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These special conditions shall be construed as part of tender document and shall be read along with general conditions of contract (GCC) and other volumes of tender. In case of any conflict or inconsistency between GCC, other volumes and these Technical conditions contract (TCC), the same shall be brought out by the bidder in writing to BHEL for clarification with stipulated date & before due date of submission of offer, failing which most stringent interpretation/ clause in favour of BHEL shall be adopted and the same shall be binding to the bidder.

CL. NO	DESCRIPTION
1.0	PROJECT SYNOPSIS AND GENERAL INFORMATION Name of the Owner : NTPC LTD Address : KAHALGAON SUPER THERMAL POWER STATION STAGE-II (3X500 MW),NTPC Ltd., District-Bhagalpur, Bihar, India Nearest Railway Station : Kahalgaon Railway Station is situated about 7km from the plant site. Nearest Road : The Bhagalpur-Sahibganj State Highway runs parallel to the railway track. Bhagalpur, the nearest major Town, is about 30-km southwest of project site.
2.0	SITE VISIT The bidder should visit project site and acquire full knowledge & information about the conditions prevailing at site and in & around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of offer. In line with the above, site visit confirmation will be required to be submitted by the bidder with nthe technical bid.
.3.0	NAME OF WORK PROJ-I: Receipt, unloading, storage,material transportation (store/ yard to site) Dismantling, New Material Erection, Re-Erection of Old Items, Modification of existing Items, Restoration, Commissioning, Painting(supply & application),Testing & PG Test etc of Combustion modification system for Nox mitigation of of U#5,6 & 7, STG-II (3X500MW) at NTPC -KAHALGAON STPS

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4.0	SCOPE OF WORK
4.1	BROAD DETAILS
4.1.1	The job includes modification of all three Units of of Stage-II (3x500MW) at NTPC-KAHALGAON STPS in the Burner fuel nozzles (coal / oil/ air/ cc-ofa), Laying of duct from Windbox to BOFA Panels (above burners) & its control instrumentation work. Modification in floors to carry out aforsaid work. Detailed scope is mentioned below, however it may be noted that below mentioned scope of work is only a guide line if any additional work which is not written below and required for carrying out for completion of work is to be done without any additional extra cost.
4.1.2	Bidders are strongly advised to inspect the site, examine and obtain all information required and satisfy himself regarding all matters. The price quoted by the bidder shall be based on his knowledge and judgement of the conditions and hazards involved. Ignorance of site conditions shall not be accepted as basis for any claim for compensation or will not be considered a reason under force majeure. This is a major and skilled job, it requires precision and timely preparation before the start of job. contractor is advised to completely mobilize the site at-least 01 month before official date of shutdown for pre shutdown jobs like Planning of job, fabrication of ducts, dismatling / erection of structural floors,arrangements f T&P, gate pass preparation, fixing of winch and chain pulley blocks, removal of fouling structure etc.
4.1.3	<p><u>MECHANICAL ITEMS</u></p> <p>a) Modification of Wind Box with BOFA panel.</p> <ul style="list-style-type: none"> • New/ modified Re-designed Wind box including new coal, oil and air nozzle tips for all four corners. • New /Re-designed Tilting Tangential Burner Assembly. • Burner Tilt Power cylinders (based on the assessment of actual condition vendor may reuse the existing items also • Modification in coal piping, coupling & its supports. • Strengthening/ modification of structure as required for carrying out combustion modification job (if required) • Burner Panel matching with frames (water wall panel for fitting new redesigned tangential tilting burner assemblies and windbox). • BOFA panel matching with frames (water wall panels for fitting in the new BOFA compartments). • SADC Pneumatic actuators with Positioners & Position transmitters. • BOFA Compartment with dampers and power operated actuators. • Wind box connecting duct along with Expansion bellows between wind box connecting duct and wind box. • Instrumentation Air piping for all pneumatic actuators and instruments being replaced, refurbished under this package. <p>b) Dismantling/Modification of existing Wind box assembly, Platforms/floors/starirs, Ducts, Pr Parts, coal burner, Coal nozzle tip, coal piping, hangers etc.</p> <p>c) Preservation of Scanners and HEA Ignites and critical equipment which can be reused again shall be cleaned and stored in proper shed and shall be reused/ re erected/restored.</p> <p>d) Necessary access, platforms, walkways, handrails, staircase, ladders and gratings etc. for proper approach shall be made by vendor for all equipments, instruments (for newly added items as per scope of supply of Combustion modification) including required during commissioning and testing and accessories.</p> <p>e) Necessary handling/lifting arrangement with monorail and hoist alongwith suitable platform & approach</p> <p>f) Insulation and Cladding.</p> <p>g) Repair / replacement/modification of water wall tubes for installation of Separated over fire air damper/panel (part of scope of combustion modification only), assistance for hydro tes(hydro test is in Customer's Scope),attend failures during hydro test.</p> <p>h)Vendor need to take approval from Boiler Directorate/Bihar under Section 392 of IBR. Vendor has to co-ordinate with Boiler Directorate/Bihar for approval of Drawings for the subject work. Arrangement for inspections/approval through Boiler Directorate/West Bihar upto hydro test/completion of work.</p> <p>i) 100% RT of Pr Parts Weld Joints.</p>

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	<p>j) All associated Structural works.</p> <p>k) Existing features where are interfering with the new arrangement of BOFA are to be suitably relocated at site to the extent required.</p> <p>l) Duct stiffeners and insulation at existing items to be adjusted at site for required clearance.</p> <p>m) Dismantling of Mechanical Items like Floors/Platforms/stairs/Ducts/Pr Parts/Soot Blower/Buck stays/Insulation etc, Re-Erection/Re-use of old dismantled items/modification as per drawing/as instructed by Engr I/C.</p>
4.1.4	<p>Control & Instrumentation/Electrical:</p> <p>Contractor's scope shall include but not limited to the following: -</p> <ul style="list-style-type: none"> • Dismantling of C&I/Electrical Items like Instruments/cables/cable trays/JB's/Ligght/Light Fittings/Soot Blower Connections etc & Preservation of same for re-use if required, • Erection, Testing & Commissioning of Pneumatic actuators with positioners and I/P converters for BOFA dampers • Erection, Testing & Commissioning of BOFA tilt power cylinders with positioners and shear pin failure indicator and alarm. • Erection, Testing & Commissioning of Air Filter Regulator and pressure switches/ transmitters in BOFA signal airline. • Erection, Testing & Commissioning of Flow elements (Aerofoil or as per the standard and proven practice of Contractor) with flow transmitter in BOFA secondary air duct • Erection, Testing & Commissioning of Solenoids and pneumatic tubing for auto purging of BOFA flow element. • Power/Control/Instrumentation cables Laying & termination for Powered-up, Control & interconnection/ integration of C&I instruments/equipment of system with existing unit DDCMIS. • Erection, Testing & Commissioning LIE/LIR, including Erection, Testing & Commissioning Instrument(s) related to the LIE/LIR with necessary erection hardware, impulse tubing/piping,fitting, racks, enclosures, junction boxes etc. for C&I. • Erection of Branch cable trays up to field Junction boxes. • Erection of Instrument air piping from the existing instrument airline to existing and new equipment/instruments. • Erection, Testing & Commissioning of Instrument air distribution SS tubing, fittings for SADC /BOFA actuators, Corner Nozzle valves, HEA ignitors, Burner Tilt Power cylinders and BOFA Tilt Power cylinders etc.. • Erection, Testing & Commissioning of Two (02 Sets.) of CO analyzers at Economizer outlets of each unit. Tapping points for CO analyzers, suitable for analyser mounting, shall be erected at Economizer outlet ducts etc. • Erection, Testing & Commissioning of Microprocessor based electronic positioners with all the pneumatic operated control valves/ dampers for burner-tilt application. Microprocessor based electronic positioners with remote positioner units shall be provided. However, pneumatic positioners along with I/P converters are also a part for SADC BOFA dampers etc. • Erection of required cable tray(s) along with supporting stuctures to be done. Cable trays may be different sizes & kind as per drawing. • Cable Laying, dressing, tagging, glanding, ferruling, terminating at both end,cable splicing, etc. as applicable including continuity checking & IR Value checking (if required) to be done towards commissioning of C&I & Electrical system/items realted to Nox mitigation system. • All associated Electrical, Control & Instrumentation works realted to Nox mitigation of U#5,6&7, (3X500MW) at NTPC -Kahalgao STPS to be carried-out under the scope of work. <p>Note: - Dismantled HEA ignitors, Flame scanners, Burner tilt actuators & SADC actuators along with I/P converters, 1/4" Air Filter Regulator and pressure switches etc. shall be re-used as per the drawing / site engineer instruction.</p>
4.2	DETAILS SCOPE OF WORK

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4.2.A	<p>Dismantling activities and items(MECHANICAL/ELECTRICAL/ C&I) to be retained properly & to be re-used/re-erected/alignment/modified/commissioned/painting(supply & application)/testing etc..</p>
	<p>The contractor shall carry out Dismantling, Removal, Shifting of any obstructing Pr Parts, structures, buck stay, pipe lines, cables & cable trays, boiler lighting arrangement,wall blowler system at BOFA panel elevation ,facilities etc. and upkeepment of the items & shifting oif material from store to site, Re-Use/Re-Erection/Modification as per drawing/Instruction of Engr I/C.</p> <p>A. Following Items to Be dismantled, preserved & to be re-used/ re-erected/ modified/ commissioned:-</p> <p><u>MECHANICAL ITEMS:</u></p> <ul style="list-style-type: none"> ● Insulation cladding, wool, refractory etc as required. ● Structure components like Platform, hand rails, floor gratings, stair cases, ladders etc of Different Elevation etc.as required. ● Existing Wind box assembly, coal burner, Coal nozzle tip, coal piping, hangers etc ● Misc structural items(channel, Angles, Beams etc.) ● Wall blower,soot blower, its piping as required. ● Duct, duct support, expansion below etc as required. ● Buckstay beams and its associated members like leveller guide, scalloped bar, pin etc. ● Water wall panels/tubes/ bends as required. ● Burner Nozzles (air/coal/oil). ● Coal Pipe Bends/elbows as required. ● Removal / dismantling of FIE (Fuel Inlet Elbows = 36 Nos,it may vary , as per drawings) for all four corners at all elevation. Transporatation of FIE's to designated location as decided by BHEL/ Customer ● Removal of Oil Guns, Gun Guide Pipes, HEA Ignitor, its fittings & its guide pipes, Scanner & their guide pipes. Proper care shall be given while dismantling as these items shall be reused, Oil Gun Vice assy & Rack, Air Cooled Oil gun Assemblies, oil gun mainmtenance box, oil gun vice assy an rack etc. ● Burner station skid assemblies. ● Corner station piping, valves & fittings. ● Coal piping, coal pipe coouplings, supports etc(as required). ● Buckstays in the wind box and BOFA locations. ● Any other piping, supports, valves and fittings etc. ● Removal of all Coal Nozzles from coal compartment for all four corners.Replacement of Nozzle tips with new tips & inert back the nozzles to burners coal compartments etc.. ● Instrument Air, Service Air Line as required. ● Any other mechanical items not mentioned above but required to be dismantled & re-erected/re-used/modified/Alignment/painting for completion of the sytem, same to be carried out by vendor as per instruction of Engr I/C without any extra cost <p><u>C&I & ELECTRICAL ITEMS :</u></p> <ul style="list-style-type: none"> ● Approximately, 44 Nos. Flame Scanner Head assemblies, Cooling air piping, Scanner hoses etc. (Quantity may vary, as per erection drawings). ● Furnace flame viewing camera(s)/system. ● ASLD(s) etc. ● SADC(s) and Burner tilt power cylinder(s)/actuator(s). ● Dismantling of Cable trays and cables, which are required to be eatsblied the DE-NOX system duct panels etc. ● Existing Pressure gauge(s) in Corner skid for oil and atomizing medium. ● Wind box to Furnace DP Transmitter(s) and related impulse piping. ● Tapping point(s) for any Instrument in water wall. ● Field cables and Junction boxes in Boiler Operating Floor/Firing Floor/ air and flue gas path as required to be eatsblied the DE-NOX system. ● Existing SADC I/P converter(s), 1/4" Air Filter Regulator(s) in existing SADC(s) signal airline, Existing SADC signal air Line pressure switch(s) etc.

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	<ul style="list-style-type: none"> ● Illumination items. ● Existing secondary air flow measurement element(s) and transmitter(s) along with cable(s) & accessories. ● Existing corner oil skid(s), instruments in oil line(s), trip valve(s) and control valve(s) along with all associated cable(s). ● Field JB(s) and related impulse piping. ● All existing cable(s) & Cable tray(s) associated with existing SADC actuator I/P(s), pressure switch(s) and SADC(s)/FSSS panel(s) (including field cable(s) till local JB(s)). ● All existing cables between existing corner oil skid, HEA ignitors, oil gun, LGM box and FSSS panel etc. (including field cables till local JB) etc.. ● All existing Power, Control & Instrumentation cables for Soot Blowers. ● Existing instruments in air and flue gas path, associated cabling, field JB's and Impulse piping. ● Erection, installation, cable tray erection, cable laying, cable splicing, cable dressing, cable glanding, cable termination, ferruling, tagging, applicable testing, commissioning of C&I & Electrical system/items. ● Any other C&I/Electrical items not mentioned above but required to be dismantled & re-erected/re-used/modified for completion of the system, same to be carried out by vendor without any extra cost as per drawing / instruction of Engr I/C. <p>Note: - The above work includes Erection, Testing & Commissioning, Laying, dressing, tagging, glanding, ferruling, terminating at both end/splicing, etc. as applicable including continuity checking & IR Value checking (if required) applicable testing, to be done towards commissioning of C&I & Electrical system/items related to Nox mitigation system. The above item list are tentative only.</p> <p>B. Work to be done as under:-</p> <ol style="list-style-type: none"> i) Dismantling, Removal, Shifting of any obstructing items (Mechanical, C&I, Electrical) as mentioned above for De-Nox system. ii) Upkeepment/preservation of the items for re-use, re-erection, modification, welding, alignment, laying, termination, commissioning, testing, PG Test as per instruction of Engr I/C/Drawing as reqd. iii) Relaying/re-erection of Instrument air, service air, other dismantled pipe lines, lighting system, cable(s), cable tray(s), termination, jb's etc. iv) Disposal of scrap to the scrap yard or as instructed by Engr I/C inside plant premises. v) Erection testing commissioning of Instrument air distribution SS tubing, fittings for SADC actuators, Corner Nozzle valves, HEA ignitors, Burner Tilt Power cylinders Power cylinders. vi) Dismantling/Modification of existing Wind box assembly, coal burner, Coal nozzle tip, coal piping, hangers etc. vii) Preservation of Scanners and HEA Ignites and critical equipment which can be reused again shall be cleaned and stored in proper shed and shall be reused/ re erected/restored/commissioning/alignment/testing along with cabling, termination, testing etc as applicable. viii) Restoration/re-erection of all removed structure, floor grills, air lines, hand rails, Re-erection of removed insulation and cladding with the help of hooks and retainer plates. Existing access openings/observation doors are to be retained. Restoring JB, cable, cable tray as and where applicable. Dismantling & Removal of scaffolding and other temporary structures & arrangements made for handling after completion of work & Transportation of removed material and other scraps generated during the work to disposal yard/handing over the same to NTPC customer. Any other alteration which is done for modification is to be restored in original position without any extra charge. If any modification of floor/ bracing is required to successfully complete this BOFA modification job which is not mention here, same has to be carried out with out any extra cost. ix) Existing Floor at 51.850 Mtrs, & other Elevations to be modified to clear BOFA assembly & Ducting. x) Modification of Existing Floors as per drawing/guidance of Engr I/C. xi) Existing Buckstay at El 51.00 Mtrs to be modified at corners. xii) Horizontal Bracings interfering with BOFA system to be modified to clear BOFA & Ducting.
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	<p>xiii) Duct Stiffeners & Insulation at existing items to be adjusted locally at site for clearance.</p> <p>xiv) All the existing features which are interfering with the proposed arrangement of BOFA are to be suitably relocated at site to the extent required.</p> <p>xv) Supply & application of paints for the re-erected/re-used/modified items.</p> <p>xvi) Fabrication of Floors/benches (where ever required)</p> <p>xvii) Painting (including supply) as and where applicable.</p> <p>xviii) Vendor need to take approval from Boiler Directorate/Bihar under Section 392 of IBR. Vendor has to co-ordinate with Boiler Directorate/Bihar for approval of Drawings for the subject work. Arrangement for inspections/approval through Boiler Directorate/West Bihar upto hydro test/completion of work.</p> <p>xix) 100% RT of Pr Parts Weld Joints</p> <p>xx) Erection, installation, cable tray erection, cable laying, cable splicing, cable dressing, cable galnding, cable termination, ferruling, tagging, applicable testing, commissioning of C&I & Electrical system/items.</p> <p><u>Tentative quantity of work/Boiler:</u></p> <ul style="list-style-type: none"> • Approx weight to be dismantled will be 50 MT/Boiler. for 3 no Units total weight to be dismantled is 150 MT (Approx). • Approx weight to be re-erected/re-used will be 30 MT/Boiler. for 3 no Units total weight to be re-erected / re-used is 90 MT (Approx). <p>Note:Quantity mentioned above may vary to any extent, no extra paymnet shall be made for quantity variation to complete NOx modification job.</p>
4.2.B	SHIFTING OF MATERIAL FROM STORE/YARD TO SITE, ERECTION, ALIGNMENT ,WELDING,NDT,PAINTING (SUPPLY&APPLICATION), TESTING, COMMISSIONING & PG TEST ETC. WORK OF NEWLY SUPPLIED MECHANICAL ITEMS.
	<p>Tentative weight of new materials envisaged for erection is 200.72 MT per Boiler (Refer Annexure –II of TCC) i.e for Three Units is $3 \times 200.72 = 602.16$ MT.</p> <p>Note: Quantity may be increase or decrease as per site requirement. Paymnet will be made on prorata rate basis as per actual quantity.</p>
4.2.B1	TENTATIVE PRE SHUTDOWN / PREPARATORY WORKS
B1.1	All Necessary arrangements are to be made for handling, lifting, shifting, erection, placement, assembly, matching, alignment, supporting, welding, cutting, grinding, drilling, DPT, Radiography, Heat Treatment and other associated works etc. for the materials to be erected/dismantled. Including providing of all required Manpower, T&Ps, MMDs, Consumables and Other Materials.
B1.2	All necessary arrangements are to be made by the contractor for transportation of materials including providing of all required Manpower, Hydras, Trailers, Tractors and other means of transportation along with operators & fuel.
B1.3	Removal & replacement of structural floors, beams, bracings, cable trays buckstays or any other structure and system fouling with duct routing. BOFA Duct laying from Hot air duct (Left & Right) near windbox (EI 38.50 Mtr tentatively) to BOFA assembly above Burner area (EI 50.20 Mtr tentatively). Relocation of stairs.
B1.4	Removal of fouling structural floors at Elevation (tentative) 51.850 Mtr & other elevations as per BHEL requirement.
B1.5	Modification of structural floor to accommodate New ducting (Hot air duct to BOFA Panels) system as per BHEL drawing/Instruction of Engr I/C.
B1.6	Placement, erection of structural beams, bracings, floor grills, hand rails, pipes etc. Erection, fitup & welding of structures & platforms. Self drilling screw for floor grills is in subcontractor scope.
B1.7	Erection & welding of structure as per BHEL standards & quality plan. LPI of all welded beams, bracings. Supply of all consumables including Welding electrodes is in subcontractor scope.
B1.8	Modification of Stair & Floor as per drawing/as required.

