEAR. Approx dimension (in mm)- 11450 (L) X 1300 (D) X 2450 (H), weight- 7300 kg approx.	SET	1	.003459
E.1.2,	AUXILIARY CONTROL PANEL. Approx dimension (in mm)- 11750 (L) X 1300 (D) X 2450 (H), weight- 13500 kg approx.	SET	2	.0070992
XII	ERECTION AND COMMISSIONING OF 415 V LT NON SEGREGATED PHASE BUSDUCT	--		
F.1.2, F.1.1,	415 V, LT NSPBD TYPE BUSDUCT 4000A,3200A,2500A, 2000A,1600A and 1000A	Mtrs	34	.0022633
XIII	LAYING OF LT POWER CABLES 1.1 kV, XLPE INSULATED, GLAVANISED STEEL ARMoured, SINGLE/MULTICORE CABLES FRLS (Al/Cu CABLES)	--		
E.3.1,	3.5C-300 sq.mm	Mtrs	1,000	.000735
D.8.32 , D.8.24 ,	3C-240 sq.mm / 3.5C-240 sq.mm / 4C-185 sq.mm	Mtrs	4,600	.002861

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.8.6, D.8.23 ,	1C-630 sq.mm / 3.5C-185 sq.mm	Mtrs	15,450	.0133948
D.8.19 ,	1C-400 Sq. mm / 3C-150 sq.mm	Mtrs	500	.0004052
K.2.3, E.3.2, D.8.12 ,	2C-120 Sq. mm	Mtrs	9,850	.0085397
D.8.22 ,	3C-95 sq.mm / 3.5C-95 sq.mm	Mtrs	2,700	.0015775
K.4.3, K.2.4, D.8.31 , D.8.21 , D.8.18 ,	3C-50 sq.mm / 3.5C-50 sq.mm / 2C-95 sq.mm / 3.5C-70 sq.mm/2C-70 sqmm / 4C-35 sqmm	Mtrs	6,000	.0030533
K.4.4, E.3.3, D.8.30 , D.8.20 ,	1C-95 sq.mm / 1C-120 sq.mm / 2C-50 sq.mm / 3C - 35 Sq.mm / 3.5C - 35 Sq.mm / 4C - 25 Sq.mm	Mtrs	15,250	.0077604

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D.8.17 , D.8.11	3C-25 sq.mm / 3.5C-25 sq.mm / 1C-70 sq.mm/2C - 35 sq.mm	Mtrs	4,100	.0016228
E.3.4, D.8.29 , D.8.16	2C-25 sq.mm / 3C - 16 Sq.mm / 4C - 16 Sq.mm	Mtrs	26,000	.0078405
D.8.9, D.8.28 , D.8.27 , D.8.15 , D.8.10	1C-35 sq.mm / 2C-10 sq.mm / 3C-10 sq.mm / 4C-6 sq.mm / 4C-10 sq.mm / 1C-25 sq.mm / 2C-16 sq.mm	Mtrs	21,900	.0061914
D.8.8, D.8.26 , D.8.14 , C.5.6, C.5.5,	1C - 16 sq.mm / 2C - 6 sq.mm / 3C - 6 sq.mm / 3C - 4 sq.mm / 4C - 4 sq.mm	Mtrs	17,000	.0044857
XIV	LAYING OF LT POWER CABLES 1.1 kV, XLPE INSULATED, UNARMoured, -- SINGLE/MULTICORE CABLES FRLS (Al/Cu CABLES)	--		

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D.8.1,	1C - 10 sq.mm	Mtrs	2,000	.0004146
D.8.5, D.8.4, D.8.2,	1C-35 sq.mm /1C-25 sq.mm	Mtrs	4,100	.0010818
D.8.3,	1C-120 sq.mm	Mtrs	1,500	.0006785
XV	END TERMINATION OF LT POWER / CONTROL CABLES - 1.1 kV, XLPE INSULATED, GALVANISED STEEL ARMoured SINGLE/ MULTICORE CABLES FRLS (Al/Cu CABLES)	--		
D.9.6,	1C-630 sq.mm	Nos.	100	.0010159
K.4.7,	1C-120 sq.mm	Nos.	8	.0000244
D.9.5,	1C-35 sq.mm	Nos.	14	.0000127
D.9.7,	2C-6 sq.mm	Nos.	36	.0000224
D.9.8,	2C-10 sq.mm	Nos.	10	.0000085
D.9.9,	2C-16 sq.mm	Nos.	34	.0000564
D.9.10 ,	2C-35 sq.mm	Nos.	10	.0000422
K.4.6, K.2.7,	2C-70 sqmm	Nos.	12	.0000599