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B1.9	Erection & Placement of Benches required for operation for all newly installed systems.
B1.10	Area cleaning for the placement of duct pieces before assembly. Pre assembly of Duct for BOFA system. Seal Welding of duct as per BHEL norms. Checking of dimensions as per quality plan.
B1.11	Erection of temporary platforms at boiler floors for duct assembly work.
B1.12	Routing & Erection of Duct from BOFA System to Hot secondary air duct (Left & Right side of furnace) to the extent possible before shutdown.
B1.13	Erection of duct supports, guides, hangers as per BHEL drawing & site requirement.
B1.14	Erection of Access doors & providing access structural platforms as per drawing & site requirement.
B1.15	Erection of Junction Box (JB's) near the BOFA Panels. Erection of Cable trays & Laying of Cables to the extent possible during preshutdown.
B1.16	Arrangement of Scaffolding materials & erection of scaffolding for outside furnace area as required.
B1.17	Arrangement of sufficient Illumination for erection work to be arranged by vendor. Note: 24 V DC lights with transformer to be arranged by vendor for confined area work.
4.2.B2	TENTATIVE SHUT DOWN WORKS
4.2.B2.a	SCAFFOLDING
B2.a.1	Arrangement of scaffolding materials & erection of same in outside boiler (except boiler 1st pass furnace inside) area is in vendor Scope.
B2.a.2	For Erection of scaffolding in inside Boiler Furnace 1st pass & arrangement of Scaffolding material for the same, refer sl no 4.2.E & 4.2.F of this TCC.
4.2.B2.b	Windbox / Burner
B2.b.1	Locking of Coal pipes before removal of Elbow / Gate valve from coal pipes.
B2.b.2	Installation of New or dismantled FIE (Fuel Inlet Elbow) as decided by BHEL. Replacement of coal pipe couplings /gaskets.
B2.b.3	Transportation & handing over these items to BHEL / customer stores.
B2.b.4	Replacement of Oil / Air / End Air /CC-OFA nozzle tips for all four corner burners including modification in winbox compartment to suit new designed nozzles. Reinstallation of Guidepipes of Oil/HEA/Scanner. Scaffolding required to complete job shall be in subcontractor scope.
B2.b.5	Modification in the windbox SADC dampers by welding of locking plates, shielding plates as per BHEL Drawing. After modification ensure free rotation of dampers in all compartments.
B2.b.6	Scanner Air header modification / Rerouting as per site requirement.
B2.b.7	if any modification required in new nozzle tips at site due to difficulty in reinstallation of guide pipe of OIL/HEA/Scanner same to be executed at site by agency without any cost impact
4.2.B2.c	DUCT (Hot Air to BOFA) , Buckstay,Insulation & Structures
B2.c.1	Routing & Erection of Duct from BOFA System to Hot secondary air duct (Left & Right side of furnace) as per drawing & site condition.
B2.c.2	Supporting of duct as per drawing & site requirement.
B2.c.3	Erection of duct expansion bellows & supporting as per drawing & site condition.
B2.c.4	Buckstay (front & rear) to be relocated with & modified to link with BOFA Assy (Tentative EL51000). Buckstay (Left & Right) at El 47075(Tentative) to be removed as per drawing.
B2.c.5	Relocation of Wall blowers at El 46050 (tentative) on left & right side (Approx.5 Nos Each side) to be lowered by 500(approximate) mm to clear BOFA ducting. Rerouting of wall blowers steam pipe header & its supports.
B2.c.6	Gas / Air tightness test of Duct as per BHEL procedure.
B2.c.7	Welding of insulation fixing components at ducts, fixing of mineral wool as per BHEL standards.
B2.c.8	Laying of Insulation, Refractory & Cladding as per BHEL norms. Application of castable & pourbale refractory for buckstay, wall blowers, peepholes, access doors, burners ww transition tubes etc.
B2.c.9	Additional floors are to be added at EL (tentatively) 44850, 48350, 51850 & other Elevations as per Drawing/ Instruction of Engr I/C. Floor items wherever required to be fabricated from standard size

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	structure materials, without any extra cost.
B2.c.10	Kersone test to be carried out for duct welding.
4.2.B2.d	BOFA Panels/Pr Parts
B2.d.1	Transporataion of BOFA panels to site from stores.
B2.d.2	Cutting of Water wall above burner to accommodate new BOFA system. Fitup of WW tubes to BOFA Panel tubes. Welding of HP Joints by IBR welder.
B2.d.3	Vendor need to take approval from Boiler Directorate/Bihar under Section 392 of IBR. Vendor has to co-ordinate with Boiler Directorate/Bihar for approval of Drawings for the subject work. Arrangement for inspections/approval through Boiler Directorate/Bihar upto hydro test/completion of work.
B2.d.4	100% Radiography of the new HP Joints as per IBR, including necessary rectification of the defects observed during radiography. Pre Heat & PWHT (if required).
B2.d.5	Connection welding of BOFA system to newly erected duct. Supporting of BOFA system.
B2.d.6	Erection of power cylinders for New BOFA system at four elevation in all for corners. Stroke adustment / tuning of power cylinders. Adjustment / tuning of existing SADC power cylinders.
B2.d.7	Laying of Instrument air line from existing header to all newly installed power cylinders. & other installed systems as per site requirement.
B2.d.8	Approch Platform erection. Erection & placement of benches for operating the installed instruments / systems as per drawing and site requirement.
B2.d.9	Existing Flame viewing system (FVS) on left & right side wall to be relocated at El 51000 (Tentative). Cutting of water wall to accommodate FVS. Welding of spool ww piece. Erection of approach platform for FVS.
4.2.B2.e	Other Work
B2.e.1	Additional Floors to be added at El 44.850 Mtrs, El 48.350 Mtrs, and El 51.850 Mtrs as per drawing/guidance of Engr I /C.
B2.e.2	Fabrication of Floors/benches (where ever required as per drawings)
4.2.B2.f	SUPPLY & APPLICATION OF PAINTS
B2.f.1	The contractor's scope of work includes supply & application of paints of all equipment and structures which are supplied new & of those items which will be re-used as per the Employer's standard color coding scheme which shall be furnished to the Contractor. The painting of various components shall comply with the requirements stipulated in different part of this specification. However, for components where no specific requirement is stipulated, the painting conforming to the requirements stipulated below shall be provided. The quality and finish of paints shall be as per standards of BIS or equivalent. The surfaces which have surface temperature of 95 degree Celsius (with or without insulation) shall be applied with at least two coats of high temperature primer/ paint with total OFT not less than 40 micron.
B2.f.2	Red oxide paints to be applied on all weld joints.
4.2.B2.g	Insulation & Refractory Work
B.2.g.1	Insulation to be applied in Pr Parts, Water Wall, Ducts as per drawing/Instruction of Engr I/C.
B.2.g.2	Refractory to be applied as per drawing/instruction of Engr I/C.
B.2.g.3	Self tapping screw for insulation to be supplied by vendor.
B.2.g.4	Cutting of cladding sheets as per the profile of the equipment and painting on inner surface two coats of bituminous paint. Black Bituminous Paint will be supplied by Contractor
4.2.B2.h	Commissioning Activities
B.2.h.1	"Contractor shall provide qualified manpower with necessary T&P for testing and commissioning of system for conducting Hydro test, air tightness test, commissioing of SADC system & BOFA system etc. Attending any defects / deficiency observed during the commissioing activity."
4.2.B.3	Post Shutdwon Commissioning activities/fine tuning & Performance Guarntee test
B.3.1	Contractor shall provide qualified manpower with necessary T&P for post shutdown testing, commissioning & fine tuning of the system. Full necessary assistance for conducting performance

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	guarantee (PG) test etc as required to complete the system. Attending any defects / deficiency observed during this period for successful completion of PG Test.
4.2.C	SHIFTING OF MATERIAL FROM STORE /YARD TO SITE,ERECTION,TESTING,COMMISSIOING,CABLE & CABLE TRAY LAYING ,TERMINATION/SPLICING ,TAGGING, FERRRULING ,DRESSING OF NEWLY SUPPLIED C&I & ELECTRICAL ITEMS (Refer Annex-III of this TCC for tentative list of New C&I & Electrical Items) and including PG test etc.of the system.
C.1	Control instrumentation for New BOFA power cylenders, erection of I/P converters, pressure switches, flow transmitters, LIE / LIR, hook ups, BOFA air flow pitot tube. Including laying of cables to Junction box. Erection of New Junction Boxes. C&I of all other work required to complete given scope of work.
C.2	Pneumatic actuators with positioners and I/P converters for BOFA dampers, BOFA tilt power cylinders with positioners and shear pin failure indicator and alarm. Air Filter Regulator and pressure switches/ transmitters in BOFA signal airline.
C.3	Flow elements (Aerofoil or as per the standard and proven practice of Contractor) with flow transmitter in BOFA secondary air duct. • Solenoids and pneumatic tubing for auto purging of BOFA flow element
C.4	Instrumentation and control cables, power supply distribution cables, special cables (such as Scanner pig tail cable) along with accessories for interconnection/ integration of C&I instruments/equipment of system with existing unit DDCMI, Instrument hook up material, erection hardware, impulse tubing/ piping,fitting, racks, enclosures, junction boxes etc. for C&I:
C.5	Branch cable trays up to field Junction boxes, Instrument air piping from the existing instrument airline to existing and new equipment/instruments, Instrument air distribution SS tubing, fittings for SADC /BOFA actuators, Corner Nozzle valves, HEA ignitors, Burner Tilt Power cylinders and BOFA Tilt Power cylinders
C.6	Two (02 nos.) of CO analyzers at Economizer outlets of each unit. Tapping points for CO analyzers, suitable for analyser mounting, shall be erected at Economizer outlet ducts
C.7	Microprocessor based electronic positioners with all the pneumatic operated control valves/ dampers being erected and commissioned. For burner-tilt application, Microprocessor based electronic positioners with remote positioner units shall be provided. However, pneumatic positioners along with I/P converters are also a part for SADC BOFA dampers
C.8	All associated Electrical, Control & Instrumentation works
C.9	Erection & Commissioning of CO analysers at ECO Outlet duct. Erection of approach platform & benches for CO analyser. 4 nos CCTV are to be erected and commissioned at bottom ash hopper.
C.10	Erection, installation,cable tray erection, cable laying, cable termination in both ends,cable splicing,ferruling, tagging,cable dressing, applicable testing, commissioning of all newly supplied C&I & Electrical system/items.
C.11	Installation of all pneumatic actuators including pneumatic cylinders, solenoid valves, and pneumatic accessories limit switches etc.
C.12	Laying of instrument air pipes to various valves and instruments form the terminal points onward as required.
C.13	Laying of cables, cable trays, JB's, cable termination with instruments, ferruling, tagging, testing, commissioning & PG test.
C.14	Branch cable trays up to field Junction boxes for the newly supplied cables.
C.15	Instrumentation and control cables, power supply distribution cables, special cables (such as Scanner pig tail cable) along with accessories for interconnection/ integration of C&I instruments/equipment of system being renovated/upgraded with existing unit DDCMIS
C.16	Instrument air piping from the existing instrument airline to existing and new equipment/instruments
C.17	Installation of Two (02) nos. of CCTV cameras (High Definition (HD) fixed type) outside the furnace (one on left and right side) at about 10.5 M elevation. Installation of Seal Boxes fitted with sight glass in each side of boiler water walls
C.18	Installation of Two (02) nos. of CCTV cameras (High Definition (HD) fixed type) outside the bottom ash hopper at about 8 M elevations.

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C.19	E&C of Burner Tilt shear pin failure system, Flame scanner pigtail cable, Furnace bottom ash viewing CCTV cameras.
C.20	Instrumentation and control cables, power supply distribution cables, special cables (such as Scanner pig tail cable) along with accessories for interconnection/Integration of C&I instruments/equipment of system being renovated/upgraded with Existing unit DDCMIS.
C.21	Supply and application of paints wherever required.
C.22	Shifting of materials from material store to site.
C.23	Quantity & Size of C&I & Electrical Works/Items may vary to any extent. No extra payment shall be made for quantity/size variation to complete NOx modification work.
4.2.D	MATERIAL HANDLING JOB: RECEIPT, UNLOADING, TRANSPORTATION, STORAGE, WATCH & WARD ETC. OF MATERIALS TILL THE COMMISSIONING OF BOTH THE BOILER & RECONCILIATION OF THE MATERIALS.
4.2.D.1	NEW MATERIALS SUPPLIED BY BHEL MANUFACTURING UNIT / BHEL VENDOR
D1.1	Material for combustion modification system shall be supplied by BHEL manufacturing unit / BHEL vendor. All the materials are to be unloaded and stored at BHEL / NTPC stores/ open yard by the contractor. Location of unloading will be intimated by BHEL site engineer. Unloading is to be done as per instruction of BHEL site engineer.
D.1.2	Unloading, stacking, reloading the materials/ equipment received, wherever/whenever required, to trucks/ trailers etc. & transportation to stores/ storage yard/ work site at subject project, unloading and stacking at site stores/storage yard/ work site in line with BHEL storage manual and as per the instruction of BHEL engineer.
D.1.3	Material Receipt/unloading/stacking/storage/upkeepment /verification /record keeping / issue / assistance for insurance /reconciliation/ watch & ward. All records are to be kept/entered in computer as well as in registrar.
D1.4	The contractor shall maintain computerised records as well as in Registrar for receipt of materials, issued to BHEL's vendors and return by BHEL's vendors in BHEL standard format/ BHEL Computerised system like (ISCMS/E-store etc). Monthly report shall be produced by contractor and Suitable soft & hard copy be maintained as a back up. Vendor need to keep record of all received items, its location of unloading, issue details etc. After completion of job vendor will have to provide reconciliation of materials.
D.1.5	The contractor shall assist for raising insurance claim in case of damage, short supply, theft or any other cause in consultation with BHEL engineers and assist during survey work by the surveyor of insurance company. For theft of materials, contractor shall raise FIR with local police
D.1.6	Complete manpower, T&P, crane/ hydra & its operator & consumables etc. required for convenient unloading, transportation to store & store to erection site of material is to be provided/ arranged by contractor.
D.1.7	Services for watch & ward of BHEL Material, it may be its own store/BHEL store/ NTPC store/open yard. Agency have to arrange suitable watch and ward facility on round the clock basis along with store supervisor.
D.1.8	Preliminary verification of materials at the time of unloading reporting discrepancies like damages and storages, raising insurance, coordination with insurance agency if noticed. The contractor shall raise insurance claim in case of damage, short supply, theft or any other cause in consultation with BHEL engineers and assist during survey work by the surveyor of insurance company. Insurance is under BHEL- scope.
D.1.9	The contractor shall raise MDR & monthly MIR pertaining to material management in Consultation with BHEL engineers.
D.1.10	Contractor is advised to keep ready his T&P, hydra etc. for unloading the material at site/stores and should report to site immediately for unloading of such item when ever asked for. Contractor will be intimated timely to mobilize for such activity.
D.1.11	Stacking and storing of materials at Customer open storage yard or covered stores or semi-closed sheds as per BHEL site engineer instructions. Storage & Preservation of materials received inside the project premises up to erection of same shall be in accordance with BHEL's preservation manual or as

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	per BHEL's instructions. Submission of stacking/storing records. All arrangements like Wooden sleepers / concrete blocks / steel frames and tarpaulins, preservatives, paints etc for this purpose wherever deemed necessary shall be made by sub-contractor.
D.1.12	Detailed verification of materials within 07 days with reference to packing list and loading advice slip after unpacking of boxes; repacking after detailed verification; preparation of receipt inspection reports.
D.1.13	Issue of materials for execution of work at site. Identification of Materials at Stores & their transportation from stores to site including Necessary shifting/removal of other materials stacked on the identified material, un packing of the materials, removal of any obstructions & hindrances etc
D.1.14	Maintenance of area where the material will be kept by means of proper lighting, cleaning in and around storage yards and sheds. General cleaning, controlling vegetation growth and upkeep of storage yard, covered and semi-closed /stores sheds.
D.1.15	Supply of material is expected to commence from July' 2020. Approximate weight of material to be unloaded at site is around 210 MT/Unit, i.e 630 MT for all three units. Final weight for unloading may be increased / decreased as per actual shipment from BHEL Manufacturing units. Refer annex-II for New Mechanical Item List & Annex-III for C&I/Electrical Item list. Paymnet will be made on prorata rate basis as per actual quantity. If the consignment is not unloaded in time and BHEL had to pay any detention/ demurrage then the amount of such charges + 5% over head in each case shall be deducted from from contractor's R.A. bill or any other dues.
4.2.D.2	EXISTING OLD MATERAILS
D.2.1	SHIFTING/RE-STACKING of existing old materials kept in covered Stores/semi covered store/open yard to create storage space for new material.
D.2.2	Approx weight of existing/old materials shifting/re stacking inside cover store/semi covered store/material yard is 10 MT for three units. Paymnet will be made on prorata rate basis as per actual quantity
4.2.E	Erection of cup lock Scaffolding along with Steel Planks, Staircase, handrails etc. for 1 st Pass Inside Boiler Furnace:
4.2.E.1	<ul style="list-style-type: none"> a) Receipt & transportation of Scaffolding Materials from NTPC store to site. b) Erection of Scaffolding. c) Dismantling of Scaffolding on completion of work. d) Return of Scaffolding material to customer store. e) This scaffolding work to be carried out during shutdown period, however material shifting to be carried out during pre-shutdown period. <p>Note: sl. no.4.2.E may not be excuted in case customer carries out the same during execution, In that case payment shall not be made against sl no 4.2.E.</p>
4.2.F	Arrangement of cup lock Scaffolding materials along with Steel Planks, Staircase.hand rails etc. for 1 st Pass Inside Boiler Furnace:
4.2.F.1	<ul style="list-style-type: none"> a) For making Scaffolding upto 55 Mtr Elevation inside Boiler furnace 1 st pass. b) Approximate dimension of furnace inside is 19.939 Mtrs X 16.559 Mtrs. c) Requirement of these scaffolding will be during shutdown perio, however all materials to be made available at site before commencement of shutdown. <p>Note: sl. no.4.2.F may not be excuted in case the same is arranged by customer during execution, In that case payment shall not be made against sl no 4.2.F.</p>
5.0	GENERAL SCOPE OF WORK
5.1	Vendor need to take approval from Boiler Directorate/Bihar under Section 392 of IBR. Vendor has to co-ordinate with Boiler Directorate/Bihar for approval of Drawings for the subject work. Arrangement for inspections/approval through Boiler Directorate/Bihar upto hydro test/completion of work.
5.2	The Sub-contractor has to obtain all statutory clearances and permissions from concerned authorities as required for the work and they must observe and strictly adhere to all labor & industrial laws, and other statutory laws, acts & regulations as applicable for the contract.
5.3	The Sub-contractor has to provide all required skilled & semi-skilled labors & technicians, experienced engineers & supervisors, qualified Electrician, qualified Quality & Safety Engineer/supervisor and other Manpower.

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5.4	The Sub-contractor has to provide all required Tools & Plants (T&Ps) in sufficient quantities including Trucks/Tractors/Trailers, Hydra cranes, Winch Machines, Multi Sheave Pulley Blocks, Chain Pulley Blocks, Pulls & Lifts, Slings, Eye Bolts, D-Shackles, Turn Buckles, Hoists, Hydraulic Jacks, Manual Jacks, Torque Wrenches (up to 750 KG – M), Alignment Clamps, Pipe Clamps, Welding Machines. Gas Cutting Sets, Arc Welding Sets, Spanners (up to 90 mm), TIG set,Files, Grinders, Drill Machines, Taps & Dies, Tube Bending Machine, Tongue tester, meggar, Water Washing Hose Pipes and Attachments and all other types of Tools & Plants. Tentative Requirement shall be as per Annexure- V
5.5	The Sub-contractor has to provide all required Measuring & Monitoring Devices (MMDs) in sufficient quantity including Master Level (0.02 mm/m), Spirit Level, Straight Edge, Water Level, Dumpy Level, DPT Kit, Piano Wire, Plumb Line, Measuring TapeScale, Vernier Calipers, Column Alignment Checking Instruments, Tri Square and all other types of Measuring & Monitoring Devices (MMDs). Tentative Requirement shall be as per Annexure-V
5.6	The Sub-contractor has to provide all required Consumables including Welding Electrodes & Filler Wires (BHEL approved only), D.A., Oxygen, Argon, Nitrogen and other Industrial Gases, DPT & MPI Consumables, Blue Paste, Diesel, Petrol, Kerosene and other oil, Rust Remover Compound, Sealing & Jointing Compounds, Cloths, Emery Paper, Coir Rope and all other types of Consumables as per site requirement as per Annexure – VI
5.7	Vendor has to arrange following items like tarpaulin, plastic sheets, wire brushes and all other types of other materials & resources required for completion of work
5.8	The Sub-contractor has to provide following items like all lugs of size 2.5 sq mm & below, all ferules etc. asbestos ropes for manhole doors (if required).
5.9	Proper Arrangement of House Keeping, strict compliance of Health Safety & Environment norms of BHEL, Day to Day cleaning of the entire working area and final area cleaning on completion of work including arrangement of water washing equipments and accessories is included in the Scope of Work of the Sub-contractor.
5.10	Electrical power connection at one point only and supply for execution of job shall be on chargeable basis & contractor has to arrange for distribution to various work place at site. Vendor has to arrange power cable, junction box, MCB's ELCB's etc as required power power intake. Supply used for stores and office shall be on chargeable basis. For this the sub-contractor shall apply to NTPC for electrical connection to concerned distribution agency of NTPC after completing all formalities. Bills for electricity consumed for office and stores will be settled by the sub-contractor. All necessary arrangements i.e. extension switch boards with MCBs of required capacity for tapping power shall be arranged by sub-contractor.
5.11	Space for Office and Stores shall be provided to the sub-contractor and the Sub-contractor has to build and furnish office & stores at their own cost. The sub-contractor shall arrange for sufficient nos. of flood lights and other arrangement for ensuring round the clock work. Necessary co ordination with stores and other agencies shall be in the scope of the sub-contractor.
5.12	The sub-contractor shall submit daily progress report and attend review meeting with BHEL on day to day basis.
5.13	The sub-contractor shall arrange accommodation, transport, medical, sanitary, safety and other arrangements for all Manpower at their own cost.
5.14	The sub-contractor must maintain proper system of documentation for Quality, Safety, HSE and other aspects so as to fulfill the requirement of ISO, OHSAS, 5S, SA 8000 and other National/International Standards
5.15	All necessary arrangements are to be made by the sub-contractor for transportation of materials including providing of all required Manpower and Cranes, Hydras, Trucks, Trailers, Tractors and other means of transportation
5.16	All Necessary arrangements are to be made for handling, lifting, shifting, erection, placement, assembly, matching, alignment, supporting, welding, cutting, grinding, drilling, DPT, RT, SR and other associated works etc. for the materials to be erected/dismantled. Including providing of all required Manpower, T&Ps, MMDs, Consumables and Other Materials.

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5.17	The sub-contractor shall carry out Dismantling, Removal, shifting of any obstructing structures, pipe lines, cables & cable trays, facilities etc. as required including restoration of the same on completion of work. Any re routing of pipelines, cables and cable trays, equipments facilities etc, if required, shall be carried out by subcontractor free of cost and shall be done in the pre-shutdown period up to the extent possible.
5.18	All Necessary Preparation, Development, Barricading and Marking of the Area has to be made by the sub-contractor for Storage, Fabrication, and Pre Assembly & Erection of the Materials.
5.19	The sub-contractor has to carry out Erection of Scaffolding, Platforms, Approaches as required including arrangement of scaffolding materials for other areas except 1 st pass inside of Boiler Furnace. Dismantling of the same on completion of work. Note: For Erection & supply/arrangement of scaffolding materials for 1 st Pass Inside Boiler Furnace, refer sl no 4.2.E & 4.2.F of this TCC.
5.20	Identification & Receipt of Materials at Stores & their transportation from stores to site including Necessary shifting/removal of other materials stacked on the identified material, un packing of the materials, removal of any obstructions & hindrances etc.
5.21	Transportation of dismantled components, scraps & debris generated and other materials removed to disposal yard/stores on day to day basis. After completion of work, cleaning & shifting of all type of scrap from site to scrap yard and Transportation balance/surplus materials to store.
5.22	RT, SR, DPT of Pr Parts weld joints and other components as per BHEL norms.
5.23	Fabrication of duct, support frame, Platform members etc to be carried out from standard size plates, structures without any extra work wherever required..
5.24	Laying of Insulation, Refractory & Cladding as per BHEL norms including curing of the refractory.
5.25	Laying of instrument air, service air for different equipments wherever required in Boiler.
5.26	All temp, pressure, flow sensing devices, pg test points, and tapping points (Up to root valve) for air /gas /water required for the Boiler shall be covered under the scope of work.
5.27	The erection/fabrication of platforms wherever required for approaching to the different types of instruments, pneumatic actuator and electrical actuator etc shall be covered under the scope of work.
5.28	Supply & application of Painting of the structures, piping, equipments & other components as per BHEL norms including supply of paints The codes and standards applicable, preparation of surfaces, primer paint, finish paint, shall be as per enclosed Annexure – VII.
5.29	Testing and commissioning of all equipments & systems including installation of testing equipments, tapping points etc. and rectification of defects observed including replacement/re erection/rectification of components as required.
5.30	Trial operations of all equipments & systems and rectification of defects observed including replacement/re erection/rectification of components as required.
5.31	Insulation of expansion joints, dampers, etc shall be carried out after NDT / gas tightness test is completed.
5.32	Necessary assistance for other Tests of Equipments & Systems and other pre commissioning & commissioning activities and rectification of defects observed including replacement/re erection/rectification of components as required.
5.33	Necessary assistance for Performance Guarantee Test including installation of testing equipments, tapping points etc. and necessary adjustments/rectification as required.
5.34	Necessary assistance for Hydro test, commissioning of the unit upto full load and rectification of defects observed including replacement/re erection/rectification of components as required.
5.35	All works are to be carried out as per drawings and as per instruction of BHEL Engineer and all necessary adjustments, setting, alignment, testing and other associated works shall be carried out as per drawings and as per instruction of BHEL Engineer
5.36	For completion of work, the contractor will have to work in round the clock basis. He will not be eligible for any extra charges on account of this.
5.37	All the contractor's employees shall carry identification cards/gate passes while working at site.
5.38	Vendor has to arrange following items like tarpaulin, plastic sheets, wire brushes and all other types of other materials & resources required for completion of work
6.0	GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)

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6.1	Unless otherwise specified, the plant/ equipment shall comply with appropriate Indian Standard or an agreed internationally accepted Standard Specification as mentioned elsewhere in tender, each incorporating the latest revisions at the time of tendering. Where no internationally accepted standard is applicable, the bidder shall give all particulars and details as necessary; to enable BHEL to identify all of the plant/ equipment in the same detail as would be possible had there been a standard specification.
6.2	Where the bidder propose alternative codes or standards, they shall include in their offer one copy (in English) of each standard specification to which materials/ process offered shall comply. In such case, the adopted alternative standard shall be equivalent or superior to the standards mentioned in the specification.
6.3	In the event of any conflict between the codes & standards referred above, and requirements of the tender, requirements which are more stringent shall govern.
6.4	Tools used during erection & commissioning/ completion shall not be accepted except with the specific approval of the engineer.
6.5	Wherever specified or required the plant/ equipment shall conform to various statutory regulations such as Indian Boiler Regulation, Indian Electricity Rules, Indian Explosive Act, Factories Act, etc, wherever required, obtaining approval for plant/ equipment supplied under the specification from statutory authorities shall be the responsibility of the successful bidder.
7.0	GENERAL SERVICES TO BE RENDERED BY THE BIDDER
7.1	Services for construction, fabrication, equipment erection, testing as well as trial run & commissioning of various equipment and accessories under the contract shall include but not be limited to the following.
7.2	Issuing materials from store/ storage yard from time to time for erection as per the construction program. The successful bidder shall be the custodian of all the materials issued till the plant/ equipment is officially taken over by the owner/ BHEL after complete erection any successful trial run & commissioning.
7.3	Transport of material to their respective places of erection and erection of complete plant & equipment as supplied under this tender.
7.4	Trial run, commissioning of individual equipment/ sub-systems to the satisfaction of BHEL/ customer.
7.5	Deployment of all skilled & unskilled manpower required for erection, supervision of erection, watch & ward, commissioning and other services to be rendered under this tender.
7.6	Deployment of all erection tools & tackle, construction machinery, transportation vehicles, all other implements in adequate number & size, appropriate for erection work to be handled under scope of this tender, unless otherwise specified.
7.7	Supply of all consumables, eg welding electrodes, cleaning agents, diesel oil, lubricant, etc as well as materials required for temporary supports, etc as necessary for such erection work, unless specified otherwise.
7.8	Providing support services for successful bidder's erection staff, eg, construction of site offices, temporary stores, residential accommodation and transport to work site for erection personnel, watch & ward for security & safety of materials under the successful bidder's custody, etc, as required.
7.9	Maintaining proper documentation of all site activities undertaken by successful bidder as per the proforma mutually agreed with BHEL, submitting monthly progress reports as also any such document as & when desired by BHEL/ owner, taking approval of all statutory authorities, ie Boiler Inspector, Factory Inspector, Inspector of Explosives etc, as applicable, for respective portions of work under the jurisdiction of such statutes of laws.
7.10	All the materials issued to the bidder by BHEL shall be reconciled by the bidder and the unused materials have to be returned back to BHEL stores/ yard or any other place as specified by BHEL.
7.11	After completion of commissioning activity of equipment/ systems, the successful bidder shall prepare test reports which shall include all relevant information related to various commissioning checks, tests carried out, any deviations/ commissioning noticed wrt intended design requirements, sequence of various commissioning activities as actually adopted vis-à-vis as recommended in the procedures, programme schedule achieved and any other such information as required .These test reports shall be submitted in requisite number of copies to BHEL/ Alstom/ owner during the commissioning activities.

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8.0	GENERAL GUIDELINES FOR FIELD ACTIVITIES
8.1	The successful bidder shall execute the works in a professional manner so as to achieve the target schedule without any sacrifice on quality and maintaining highest standards of safety and cleanliness.
8.2	The successful bidder shall co-operate with owner/ BHEL and other successful bidders working in site and arrange to perform his work in a manner so as to minimise interference with other successful bidder's works. BHEL's engineer shall be notified promptly of any defect in other successful bidders' works that could affect the successful bidder's work. If rescheduling of successful bidder's work is requested by the owner's/ BHEL's engineer in the interest of overall site activities, the same shall be compiled with by the successful bidder. In all cases of controversy, the decision of BHEL shall be final and binding on the successful bidder without any commercial implication.
8.3	The engineer shall hold daily meeting with the successful bidder working at site at a time and a place to be designated by the engineer. The successful bidder shall attend such meetings and take notes of discussions during the meeting and the decisions of the engineer and shall strictly adhere to those decisions in performing this work. In addition to the above weekly meeting, engineer may call for other meetings either with individual successful bidders or with selected number of successful bidders and in such a case the successful bidder, if called will also attend such meetings.
8.4	Time is the essence of the contract and the successful bidder shall be responsible for performance of his work in accordance with the specified construction schedule. If at any time the successful bidder is falling behind the schedule, he shall take necessary action to make good of such delays by increasing his work to comply with the schedule and shall communicate such action in writing to the engineer, satisfying that his action will compensate for the delay. The successful bidder shall not be allowed any extra compensation for such action.
8.5	The engineer shall however not be responsible for provision of additional labour and or materials or supply of any other services to the successful bidder except for the co-ordination work between various successful bidders as set out earlier.
8.6	The works under execution shall be open to inspection & supervision by BHEL/ customer engineer at all times. The successful bidder shall give reasonable notice to BHEL before covering up or otherwise placing beyond the reach of inspection any work, in order that same may be verified, if so desired by owner/ BHEL.
8.7	Every effort shall be made to maintain the highest quality of workmanship by stringent supervision & inspection at every stage of execution. Manufacturer's instruction manual & guidelines on sequence of erection and precautions shall be strictly followed. Should any error or ambiguity be discovered in such documents, the same shall be brought to the notice of BHEL's engineer. Manufacturer's interpretation in such cases shall be binding on successful bidder.
8.8	Successful bidder shall comply with all the rules & regulations of local authorities, all statutory laws including Minimum Wages, Workmen Compensation etc. All registration and statutory inspection fees, if any, in respect of the work executed by the successful bidder shall be to his account.
8.9	All the works such as cleaning, checking, levelling, blue matching, aligning, assembling, temporary erection for alignment, opening, dismantling of certain equipment for checking and cleaning, surface preparation, edge preparation, fabrication of tubes and pipes as per general engineering practice at site, cutting, grinding, straightening, chamfering, filling, chipping, drilling, reaming, scrapping, shaping, fitting-up, bolting/ welding, etc, as may be applicable in such erection and necessary to complete the work satisfactorily, are to be treated as incidental and the same shall be carried out by the successful bidder as part of the work.
8.10	It is the responsibility of successful bidder to do alignment, etc if necessary, repeatedly to satisfy engineer, with all necessary tools & tackles, manpower, etc. The alignment will be complete only when jointly certified so, by the successful bidder's engineer and BHEL. Also, successful bidder should ensure that the alignment is not disturbed afterwards.E
8.11	Equipment & material, in case wrongly installed, shall be removed & reinstalled to comply with the design requirement at the successful bidder expense, to the satisfaction of BHEL/ owner.
8.12	After identification of erection materials by BHEL at BHEL's store/ storage yard, it shall be the responsibility of successful bidder to take delivery of materials from BHEL's store/ storage yard by successful bidder's own manpower and re-stack the leftover materials as per erection sequence at BHEL store at their own cost. The entire activities are to be carried out under supervision of BHEL's

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	engineer.
9.0	DEVIATIONS/CLARIFICATIONS
	The bidder is required to submit with his offer in the relevant schedule/ format without any ambiguity. Any assumptions, presumptions, deviations etc indicated or implied anywhere by the bidder except those indicated in the deviation schedule/ format will not be recognized and will not form a part of consideration/ offer. In the absence of such filled-up schedule/ format it will be understood and agreed that the bidder's offer is based on strict conformance to the specification and no negotiation would be allowed in this regard. BHEL reserve the right not to recognize any/ all deviations submitted after opening of the bid.
10.0	DEWATERING
10.1	Vendor will have to arrange pumps, pipes etc in case dewatering is required.
11.0	QUALITY CONTROL & QUALITY ASSURANCE
	Contractor's engineers & supervisors shall be adequately qualified and also inclined to do a quality job. The quality assurance engineer shall co-ordinate all aspects of quality control, inspection, implementation of quality assurance procedures laid down in Quality Plan and technical specification by BHEL. He shall fill up quality assurance log sheets/ formats and submit to BHEL for joint inspection & acceptance. The contractor shall fill up, maintain & preserve the quality records in computerized media. BHEL's/ customer's authorized representative shall be given free access at all time to such quality related records etc for inspection, review etc.
12.0	QUALITY ASSURANCE PROGRAMME
12.1	The contractor shall arrange for suitable quality assurance programme to control all activities pertaining to the scope of work, as necessary. Such programs shall be outlined by the contractor and shall be finally accepted by BHEL. A quality assurance programme of the contractor shall generally cover the following.
12.2	The organisation structure & qualification data of key personnel for management and implementation of the proposed quality assurance program.
12.3	System for site erection control including process controls and fabrication and assembly controls.
12.4	Control of non-conforming items and system for corrective actions.
12.5	Inspection and test procedure for all site related works.
12.6	Control of calibration and testing of measuring and testing equipment.
12.7	System for quality audit.
12.8	System for indication and appraisal of inspection status.
12.9	System for maintenance of records.
12.10	General requirements – quality assurance
12.11	All materials, components and equipment covered under the specification shall be procured, manufactured, erected, commissioned & tested, as applicable, at all stages as per comprehensive quality assurance program. An indicative program for inspection/ test, to be carried out by the successful bidder, for some of the major items is given in the respective volume of tender.
12.12	Field quality plan will detail out the quality practices and procedures etc to be followed by the successful bidder's site quality control organization, during various stages of site activities from receipt of material/ equipment at site.
12.13	BHEL reserve the right to carry out quality audit & quality surveillance of the systems & procedures of successful bidder's quality management. Successful bidder shall provide necessary assistance to enable BHEL to carry out such audit.
12.14	Quality audit/ approval of the results of test & inspection will not prejudice the right of BHEL to reject an equipment service not giving desired performance and shall not in no way limit the liabilities and responsibilities of the successful bidder in earning satisfactory performances of equipment/ service as per specification.
12.15	Repair/rectification procedure to be adopted to make any job acceptable shall be subject to the approval of BHEL.
12.16	All the latest relevant IS codes as per technical specification should be available with the successful bidder at site within 45 days from the date of placement of LOI or otherwise specified by Construction Manager/ Project Manager, BHEL.

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13.0	AREA REQUIREMENT
	The contractor shall furnish the estimated area required for the construction of his office etc separately (based on BHEL's customer's design), in their technical bid. The same will be reviewed by BHEL and allotted to the extent available/ considered necessary, depending upon the area availability. Contractor shall also have to arrange the watch and ward of its office within the quoted price.
14.0	PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT
	To meet the need of construction management at site, successful bidder shall provide the following services within accepted rates.
14.1	PLANNING & MONITORING
14.1.1	Within 15 days of placement of order/ LOI by BHEL, successful bidder shall interact with BHEL site for kick-off meeting to discuss & firm up item-wise/ activity-wise schedule of erection, testing, commissioning so as to complete the entire job within the stipulated completion period, matching with project schedule.
14.1.2	Based on the discussion of the kick-off meeting or otherwise, a master schedule shall be drawn and successful bidder shall submit the same within 7 days of kick-off meeting, for review & acceptance/ approval of BHEL. Successful bidder shall interact with BHEL to ensure acceptance/ approval of the master schedule within 7 days of submission.
14.1.3	On the basis of accepted/ approved master schedule, on every month, the successful bidder shall submit to Construction Manager, BHEL schedule-wise plan vs actual status of erection, testing, commissioning, along with action plan to make-up delay, if any.
14.1.4	The project schedule might undergo revision/ modification periodically, for which the successful bidder may have to prepare/ modify schedule periodically in consultation with BHEL, so as to match with revised project milestones.
14.1.5	The successful bidder shall ensure monitoring of these activities at least on fortnight basis or at other frequency as mutually agreed with BHEL.
14.1.6	Successful bidder shall submit daily work program based on above schedule. Deferment of above schedule is not acceptable. Successful bidder will adhere to schedule & augment resources to ensure completion as per schedule.
14.1.7	Progress reviews on entire activities will be held periodically as per direction of BHEL, at site/ Kolkata. These meetings will be used as a forum for discussing all areas where progress needs to be expedited. The successful bidder shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
14.1.8	Successful bidder shall prepare progress report indicating progress on key activities, management summary for critical activities, list of actions require BHEL's attention. The schedule shall preferably be made in Primavera/ MS Projects, so that the same is compatible with BHEL's project management software.
14.2	INFRASTRUCTURE
14.2.1	The successful bidder shall install 1 no all in one PC (multimedia PC work station Core-i5, 2.1 GHz or above, 500 GB HDD, 4 GB RAM, 100/ 1000 MBPS LAN card) of HP/ Compaq/ Lenevo or equivalent make with window 8 or 7 O/S and required software like MS Office 2010 Professional, AutoCAD 2009 or higher, PageMaker (7.0, etc), ADOBE PDF CREATOR with one no laser jet printer compatible for A3 size printing (ink/ cartridge for which to be supplied as & when required), one no laser jet printer compatible for A4 size printing (ink/ cartridge for which to be supplied as & when required) with power backup at places, 01 no dongle/ broad band connection for internet(every month the dongle should be recharged by vendor for un-interrepted internet service) as per instruction of BHEL for exclusive use of BHEL. These computers/ printers shall remain successful bidder's property and they will be allowed to take out the same after completion of original contract period. The successful bidder shall provide data/ information, etc in prescribed formats for periodical updating of progress reports, material management reports, updating of network pertaining to the successful bidder's scope of work, etc. The successful bidder shall also provide 1 no computer operator and 1 number service staff for miscellaneous service for BHEL's use at site for reconciliation, progress review & day-to-day planning purpose, documentation, etc. These facilities are to be provided within 10 days from date of Intimation of BHEL. Computer operator to be provided for 4 months/Boiler (tentatively during pre shutdown,

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	shut down & Post Shutdwon Commng period), including extension, if the reason for extension is attributable to successful bidder. If case successful bidder fail to provide computer/ printer or personnel as per requirement, for a continuous period of fifteen days or more, BHEL shall have the right to deduct as per following rates on prorata basis, from successful bidder's RA bill or any other dues.
14.2.1.1	@ Rs 15,000/- (Fifteen thousand) per month for computer operator or at actual rate +5%, whichever is lower.
14.2.1.2	@ Rs 10,000 (Ten thousand) per month for computer with printer or at actual rate +5%, whichever is lower.
14.2.1.3	@ Rs 12,000/- (Twelve thousand) per month for service staff or at actual rate +5%, whichever is lower.
14.2.2	In case BHEL extends the service of computer with printer, computer operator or service staff beyond the aforesaid mandatory period, the successful bidder shall extend the service to BHEL, for which BHEL will reimburse following rates.
14.2.2.1	@ Rs 11,000/- (Eleven thousand) per month for each computer operator or at actual rate +5%, whichever is lower.
14.2.2.2	@ Rs 8,000 (Eight thousand) per month for each computer with printer or at actual rate +5%, whichever is lower.
14.2.2.3	@ Rs 9,000/- (Nine thousand) per month for each service staff or at actual rate +5%, whichever is lower.
14.2.3	The successful bidder's site office must have facilities of communications like Fax, E-mail, and telephone with STD facility within a month from LOI.
14.3	PROGRESS REPORTING
14.3.1	The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases/electrodes) report and other reports as per pro-forma considered necessary by BHEL. In case of any failure on successful bidder's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills.
14.3.2	The progress report shall indicate the progress achieved against planned with reasons indicating delays, if any, and shall give the remedial actions which the successful bidder intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippages do not accumulate and effect the overall program.
14.3.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.
14.3.4	Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the successful bidder shall present program of subsequent week. The successful bidder shall constantly update/ revise his work program to meet the overall requirement.
14.3.5	Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of successful bidder will be held once in a month at site/ Kolkata. These meetings will be attended by reasonably higher officials of the successful bidder and will be used as a forum for discussing all areas where progress needs to be speeded up. The successful bidder shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
14.3.6	During construction successful bidder shall take adequate digital photograph/ slides (indicating date) each month (not less than nine per week) of the works during progress and submit the soft/hard copy to BHEL office.
14.3.7	Successful bidder has to provide for electronic/ computerized storing and re-production/ printing/ plotting of various data, log sheets, protocols, measurements etc. These may be stored in CD (as per requirement) and handed over to BHEL as per requirement.
14.4	SITE ORGANIZATION
14.4.1	Successful bidder shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all time for smooth execution of the contract headed by a competent Site In-charge (SIC) for site operations with sufficient level of authority to take site decisions. The successful bidder will submit organization chart (showing the name of SIC) with individual bio-data indicating various levels of experts to be posted for supervision in the fields of supervision & execution, quality, material management, planning, safety, etc. The organization shall be