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K.2.6, E.6.2, D.9.11 ,	2C-120 sqmm	Nos.	66	.000403
D.9.12 ,	3C-6 sq.mm	Nos.	60	.0000418
D.9.13 ,	3C-10 sq.mm	Nos.	48	.0000434
E.6.4, D.9.14 ,	3C-16 sq.mm	Nos.	84	.0002707
D.9.15 ,	3C-25 sq.mm	Nos.	22	.0000962
E.6.3, D.9.18 ,	3C-35 sq.mm / 3.5C-35 sq.mm	Nos.	26	.0001406
D.9.16 ,	3C-50 sq.mm	Nos.	10	.0000671
D.9.19 ,	3C-70 sq.mm / 3.5C-70 sq.mm	Nos.	10	.000069
D.9.20 ,	3C-95 sq.mm / 3.5C-95 sq.mm	Nos.	18	.0001289

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D.9.21 ,	3.5C-185 sq.mm /3C -185 sqmm	Nos.	8	.0001315
D.9.22 ,	3C-240 sq.mm / 3.5C-240 sq.mm	Nos.	20	.000331
E.6.1,	3.5C-300 sq.mm	Nos.	6	.0001485
D.9.23 ,	4C-4 sq.mm	Nos.	10	.0000064
D.9.24 ,	4C-6 sq.mm	Nos.	30	.0000237
D.9.25 ,	4C-10 sq.mm	Nos.	18	.0000176
D.9.26 ,	4C-16 sq.mm	Nos.	90	.0004309
D.9.27 ,	4C-25 sq.mm	Nos.	74	.0004184
D.9.28 ,	4C-35 sq.mm	Nos.	20	.0001319
D.9.29 ,	4C-185 sq.mm	Nos.	20	.0004161
XVI	END TERMINATION OF LT POWER / CONTROL CABLES - 1.1 kV, XLPE -- INSULATED, UNARMoured SINGLE/ MULTICORE CABLES FRLS (Al/Cu CABLES)	--		

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D.9.1,	1C - 10 sq.mm	Nos.	10	.000006
D.9.4, D.9.2,	1C-35 sq.mm / 1C-25 sq.mm	Nos.	16	.0000124
D.9.3,	1C-120 sq.mm	Nos.	10	.0000628
XVII	ERECTION OF PRE FABRICATED CABLE TRAYS (LADDER/ PERFORATED TYPE) AND ACCESSORIES LIKE BEND, TEE, ELBOWS, CROSS and REDUCERS, ETC.	--		
D.10.2 , D.10.1 ,	600 mm wide-GI-Cable Tray Ladder Type	Mtrs	8,850	.0226847
D.10.4 , D.10.3 ,	300 mm wide-GI Cable Tray Ladder Type	Mtrs	5,488	.0128259
D.24.2 , D.24.1 ,	600 mm wide-GI Cable Tray Perforated Type	Mtrs	2,300	.0074127
D.24.4 , D.24.3 ,	300 mm wide-GI Cable Tray Perforated Type	Mtrs	3,350	.0082712

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Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
XVIII	ERECTION AND COMMISSIONING OF INTERMEDIATE SUPPORTING PANELS AND ACCESSORIES/ CONTROL PANEL SYSTEM AND ACCESSORIES	--		
E.7.4, E.7.3,	IOS System and Data Logger System with Industrial Grade Computers and accessories	SET	2	.0005287
E.2.1,	Electronic Controller Panel (ECP) with ARECA controllers, firing cards, interfacing cables, FR modules and cutout plates	SET	14	.0028384
XIX	ERECTION OF JUNCTION BOXES / PUSH BUTTON STATIONS/FUSE DBs(AC/DC)	--		
F.3.1, E.7.1, E.13.3 .6, E.13.3 .5,	Pushbutton Stations/Starters	Nos.	346	.00523
F.3.2,	Local Motor Isolator <125A	Nos.	610	.0140607
F.3.3,	Local Motor Isolator 125A and above	Nos.	36	.0012444
XX	INSTALLATION, TESTING AND COMMISSIONING OF EARTHING SYSTEMS (GS/GI)	--		
D.11.1 ,	FLAT 65 x 8 / 75 X 10 mm	Mtrs	5,500	.0156527

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.9.1, D.11.3 , D.11.2 ,	FLAT 50 X 6 mm / 35 X 6 mm	Mtrs	11,155	.0212345
D.11.5 , D.11.4 ,	FLAT 25 X 3 /25 X 6 /30 X 5mm	Mtrs	9,500	.0161145
G.9.2, D.11.7 , D.11.6 ,	6 sqmm GI Wire, 16 sqmm GI Wire, GI/GS WIRE 8 SWG	Mtrs	55,190	.0052009
D.11.1 0,	32 mm dia GI rod long 1400 mm vertical air termination, along with 50mm solid GI Sphere, 3nos. 150mm long 6mm base dia solid GI Conical Spikes inclined at an angle of 30 deg to the vertical, equally spaced and screwed to the GI Sphere with 300x50x10 GI Base Plate, 50X6 GI Flat Supports and related accessories	SET	25	.0021406
XXI	COMMISSIONING OF THE FOLLOWING ERECTED BY MECHANICAL CONTRACTOR	--		
B.4.1,	High Voltage Rectifier Transformers- 95 kV, 1200 mA and Disconnecting Switches	SET	14	.0021336
E.8.7, E.8.6,	Heating Elements for Hoppers//Shaft Insulators/Support Insulators and Thermostats for Hopper	Nos.	114	.000795
E.8.8,	Interlocks ESP panels/field with Master keys	SET	6	.0003596

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
J.1.1, G.11.3 , G.11.1 , G.1.1, E.8.9, E.8.4, E.8.2, E.8.12 , E.8.11 , E.13.1 .J, E.11.1 , D.15.1 , C.6.2, E.8.10 ,	LT Unidirectional and Bidirectional drives	Nos.	548	.0107105
E.8.5,	Hoist/ Cranes/ Monorail	Nos	2	.0001296
E.7.5,	Ash level indicator with probe head assembly, sensor processor unit and accessories	SET	56	.0019019
XXII	ERECTION AND COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS, DEVICES, SWITCHES	--		

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
J.3.1, G.7.14 ,	PD Type Mass flow meter in HFO,LDO/HSD and HFO return line with mounting flanges, electronics amplifier box, inter connecting cabling, etc.	SET	3	.0001049
G.7.9, G.7.7, G.7.6, G.7.5, E.13.3 .3, E.13.3 .2, E.13.3 .11, D.17.9 , D.17.8 , D.17.1 1, D.17.1 0,	Pressure Transmitters / DP Transmitters / DP Type flow transmitters/Conductivity Transmitters/DP type LT	Nos	408	.006121
G.7.10 , E.13.3 .4, D.17.3 ,	Level Transmitter (Guided Wave/Ultrasonic/Capacitance Type) along with accessories	Nos	17	.0011278

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.14.2 'H.1.1, G.7.1, E.13.3 .10, D.17.7 'D.17.6 'D.17.5 'D.17.4 'C.8.1,	Pressure / DP Gauge/Reverse Rotation Indicators/Discharge indicators/ Rotameter	Nos	387	.0044347
K.14.3 'H.1.2, G.7.2, D.17.1 3,	Temperature Gauge, Temperature Gauge with Thermowell	Nos	347	.0057029
H.1.3, G.7.4, G.7.3, G.7.15 'D.17.2 ,	Level Gauge/Level Alarm	Nos	28	.0011562

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.14.6 'K.14.1 'D.17.1 6, D.17.1 5, C.8.4,	Pressure / Differential Pressure Switch / Temperature Switch	Nos	87	.0012806
C.8.5,	Level Switches (RF/Float/Capacitance/Conductivity type) along with accessories	Nos	2	.0000834
G.7.11 'E.13.3 .8, D.17.1 2, D.17.1 'C.8.2, C.12,	Temperature Elements(RTD)/Thermocouple with Thermowell/RTD with Thermowell) / Flow Elements/Thermocouple with threaded connection	Nos	261	.0037632
K.14.8 ,	E/P Converters, I/P Converters	Nos	44	.0005705
J.2.4,	ERV Controller with Pressure Switch	SET	1	.000084
J.2.3,	FSSS Local Oil Gun Maintenance Switch Box	Nos	8	.0002042
J.2.6,	H.E.A Exciter Box with Accessories	SET	8	.0003583

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.2.2,	Flame Scanner Head Assembly with accessories	SET	12	.0005267
J.3.3,	MTM T/C (Route Length 8 to 18 MM) - 8MM OD	Nos	8	.0002477
J.3.2,	MTM T/C (Route Length 20 to 28 MM) - 8MM OD	Nos	29	.001655
K.14.5 , D.17.1 9, C.13,	Speed Measuring Loop/Speed Probe/Speed Sensor/Vibration Transducer/Key Phasor/Transducer	Nos	17	.0002381
G.7.8,	Flow Transmitters (Other than DP type)	Nos	6	.000363
K.14.7 , J.8.6, J.8.5,	Air Filter Regulator-(1/4 inch -1 inch)/Purge meter cum DP regulator	Nos	59	.0005093
K.17.1 ,	Analyzers (Oxidation Reduction Potential/Turbidity/Ph/Conductivity)	Nos	5	.0002774
G.7.12 , E.13.3 .1, D.17.1 4,	Temperature Transmitter	Nos	240	.0038946
J.3.4,	EWLI with all associated cabling and accessories	Set	2	.0002768
C.8.3,	Noise level Transmitter	Nos	2	.00003