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	reinforced from time to time, as required to make up slippage (if any) from schedule without any commercial implication to BHEL. The organization chart is to be submitted within 10 days from date of LOI.	
14.4.2	Following (minimum) engineering manpower with power plant construction background to be deployed at site by the successful bidder for their day to day supervision, etc, within specified days from start of work or otherwise decided jointly with Construction Manager, BHEL. Regarding qualification & experience of each of following categories of manpower, successful bidder shall take prior approval of Construction Manager, BHEL, whose decision shall be final & binding regarding acceptance of any person. Details refer to annexure-IX.	
	Area	Quantity, deployment schedule
14.4.2.1	Site Incharge	1 no, (To be deputed from the date of site mobilization.)
14.4.2.2	Qualified safety officer (Graduate + Diploma in Industrial Safety).	1 nos. (Minimum)
14.4.2.3	Site engineer/Supervisor (Mechanical)	3 nos. (Minimum)
14.4.2.4	Experts of boiler area(pr parts & Burner) to be deployed by the contractor for complete duration of contract till the completion of e&c of combustion modification system	1 No for 35 days in each boiler. (Expert to be deputed as per intimation of BHEL)
14.4.2.5	Site engineer/Supervisor (Electrical/C&I)	1 no.(Minimum)
14.4.2.6	Quality engineer /Supervisor	1 no. (Minimum)
14.4.2.7	Material Management Supervisor	1 no.
14.4.3	Engineer/ supervisor for other functions like store & purchase, material management, planning, FIN, administration etc are to be provided as per site requirement and not referred above.	
14.4.4	In the event of failure of the successful bidder to provide necessary manpower indicated above as per requirement, BHEL reserve the right to deduct Rs 50,000 per man-month for engineer/safety officer and Rs30,000 per man-month for the supervisor/ quality officer/electrician from the date of start of work as indicated as above from RA bills. Further induction of manpower regarding site supervisor & site engineer will be decided at site as per requirement. Further induction of manpower regarding site supervisor & site engineer will be decided at site as per requirement.	
14.4.6	In the event of failure of the successful bidder to provide necessary manpower indicated above as per requirement for a continuous period of 3 days or more, BHEL reserve the right to recover at the following rates.In the event of non-deputation of engineer/ supervisor by successful bidder, BHEL reserve the right to deduct Rs 50000 for Engr/Safety Officer & Rs 30,000 per man-month for supervisor/electrician, from the date of deputation as indicated as above from RA bills.	
14.4.7	In the event of failure of the successful bidder to depute 1 no Expert for Boiler Pr Parts & Burner area for period of 35 days in each unit duly vetted by BHEL Site Engineer In charge,an amount of Rs 7000/- per man day will be deducted from RA bills.	
14.4.8	BHEL reserve the right to reject or approve the list of personnel proposed by successful bidder. The persons whose bio-data have been approved by BHEL will have to be posted at site and deviation in this regard will not be permitted unless specific & reasonable justification is made.	
14.4.9	In addition to above, a well experienced qualified engineer to be designated, as 'Project Coordinator', shall be deployed by successful bidder. Such engineer shall have adequate exposure on the job and shall remain fully involved in all planning activities, guidance, etc. to successful bidder's own team during complete execution period of contract.	
14.4.10	Successful bidder should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL.	
14.4.11	Successful bidder should also submit network programs for the erection of various items. These networks shall show owner/ BHEL hold points, which have to be cleared by BHEL/ customer, or their authorized representatives before further erection can take place. These programs for the erection would clearly identify responsibilities of successful bidder & BHEL/ customer. It is the responsibility of successful bidder to get the Networks approved by BHEL within four weeks of the date of finalization of	

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	award of work/ placement of LOI.
14.5	CONSTRUCTION MANAGEMENT
14.5.1	Based on approved program, successful bidder shall submit program of construction/ erection/ commissioning for implementation. These programs would be amplified showing start of erection & subsequent activities and shall form the basis for site execution & detail monitoring. Daily rolling program with first month's program being tentative based on the site condition would be prepared based on these programs. The successful bidder shall also be involved along with owner/ BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets.
14.5.2	The program would be jointly finalized by the site in-charge of successful bidder with BHEL/ customer's project coordinator as well as site-planning representative. Erection program will also identify sequential events matching financial turnover.
14.5.3	Successful bidder is liable to furnish all documentary evidences towards payment of Works Contract Tax as and when required by BHEL.
14.6	PROGRESS REPORTING
14.6.1	The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases/ electrodes) report and other reports as per pro-forma considered necessary by the BHEL. In case of any failure on contractor's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills.
14.6.2	The progress report shall be in line with project L2 schedule and indicate the items to be erected and actual erected as per BHEL agreed format. A sample format is attached for your reference, however, it may be finalised at site.
14.6.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.
14.6.4	Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the contractor shall present program of subsequent week. The contractor shall constantly update/revise his work program to meet the overall requirement.
14.6.5	Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of bidder will be held once in a month at Kolkata/site. These meetings will be attended by reasonably higher officials of the contractor and will be used as a forum for discussing all areas where progress needs to be speeded up. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
15.0	LIQUIDATED DAMAGE
15.1	If the successful bidder fail to complete entire scope within completion period, for reasons attributable to them, BHEL shall have the right to recover as liquidated damages (LD) a sum INR 44,525 for each day of delay for each unit.
15.2	If the successful bidder fail to complete the stipulated work within shutdown period, for reasons attributable to them, BHEL shall have the right to recover as liquidated damages (LD) a sum INR 44,525 for each day of extension in Shut Down of each unit.
15.3	The total liquidated damages (LD) for delay in completion of facilities and extension in shutdown period combined together will be subject to a maximum of five percent (5%) of the total Contract Price (including taxes, duties, etc.). Contract price for this purpose, shall be the final executed value exclusive of ORC, extra work executed, supplementary/ additional items and PVC.
15.4	BHEL shall deduct aforesaid amounts from any money due or which may become due to the successful bidder and/ or recover from the bank guarantees/ security deposit of the successful bidder. To be entitled to impose such compensation/ penalty/ recovery, BHEL will not be required to prove that they have incurred such amount as actual damage.
15.5	BHEL reserve the right to complete the job through other resource at the risk & cost of successful bidder as per tender provision, with/without cancelling the order/ contract.
15.6	BHEL reserve the right to cancel the order/ contract or a portion thereof for the work not so completed at the risk & cost of the successful bidder and the successful bidder shall be liable to BHEL for any excess costs thereof.

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15.7	The successful bidder shall continue with performance of the order/ contract under all circumstances, to the extent not cancelled.
15.8	Where action is taken as per above, the successful bidder shall be liable for any loss, which BHEL may sustain on that account. The successful bidder shall not be entitled to any gain on such action and the manner & the method of such purchase shall be at the discretion of BHEL. It shall not be obligatory on the part of BHEL to serve a notice of such completion, through other resource, on successful bidder.
15.9	In case of LD recovery, the applicable GST shall also be recovered from vendor. Other provision shall be as per the GCC.
16.0	HEALTH, SAFETY & ENVIRONMENT
16.1	As per BHEL HSE Plan doc no. HSEP:14-ER,Rev.01 dtd. 08/05/20, HSE OCP:61, Rev 01, dtd. 01/06/20 & HSEOCP:61A, dtd.27/04/20
17.0	SPECIFIC REQUIREMENTS FOR ISO 9002
17.1	Bidders shall ensure that all their staff/ employees are exposed to periodical training programmes conducted by qualified agencies/ personnel on ISO-9002 Standards.
17.2	Bidder shall ensure that the quality is maintained in all the works connected with this contract at all stages of the requirement of BHEL.
17.3	Bidder shall ensure that all Inspection, measuring and testing equipment that are used, whether owned by bidders or used on loan, are calibrated by the authorized agencies and valid calibration certificate will be available with them for verification by BHEL. A list of such instruments possessed by bidder at site with its calibration status is to be submitted to BHEL engineer for control.
17.4	Bidder shall ensure that fitness certificate of the tools & plants, that are in use, whether owned by bidder or issued on loan, are tested by authorised agency & valid fitness certificate are available for verification by BHEL.
17.5	Bidders shall arrange for the inspection of the works at various stages as required by BHEL. Bidders shall take immediate corrective action for the non-conformances if any, observed and pointed out by BHEL.
18.0	LAND
18.1	Land will be provided free of cost by BHEL to the extent available/ considered necessary by BHEL to the successful bidder for their office, store, within plant premises. Availability of land within plant boundary is very limited and successful bidder have to plan & use existing land considering use of land by other civil/ mechanical/ electrical successful bidders and storage of plant machineries & materials. The existing land shall be shared by all agencies.
18.2	The successful bidder shall arrange at his own cost cleaning and grading of area allotted, construction of their temporary office, stores, godown, fabrication yards etc. and also the watch & ward, etc.
18.3	On completion of work, all the temporary buildings, structures, pipelines, cables, etc. shall be dismantled & leveled and debris shall be removed as per instruction of BHEL by the successful bidder at their cost. In the event of failure to do so, the same will be removed and expenditure thereof will be recovered from successful bidder. Decision of BHEL in this regard shall be final & binding. However, the scope of dismantling & leveling the area is limited only to the successful bidder's site office, yard and other spaces occupied by successful bidder.
18.4	The bidder, however, may make a note that only limited space is available at site and it shall be amicably used by all the vendors available at site.
19.0	WATER
19.1	BHEL will provide single point supply for construction water inside the project premises for office free of cost.
19.2	Further necessary network for construction water system shall be done by the bidder at his own cost.
19.3	Contractor should arrange for water for labour colony of their own.
19.4	BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of water supply and the contractor shall claim no compensation for delay in work for such interruption. Contractor may make standby arrangement for water at their own cost.
19.5	Contractor will have to arrange for storage of water to meet the day-to-day requirement.
19.6	The availability of water (construction) may be limited. Contractor shall ensure that no water is wasted. In this regard the contractor shall take all necessary measure towards preservation of water.

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19.7	Contractor to arrange drinking water at its own cost.
20.0	ELECTRICITY
20.1	BHEL shall provide construction power on chargeable basis at 415V level at one point. Contractor has to make their own distribution arrangement to draw electricity by arranging all required items e.g power cable, construction cable, ELCB,MCCB, JB's, Switch Borads etc to be arranged by vendor at his own cost.
20.2	The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/ T&Ps are deployed.
20.3	The power supply will be from the available grid. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of power supply/ variation in voltage level and no compensation for delay in work can be claimed by the contractor due to such non-supply on the grounds of idle labour, machinery or any other grounds.
20.4	Bidder will have to arrange sufficient illumination at their own work areas.
20.5	The contractor should ensure that the work in critical areas is not held up in the event of power breakdown. In the event of breakdown in the electric supply, if the progress of work is hampered, it will be the responsibility of the contractor to step up the progress of work after restoration of electric supply so that overall progress of work is not affected.
20.6	The contractor shall have to make arrangement at their own cost for illumination that will be required in the working area for execution of the work & safety of workmen.
20.7	Contractor shall make arrangement of electricity of their own for labour colony.If the same is provided by customer, it will be chargeable.
21.0	CONSTRUCTION OF TEMPORARY OFFICE, BIDDER'S OWN STORES ETC The contractor shall arrange at their own cost -cleaning of area allotted, construction of his temporary office, his own stores, etc and also the watch & ward of all the above. Materials required for the same shall be arranged by contractor at their own cost.
22.0	CONSUMABLE
22.1	All consumables, like gas, electrodes, chemicals, lubricants etc required for the scope of work, shall be arranged by the contractor at his cost unless otherwise specifically mentioned in the contract.
22.2	All consumables to be used for the job shall have to be approved by BHEL/ customer prior to use.
22.3	In the event of failure of contractor to bring necessary and sufficient consumables, BHEL may arrange for the same at the risk & cost of the contractor. The entire cost towards this along-with overhead shall be paid by the contractor or deducted from the contractor's bills.
23.0	TEST CERTIFICATE FOR T&P All T&P, lifting tackles and pulling devices to be deployed by the contractor must bear valid/ latest test certificates for their suitability, and the documents shall be preserved at site & copy to be submitted to BHEL.
24.0	MMD The contractor shall ensure deployment of reliable & calibrated instrument, measuring and test equipment (MMD). The MMD shall have test calibration certificate from authorized/ Govt approved agencies. The contractor shall also keep provision of alternate engagement for such MMD so that the work does not suffer when a particular MMD is sent for calibration. Re-testing/ re-calibration shall also be arranged by the contractor at their own cost at regular interval during the period of use as advised by BHEL. Refer Annex-V of TCC for Tentative list of MMD..
25.0	ISSUE OF T&P BY BHEL
25.1	NIL
26.0	TOOLS & PLANTS (TO BE PROVIDED BY CONTRACTOR)
26.1	Tentative list of tools & plants to be deployed by bidder is furnished in the tender. It may be noted that the list is not exhaustive and is only for general guidance. The contractor is required to provide all necessary T&P measuring (calibrated) instruments & handing equipments for timely completion of total work as per contract. In case of project requirement, some activities may have to pre-pone. In such cases the contractor may have to deploy additional T&P. Quoted rate shall be inclusive of such requirements. Refer Annex-V of TCC for tentative list of T&P.
26.2	In the event of any failure of the part of contractor, BHEL may at his discretion also terminate the

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	contract on this ground and take out any or whole amount of the contract from the scope of contractor. In the event of failure of contractor to deploy necessary and sufficient T&P/ MMDs, BHEL will be at liberty to arrange the same at the risk & cost of contractor including transportation cost of same from any of BHEL site/ other agency & charges as applicable shall be deducted from contractor's RA bill. Decision of BHEL in this regard will be final & binding on contractor.
26.3	T&P shown in the list of tender are minimum requirement. Further requirement will be reviewed time to time at site and vendors will provide additional T&P/ equipments to ensure completion of entire work within schedule time without any financial implication to BHEL. Contractor will give advance intimation & certification regarding capacity etc prior to dispatch of heavy equipment.
26.4	For balance T&P as per above list and any other Item required for carrying out the job, no separate payment shall be made and deployment of same will be within quoted rate.
26.5	In case of non-deployment within the period indicated, BHEL reserves the right to arrange the same at the vendor's risk & cost or suitable recoveries will be made from RA bills at site.
26.6	All T&P and all MMDs, which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor at his own cost in working condition.
26.7	In the event of non mobilisation of any T&P by the successful bidder and as a result progress of work is suffered, BHEL reserve the right to deduct suitable amount from the dues of contractor. BHEL's decision in this regard shall be final & binding on contractor.
26.8	It is not obligatory on the part of BHEL to provide any tools and tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon the availability, BHE's handling equipment and other plants may be made available to the contractor free of cost, subject to the conditions laid down by BHEL from time to time. Unless paid in advance, such hire charges, if applicable shall be recovered from contractor's bill /security deposit or any other payment in one installment.
27.0	FACILITIES TO BE PROVIDED BY THE SUCCESSFUL BIDDER
27.1	All tools and tackles, machinery, equipment, instruments required for the work have to be arranged by the successful bidder including its transportation before and after work and including storage, insurance etc.
27.2	The successful bidder shall provide all required tools and plants, inspection, measuring and test equipment and handling & transportation equipment for the scope of work covered under these specifications. Some of the major T&Ps to be necessarily provided by the successful bidder is listed in relevant appendix of this tender. BHEL will provide the services of their T&Ps listed vide appendix-II, free of charge, on sharing basis.
27.3	All tools and tackles to be deployed by the successful bidder for the work shall have the prior approval of BHEL engineer with regard to brand, quality and specification.
27.4	Successful bidder shall provide all the necessary scaffolding(except for 1 St Pass furnace inside) materials, temporary structures, as may be required and necessary safety devices etc.
27.5	Successful bidder's responsibilities with regard to operator, fuel, lubricants and daily upkeep of T & Ps provided by BHEL is further detailed in relevant section.
27.6	Timely deployment of adequate quantity of T&P is the responsibility of the successful bidder. The successful bidder shall be prepared to augment the T & P at short notice to match the planned program and to achieve the milestones.
27.7	Successful bidder shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major breakdown, successful bidder shall make alternative arrangements expeditiously so that the progress of work is not hampered.
27.8	Vendor shall maintain one hindrance register & keep records daily basis. Hindrance register shall be kept at BHEL site office.
28.0	RESPONSIBILITIES WITH REGARD TO EMPLOYMENT OF LABOUR, ETC
28.1	Successful bidder shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff, etc.
28.2	BHEL/ customer may insist for witnessing the regular payment to the labour. They may also like to verify the relevant records for compliance with statutory requirements. Successful bidder shall enable

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	such facilities to BHEL / Customer.
28.3	It is the responsibility of the successful bidder to arrange gate pass for all his employees, T & P etc. for entering the project premises. Necessary coordination with customer officials is the responsibility of the successful bidder. Successful bidder to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer/ BHEL, to work beyond normal working hours, the successful bidder shall arrange necessary work permits for working beyond normal working hours.
28.4	If at any time during the execution of work, it is noticed that the work is suffering on account of non-availability/shortfall in provision of resources from the successful bidder's side BHEL will make suitable alternate arrangements at the risk and cost of successful bidder. The expenditure incurred with overheads thereby shall be recovered from the successful bidder.
28.5	The successful bidder shall deploy all the skilled/semiskilled/ unskilled labour including highly skilled workmen etc. These workmen should have previous experience on similar job. They shall hold valid certificates wherever necessary. BHEL reserves the right to insist on removal of any employee of the successful bidder at any time if he is found to be unsuitable and the successful bidder shall forthwith remove him. Successful bidder should furnish a tentative deployment plan of his manpower as required in GCC. Also the actual deployment will be so as to satisfy the erection and commissioning targets set by BHEL.
28.6	It is the responsibility of the successful bidder to engage his workmen in shifts and or on overtime basis for achieving the targets set by BHEL. This target may be set to suit BHEL's commitments to its customer or to advance date of completion of events or due to other reasons. The decision of BHEL in regard to set the erection and commissioning targets will be final and binding on the successful bidder.
28.7	Successful bidder shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work.
28.8	The successful bidder's supervisory staff shall execute the work in the most professional manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. They shall be responsible to ensure that the assembly and workmanship conform to dimensions and tolerances given in the drawings/instructions given by BHEL engineer from time to time.
28.9	The supervisory staff employed by the successful bidder shall ensure proper outturn of work and discipline on the part of the labour put on the job by the successful bidder. Also in general they should see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other successful bidders of BHEL or BHEL's client.
28.10	If at any time, it is found that the successful bidder is not in a position to deploy the required engineers/supervisors/workmen due to any reason, BHEL shall have the option to make alternate arrangements at the successful bidder's risk and cost.
29.0	RECONCILIATION OF BHEL ISSUED MATERIALS
29.1	Successful bidder shall submit a reconciliation statement of material s issued to them, once in two months. The same may be submitted along with RA bill.
29.2	Successful bidder shall properly account for the material issued to them as specified herein to the satisfaction of BHEL certifying that the balance material are available with successful bidder's custody at site.
30.0	INSURANCE
30.1	It is the entire responsibility of successful bidder to insure their workmen against accident & injury while at work, as required by relevant rules and to pay compensation, if any, to their workmen as per workmen's compensation act. The successful bidder shall also insure their staff against accident/ injury.
30.2	The successful bidder shall take insurance cover for all materials, tools & plants, etc, required to be provided & deployed for the job by them.
30.3	The insurance coverage have to be taken prior to start of work and successful bidder shall make the policy available to Construction Manager, BHEL for necessary verification before start of work. However, irrespective of such verification/ acceptance, sole responsibility to maintain adequate insurance cover at all times during the period of contract shall lie with successful bidder. Regarding aforesaid insurance cover, successful bidder shall directly deal with the insurance company for all matters regarding the insurance in their scope.

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30.4	BHEL/ customer shall arrange comprehensive insurance policy for total supply & services for main equipment/ system covering transit risks & loss, destruction or damage during handling at site, storage, civil work, erection, testing, commissioning, etc up to trial operation/ completion of unit(s) including theft, sabotage, fire, lightning and other natural calamities.
30.5	Successful bidder shall timely intimate discrepancy during contract operation, to the underwriter. Name of the underwriter and Policy No shall be intimated in due course of time.
30.6	Successful bidder shall be responsible for timely submission of loss/ damage/ theft for the materials under vendors custody to the underwriter, assistance in lodging & settlement of claim for losses/ damages/ theft/ lodging of FIR with police. Any consequential loss arising out of non-compliance of this stipulation will be borne by successful bidder.
30.7	Successful bidder will take necessary precautions/ due care to protect the material at project site, while in their custody from any damage/ loss till the same is handed over to BHEL/ customer at project site. For lodging/ processing of insurance claim, the successful bidder will submit necessary documents. BHEL reserve the right to recover the loss from the successful bidder in case the damage/ loss is due to negligence/ carelessness on the part of the successful bidder. In case of theft of material under successful bidder's custody, erected & commiioned items upto handing over to customer, the same shall be reported to police by the successful bidder immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL/ customer for taking up with insurance. However this will not relieve the successful bidder of their contractual obligation for the materials in their custody.
30.8	In case the damage/ loss/ theft of materials are attributable to negligence/ failure in discharging the duties and obligations of the successful bidder, the expenses incurred for repair/ replacement of such components in excess of the amount realized from the underwriters, limited to Normal Excess (Deductible Franchise) shall be recovered from the successful bidder.
30.9	In case the claim is summarily rejected by the underwriters due to WILFUL NEGLIGENCE of successful bidder, the entire cost of repair/replacement will be recovered from successful bidder.
30.10	It will be responsibility of successful bidder to replenish the items lost/ damaged in time without hampering the schedule of work and without waiting for settlement of insurance claim. Amount received from the underwriters on settlement of insurance claim shall be passed on to successful bidder as and when available.
30.11	Other conditions of Insurance shall be as per relevant clause of GCC.
31.0	SECURITY DEPOSIT, PERFORMANCE BOND & FINAL BILL .
31.1	Security deposit shall be applicable as per relevant clause of GCC (Volume-IB).
31.2	Performance bond is not applicable for the tender.
31.3	RELEASE OF SD BG AND FINAL BILL
	In addition to other provisions of tender regarding release of SD and final bill, following provisions shall also be governing to this tender.
31.3.1	For SD BG- further extension beyond date of acceptance of final bill will not be enforced if the following is fulfilled.
31.3.1.1	Successful bidder discharges their responsibility in r/o of submission of final bill along with absolute 'No Demand Certificate' and other documents as detailed below to the satisfaction of BHEL
31.3.1.2	Joint protocol of set of documents as submitted as detailed in below is certified by site & successful bidder's representative.
31.3.1.3	There is no negative value of the final bill (after release of SD BG) - site to certify the same before release of SD BG.
31.3.1.4	Successful bidder has returned the property belonging to BHEL - site to certify the same before release of SD BG.
31.3.1.5	Successful bidder has submitted joint protocol against 'Delay analysis', if applicable for delayed execution of job.
31.3.2	List of documents to be submitted & jointly protocolled indicating acceptance of final bill by BHEL.
31.3.2.1	Final bill.