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.7.13	Density meter	Nos	3	.0000344
E.13.3.9,				
XXIII	ERECTION AND COMMISSIONING OF SPECIAL INSTRUMENTS	--		
J.4.3,	High Temp/Low Temp O2 Analyzer including all accessories	SET	2	.0006738
J.4.4, E.12,	Opacity Monitor including all accessories, Wet Gas Dust Analyser	SET	3	.0013885
K.17.2, J.4.1,	SOX/NOX/CO (Combined) Analyzer / Flue Gas Analyzer/FGD SO2 Analyser including all accessories	SET	3	.0040778
J.4.5, J.4.2,	CO/Velocity/HF/Mercury/NOX/SOX/NH3/Gas Flow Analyzer including all accessories	SET	2	.0023111
D.18.1,	SWAS System	SET	1	.0028792
K.16.1,	Installation of vibration sensors, driver, extension cable with mounting block, Phase marker sensor, driver, extension cable with bracket , Shaft vibration sensors, driver, extension cable with probe holder, Loop checking using Portable Shaker Table for each vibration sensor and eddy-current sensors. This broadly covers Main Vibration Monitoring System	SET	1	.0007109
K.16.2,	Installation of vibration sensors, driver, extension cable with mounting block, Phase marker sensor, driver, extension cable with bracket , Shaft vibration sensors, driver, extension cable with probe holder, Loop checking using Portable Shaker Table for each vibration sensor and eddy-current sensors. This broadly covers Vibration Monitoring System for FGD System	SET	1	.0004909

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.16.3 ,	Installation of vibration sensors, driver, extension cable with mounting block, Phase marker sensor, driver, extension cable with bracket , Shaft vibration sensors, driver, extension cable with probe holder, Loop checking using Portable Shaker Table for each vibration sensor and eddy-current sensors. This broadly covers equipments of This broadly covers Vibration Monitoring System for Switchgear	SET	1	.0002111
K.16.4 ,	Loop checking using Portable Shaker Table for sensors	Nos.	128	.0008154
XXIV	ERECTION AND COMMISSIONING OF UPS/BATTERY and BATTERY CHARGER	--		
K.2.1,	2X90 kVA Main UPS	SET	1	.0014933
K.3,	UPS BATTERY: 480 AH/ 220 V VRLA Battery for 90kVA UPS	SET	2	.0012212
K.4.1,	2X45 kVA Main UPS	SET	1	.0007466
K.4.8,	UPS BATTERY: 400 AH/ 220 V VRLA Battery	SET	2	.0005232
K.2.2, K.4.2,	ACDB	Nos	4	.0028109
D.1.1,	VRLA 110V Battery for DC System-1 of approx. 2400 Ah	SET	2	.0025232
D.1.2,	110V, 650A Battery Charger	SET	2	.0005977
D.1.3,	Battery Isolation Box (650A)	SET	1	.0000232
D.2.1,	VRLA 110V Battery for DC System-2 of approx. 100 Ah	SET	2	.0013873
D.2.2,	110V, 50A Battery Charger	SET	2	.0005977

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.2.3,	Battery Isolation Box (50A)	SET	2	.0000464
D.3.1,	2X30/40 kVA UPS for Illumination	SET	1	.0007466
D.3.2,	Battery for 30/40 kVA UPS for Illumination	SET	2	.0005232
D.3.3,	Battery Isolation Box in Illumination System	SET	2	.0000461
XXV	ERECTION AND COMMISSIONING OF CONTROL PANELS AND RELATED ACCESSORIES	--		
G.2.1,	Gravimetric Feeder Remote Power Cabinet and accessories	SET	4	.0011097
J.2.5,	Installation fo 19 inch racks	SET	3	.0001679
K.11.1 ,	TSI System for Main Turbine: TSI Rack and Panel along with interconnections / Main Turbine Complete Sensors and Assembly	SET	1	.0007266
K.1.6,	Network Panels	Nos	3	.0003506
C.1,	Generator Control Panel	Nos	1	.0004861
C.3,	TVM cubicle	SET	1	.0007027
K.15.1 ,	Master Slave Clock System Panel with accessories, GPS Antennas, Signal Conditioners along with accessories	SET	1	.0001807
K.15.2 ,	Slave Clock (RS 485 based)/NTP Based	Nos	15	.0008258
D.16.2 ,	Power Distribution Board	SET	1	.0001878

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
J.2.2,	Furnace temperature probe local starter box and remote position indicator	SET	1	.0001169
J.2.1,	Fire Protection Panel	SET	2	.0002337
D.16.1	Panel for LDO/HFO	SET	1	.0004861
C.10,	Delta P Level Control Panel	SET	2	.0006792
C.15,	Girth Gear Control Panel	SET	2	.0002337
G.2.3,	Furnace Temperature Panel	SET	2	.0002337
C.4,	CO2 Fire Extinguishing Equipment Control Panel	SET	1	.0001878
XXVI	PLACEMENT, ALIGNMENT,ERECTION, ELECTRICAL INTERCONNECTION, -- TESTING AND COMMISSIONING OF DCS PANELS	--		
K.1.7, K.1.1,	Suite of One Cubicles	Nos	18	.0033796
K.1.2,	Suite of Two Cubicles	Nos	4	.0011648
K.1.3,	Suite of Three Cubicles	Nos	19	.0092368
K.1.4,	Suite of Four Cubicles	Nos	1	.000516
K.1.5,	Suite of FiveCubicles	Nos	1	.0006678
XXVI I	INSTALLATION AND COMMISSIONING OF HMI SYSTEM WITH COMPLETE ACCESSORIES AND CONNECTIVITY	--		

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.6.2,	Printers (Laser Jet/Dotmatrix A4/A3/COLOUR/BW/Multifunction Printer)	Nos	4	.0001935
K.6.1,	OWS with Monitor/Servers (incl. monitor) /Stations/User PC/OPC Client along with mini UPS	SET	12	.0009825
K.8,	LVS 80 inch	SET	1	.0001132
XXVI II	INSTALLATION OF FURNITURES	--		
K.7.1,	Desk-6 Section with Accessories and chairs	SET	1	.0012566
K.7.4, K.7.3, K.7.2,	Computer Table/Printer Table, along with chairs	SET	10	.0009942
XXIX	ERECTION AND COMMISSIONING OF JB/PUSH BUTTONS	--		

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.5.5, G.5.4, G.5.3, G.5.2, G.5.1, E.7.2, E.13.3 .7, D.19.3 , D.19.2 , D.19.1 ,	Junction Boxes upto 48 way	Nos	368	.0084825
G.6.2, G.6.1, XXX C.7.3, C.7.1, K.12.3 , K.12.2 , K.12.1 ,	Push Button Station/ Fire Protection switch ERECTION AND COMMISSIONING OF LIE/LIR Local Gauge Board Local Instrument Enclosure	Nos -- SET SET	12 5 16	.0001504 .0007255 .0023307

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.12.6	Local Instrument Rack	SET	8	.0010803
K.12.5				
K.12.4				
E.13.2				
C.7.4,				
XXXI	ERECTION AND COMMISSIONING OF PNEUMATIC POWER CYLINDERS (ON/OFF and REGULATING TYPE)	--		
J.7.7,	SADC	SET	44	.0039515
J.7.6, J.7.5, J.7.4, G.12,	PA/ID/FD Blade Pitch and other Control Dampers	SET	7	.0012752
J.7.3, J.7.2,	Hot Air/Cold Air/FD Fan and other Regulating Dampers	SET	12	.0024856
J.10.1,	Solenoid Operated Valves with Manifolds and tubing	Nos.	62	.0006684
C.11,	Solenoid Valves	Nos.	1	.0000123
XXXI I	LAYING AND TERMINATION OF CONTROL CABLES, POWER CABLES, LOOP CABLES	--		

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.15.5 G.3.9, E.4.2, D.8.7,	2CX0.5 SQMM/2CX1.5 SQMM/2CX2.5 SQMM/	Mtrs	74,050	.0181434
K.15.6 E.5.1, E.4.1, D.8.25 D.8.13 D.23.6 D.23.1 C.5.1,	3CX1.5 SQMM/3CX2.5 SQMM/4CX2.5 SQMM/4CX6 SQMM/3CX1 SQMM	Mtrs	195,300	.0515324
G.3.10 D.23.7 D.23.3 D.23.2 C.5.2,	5CX2.5 SQMM/7CX2.5 SQMM/5CX1.5SQMM, 7C X 1.5 SQ.MM	Mtrs	82,950	.0234508