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31.3.2.2	Measurement for final bill signed, jointly signed by BHEL & successful bidder's representative.
31.3.2.3	Statement having cumulative joint measurement for the contract, jointly signed by BHEL & successful bidder's representative.
31.3.2.4	Claim by successful bidder for refund of security deposit.
31.3.2.5	Jointly signed material reconciliation statement.
31.3.2.6	Statement of payment received from BHEL – Bill wise (Including RA/ PVC/ ORC/ rate revision/ extra work).
31.3.2.7	No claim certificate by successful bidder.
31.3.2.8	Clearance certificates wherever applicable, viz clearance certificates from customer, various statutory authorities, like Labour Department, PF Authorities, Commercial Department, etc.
31.3.2.9	Notarized Indemnity Bond as per prescribed format.
32.0	COMPLETION PERIOD
32.1	The entire work under this scope shall be successfully completed in all respect within 13 months (Thirteen months) from the date of start of work as certified by Construction Manager, BHEL.
32.2	The successful bidder shall arrange to mobilize within 15 days from the date of written notice/intimation by BHEL.
32.3	Material supply at site is expected from July'2020.
32.4	<p>Dismantling, Erection, Re-erection, Modification and Commissioning of combustion modification work</p> <p>Pre shut down period is tentatively 25 Days, Shutdown Period of 35 Days, Testing /Commissioning Period of 60 Days.</p> <p>Tentative Shutdown schedule ref Annexure- VIII.</p> <p>It is expected that shutdown for U#5,U#6 & U#7 will be given separately & work shall be carried out during different periods for three boilers. In such case following may be noted:</p> <p>This may require contractor to mobilize & demobilize the site more than once. (If done, no additional charges for mob de-mob shall be paid). In such case after completion of the work for one unit, contractor shall complete all contractual obligations viz, material reconciliation, HR clearances, Labor clearances, other statutory clearance & submit the final bill etc., w.r.t. the completed unit</p> <p>Tentative Shutdown schedule of U#5 is expected from End of Sept' 2020,U#6 is expected from Nov'2020 & Shutdown of U#7 is expected from End of April'2021 .</p>
32.5	The actual date of contractual start of work will be certified by Construction Manager, BHEL after adequate mobilization of manpower, T&P by successful bidder. This certificate date will be deemed as start of work at site for purpose of the contract time schedule.
32.6	The work under the scope of contract will be deemed to be completed in all respects only when all the components are erected and trial runs, testing and commissioning of all individual equipment including trial operations with full load are conducted and handed over. The decision of BHEL shall be final and binding on the successful bidder.
33.0	CONSTRUCTION SCHEDULE
33.1	Entire work shall be carried out in accordance with the broad schedule of this package as furnished below, within the stipulated completion period. This schedule will undergo review and based on progress vis-à-vis project requirement, successful bidder may have to submit revised schedule for approval of BHEL.
33.2	Total completion schedule for this work in all respect is 13 Months from start of work. For detail schedule refer Annexure- VIII
33.3	Periodic progress reviews on the entire activities of execution in respect of supply & works in scope of

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	successful bidder will be held once in a month at Kolkata/ site. These meetings will be attended by reasonably higher officials of the successful bidder and will be used as a forum for discussing all areas where progress needs to be speeded up. The successful bidder shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
34.0	CERTIFICATE TOWARDS COMPLETION
	The work under the scope of the successful bidder shall be deemed to have been completed in all respects only when so certified by BHEL/ owner. The decision of BHEL in this regard shall be final and binding on the successful bidder.
35.0	EXTENSION OF TIME FOR COMPLETION
35.1	If the completion of work as detailed in the scope of work gets delayed beyond the contract/ completion period, the successful bidder shall request for an extension of the contract and BHEL at its discretion may extend the contract.
35.2	Based on the reviews jointly signed, the works balance at the end of original contract period less the backlog attributable to the successful bidder shall be quantified, and the number of months of 'Time extension' required for completion of the same shall be jointly worked out. Within this period of 'Time extension', the successful bidder is bound to complete the portion of backlog attributable to the successful bidder. Any further 'Time extension' or 'Time extensions' at the end of the previous extension shall be worked out similarly.
35.3	However, if any 'Time extension' is granted to successful bidder to facilitate continuation of work & completion of contract, due to backlog attributable to successful bidder alone, then it shall be without prejudice to the rights of BHEL to impose penalty/ LD for the delays attributable to successful bidder, in addition to any other actions BHEL may take at the risk and cost of successful bidder.
35.4	A joint programme shall be drawn for the balance amount of work to be completed during the period of 'Time Extension', along with matching resources to be deployed by the successful bidder as per specified format. Review of the programme and record of shortfall shall be done.
35.5	During the period of 'Time extension', successful bidder shall maintain their resources as per mutually agreed program
35.6	At the end of total work completion as certified by BHEL engineer, and upon analysis of the total delay, the portion of time extensions attributable to (i) Successful bidder, (ii) Force majeure conditions, and (iii) BHEL, shall be worked out and shall be considered to be exhausted in the same order. The total period of time extensions shall be the sum of (i), (ii) and (iii) above and shall be equal to period between the scheduled date of completion and the actual date of completion of contract. LD shall be imposed/ levied for the portion of time extensions attributable to successful bidder and recoverable from the dues payable to the successful bidder.
36.0	MOBILIZATION ADVANCE/ INTEREST BEARING RECOVERABLE ADVANCE
	Not applicable for this tender.
37.0	OVER RUN CHARGES
	Not applicable for this tender
38.0	PRICE VARIATION COMPENSATION (PVC)/ ESCALATION
	PVC Applicable as per relevant provision of GCC.
39.0	TAXES & DUTIES, ETC.
39.1	All taxes excluding GST with applicable cess & BOCW Cess (mentioned elsewhere in the Tender) but including, Charges, Royalties, , any State or Central Levy and other Taxes for materials if any obtained for the work and for the execution of the contract shall be borne by the bidder and shall not be payable extra by BHEL.
39.2	Any increase in the above at any stage during execution including extension of the contract, if any, shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements.
39.3	GST with applicable Cess, legally leviable & payable by the successful bidder as per GST Law, shall be paid extra by BHEL. Hence, Bidder shall not include GST with applicable Cess in their quoted price.
39.4	The successful bidder shall furnish proof of GST registration with GSTN Portal covering the services

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	under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by the successful bidder on BHEL for this project/ work.
39.5	Since GST on output will be paid by BHEL separately as enumerated above, bidder's quoted rates/ price should be after considering the Input Credit under GST law at their end.
39.6	TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished.
39.7	TDS under GST shall be deducted at applicable rates on gross invoice value from the running bills.
39.8	Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details shall be as per following. BHEL GSTN – 10AAACB4146P1ZU NAME - BHARAT HEAVY ELECTRICALS LIMITED ADDRESS – BHEL SITE OFFICE (NOx MITIGATION JOB), KAHALGAON SUPER THERMAL POWER STATION, STAGE-II (3X500 MW),NTPC LTD., DISTRICT-BHAGALPUR, BIHAR, INDIA
39.9	Bidder to intimate immediately on the day of removal of Goods(in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice through following communication mode for enabling BHEL to meet its GST related compliances Portal Address – Shall be intimated later. And Email Address – Shall be intimated later. In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is attributable to the bidder.
39.10	In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
39.11	Bidder shall Comply with the Time limit prescribed under the GST Law and rules thereof for raising of the tax invoice. If any supply of goods is applicable, Bidder shall also ensure prompt delivery of Goods after dispatch.
39.12	Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons attributable to the bidder, GST amount shall be recoverable from the bidder along with interest levied / leviable on BHEL, as the case may be.
39.13	Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law , GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the bidder along with interest levied / leviable on BHEL.
39.14	Way Bill: Successful Bidder shall arrange way bill / e-waybill for any transfer of goods for the execution of the contract. The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.
39.15	Any new taxes & duties, if imposed subsequent to the due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extensions for which delay is not attributable to the bidder), shall be reimbursed by BHEL on production of relevant supporting document to the

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	satisfaction of BHEL. However, bidder shall obtain prior approval from BHEL before depositing any such new taxes and duties. Benefits and/or abolition of all existing taxes must be passed on to BHEL against new taxes, if any, introduced at a later date.	
40.0	TERMS OF PAYMENTS (The quoted / awarded amount shall be released progressively on pro-rata basis as per the following for each unit or boiler)	
	STAGES OF PAYMENT	PAYMENT BREAK UP IN %
40.1	PAYMENT BREAK UP FOR SL NO.A OF PRICE SCHEDULE (VOL-III, SCH-2)	
40.1.1	On pro rata basis progressively for Dismantling of Mechanical, Electrical & C&I items of each unit.e.g Pr Parts, Structure, Instruments, Electrical/C&I items and disposal of scraps of each unit, Up keepment/storage of items which will be re-used & Re-Erection/re-use/modification, alignment, welding & commissioning of old dismantled items	41%
40.1.2	On pro rata basis progressively for disposal of Scrap Items & Upkeepment of Items to be re-used	10%
40.1.3	On pro rata basis progressively for Re-Erection/Re-use/Modification of Mechanical, Electrical & C&I items of each unit	41%
40.1.4	Supply & Application of Paints for re-erected/re-used/modified items	3%
40.1.5	On pro rata basis progressively for System Commissioning & Assistance for PG Test	5%
	SUB TOTAL	100%
40.2	PAYMENT BREAK UP FOR SL NO.B OF PRICE SCHEDULE (VOL-III, SCH-2)	
40.2.1	Pre-Assy & Erection	44%
40.2.2	Alignment & welding,application of insulation	32%
40.2.3	Hydro Test of Pr Parts & IBR compliance	10%
40.2.4	Air Leak Test	2%
40.2.4	Supply & Application of Paints	3%
40.2.5	System Commissioning & Assistance for PG Test	5%
40.2.6	House Keeping, Scrap Disposal	1%
40.2.7	Submission of as Built Drawing	1%
40.2.8	Punch Point Liquidation	1%
40.2.9	Material Reconciliation	1%
	SUB TOTAL	100%
40.3	PAYMENT BREAK-UP FOR SL NO.C OF PRICE SCHEDULE (VOL-III, SCH-2)	
40.3.1	On pro-rata basis progressively as & when erection work/ cable laying/cable dressing/Cable tagging/termination(in both ends)/cable splicing/Instrument fixing/cable tray/ferruling/testing/house keeping/painting(supply & application)/disposal of scrap is complete as per BHEL drawing & instructions	90%
40.3.2	Successful commissioning of Instruments/system,as bult drawing submission, material reconciliation & punch point liquidation.	10%
	SUB TOTAL	100%
40.4	PAYMENT BREAK-UP FOR SL NO.D.1 OF PRICE SCHEDULE (VOL-III, SCH-2)	
40.4.1	Receipt/ taking delivery of material at plant, unloading from truck/ trailer, re-loading/ shifting to site store/ storage yard/ work site, verification, stacking, storage, etc, including providing material management service and arrange suitable watch and ward facility round the clock basis along with store supervisor as per tender & as directed by BHEL engineer, for various item/ material).	40%
40.4.2	Updation of store documents (both hard & soft) of above.	10%
40.4.3	Proper stacking, as per direction of BHEL	20%
40.4.4	Verification, as required, as per direction of BHEL	20%

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40.4.5	Material Re-conciliation	10%
	SUB TOTAL	100%
40.5	PAYMENT BREAK-UP FOR SL NO.D.2 OF PRICE SCHEDULE (VOL-III, SCH-2).	
40.5.1	existing/old materials shifting/re stacking inside cover store/semi covered store/material yard	100%
40.6	PAYMENT FOR SL NO.E OF PRICE SCHEDULE (VOL-III, SCH-2). This item may not be excuted in case the same is carried out by customer during execution, in that case payment shall not be made for this.	
40.6.1	Scaffolding Materials receipt & shifting/transporatation from NTPC store/yard to site	60%
40.6.2	Erection of Scaffolding.	30%
40.6.3	Dismantling of Scaffolding & handing over in customer store/yard	10%
	SUB-TOTAL	100%
40.7	PAYMENT FOR SL NO.F OF PRICE SCHEDULE (VOL-III, SCH-2). This item may not be executed in case the same is supplied by customer during execution, in that case payment shall not be made for this.	
40.7.1	Arrangement of Cup lok scaffolding along with steel planks, hand rails, stair case at site for each unit	100%
i	Payment shall be made on the basis of progress of work on pro-rata basis as certified by BHEL-Engineer as per above break up	
ii	All payments shall be subject to statutory deduction as per rule.	
iii	Necessary documents as specified in GCC shall be submitted with bill.	
iii	All payment shall be made by Electronic Fund Transfer and necessary Bank Details shall be furnished by the sub-contractor.	
iv	Successful bidder shall submit RA bill once in a month at the end of each month as per billing break-up of the tender. The measurement will be taken by BHEL engineer as per relevant clause of GCC and certify regarding the actual work executed in the measurement book and bills for work.	
v	Progressive payment shall be made by BHEL against successful bidder's RA bill, complete & correct in all respects accompanied by BHEL engineer's certified/ measurement sheet, jointly signed; requisite statutory certificates, certified by BHEL; within 60 days of submission of the bill. The bill shall also accompany monthly progress report as per clause no. 14.6 of this TCC.	
vi	The RA bill, complete in all respects accompanied by BHEL engineer's certificate/ jointly signed measurement sheet will be paid, as indicated elsewhere, subject to its completeness & correctness in all respects. The measurement will be taken by BHEL engineer as per relevant clause of GCC and certify regarding the actual work executed in the measurement book and bills for work. All admissible recoveries/ adjustments etc shall be made from the interim payable amount of each RA bill on completion of item of work. Contractor shall make his own arrangement for making payment of impending labour wages and other dues in the meanwhile.	
vii.a.	Out of above break up for payment, 5% will be retained from each bill which will be released on completion of guarantee period and after confirmation of full GST credit to BHEL However, this 5 %, retained from each RA bill, may be released against submission of a separate bank guarantee as per Performance Bank Guarantee format, to be kept valid till guarantee period, subject to (i) Receipt of certificate that all works are completed in all respects; (ii) Reconciliation of materials/ T&P/ MMD; (iii) Completion of final bill formalities and (iv) Handing over to BHEL/ customer. The submission of bank guarantee towards above is separate and the bank guarantee towards security deposit cannot be utilized for this purpose. The security deposit / Retention amount will be refunded as per GCC.	
vii.b.	Out of above break up for payment, 2.5 % of gross bill amount shall be paid in the following manner on certification by BHEL engineer after compliance of each of following activity in each month. In case of non-fulfillment of respective activity by successful bidder in each month, no payment shall be made by BHEL against corresponding activity and no claim of successful bidder, at a later date, whatsoever, in this regard will be entertained by BHEL.	
vii.c	0.5 % shall be paid on compliance of house-keeping of successful bidder's working area and store/ office areas.	

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vii.d	0.5 % shall be paid on compliance of general illumination of successful bidder's working area and stores, office area.
vii.e	0.5 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL and as specified in the tender.
vii.f	0.75 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL and as specified in the tender.
vii.g	0.25 % shall be paid on compliance of applicable security requirement as per guidelines of BHEL.
viii.	Each RA bill shall accompany with latest agreed & jointly signed L-3/ construction schedule, as enumerated in this tender.
ix.	All admissible recovery/ adjustment, etc. shall be made from interim payable amount.
x	GST shall be released to the vendor upon compliance of following: -
x.a	Vendor declaring such Invoice in his GSTR-1
x.b	Material Receipt Certificate (MRC) / Engineering Protocol by BHEL
x.c	Confirmation of payment of GST thereon by vendor on GSTN Portal
x.d	Above is subject to receipt of goods / service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.
x.e	Last percentage payment, will be released after confirmation of full GST Credit to BHEL. Any Interest if levied thereon, for reasons elaborated in tax & duties clause of the tender and attributable to the bidder, will be recovered from the Final Payment / Retention amount.
41.0	CONTRACT PRICE
41.1	The bidder shall quote their rates in compliance with specification and terms & conditions of tender and strictly in accordance with prescribed Price Schedule, Volume-III.
41.2	The quantities of the various items mentioned in the BOQ cum rate schedules of items of Volume-III are approximate, based on very preliminary information and may vary to any extent or to be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of the work executed under any part of the this contract including extra items, if any, but excluding any price variation, remains within +/- 15 % (plus/minus fifteen percent) of the awarded price as per LOI / WO.
41.3	All other provisions of GCC on quantity variation shall be applicable for this tender.
42.0	GUARANTEE/ WARRANTY PERIOD/DEFECT LIABILITY (UNIT WISE)
42.1	Even though the work will be carried out under supervision of BHEL, the successful bidder will be responsible for the quality of workmanship, quality of materials/ items and design for which the successful bidder is responsible.
42.2	The successful bidder shall guarantee the work executed under the scope of the contract for a period of eighteen (18) months from the date of successful Completion of the Facilities (or any part thereof) or twelve (12) months from the date of Operational Acceptance of the Facilities (or any part thereof), whichever occurs first. The date of start of guarantee period is considered as certified by the engineer (i.e. on completion of total work under scope of work and/ or handing over to BHEL/ owner) and shall rectify free of cost all defects due to faulty work done, supply (if applicable) within the gurantee/warrantee/defect liability period. In case the successful bidder fails to repair/ replace the defective works within the time specified by the engineer, BHEL may proceed to undertake the repairs/ replace such defective works at successful bidder's risk & cost without prejudice to any other rights and recover the same from security deposit/ other dues.
42.3	Other provision shall be as per the GCC.
43.0	DELETED
44.0	REVISION ON ACCEPTED CONTRACT RATE
	Rate revision is not applicable for this tender.
45.0	EXTRA WORKS
	As per GCC
46.0	OTHER TERMS
46.1	All other term & conditions of this specification, not mentioned above shall be governed by the pertinent provisions of GCC, Volume-IB.
47.0	Terminal Points:-

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47.1	Instrument and service air:- at one point in Boiler area (4-6 Ksc) <ul style="list-style-type: none"> • Marshalling panel of NTPC DDCMIS. • 230V Single phase AC UPS and 24 DC power supply feeder from NTPC ACDB and DCDB in CER. • Marshaling cabinet of NTPC DDCMIS in CER for input/output signals
48.0	Exclusions
48.1	<ul style="list-style-type: none"> • LDO oil skid • Existing pressure gauges in corner skid for oil and atomizing medium.

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49.0

ANNEXURE-I
[REF. PRICE SCHEDULE, VOL-III, SCH-2, SL. NO.A]

**TENTATIVE WEIGHT OF ITEMS (Mechanical/ C&I/ Electrical) TO BE DISMANTLED & RE-USED/RE
ERECTED/MODIFIED/COMMISSIONED ETC. IS MENTIONED BELOW. HOWEVER ACTUAL QTY OF
ITEMS TO BE DECIDED AS PER SITE CONDITION/ENGINEER I/C.**

The contractor shall carry out Dismantling, Removal, Shifting of any obstructing Pr Parts, structures, buck stay, pipe lines, cables & cable trays, boiler lighting arrangement, wall blower system at BOFA panel elevation, facilities etc. and upkeepment of the items & shifting of material from store to site, Re-Use/Re-Erection/Modification etc. as per drawing/Instruction of Engr I/C.

A. Following Items to Be dismantled, preserved & to be re-used/ re-erected/ modified/ commissioned:-

MECHANICAL ITEMS:

- Insulation cladding, wool, refractory etc as required.
- Structure components like Platform, hand rails, floor gratings, stair cases, ladders etc of Different Elevation as required.
- Existing Wind box assembly, coal burner, Coal nozzle tip, coal piping, hangers etc
- Misc structural items(channel, Angles, Beams etc.)
- Wall blower, soot blower, its piping as required.
- Duct, duct support, expansion below etc as required.
- Buckstay beams and its associated members like leveller guide, scalloped bar, pin etc.
- Water wall panels/tubes/ bends as required.
- Burner Nozzles (air/coal/oil).
- Coal Pipe Bends/elbows as required.
- Removal / dismantling of FIE (Fuel Inlet Elbows = 36 Nos, it may vary, as per drawings) for all four corners at all elevation. Transportation of FIE's to designated location as decided by BHEL/ Customer
- Removal of Oil Guns, Gun Guide Pipes, HEA Ignitor, its fittings & its guide pipes, Scanner & their guide pipes. Proper care shall be given while dismantling as these items shall be reused, Oil Gun Vice Assy & Rack, Air Cooled Oil gun Assemblies, oil gun maintenance box, oil gun vice Assy and rack.
- Burner station skid assemblies.
- Corner station piping, valves & fittings.
- Coal piping, coal pipe couplings, supports etc(as required).
- Buckstays in the wind box and BOFA locations.
- Any other piping, supports, valves and fittings etc.
- Removal of all Coal Nozzles from coal compartment for all four corners. Replacement of Nozzle tips with new tips & inert back the nozzles to burners coal compartments etc..
- Instrument Air, Service Air Line as required.
- Any other mechanical items not mentioned above but required to be dismantled & re-erected/re-used/modified/Alignment/painting for completion of the system, same to be carried out by vendor as per instruction of Engr I/C without any extra cost

C&I & ELECTRICAL ITEMS :

- Approximately, 44 Nos. Flame Scanner Head assemblies, Cooling air piping, Scanner hoses etc. (Quantity may vary, as per erection drawings).
- Furnace flame viewing camera(s)/system.
- ASLD(s) etc.
- SADC(s) and Burner tilt power cylinder(s)/actuator(s) etc..
- Dismantling of Cable trays and cables, which are required to be established the DE-NOX system duct panels etc.
- Existing Pressure gauge(s) in Corner skid for oil and atomizing medium.
- Wind box to Furnace DP Transmitter(s) and related impulse piping etc..
- Tapping point(s) for any Instrument in water wall etc..
- Field cables and Junction boxes in Boiler Operating Floor/Firing Floor/ air and flue gas path as required to be

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eatsblid the DE-NOX system.

- Existing SADC I/P converter(s), 1/4" Air Filter Regulator(s) in existing SADC(s) signal airline, Existing SADC signal air Line pressure switch(s) etc.
- Illumination items.
- Existing secondary air flow measurement element(s) and transmitter(s) along with cable(s) & accssories.
- Existing corner oil skid(s), instruments in oil line(s), trip valve(s) and control valve(s) along with all associated cable(s).
- Field JB(s) and related impulse piping etc..
- All existing cable(s) & Cable tray(s) associated with existing SADC actuator I/P(s), pressure switch(s) and SADC(s)/FSSS panel(s) (including field cable(s) till local JB(s)) etc..
- All existing cables between existing corner oil skid, HEA ignitors, oil gun, LGM box and FSSS panel etc. (including field cables till local JB) etc..
- All existing Power, Control & Instrumentation cables for Soot Blowers etc..
- Existing instruments in air and flue gas path, associated cabling, field JB's and Impulse piping.
- Erection, installation, cable tray erection, cable laying, cable splicing, cable dressing, cable galnding, cable termination, ferruling, tagging, applicable testing, commissioning of C&I & Electrical system/items etc..
- Any other C&I/Electrical items not mentioned above but required to be dismantled & re-ereted/re-used/modified for completion of the sytem, same to be carried out by vendor without any extra cost as per drawing / instruction of Engr I/C.

Note: - The above work includdes Erection, Testing & Commissioning, Laying, dressing, tagging, glanding, ferruling, terminating at both end/splicing, etc. as applicable including continuity checking & IR Value checking (if required) to be done towards commissioning of C&I & Electrical system/items realted to Nox mitigation systemThe above item list are tentative only.

B. Work to be done as under:-

- i) Dismantling, Removal, Shifting of any obstructing items (Mechanical, C&I, Electrical) as mentioned above for De-Nox system.
- ii) Upkeepment/preservation of the items for re-use, re-erection, modification, welding, alignment, laying, termination, commissioning, testing, PG Test as per instruction of Engr I/C/Drawing as reqd.
- iii) Relaying/re-erection of Instrument air, service air, other dismantled pipe lines, lighting system, cable(s), cable tray(s), termination, jb's etc.
- iv) Disposal of scrap to the scrap yard or as instructed by Engr I/C inside plant premises.
- v) Erection testing commissioning of Instrument air distribution SS tubing, fittings for SADC actuators, Corner Nozzle valves, HEA ignitors, Burner Tilt Power cylinders Power cylinders.
- vi) Dismantling/Modification of existing Wind box assembly, coal burner, Coal nozzle tip, coal piping, hangers etc.
- vii) Preservation of Scanners and HEA Ignites and critical equipment which can be reused again shall be cleaned and stored in proper shed and shall be reused/ re erected/restored/commissioning/alignment/testing along with cabling, termination, testing etc as applicable.
- viii) Restoration/re-erection of all removed structure, floor grills, air lines, hand rails, Re-erection of removed insulation and cladding with the help of hooks and retainer plates. Existing access openings/observation doors are to be retained. Restoring JB, cable, cable tray as and where applicable. Dismantling & Removal of scaffolding and other temporary structures & arrangements made for handling after completion of work & Transportation of removed material and other scraps generated during the work to disposal yard/handing over the same to NTPC customer etc.. Any other alteration which is done for modification is to be restored in original position without any extra charge. If any modification of floor/ bracing is required to successfully complete this BOFA modification job which is not mention here, same has to be carried out with out any extra cost.
- ix) Existing Floor at 51.850 Mtrs, & other Elevations to be modified to clear BOFA assembly & Ducting etc..
- x) Modification of Existing Floors as per drawing/guidance of Engr I/C.
- xi) Existing Buckstay at El 51.00 Mtrs to be modified at corners etc..
- xii) Horizontal Bracings interfering with BOFA system to be modified to clear BOFA & Ducting.
- xiii) Duct Stiffeners & Insulation at existing items to be adjusted locally at site for clearance.
- xiv) All the existing features which are interfering with the proposed arrangement of BOFA are to be suitably relocated at site to the extent required.
- xv) Supply & application of paints for the re-erected/re-used/modified items.
- xvi) Fabrication of Floors/benches (where ever required)
- xvii) Painting (including supply) as and where applicable.

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xviii) Vendor need to take approval from Boiler Directorate/Bihar under Section 392 of IBR. Vendor has to co-ordinate with Boiler Directorate/Bihar for approval of Drawings for the subject work. Arrangement for inspections/approval through Boiler Directorate/Bihar upto hydro test/completion of work.

xix) 100% RT of Pr Parts Weld Joints

xx. Erection, installation, cable tray erection, cable laying, cable splicing, cable dressing, cable galnding, cable termination, ferruling, tagging, applicable testing, commissioning of C&I & Electrical system/items etc

Tentative quantity of work/Boiler:

- Approx weight to be dismantled will be 50 MT/Boiler.
- Approx weight to be re-erected/re-used will be 30 MT/Boiler.

Note: Qunatity mentioned above may vary to any extent, no extra paymnet shall be made for quantity variation to complete NOx modification job.

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ANNEXURE-II

[REF. PRICE SCHEDULE, VOL-III, SCH-2, SL. NO.B]

TENTATIVE LIST OF NEWLY SUPPLIED MECHANICAL ITEMS/BOILER FOR SHIFTING OF MATERIALS FROM STORE/YARD TO SITE, ERECTION, ALIGNMENT, WELDING, PAINTING (SUPPLY & APPLICATION), NDT, TESTING, COMMISSIONING & PG TEST ETC. FOR DE-NOX SYSTEM OF BOILER U#5,6&7 (3X500 MW) AT NTPC –Kahalgaoon

A) NEWLY SUPPLIED ITEMS(ITEMS ARE GIVEN IN PER BOILER)

DU	PGMA	Description	Unit	DU Qty/Unit	DU Wt In Kgs/Unit
A. PRESSURE PARTS					
F4240106500001	06-500	BOFA PANEL (OFA-1 & OFA-3)	NO	2	3,228.960
F4240106500002	06-500	BOFA PANEL (OFA-2 & OFA-4)	NO	2	3,214.420
F4240106500003	06-500	ERECTION MATERIALS	NO	1	213.120
F4240106655001	06-655	RIFLED TUBE D51X7.1	NO	4	26.080
F4240106655002	06-655	PLATE 6 THK.	NO	4	1.160
F4240106655003	06-655	ROD D6	NO	2	0.340
F4240106655004	06-655	SEAL BOX	NO	2	57.000
F4240106655005	06-655	SCALLOPED BAR	NO	2	6.000
F4240106655006	06-655	SCALLOPED BAR	NO	2	4.400
F4240106655007	06-655	PLATE 6 THK.	NO	2	2.200
F4240108006001	08-006	WIND BOX TRUSS	NO	2	1,398.368
F4240108006002	08-006	WIND BOX TRUSS	NO	2	1,179.048
F4240108006003	08-006	PLATE 16	NO	2	232.612
F4240108006004	08-006	PLATE-12	NO	4	16.400
F4240108006005	08-006	PLATE	NO	4	35.200
F4240108006006	08-006	LINK	NO	8	79.200
F4240108006007	08-006	PIN	NO	8	10.400
F4240108006008	08-006	WASHER	NO	16	6.400
F4240108006009	08-006	PLATE	NO	2	27.200
F4240108006010	08-006	LINK	NO	8	116.800
F4240108006011	08-006	PIN	NO	8	20.000
F4240108006012	08-006	WASHER	NO	16	12.800
F4240108006013	08-006	PLATE-25	NO	4	6.800
F4240108006014	08-006	PLATE	NO	2	27.800
F4240108006015	08-006	PLATE-16	NO	2	150.720
F4240108006016	08-006	LUG	NO	120	52.800
F4240108006017	08-006	VERTICAL BUCKSTAY BEAM	NO	4	2,860.000
F4240108006018	08-006	ISA 100 X 100 X 10	NO	8	36.320
F4240108006019	08-006	ANGLE	NO	8	35.200
F4240108006020	08-006	ANGLE	NO	8	138.400
F4240108006021	08-006	T-PLATE	NO	4	54.400
F4240108006022	08-006	LINK	NO	8	52.000
F4240108006023	08-006	PLATE	NO	44	158.400

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F4240108006024	08-006	PLATE-16	NO	44	189.200
F4240108006025	08-006	PLATE	NO	4	40.800
F4240108006026	08-006	BOLT HEX GR C4.6 M20X 70	NO	16	3.728
F4240108006027	08-006	NUT HEX GR C M20	NO	16	1.120
F4240108006028	08-006	WASHER PNCHD A20	NO	16	0.272
F4240108006029	08-006	PLATE-36	NO	8	13.600
F4240108006030	08-006	HSFG BOLT & NUT M24 X 90	NO	32	19.264
F4240108006031	08-006	WASHER M24 A (HSFG WASHER)	NO	32	1.376
F4240108006032	08-006	PLATE-16	NO	12	5.640
F4240108006033	08-006	PLATE-16	NO	4	1.884
F4240108006034	08-006	PLATE-16	NO	2	23.300
F4240108006035	08-006	PLATE-16	NO	4	35.360
F4240108006036	08-006	SCALLOPED BAR	NO	60	72.000
F4240108006037	08-006	PLATE-16	NO	2	26.600
F4240108006038	08-006	PLATE-16	NO	7	124.600
F4240108006039	08-006	SCALLOPED BAR	NO	2	6.600
F4240108006040	08-006	LUG	NO	88	114.400
F4240108006041	08-006	SCALLOPED BAR	NO	2	6.600
F4240108006042	08-006	LUG	NO	8	9.968
F4240121600001	21-600	PIPE OD 60.3 X 3.91 - SA106GRB	M	8	43.496
F4240121992001	21-992	ER 70S-A1 GTAW ROD DIA2.4MM	KG	0.70	0.700
SUB-TOTAL WEIGHT OF PR PARTS ITEMS					14201.456
B. INSULATION ITEMS					
F4240132310001	32-310	PLATE - 5	NO	2	24.492
F4240132310002	32-310	PLATE - 5	NO	4	11.020
F4240132310003	32-310	PLATE - 5	NO	4	5.652
F4240132310004	32-310	PLATE - 5	NO	4	4.900
F4240132310005	32-310	PLATE - 5	NO	4	2.512
F4240132310006	32-310	OUTER PIPE	NO	2	1.928
F4240132310007	32-310	CAFJOINTING GRW/1 2MM OD111/ID105	NO	4	0.180
F4240132310008	32-310	HR GLASS DIA109MM X 5MM THK	NO	4	0.800
F4240132310009	32-310	PIPE CAP DIA 130	NO	2	9.184
F4240132310010	32-310	INNER PIPE	NO	2	4.284
F4240132310011	32-310	ERW TUBE NB25 MEDIUM	NO	2	0.714
F4240132310012	32-310	FLEX HOSE 25MM BORE RAYON BRAIDED	NO	2	10.000
F4240132310013	32-310	HEX HD SCRUB-M12X50 -4.6-IS1363P2	NO	44	2.596
F4240132310014	32-310	NUT -M12 -CL4-IS1363P3	NO	44	0.880
F4240132310015	32-310	PUN WASHER-M12 -IS2016-A	NO	44	0.440
F4240132310016	32-310	MILL BOARD 25 MM - TP 23296	KG	5	5.000
F4240132310017	32-310	FIXING PIN L - 225	NO	6,800	340.000
F4240132310018	32-310	RETAINER TYPE-A	NO	6,800	414.800
F4240132310019	32-310	AL CASING SUPPORT 03-650L	NO	2,270	340.500
F4240132310020	32-310	TAPSCREW-ST 4.2X13C	NO	45,000	45.000
F4240132310021	32-310	WIRE DIA 0.914 MM - GI - IS280	KG	120.000	120.000
F4240132310022	32-310	PLAINALUMINI SH 1.6 MM THK IS737/19000H2	M2	1,150.000	4,968.000
F4240132310023	32-310	NUT -M10 -CL4-IS1363P3	NO	218.000	2.180

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F4240132310024	32-310	SHEET 1.6 MM	NO	20.000	55.020
F4240132310025	32-310	SHEET:3.15	NO	8.000	296.736
F4240132310026	32-310	WELD STUD M10	NO	218.000	47.306
F4240132310027	32-310	WASHER A11	NO	250.000	10.000
F4240132310028	32-310	BENT SHEET	NO	218.000	361.880
F4240132310029	32-310	BRACKET	NO	218.000	94.394
F4240132310030	32-310	SUPPORT SHEET	NO	41.000	8.774
F4240132310031	32-310	CASING SUPPORT	NO	13.000	78.585
F4240132310032	32-310	CASING SUPPORT	NO	13.000	121.810
F4240132310033	32-310	SHEET 2	NO	13.000	163.280
F4240132310034	32-310	ROD D 6.0 MM-IS2062GRA SAE1010/SAE1018	NO	40.000	53.280
F4240132310035	32-310	RETAINER TYPE 'C'	NO	800.000	33.600
F4240132310036	32-310	WELD MESH 50 X 50 WIRE DIA 3MM - IS 1566	M2	170.000	377.230
F4240133210001	33-210	CASTABLEREFRRACTORY GR A	KG	9,325.000	9,325.000
F4240133230001	33-230	POURABLE INSULATION	KG	1,000.000	1,000.000
F4240133321001	33-321	WOOL-100KG/CU.M-50MM ONE SIDE GI WIRENET	M2	850.000	4,675.000
F4240133321002	33-321	WOOL-100KG/CU.M-60MM-ONE SIDE GI WIRENET	M2	2,110.000	13,715.000
F4240133321003	33-321	WOOL-100KG/CU.M-50MM-BOTH SIDE GI WIRENE	M2	900.000	5,400.000
SUB-TOTAL WEIGHT OF INSULATION					42131.957
C. NON PRESSURE PARTS					
F4240136321001	36-321	FLB321-101 ISMB150	NO	4.000	83.680
F4240136321002	36-321	FLB321-102 ISMB125	NO	2.000	24.656
F4240136321003	36-321	FLB321-104 ISMB125	NO	1.000	12.301
F4240136321004	36-321	FLB321-105 ISMB150	NO	4.000	73.584
F4240136321005	36-321	FLB321-106 ISMB450	NO	4.000	275.120
F4240136321006	36-321	FLB321-107 ISMB125	NO	6.000	42.210
F4240136321007	36-321	FLB321-108 ISMB125	NO	1.000	12.361
F4240136321008	36-321	FLB321-109 ISMB125	NO	13.000	172.185
F4240136321009	36-321	FLB321-110 ISMB200	NO	3.000	157.746
F4240136321010	36-321	FLB321-111 ISMB200	NO	1.000	52.582
F4240136321011	36-321	FLB321-112 ISMB125	NO	16.000	133.872
F4240136321012	36-321	FLB321-113 ISMC75	NO	2.000	8.362
F4240136321013	36-321	FLB321-114 ISMC75	NO	10.000	78.080
F4240136321014	36-321	FLB321-115 ISMB200	NO	2.000	110.074
F4240136321015	36-321	FLB321-116 ISMB125	NO	2.000	21.980
F4240136321016	36-321	FLB321-117 ISMB500	NO	2.000	1,497.930
F4240136321017	36-321	FLB321-118 ISMB400	NO	2.000	1,093.258
F4240136321018	36-321	FLB321-119 ISMB125	NO	1.000	6.776
F4240136321019	36-321	FLB321-120 ISMB125	NO	1.000	7.266
F4240136321020	36-321	FLB321-121 ISMB150	NO	2.000	60.604
F4240136321021	36-321	FLB321-122 ISMB125	NO	1.000	13.245
F4240136321022	36-321	FLB321-123 ISMC75	NO	2.000	4.192
F4240136321023	36-321	FLB321-124 ISMB450	NO	2.000	975.264
F4240136321024	36-321	FLB321-125 ISMB125	NO	4.000	53.056

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F4240136321025	36-321	FLB321-126 ISMB250	NO	2.000	297.568
F4240136321026	36-321	FLB321-127 ISMB125	NO	10.000	199.610
F4240136321027	36-321	FLB321-128 ISMB125	NO	3.000	36.984
F4240136321028	36-321	FLB321-129 ISMB150	NO	1.000	14.925
F4240136321029	36-321	FLB321-130 ISMB150	NO	1.000	14.860
F4240136321030	36-321	FLB321-131 ISMB125	NO	2.000	14.070
F4240136321031	36-321	FLB321-132 ISMB150	NO	3.000	88.656
F4240136321032	36-321	FLB321-133 ISMB125	NO	1.000	12.395
F4240136321033	36-321	FLB321-134 ISMB125	NO	1.000	17.329
F4240136321034	36-321	FLB321-135 ISMB125	NO	1.000	17.329
F4240136321035	36-321	FLB321-136 ISMB150	NO	1.000	29.552
F4240136321036	36-321	FLB321-137 ISMB400	NO	2.000	1,310.090
F4240136321037	36-321	FLB321-138 ISMB200	NO	2.000	102.624
F4240136321038	36-321	POST321-201 ISMC75	NO	9.000	206.883
F4240136321039	36-321	POST321-202 ISMC75	NO	1.000	22.987
F4240136321040	36-321	POST321-203 ISMC75	NO	4.000	89.184
F4240136321041	36-321	POST321-204 ISMC75	NO	2.000	45.974
F4240136322001	36-322	FBR322-501 DBA75X75X6	NO	1.000	39.452
F4240136322002	36-322	FBR322-502 DBA75X75X6	NO	1.000	39.452
F4240136322003	36-322	FBR322-503 DBA75X75X6	NO	1.000	40.015
F4240136322004	36-322	FBR322-504 DBA75X75X6	NO	1.000	40.015
F4240136322005	36-322	FBR322-505 DBA75X75X6	NO	2.000	78.396
F4240136322006	36-322	FBR322-506 DBA75X75X6	NO	1.000	39.198
F4240136322007	36-322	FBR322-507 DBA75X75X6	NO	1.000	39.198
F4240136322008	36-322	FLB322-401 ISMB200	NO	1.000	52.582
F4240136322009	36-322	FLB322-402 ISMB200	NO	1.000	52.582
F4240136322010	36-322	FLB322-403 ISMB200	NO	5.000	278.420
F4240136322011	36-322	FLB322-404 ISMB200	NO	1.000	55.782
F4240136322012	36-322	FLB322-405 ISMB125	NO	2.000	16.770
F4240136322013	36-322	FLB322-406 ISMB200	NO	2.000	128.024
F4240136322014	36-322	FLB322-407 ISMB200	NO	2.000	110.074
F4240136322015	36-322	FLB322-408 ISMB150	NO	1.000	23.007
F4240136322016	36-322	FLB322-409 ISMB150	NO	1.000	23.007
F4240136322017	36-322	FLB322-410 ISMB125	NO	6.000	48.384
F4240136322018	36-322	FLB322-411 ISMB150	NO	2.000	46.732
F4240136322019	36-322	FLB322-412 ISMB200	NO	2.000	105.164
F4240136322020	36-322	FLB322-413 ISMB200	NO	1.000	63.745
F4240136322021	36-322	FLB322-414 ISMB250	NO	1.000	93.610
F4240136322022	36-322	FLB322-415 ISMB150	NO	2.000	26.618
F4240136322023	36-322	FLB322-416 ISMB125	NO	1.000	13.309
F4240136322024	36-322	FLB322-417 ISMB150	NO	2.000	39.730
F4240136322025	36-322	FLB322-418 ISMB125	NO	1.000	13.309
F4240136322026	36-322	FBR322-201 DBA80X80X8	NO	2.000	125.272
F4240136322027	36-322	FBR322-202 DBA80X80X8	NO	1.000	62.636
F4240136322028	36-322	FBR322-203 DBA80X80X8	NO	4.000	254.300
F4240136322029	36-322	FBR322-204 DBA80X80X8	NO	2.000	126.142
F4240136322030	36-322	FBR322-205 DBA80X80X8	NO	4.000	254.300
F4240136322031	36-322	FBR322-206 DBA80X80X8	NO	1.000	67.871