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.3.11 E.9.2, D.23.5 D.23.4 C.5.4, C.5.3,	9CX1.5SQMM/10C X 1.5 SQMM/10C X 2.5 Sq.mm/10TX0.5 sq.mm/12CX1.5SQMM	Mtrs	28,800	.0103133
XXXI II	LAYING AND TERMINATION OF INDIVIDUAL and OVERALL SHIELDED -- (TYPE G/F), TWISTED PAIR, ARMoured/UNARMoured CABLES, KX TYPE CABLES, OFC, OTHER SPECIAL CABLES	--		

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.3.8, G.3.7, G.3.4, G.3.1, D.22.9 D.22.4 D.22.3 D.22.2 D.22.1 6, D.22.1 4, D.22.1 0, D.22.1 ,	2PX0.5 SQMM/ 2TX0.5SQMM/ 2PX1.5SQMM/ 2PX1.31SQMM/ 2PX16AWG KX/NX/RX/G CABLE, Heat Flux Sensor Cable 2P, Flame Scanner Cable, 3P, 3P X 1.0 SQ.MM, 2TX 1SQMM, 2P X 1 SQmm, 1PX1.5 sqmm, 1T X 1.5 SQMM, 1P X 16AWG	Mtrs	106,226	.026027
G.3.5, E.9.1, D.22.6 D.22.5 D.22.1 2,	4PX0.5 SQMM/ 6PX0.5SQMM, F/G CABLE, 4PX1.31 SQ.MM KX, 6 PairX1.31 SQ.MM, 16 AWG, KX Type, 4PX1.5 sqmm 4Px1 SQMM, 6Px1.5 SQMM, 6Px1 SQMM	Mtrs	79,720	.0210352

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
G.3.6, G.3.3, G.3.2, D.22.1 5, D.22.1 1,	8PX0.5 SQMM CABLE, 8PX1.31SQMM KX Type, 8PX1.5 SQMM, 8PX1 SQMM, 8T X 1.5 SQMM	Mtrs	65,665	.0247522
D.22.8 , D.22.7 , D.22.1 3,	10Tx1.5 SQMM, 12PX0.5 SQMM, 12PX1.31 SQMM KX CABLE, 12Px 1.5 SQMM, 12Px1 SQMM	Mtrs	30,638	.0138587
K.15.4 ,	CAT-6 UTP CABLES/Ethernet Cables	Mtrs	915	.000138
K.4.5, K.2.5, K.15.3 ,	RS-485/RG-58 CABLE	Mtrs	1,600	.0006936
K.9, K.15.7 ,	Laying of Optical Fibre Cable	Mtrs	10,000	.0041464
K.15.8 , K.10,	Splicing of Optical Fibre Cable	Nos	62	.0003447

Part C : Bill of Quantities					
Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion at NALCO Damanjodi 18.5 MW BTG					
Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount	
XXXI V	ERECTION OF CABLE TRAYS WITH/WITHOUT COVER	--			
G.4.1, D.24.8 , D.24.7 ,	PERFORATED CABLE TRAYS 50 MM WIDE	Mtrs	4,150	.0082127	
G.4.2,	PERFORATED CABLE TRAYS 100 MM WIDE	Mtrs	1,000	.0024313	
G.4.3, D.24.6 , D.24.5 ,	PERFORATED CABLE TRAYS 150 MM WIDE	Mtrs	5,875	.0160556	
XXX V	ERECTION AND TESTING OF IMPULSE PIPES CS/AS/SS PIPES, TUBES	--			
D.20.8 , D.20.7 , C.14,	AS tubes/pipes upto 1 inch, 13.5X2.6, 21.3X2.77. 21.3x7.47	Mtrs	1,284	.0060742	

Part C : Bill of Quantities

Tender Specification for Electrical works, Control and Instrumentation (C&I) works and Illumination works for Boiler & Aux, ESP, Steam Turbine, Generator & auxiliaries, complete Piping, SCR system, FGD and BOI items of Steam-cum-Cogeneration Power Plant at 5th Stream Alumina Refinery Expansion

at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
K.13.2 'K.13.1 'H.2.1, G.10.3 'G.10.2 'D.20.6 'D.20.5 'D.20.4 'D.20.3 ,	CS tubes/pipes upto 1 inch, 16X2.6mm, 13.5 X 2.6	Mtrs	11,341	.0480933
D.20.1 0,	CS Pipe 2 inch. MS Pipe	Mtrs	152	.001779
J.8.2, J.8.1, G.10.1 'D.20.2 'D.20.1 ,	SS Tube upto 1 inch, Tube OD 6.35X1.6, D 6.34 X 1.24, 8 mm OD X 1 mm with accessories	Mtrs	6,124	.0083103