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F4240136322032	36-322	FBR322-207 DBA80X80X8	NO	1.000	67.850
F4240136322033	36-322	FBR322-208 DBA80X80X8	NO	1.000	63.071
F4240136322034	36-322	FBR322-209 DBA80X80X8	NO	2.000	135.686
F4240136322035	36-322	FBR322-210 DBA80X80X8	NO	2.000	135.570
F4240136322036	36-322	FBR322-211 DBA80X80X8	NO	2.000	135.584
F4240136322037	36-322	FBR322-212 DBA80X80X8	NO	1.000	63.071
F4240136322038	36-322	FBR322-213 DBA80X80X8	NO	1.000	62.636
F4240136322039	36-322	FLB322-103 ISMB250	NO	4.000	912.656
F4240136322040	36-322	FLB322-104 ISMB250	NO	4.000	922.952
F4240136322041	36-322	FLB322-105 ISMB600	NO	2.000	2,143.464
F4240136322042	36-322	FLB322-106 ISMB250	NO	4.000	573.092
F4240136322043	36-322	FLB322-107 ISMB125	NO	1.000	25.589
F4240136322044	36-322	FLB322-108 ISMB125	NO	3.000	79.143
F4240136322045	36-322	FLB322-109 ISMB200	NO	4.000	390.256
F4240136322046	36-322	FLB322-110 ISMB125	NO	2.000	50.710
F4240136322047	36-322	FLB322-111 ISMB125	NO	2.000	52.558
F4240136322048	36-322	FLB322-112 ISMB150	NO	4.000	134.372
F4240136322049	36-322	FLB322-113 ISMB600	NO	4.000	4,969.200
F4240136322050	36-322	PLATE 16.0 MM - IS2062E250A	NO	16.000	477.280
F4240136322051	36-322	PLATE 25.0 MM -IS2062E250BR	NO	8.000	357.176
F4240136322052	36-322	PLATE 10.0 MM - IS2062E250A(FE410W)	NO	8.000	54.952
F4240136322053	36-322	SLIDE BEARING PLATE(ASBESTOS FREE)	NO	8.000	36.296
F4240136322054	36-322	ANGLE 50 X 50 X 6 -IS2062E250A	NO	16.000	12.240
F4240136322055	36-322	PLATE 16.0 MM - IS2062E250A	NO	8.000	95.504
F4240136810001	36-810	LSEFFGG 32 X305X6000	NO	10.000	892.880
F4240136810002	36-810	LSEFFGG 32 X515X6000	NO	15.000	2,194.800
F4240136810003	36-810	LSEFFGG 32 X995X6000	NO	15.000	4,149.600
F4240136810004	36-810	CADMIUM PLATED CLIPS	NO	480.000	28.320
F4240136810005	36-810	PLATE 5.00 MM-IS2062E250A	NO	20.000	75.360
F4240136820001	36-820	STAIR-1	NO	2.000	1,449.488
F4240136820002	36-820	HOOD LADDER-1	NO	2.000	251.406
F4240136820003	36-820	VERTICAL LADDER	NO	4.000	131.528
F4240136850001	36-850	HAND RAIL & POST FOR PLATFORM 3M ASSY	NO	2.000	69.090
F4240136850002	36-850	HAND RAIL & POST FOR PLATFORM 4.5M ASSY	NO	6.000	324.828
F4240136850003	36-850	HAND RAIL & POST FOR PLATFORM 6M ASSY	NO	4.000	294.920
F4240136850004	36-850	HAND RAIL POST FOR PLATFORM	NO	40.000	129.920
F4240136850005	36-850	MIDDLE HANDRAIL FOR PLATFORM	NO	52.000	241.280
F4240136850006	36-850	HAND RAIL & POST FORSTAIRS 4.5M ASSY	NO	4.000	166.676
F4240136850007	36-850	HAND RAIL POST FOR STAIR	NO	4.000	13.212
F4240136850008	36-850	MIDDLE HANDRAIL FOR STAIR	NO	4.000	18.560
F4240136850009	36-850	90 DEGREE BEND	NO	116.000	164.024
F4240136850010	36-850	135 DEGREE BEND	NO	8.000	9.376
F4240136850011	36-850	SPL.BEND	NO	4.000	9.772

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F4240136850012	36-850	ERW TUBE DIA. 42.4 X 3.2	NO	11.000	204.138
F4240136850013	36-850	ISA 65X65X6	M	6.000	34.800
F4240136850014	36-850	GUARD PLATE 6	NO	26.000	306.150
F4240137810001	37-810	CORRU.ALU.SHEET 1.6X920X1400-QTY-68 NOS	KG	497.409	497.409
F4240137810002	37-810	CORRU.ALU.SHEET 1.6X920X2500-QTY-34 NOS	KG	444.115	444.115
F4240145200001	45-200	SADC POWER CYLINER 4" X 4" (UPWARD MTG)	NO	8.000	120.000
F4240145200002	45-200	SADC POWER CYLINER 4" X 4"(DOWNWARD MTG)	NO	8.000	120.000
F4240145200003	45-200	BURNER TILT POWER CYLINDER	NO	4.000	800.000
F4240145220001	45-220	FLAT 50 X 6; L=130	NO	24.000	7.200
F4240145220002	45-220	FLAT 50X6; L=17	NO	8.000	0.320
F4240145220003	45-220	PIPE CLAMP FL 50X6; L=97	NO	20.000	4.560
F4240145220004	45-220	TUBE D14X2; L=1000	NO	16.000	9.600
F4240145220005	45-220	TUBE NB 40 D48.3 X 3.68	M	10.000	40.500
F4240145320001	45-320	ANGLE FOR EA ISA75X75X6-1215L	NO	16.000	132.192
F4240145320002	45-320	SHIELDING PLATE FOR EA PL5X186X1215	NO	16.000	141.920
F4240145320003	45-320	ANGLE FOR OIL/AIR/COAL ISA 50X50X6-1215L	NO	140.000	765.520
F4240145320004	45-320	SHIELDING PLATE FOR OIL/AIR PL5X521X1215	NO	32.000	795.040
F4240145320005	45-320	SHIELDING PLATE FOR COAL PL5X519X1215	NO	36.000	891.612
F4240145320006	45-320	SHIELDING PLATE FOR COAL PL5X417X1215	NO	36.000	716.400
F4240145320007	45-320	STOPPER PLATE PL6X50X1215L	NO	36.000	103.428
F4240145320008	45-320	LOCKING PLATE PL6X60X100L	NO	108.000	30.564
F4240145321001	45-321	PLATE WELDMENT-I FOR CORRS 1&3	NO	2.000	317.762
F4240145321002	45-321	PLATE WELDMENT-II FOR CORRS 2&4	NO	2.000	249.996
F4240145321003	45-321	SLOTTED PL(TRUSS) PL25X200X310	NO	4.000	47.200
F4240145321004	45-321	SLOTTED PL(BS SIDE) PL 20X150X370	NO	4.000	28.800
F4240145321005	45-321	PL 20X200X235	NO	4.000	28.000
F4240145321006	45-321	SHIM PL 10X150X150	NO	8.000	14.000
F4240145321007	45-321	SHEAR PIN D 25;69	NO	4.000	1.096
F4240145321008	45-321	SUPPORT PLATE PL 6X75X200	NO	32.000	15.040
F4240145321009	45-321	TUBE D42.4X3.20 L=230	NO	16.000	11.360
F4240145321010	45-321	ANCHOR PIVOT PIN D 33 ; 244	NO	16.000	17.600
F4240145321011	45-321	SPLIT PIN 4X56MM	NO	16.000	0.128
F4240145321012	45-321	FRAME	NO	8.000	315.400
F4240145321013	45-321	PLATE PL.6X199X2614	NO	8.000	195.936
F4240145321014	45-321	PLATE PL.6X150X1223	NO	8.000	68.952
F4240145321015	45-321	SH.2.5X272X1187	NO	8.000	50.712
F4240145321016	45-321	SUPPORT CLIP	NO	96.000	54.720
F4240145321017	45-321	CERAMIC CLOTH SH.3X 80;10MR	NO	4.000	7.680
F4240145321018	45-321	HEX HD BOLT M24X65 CL:10.9	NO	184.000	62.560
F4240145321019	45-321	HEX NUT M24-10	NO	184.000	20.240

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F4240145321020	45-321	MACHINED WASHER 25	NO	40.000	1.280
F4240145321021	45-321	BURNER FRAME WASHER	NO	144.000	10.080
F4240145321022	45-321	PEDESTAL	NO	4.000	56.400
F4240145321023	45-321	BOLT-M16X60	NO	16.000	1.968
F4240145321024	45-321	HEX NUT M16	NO	16.000	0.480
F4240145321025	45-321	PLAIN WASHER A16	NO	16.000	0.608
F4240145321026	45-321	INNER PANEL INT AIR CORNER 1 AND 3	NO	6.000	368.238
F4240145321027	45-321	INNER PANEL INT AIR CORNER 2 AND 4	NO	6.000	368.238
F4240145321028	45-321	INNER PANEL OFA CORNER 1 AND 3	NO	4.000	235.704
F4240145321029	45-321	INNER PANEL OFA CORNER 2 AND 4	NO	4.000	235.704
F4240145321030	45-321	FRONT OUTER PANEL (INT.AIR)(COR 1&3)	NO	6.000	97.560
F4240145321031	45-321	FRONT OUTER PANEL (OFA)(COR 1&3)	NO	2.000	54.654
F4240145321032	45-321	SCRU HEX M8X16	NO	100.000	1.100
F4240145321033	45-321	CAP NUT M8	NO	100.000	1.200
F4240145321034	45-321	PUN WASHER-M8	NO	100.000	0.200
F4240145321035	45-321	FRONT OUTER PANEL (INT.AIR)(COR 1&30	NO	6.000	97.560
F4240145321036	45-321	FRONT OUTER PANEL (OFA)(2&4)	NO	2.000	54.654
F4240145321037	45-321	SCRU HEX M8X16	NO	100.000	1.100
F4240145321038	45-321	CAP NUT M8	NO	100.000	1.200
F4240145321039	45-321	PUN WASHER-M8	NO	100.000	0.200
F4240145321040	45-321	HEX HD SCRUB-M12X30	NO	800.000	32.800
F4240145321041	45-321	NUT -M12	NO	800.000	16.000
F4240145321042	45-321	PUN WASHER-M12	NO	800.000	8.000
F4240145321043	45-321	PACKING CLOTH SH 3X40X 140M	NO	4.000	53.760
F4240145321044	45-321	HIGH TEMP (750F & ABOVE) SPRAY LUBRICANT	NO	4.000	2.000
F4240145321045	45-321	ANTI SIEZE THREAD LUBRICANT	KG	2.000	2.000
F4240145325001	45-325	ANGLE 150 X 150 X 12(FOR IA & OIL COMPT)	NO	32.000	707.616
F4240145325002	45-325	OVERFIRE AIR NOZZLE TIP - CORNERS 1&3	NO	4.000	579.184
F4240145325003	45-325	END AIR NOZZLE TIP CORNERS 1&3	NO	4.000	276.560
F4240145325004	45-325	COAL NOZZLE TIP ASSLY - CORNERS 1&3	NO	18.000	3,782.700
F4240145325005	45-325	OIL NOZZLE TIP CORNERS 1&3	NO	10.000	911.520
F4240145325006	45-325	INTER AIR NOZZLE TIP CORNERS 1&3	NO	6.000	731.568
F4240145325007	45-325	SEAL PLATE FOR COAL TIP - CORNERS 1&3	NO	18.000	317.880
F4240145325008	45-325	TUBULAR REACH ROD CORNERS 1&3	NO	42.000	327.516
F4240145325009	45-325	REACH ROD PIN D16.6;38L	NO	42.000	2.520
F4240145325010	45-325	CONNECTING LINK ASSLY "L"=1985	NO	10.000	52.870
F4240145325011	45-325	REACH ROD PIVOT PIN,D50,L107	NO	42.000	25.200
F4240145325012	45-325	L-LEVER ROUND PIN,D19,L=44	NO	42.000	7.140

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F4240145325013	45-325	HIGH TEMP (750F & ABOVE) SPRAY LUBRICANT	NO	2.000	1.000
F4240145325014	45-325	ANTI SIEZE THREAD LUBRICANT	KG	1.000	1.000
F4240145325015	45-325	CN PIVOT PIN(D22.5);D31,L-63	NO	36.000	7.920
F4240145325016	45-325	SPARE SHEAR PIN;D25 L-69	NO	8.000	2.192
F4240145325017	45-325	ANGLE 150 X 150 X 12(FOR IA & OIL COMPT)	NO	32.000	707.616
F4240145325018	45-325	OVERFIRE AIR NOZZLE TIP - CORNERS 2&4	NO	4.000	579.184
F4240145325019	45-325	END AIR NOZZLE TIP CORNERS 2&4	NO	4.000	276.560
F4240145325020	45-325	COAL NOZZLE TIP ASSLY - CORNERS 2&4	NO	18.000	3,782.700
F4240145325021	45-325	OIL NOZZLE TIP CORNERS 2&4	NO	10.000	911.520
F4240145325022	45-325	INTER AIR NOZZLE TIP CORNERS 2&4	NO	6.000	731.568
F4240145325023	45-325	SEAL PLATE FOR COAL TIP - CORNERS 2&4	NO	18.000	317.880
F4240145325024	45-325	TUBULAR REACH ROD CORNERS 2&4	NO	42.000	327.516
F4240145325025	45-325	REACH ROD PIN D16.6;38L	NO	42.000	2.520
F4240145325026	45-325	CONNECTING LINK ASSLY "L"=1985	NO	10.000	52.870
F4240145325027	45-325	REACH ROD PIVOT PIN,D50,L107	NO	42.000	25.200
F4240145325028	45-325	L-LEVER ROUND PIN,D19,L=44	NO	42.000	7.140
F4240145325029	45-325	HIGH TEMP (750F & ABOVE) SPRAY LUBRICANT	NO	2.000	1.000
F4240145325030	45-325	ANTI SIEZE THREAD LUBRICANT	KG	1.000	1.000
F4240145325031	45-325	CN PIVOT PIN(D22.5);D31,L-63	NO	36.000	7.920
F4240145325032	45-325	SPARE SHEAR PIN;D25 L-69	NO	8.000	2.192
F4240145804001	45-804	BOFA ASSY CORNER 1 AND 3	NO	2.000	9,952.488
F4240145804002	45-804	BOFA ASSY CORNER 2 AND 4	NO	2.000	10,515.158
F4240147200001	47-200	PIPE COUPLING GASKET - 26" H	NO	50.000	65.000
F4240148207001	48-207	HOLLOW SQUARE PITOTTUBE	NO	2.000	944.520
F4240148262001	48-262	STRAIGHT DUCT WALL	NO	4.000	174.568
F4240148262002	48-262	PLATE 6.0 ; 300.0x2800.0	NO	4.000	158.256
F4240148262003	48-262	TRUSS	NO	2.000	47.804
F4240148262004	48-262	TRUSS	NO	2.000	47.724
F4240148262005	48-262	TRUSS	NO	2.000	46.274
F4240148262006	48-262	TRUSS	NO	2.000	46.198
F4240148262007	48-262	STRAIGHT DUCT WALL	NO	4.000	1,058.580
F4240148262008	48-262	STRAIGHT DUCT WALL	NO	4.000	994.516
F4240148262009	48-262	STRAIGHT DUCT WALL	NO	4.000	773.104
F4240148262010	48-262	STRAIGHT DUCT WALL	NO	4.000	718.288
F4240148262011	48-262	TRUSS	NO	4.000	72.444
F4240148262012	48-262	TRUSS	NO	2.000	57.776
F4240148262013	48-262	TRUSS	NO	2.000	57.780
F4240148262014	48-262	STRAIGHT DUCT WALL	NO	4.000	1,400.180
F4240148262015	48-262	STRAIGHT DUCT WALL	NO	2.000	647.850
F4240148262016	48-262	STRAIGHT DUCT WALL	NO	2.000	647.850
F4240148262017	48-262	ELBOW DUCT WALL	NO	2.000	700.880

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F4240148262018	48-262	ELBOW DUCT WALL	NO	2.000	983.302
F4240148262019	48-262	ELBOW DUCT WALL	NO	2.000	1,222.570
F4240148262020	48-262	ELBOW DUCT WALL	NO	2.000	261.108
F4240148262021	48-262	ELBOW DUCT WALL	NO	2.000	312.450
F4240148262022	48-262	ELBOW DUCT WALL	NO	2.000	1,206.464
F4240148262023	48-262	ELBOW DUCT WALL	NO	2.000	459.944
F4240148262024	48-262	ELBOW DUCT WALL	NO	2.000	459.944
F4240148262025	48-262	ELBOW DUCT WALL	NO	2.000	1,206.464
F4240148262026	48-262	TRANSITION DUCT WALL	NO	1.000	305.723
F4240148262027	48-262	TRANSITION DUCT WALL	NO	1.000	367.986
F4240148262028	48-262	TRANSITION DUCT WALL	NO	1.000	438.310
F4240148262029	48-262	TRANSITION DUCT WALL	NO	1.000	390.355
F4240148262030	48-262	T-DUCT WALL	NO	2.000	263.226
F4240148262031	48-262	T-DUCT WALL	NO	2.000	619.642
F4240148262032	48-262	T-DUCT WALL	NO	2.000	121.582
F4240148262033	48-262	T-DUCT WALL	NO	2.000	1,411.640
F4240148262034	48-262	T-DUCT WALL	NO	2.000	1,411.640
F4240148262035	48-262	T-DUCT WALL	NO	2.000	1,320.292
F4240148262036	48-262	T-DUCT WALL	NO	2.000	224.736
F4240148262037	48-262	T-DUCT WALL	NO	2.000	511.372
F4240148262038	48-262	ISM C150 ; 4312.0	NO	4.000	289.772
F4240148262039	48-262	T-DUCT WALL	NO	2.000	216.462
F4240148262040	48-262	T-DUCT WALL	NO	2.000	973.924
F4240148262041	48-262	T-DUCT WALL	NO	2.000	973.924
F4240148262042	48-262	TRUSS	NO	2.000	50.542
F4240148262043	48-262	TRUSS	NO	2.000	50.542
F4240148262044	48-262	TRUSS	NO	2.000	23.368
F4240148262045	48-262	TRUSS	NO	2.000	23.366
F4240148262046	48-262	TRANSITION DUCT WALL	NO	2.000	431.076
F4240148262047	48-262	TRANSITION DUCT WALL	NO	2.000	431.076
F4240148262048	48-262	TRANSITION DUCT WALL	NO	2.000	387.782
F4240148262049	48-262	TRANSITION DUCT WALL	NO	2.000	387.782
F4240148262050	48-262	ELBOW DUCT WALL	NO	2.000	362.582
F4240148262051	48-262	ELBOW DUCT WALL	NO	2.000	353.704
F4240148262052	48-262	ELBOW DUCT WALL	NO	2.000	511.372
F4240148262053	48-262	ELBOW DUCT WALL	NO	2.000	635.458
F4240148262054	48-262	ELBOW DUCT WALL	NO	2.000	121.582
F4240148262055	48-262	ELBOW DUCT WALL	NO	2.000	1,060.352
F4240148262056	48-262	ELBOW DUCT WALL	NO	2.000	1,060.352
F4240148262057	48-262	TRUSS	NO	4.000	101.084
F4240148262058	48-262	TRUSS	NO	4.000	101.084
F4240148262059	48-262	TRUSS	NO	4.000	46.736
F4240148262060	48-262	TRUSS	NO	4.000	46.732
F4240148262061	48-262	STRAIGHT DUCT WALL	NO	2.000	827.842
F4240148262062	48-262	STRAIGHT DUCT WALL	NO	2.000	233.362
F4240148262063	48-262	STRAIGHT DUCT WALL	NO	2.000	567.994
F4240148262064	48-262	STRAIGHT DUCT WALL	NO	2.000	698.644
F4240148262065	48-262	STRAIGHT DUCT WALL	NO	2.000	698.644