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
H.3.1,	PIPE SCREW AND SOCKETED IS1239 GAL (1/2 inch)	Mtrs	1,920	.0031483
J.8.3, H.3.2,	PIPE SCREW AND SOCKETED GI (1 inch), OD 34.2X4.05 THK IS1239	Mtrs	770	.0019011
J.8.4, H.3.3, D.20.9	PIPE SCREW AND SOCKETED GI (2 inch), 60.8 X 4.5	Mtrs	1,200	.0044329
XXX VI	ERECTION AND TESTING OF HOSES, TUBES and GI PIPES	--		
G.8.1,	2 inch GI Pipe	Mtrs	180	.0012043
XXX VII	CHECKING AND COMMISSIONING OF THE FOLLOWING ERECTED BY MECHANICAL AGENCY	--		
J.7.1, H.4.1, G.11.2 , C.9.6,	Control Valves with Smart positioner/AFR/Air Lock valves etc	SET	79	.0017108
C.9.5,	Limit Switches/Level Switches	Nos	8	.000065
E.13.1 .2,	Pneumatic Actuators for Dampers	Nos	2	.0003492
XXX VIII	REMOVAL, CALIBRATION AND RE-FIXING OF INSTRUMENTS ERECTED BY OTHER AGENCIES	--		

Part C : Bill of Quantities

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at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E.10.5	Field Instruments (Temperature Gauges/Indicators)	Nos	24	.0003922
XXXI X	REMOVAL, CALIBRATION AND REFIXING OF INSTRUMENTS, CHECKING -- SOLENOID VALVES, DRIVES, INCLUDING WIRING ON THE RACK ETC ERECTED BY OTHER AGENCIES	--		
E.10.4	Lub Oil System/Oil Centrifuge Unit/Lub Oil skid/Main Oil Tank	SET	12	.0011847
E.10.3				
E.10.2				
E.10.1				
C.9.2, C.9.1,				
E.10.7	Hydraulic Coupling of MDBFP	SET	4	.0011555
C.9.4,				
C.7.2,	Governing Console Board	SET	1	.0002337
C.9.3,	Girth Gear Sealing System	SET	2	.0001974
XL	REMOVAL, CALIBRATION AND RE-FIXING OF INSTRUMENTS FOR ACID CLEANING, ETC.	--		
L.1,	Temp. Gauges	Nos	3	.0000438
L.2,	Pressure Gauges	Nos	4	.0000596

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at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
L.3,	Thermocouple Stem type and MTM	Nos	8	.0000335
L.4,	Junction Boxes	Nos	3	.0000703
XLI	LOOP CHECKING OF THE INSTRUMENTS OF THE FOLLOWING -- EQUIPMENTS/ACTUATORS/DAMPERS	--		
E.10.6 , C.16,	Loop checking of instruments of Generator, Turbine	Nos	106	.0006753
XLII	Lighting Luminaires (complete with accessories including fixing of lighting lamps, -- wiring including flexible conduit from Junction Box)	--		
D.25.1 ,	Surface mounted LED Bulkhead fixture (10-15W approx) suitable for 240V AC supply	Nos	30	.0003308
D.25.2 ,	Recess mounted LED Down light (12W approx) suitable for 110V DC supply	Nos	30	.0003308
D.25.3 ,	Surface mounted 10-15W LED Bulkhead fixture suitable for 110V DC supply	Nos	85	.0009372
D.25.4 ,	Flame proof DC LED Well Glass fixture (35W approx) suitable for DC Supply	Nos	4	.0000504
D.25.5 ,	Industrial type general purpose LED Batten with 2 nos. (18-22W approx, 230V AC)	Nos	400	.0044103
D.25.6 ,	600x 600mm Recess mounted decorative LED fixture (33-36W Approx, 230V AC) with high efficiency low glare optics.	Nos	575	.0063398

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at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.25.7	Industrial corrosion resistant type fixture of polycarbonate body with 2 nos. (18-22W approx,230V AC) LED tube lamp.	Nos	45	.0004962
D.25.8	LED Well Glass fixture (35-50WApprox, 230VAC)	Nos	1,700	.0214031
D.25.9	LED medium bay fixture (80-100WApprox, 230VAC)	Nos	100	.0021524
D.25.10	LED high bay fixture (150-180WApprox, 230VAC)	Nos	100	.0019677
D.25.11	Flame proof LED Well Glass fixture (35-50WApprox, 230VAC)	Nos	22	.000277
D.25.12	LED street lighting fixture (60W approx, 230V AC)	Nos	90	.0010703
D.25.13	LED Flood lighting Fixture (90 watt approx)	Nos	75	.0010913
D.25.14	Flame proof LED Street lighting fixture (60WApprox, 230VAC)	Nos	5	.0000595
D.25.15	LED Flame proof Flood lighting Fixture (180-200 watt approx)	Nos	5	.0000866
XLIII	Erection of Poles	--		
D.26.1	11 meter Steel tubular pole along with Junction Box, all accessories including PCC foundation (except light fixture and 3C-2.5sqmm cable)	Nos	2	.0006033

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at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.26.2 ,	4.75 meter 100NB GI pole along with Junction Box all accessories including PCC foundation (except light fixture and 3C-2.5sqmm cable)	Nos	10	.0009529
D.26.3 ,	3 meter 50NB GI pole along with Junction Box all accessories (except light fixture and 3C-2.5sqmm cable)	Nos	638	.0142251
XLIV	Conduit including laying of wires	--		
D.27.3 ,	50NB GI conduit	Mtrs	60	.0001493
D.27.4 ,	50NB PVC conduit	Mtrs	45	.000084
D.27.5 ,	20mm GI conduit	Mtrs	900	.0016793
D.27.6 ,	25mm PVC conduit	Mtrs	14,040	.0206401
XLV	Junction Boxes, Switchboards, Receptacles, etc. complete with accessories (with/without canopy)	--		
D.28.1 ,	4 way 250x200x120mm rectangular sheet steel weather proof JB (IP55)	Nos	50	.0002752
D.28.2 ,	MCB Box with 20A MCB	Nos	190	.0020949
D.28.3 ,	FLP DC MCB Box with 10A DC MCB	Nos	2	.0000221

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at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.28.4 ,	Switchboard (Flush/Surface mount type) with 2/3nos. 5A/6A Piano type switch	Nos	100	.0008274
D.28.5 ,	Decorative type 6/16A receptacle with 15A/16A switch (Flush/Surface mounted, modular type)	Nos	125	.0010342
D.28.6 ,	Industrial metal clad type 1Ph, 20A Socket with 20A interlocked rotary switch and Plug	Nos	130	.0014333
D.28.7 ,	Flameproof 1ph, 20A Socket with interlocked rotary switch and Plug	Nos	3	.0000331
D.28.8 ,	Industrial metal clad type 3Ph, 63A (5pin) receptacle with interlocked rotary switch and Plug	Nos	50	.0005513
XLVI	Lighting Panels (LP)	--		
D.29.1 ,	18 way AC Indoor Lighting Panel	Nos	2	.0002125
D.29.2 ,	12 way AC Indoor Lighting Panel	Nos	14	.0009367
D.29.3 ,	6 way AC Indoor Lighting Panel	Nos	42	.0028101
D.29.4 ,	6 way DC indoor Lighting Panel	Nos	10	.0006691
D.29.5 ,	18 way AC Outdoor Lighting Panel	Nos	7	.0007438

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at NALCO Damanjodi 18.5 MW BTG

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
D.29.6	12 way AC Outdoor Lighting Panel	Nos	8	.0005353
D.29.7	6 way AC Outdoor Lighting Panel	Nos	14	.0009367
D.29.8	Flame proof 12 way AC Lighting Panel	Nos	1	.0000669
D.29.9	Flame proof 6 way AC Lighting Panel	Nos	2	.0001338
XLVII	Lighting transformers	--		
D.31.1	75 kVA Normal Lighting transformers	Nos	2	.0002959
F.4.1,	415V MLDB- FGD, Approximate Overall Weight (in kg) 3370, Approximate Dimension in mm (LxDxH): 4860X644X2495 mm, No. of Panels: 6 and No. of Shipping Sections: 3	SET	1	.0008305
F.4.2,	415V MLDB- AMMONIA, Approximate Overall Weight (in kg) 4200, Approximate Dimension in mm (LxDxH): 4860X644X2495 mm, No. of Panels: 6 and No. of Shipping Sections: 3	SET	1	.0008305
XLVII I	ERECTION AND COMMISSIONING OF LT SWITCHGEAR MLDB/ELDB, etc.	--		
F.4.4,	415V UPS ELDB-1,2,3, Approximate Overall Weight (in kg) 2270, Approximate Dimension in mm (LxDxH): 3260X644X2495 mm, No. of Panels: 4 and No. of Shipping Sections: 2	SET	1	.0005571

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount	
F.4.5,	110V WALL MOUNT DC ELDB-1,2,3, Approximate Overall Weight (in kg) 200, SET Approximate Dimension in mm (LxDxH): 900X400X1000 mm	SET	7	.0009512	
TOTAL Weightage				1.0	