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F4240148262066	48-262	STRAIGHT DUCT WALL	NO	2.000	698.414
F4240148262067	48-262	STRAIGHT DUCT WALL	NO	2.000	233.362
F4240148262068	48-262	STRAIGHT DUCT WALL	NO	2.000	632.708
F4240148262069	48-262	STRAIGHT DUCT WALL	NO	2.000	698.644
F4240148262070	48-262	STRAIGHT DUCT WALL	NO	2.000	698.644
F4240148262071	48-262	STRAIGHT DUCT WALL	NO	4.000	284.324
F4240148262072	48-262	STRAIGHT DUCT WALL	NO	4.000	239.724
F4240148262073	48-262	STRAIGHT DUCT WALL	NO	4.000	285.584
F4240148262074	48-262	STRAIGHT DUCT WALL	NO	4.000	240.824
F4240148262075	48-262	T-DUCT WALL	NO	1.000	293.061
F4240148262076	48-262	T-DUCT WALL	NO	1.000	69.972
F4240148262077	48-262	T-DUCT WALL	NO	1.000	58.912
F4240148262078	48-262	T-DUCT WALL	NO	1.000	305.638
F4240148262079	48-262	T-DUCT WALL	NO	1.000	292.886
F4240148262080	48-262	PLATE 6.0 ; 489.0x1950.0	NO	1.000	44.910
F4240148262081	48-262	T-DUCT WALL	NO	1.000	70.795
F4240148262082	48-262	T-DUCT WALL	NO	1.000	66.804
F4240148262083	48-262	T-DUCT WALL	NO	1.000	18.102
F4240148262084	48-262	T-DUCT WALL	NO	1.000	157.256
F4240148262085	48-262	T-DUCT WALL	NO	1.000	292.818
F4240148262086	48-262	T-DUCT WALL	NO	1.000	324.983
F4240148262087	48-262	T-DUCT WALL	NO	1.000	435.748
F4240148262088	48-262	PLATE 6.0 ; 483.0x1950.0	NO	1.000	44.358
F4240148262089	48-262	T-DUCT WALL	NO	1.000	293.061
F4240148262090	48-262	T-DUCT WALL	NO	1.000	69.972
F4240148262091	48-262	T-DUCT WALL	NO	1.000	300.718
F4240148262092	48-262	T-DUCT WALL	NO	1.000	58.912
F4240148262093	48-262	T-DUCT WALL	NO	1.000	287.966
F4240148262094	48-262	PLATE 6.0 ; 489.0x1950.0	NO	1.000	44.910
F4240148262095	48-262	T-DUCT WALL	NO	1.000	70.795
F4240148262096	48-262	T-DUCT WALL	NO	1.000	435.748
F4240148262097	48-262	T-DUCT WALL	NO	1.000	157.256
F4240148262098	48-262	T-DUCT WALL	NO	1.000	66.804
F4240148262099	48-262	T-DUCT WALL	NO	1.000	18.102
F4240148262100	48-262	T-DUCT WALL	NO	1.000	292.818
F4240148262101	48-262	T-DUCT WALL	NO	1.000	324.983
F4240148262102	48-262	PLATE 6.0 ; 483.0x1950.0	NO	1.000	44.358
F4240148262103	48-262	TRANSITION DUCT WALL	NO	1.000	305.723
F4240148262104	48-262	TRANSITION DUCT WALL	NO	1.000	367.961
F4240148262105	48-262	TRANSITION DUCT WALL	NO	1.000	438.310
F4240148262106	48-262	TRANSITION DUCT WALL	NO	1.000	390.355
F4240148264001	48-264	FULLSIZE ROUND CORNER EXPJT 2040X2040#4	NO	8.000	6,378.816
F4240148264002	48-264	FS RC EXPN JOINT 2890X2890 #2	NO	6.000	4,045.920
F4240148264003	48-264	FULLSIZE ROUND CORNER EXPJT 2634X1260 #2	NO	4.000	1,902.040
F4240148265001	48-265	RESTRAINT-1	NO	32.000	309.952
F4240148265002	48-265	PLT 16;250X200	NO	22.000	138.160

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F4240148265003	48-265	PLT 16;475X200	NO	10.000	119.320
F4240148265004	48-265	PLT 16;476X475	NO	2.000	56.796
F4240148265005	48-265	CHANNEL BOX-2	NO	4.000	570.588
F4240148265006	48-265	CHANNEL BOX-3	NO	8.000	540.832
F4240148265007	48-265	CHANNEL BOX-4	NO	4.000	543.708
F4240148265008	48-265	CHANNEL BOX-5	NO	4.000	420.456
F4240148265009	48-265	CHANNEL BOX-6	NO	2.000	223.720
F4240148265010	48-265	CHANNEL BOX-7	NO	2.000	223.720
F4240148265011	48-265	CHANNEL BOX-8	NO	2.000	226.860
F4240148265012	48-265	RESTRAINT-2	NO	18.000	309.402
F4240148265013	48-265	CHANNEL BOX-9	NO	4.000	243.136
F4240148265014	48-265	CHANNEL BOX-10	NO	4.000	426.480
F4240148265015	48-265	CHANNEL BOX-11	NO	4.000	210.856
F4240148265016	48-265	CHANNEL BOX-12	NO	8.000	599.872
F4240148265017	48-265	CHANNEL BOX-13	NO	8.000	955.552
F4240148265018	48-265	RESTRAINT-3	NO	16.000	249.584
F4240148265019	48-265	STOPPER	NO	28.000	41.216
F4240148265020	48-265	EXPANSION JOINT (W.BCONN. DUCT)	NO	8.000	122.520
F4240148265021	48-265	EXPANSION JOINT (W.BCONN. DUCT)	NO	8.000	119.976
F4240148265022	48-265	EXPANSION JOINT (W.BCONN. DUCT)	NO	2.000	21.694
F4240148265023	48-265	OMEGA EXP. JOINT	NO	2.000	56.272
F4240148265024	48-265	OMEGA EXP. JOINT	NO	2.000	73.424
F4240148265025	48-265	OMEGA EXP. JOINT	NO	4.000	22.712
F4240148915001	48-915	MAN HOLE DOOR 450X450 - CS	NO	6.000	346.296
F4240148915002	48-915	GRAB BAR-1	NO	6.000	20.400
F4240148915003	48-915	GRAB BAR-2	NO	6.000	51.600
F4240148993001	48-993	PLATE 6	M2	25.000	1,177.500
F4240148993002	48-993	ISA 75X75X6; 15 RM	M	15.000	102.000
F4240148993003	48-993	ISM 100; 10 RM	M	10.000	95.600
F4240148993004	48-993	ISM 150; 15 RM	M	15.000	252.000
F4240148993005	48-993	ISM 200; 7 RM	M	7.000	239.400
F4240148993006	48-993	PIPE DIA 89.5: 10 RM	M	10.000	98.500
F4240148993007	48-993	SH 2; 25	M2	25.000	196.250
F4240148993008	48-993	PLATE 10 MM-IS2062E250A	M2	2.000	157.000
F4240148993009	48-993	PLATE 16	M2	2.000	251.200
F4240148993010	48-993	ISM 125; 15 M	M	15.000	196.500
SUB TOTAL WEIGHT OF NON PRESSURE PARTS					144386.739
TOTAL WEIGHT(PP+INS+NPP)/UNIT				200720.152 KGS	
TOTAL WEIGHT //UNIT				200.72 MT	
TOTAL WEIGHT OF ITEMS FOR THREE UNITS				602.16 MT	

Note: Quantity variation as per GCC shall be applicable.

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ANNEXURE-III

[REF. PRICE SCHEDULE, VOL-III, SCH-2, SL. NO.C]

TENTATIVE LIST OF NEWLY SUPPLIED C&I & ELECTRICAL ITEMS DETAIL FOR SHIFTING FROM STORE/YARD TO SITE,ERECTION,ALIGNMENT , CABLE TRAY ERECTION,CABLE LAYING, CABLE DRESSING AND TAGGING, GLANDING, FERRULING & CABLE TERMINATION /SPlicing,PRE-COMMISSIONING & TESTING,COMMISSIONING ,CHARGING & PG TEST ETC. FOR DE-NOX SYSTEM OF BOILER U#5,6&7 (3X500 MW) AT NTPC-Kahalgaon

B) NEWLY SUPPLIED ITEMS(PER BOILER)

DU/MTL CODE	PGMA	Description	Unit	Qty/ Unit	Qty for Three Units
F4240197282001	97-282	NORMALLY CLOSED - SOLENOID VALVE	NO	6	18
F4240197282002	97-282	NORMALLY OPEN - SOLENOID VALVE	NO	6	18
F4240197591001	97-591	BURNER TILT SHEAR PIN FAILURE INDI. BOX	NO	1	3
F4240197591002	97-591	HEAVY DUTY LIMIT SWITCH	NO	6	18
	95-088	FSSS FLAME SCANNERS items	Set	1	3
		Flame Scanner Pigtail Cable	No	9	27
L424119759201001	97592	CONNECTOR,1/2" NPT(F) X 1/4" OD, SS	No	40	120
L424119759201002	97592	CONNECTOR,1/2" NPT(F) X 3/8" OD, SS	No	5	15
L424119759201003	97592	CONNECTOR,1/4" NPT(M) X 1/4" OD, SS	No	70	210
L424119759201004	97592	CONNECTOR,3/8" NPT(M) X 3/8" OD, SS	No	10	30
L424119759201005	97592	EQUAL TEE UNION, 1/4", SS	No	30	90
L424119759201006	97592	EQUAL TEE UNION, 3/8", SS	No	5	15
L424119759201007	97592	STRAIGHT CONNECTOR,1/4" OD, SS	No	55	165
L424119759201008	97592	BULKHEAD CONNECTOR,1/4" BSP(M) X 1/4" OD	No	60	180
L424119759201009	97592	ELBOW,1/4" BSP(M) X 1/4" BSP(F), SS	No	60	180
L424119759201010	97592	TAPE, 1/2" -10 METERS, TEFLON	Nos	10	30
L424119759201011	97592	ALUMINIUM STRIPS - 300 MM X 25 MM X 3 MM	Nos	50	150
L424119759202001	97592	1/4" OD SS TUBE	Mtrs	650	1950
L424119759202002	97592	3/8" OD SS TUBE	Mtrs	10	30
L424119759203001	97592	1/4" TEFLON HOSE- 2 METER PER PIECE	Mtrs	28	84
L424119759204001	97592	EQUAL TEE, 3/4", A105, CL:	Nos	10	30

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		3000			
L424119759204002	97592	REDUCER, 3/4" SW X 1/2" NPT(M), A105	Nos	12	36
L424119759204003	97592	EQUAL TEE, 3/4", SS304, CL:3000	Nos	2	6
L424119759204004	97592	REDUCER, 3/4" SW X 1/2" NPT(M), A105	Nos	4	12
L424119759204005	97592	SEAMLESS TUBE, 3/4" SCH 40, A213 TP304	Nos	24	84
L424119759204006	97592	REDUCER, 1" SW X 3/4" SW, A105	Nos	2	6
L424119759204007	97592	COUPLING, 3/4", SS304, CL: 3000	Nos	20	60
L424119759204008	97592	PIPE NIPPLE, 1" SCH 40, PLAIN, SS304	Nos	4	12
L424119759204009	97592	EQ TEE, 1" SW X 1" NPT(F) X 1" SW, SS304	Nos	2	6
L424119759204010	97592	GATE VALVE, 3/4" SW, CL:150, A105	Nos	6	18
L424119759204011	97592	NIPPLE, 1" SCH40, 1"NPT(M)X1" SW, A105	Nos	2	6
L424119759204012	97592	REDUCER, 1" SW X3/4" SW, SS304	Nos	2	6
L424119759601001	97596	FIXED HD CCTV CAMERA FOR HOPPER VIEWING	Nos	4	12
L424119759601002	97596	ACCESSORIES FOR FIXED HD CAMERA SYSTEM	Set	1	3
	95-282	Flowmeters	Set	1	3
	95-591	BURNER TILT SHEAR PIN FAILURE SYSTEM a) Junction Box for Shear pin failure indication-4 Nos b)Limit switch for shear pin failure indication-20 Nos	Set	1	3
		INSTRUMENTATION CABLES: a) 2PX0.5 Sq mm I & OA shielded : 1200 mtrs b) 4PX0.5 Sq mm I & OA shielded : 3000 mtrs c) 8PX0.5 Sq mm I & OA shielded: 900 mtrs	Set	1	3
		POWER CABLES: a) 2CX2.5 Sq mm power cable:Qty1080 Mtrs b) 3CX2.5 Sq mm power cable:Qty 900 Mtrs c) 10CX2.5 Sq mm power cable:Qty 800 Mtrs d) 3CX10 Sq mm power cable: Qty 400 Mtrs	Set	1	3
		CONTROL CABLES FOR CO ANALYSER: 5CX2.5 Sq MM,	Mtrs	1500	4500

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		12CX2.5 Sq MM,19CX1.5 Sq MM			
		CABLE TRAYS a) Height 25 mm, Width 50 mm, Qty 125 Mtrs b) Height 50 mm, Width 100 mm, With Cover: Qty 175 Mtrs c) Height 40 mm, Width 150 mm, With Cover: Qty 312.5 Mtrs	Set	1	3
		JUNCTION BOX a) 24 Way JB: Qty 5 Nos b) 48 Way JB: Qty 2 Nos	Set	1	3
	95-596	CCTV system	Set	4	12
		CO Analyser & Panel	Nos	1	3
		Flow/Electronic Transmitters	Nos	2	6
		Local Instrument Enclosure	Nos	3	9
		SOCKET WELD FITTINGS	Set	1	3
		Airfilter Regulator	Nos	4	12
		Pr switch	Nos	4	12
		E/p Converter	Nos	4	12
		LIE/LIR	Nos	3	9
		Impulse Pipe, ASTM A106 GR C 3/4" NB SCH 80	Mtrs	300	900
		Erection Materials			
		GI PIPE-1/2" NB "GI pipe-1/2" NB Heavy grade / as per IS1239 threaded ends (1/2" NPT) to be protected Running length 6 Meters"	Mtrs	50	150
		MS Channel 100x50x5 mm Web thick as per IS 2062 Grade A,	Mtrs	200	600
		MS Angle 50x50x6 mm Web thick as per IS 2062 Grade A	Mtrs	400	1200
		MS Plate 10mm thick IS2062	Kgs	100	300
		HR Sheet 2.5mm thick as per IS 1079	Kgs	100	300
		NIPPLE MAT: ASTM A106 Gr.B SIZE: 1" PLAIN SCH 40 LENGTH = 100 mm	Nos	2	6
		NIPPLE MAT: ASTM A106 Gr.B SIZE: 3/4" NB SCH 80 / LENGTH = 100 mm ONE END - 3/4" NTPM ,OTHER END : PLAINCAP/ ASTM A 105 -SIZE - 3/4" NPTF	Nos	4	12
		Flexible Hose SS Braided 1/2" OD x 1 Meter with clamps.One	Set	1	3

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		end with adopter of 1/2" NPTM and other end with Bras adopter of 1/2" NPTF Rating 10 KG/CM2			
		"Isolation valve Ball type body a 105 & Trim=SS 316. Size:1/2"NPTF Pr. Testing:900PSI"	Nos	2	6
		COUPLING, MAT spec: ASTM A105 GALVANISED TO 10/15 MICRONS SIZE: 1/2" NPTF/ PR. TESTING: 800 PSI	Nos	35	105
		ELBOW, MAT Spec: ASTM A105 GALVANISED TO 10/15 MICRONS SIZE: 1/2" NPTF/ PR. TESTING: 800 PSI	Nos	10	30
		EQUAL TEE, MAT Spec: ASTM A105 GALVANISED TO 10/15 MICRONS SIZE: 1/2" NPTF/ PR. TESTING: 800 PSI	Nos	10	30
		THREE PIECE UNION, MATL: ASTM A105 GALVANISED TO 10/15 MICRONS, SIZE: 1/2" NPTF, PRESSURE RATING: 800 PSI.	Nos	8	24
		U CLAMP - TO SUIT 3/4" NB PIPE WITH NUTS AND WASHERS CS GALVANISED TO 10/15 MICRONS	Nos	500	1500

Note: Quantity & Size of C&I & Electrical Works/Items as mentioned above may vary to any extent. No extra payment shall be made for quantity/size variation to complete the NOx modification package.

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ANNEXURE-IV
[REF. PRICE SCHEDULE, VOL-III, SCH-2, SL. NO.D]

TENTATIVE WEIGHT OF ITEMS (Mechanical/Electrical/C&I) FOR MATERIAL HANDLING IS MENTIONED BELOW. HOWEVER, ACTUAL QTY OF ITEMS TO BE DISMANTLED TO BE DECIDED AS PER ENGINEER I/C.

Approximate weight of Items (Mechanical/Electrical/C&I) for Material Handling/Material Management is 210 MT/Unit (Refer Annex-II & III for list of items)

Thus for three units, total weight of items for Material Handling/Material Management is 630 MT

Shifting/re-stacking of Existing Materials inside covered store/semi covered store/matl yard for three unit is 10 MT

Note: Quantity variation as per GCC shall be applicable.

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ANNEXURE-V

TENTATIVE LIST OF T&P & MMD TO BE PROVIDED FOR DE-NOX SYSTEM OF U#5,6&7 AT NTC KAHALGAON

SL NO	DESCRIPTION OF EQUIPMENT	CAPACITY	MINIMUM QUANTITY /Boiler
A	T&P		
01	Tyre mounted mobile crane/hydra	12/ 14 T	01 No Minimum/Boiler
02	Tyre mounted mobile crane/hydra	12/ 14 T	01 No minimum for Material Management for total Project
03	Trailer (45-50 ft)	28 T, flat bed	As Required
04	Truck/ tractor trolley	9T/ 12T capacity	01 No minimum
05	Welding Generator / transformer (with welding cables)	As required	As Required
06	Heating torch along with regulator & hoses	As per requirement	As Required
07	TIG set with Argon regulator	As required	As Required
08	Tube Cutting Machine-As reqd	As required	As Required
09	Pre Heat, PWHT/Stress relieving Equipment & accessories	As required	As Required
10	Radiography Equipment	As required	As Required
11	3 phase distribution board with complete set up for drawl of construction power.	400 amp	As Required
12	Winches (electric) (winches also includes wire ropes) Winches (Hand operated)	10 T 05 T 3 T 2 T 1T	10 T-02 Nos Minimum Others, as required
13	Electric cable for drawl & distribution of construction power	As per requirement	As Required
14	Semi-automatic welding m/c	As per requirement	As Required
15	Baking oven and holding oven with thermostat and temperature gauge for baking coated welding electrodes	As per requirement	As Required
16	Portable oven for coated welding electrodes	As per requirement	As Required
17	Hydraulic jacks	As per requirement	As Required
18	Slings, pulleys and de-shakles (from 1T to 10 T)	From 1T to 10 T capacity	As Required
19	Scaffolding pipes	As per requirement	As Required
20	Digital coat meter	As per requirement	As Required
21	LPI kit	As per requirement	As Required
22	All Ring & D.E. Spanners upto 36mm	As per requirement	As Required

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23	Slogging spanners from 36mm to 100 mm	As per requirement	As Required
24	Adjustable Spanners	As per requirement	As Required
25	Allen key set upto (17 mm)	As per requirement	As Required
26	Hammer upto (05 Kg.)	As per requirement	As Required
27	Screw Driver all sizes	As per requirement	As Required
28	Hack – saw Frame	As per requirement	As Required
29	Files (smooth, rough) round, half round	As per requirement	As Required
30	Inside & Outside Circlip pliers	As per requirement	As Required
31	Wire rope (sling) 8mm, 12mm & 16mm (duly tested) Inappropriate length	As per requirement	As Required
32	D. Shackle 2T, 3T, 5T (duly tested)	As per requirement	As Required
33	Cutting torch along with regulator & hoses	As per requirement	As Required
34	Straight grinder	As per requirement	As Required
35	Chain Pulley block (2T, 3T) (duly tested)	As per requirement	As Required
36	Chain Pulley block (5T) (duly tested)	As per requirement	As Required
37	Angle Grinder	As per requirement	As Required
38	FF2 Grinder	As per requirement	As Required
39	Chisel 5", 12"	As per requirement	As Required
40	Try Square	As per requirement	As Required
41	Portable Electrode Heating oven	As per requirement	As Required
42	Vernier caliper	As per requirement	As Required
43	Measuring Tape (5 M)	As per requirement	As Required
44	Measuring Tape (10 M, 15 M)	As per requirement	As Required
45	Torch	As per requirement	As Required
46	24 V lamps and transformers	As per requirement	As Required
47	Lighting/ Extension Boards with ELCB, industrial plugs 5 point (Upto 15 Amp)	As per requirement	As Required
48	Multipoint Welding Transformer	As per requirement	As Required
49	Phase Sequence Indicator	As per requirement	As Required
50	Tong tester (Up-to 400A Range)	As per requirement	As Required
51	Leakage Tester (DC/AC) - mA Range	As per requirement	As Required
52	Voltmeter (mV – 750V Range)	As per requirement	As Required
53	Insulation Resistance Tester (Megger)	As per requirement	As Required
54	mV/mA Calibrator	As per requirement	As Required
55	Cable Continuity Tester	As per requirement	As Required
56	Micro ohm meter	As per requirement	As Required
57	Special cable (FO/UTP/Ethernet etc) termination kit	As per requirement	As Required
58	3-Phase/ 1-Phase Variac	As per requirement	As Required
59	Winding resistance measuring meter	As per requirement	As Required
60	Digital Multi-meters	As per requirement	As Required
61	LT cable termination kit	As per requirement	As Required
62	2.5 & below lugs.	As per requirement	As Required
63	PVC tape	As per requirement	As Required
64	Ferrule Typing machine	As per requirement	As Required
65	Drill Machine	As per requirement	As Required
66	Cable crimping tools	As per requirement	As Required
67	Electric blower (Normal/Hot)	As per requirement	As Required
68	Other MMD's		
	straight edge, master level, square level, inside & outside micrometer, taper gauge, filler gauge, dial	As per requirement	As per requirement

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	gauge,tape, etc		
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NOTE	
1.0	Bidder shall note that, this list is not exhaustive and they may be required to provide additional T&Ps not stated in the list for proper execution of job, at no extra cost to BHEL.
2.0	MMD and T&P shall be mobilized and deployed by successful bidder, as required at site for successful execution of the job. Deployment plan of T&P, MMD shall be jointly finalised based on project requirement prior to start of work. The plan might undergo revision depending on project requirement. Depending upon the jointly agreed deployment program, any additional T&P, MMD, if required, for proper completion of job, shall have to be deployed by successful bidder. Similarly, if any of the aforesaid items is not required for the job as per jointly agreed program, successful bidder need not have to deploy the same.
3.0	Apart from above, in case successful bidder fail to deploy other T&Ps as per jointly agreed schedule, BHEL reserve the right to deploy the same at the risk & cost of successful bidder or levy penalty at a rate, to be rationally derived by BHEL. Decision of BHEL shall be final & binding on successful bidder.
4.0	The contractor shall ensure deployment of reliable & calibrated instrument, measuring and test equipment (MMD). The MMD shall have test calibration certificate from authorized/ Govt approved agencies. The contractor shall also keep provision of alternate engagement for such MMD so that the work does not suffer when a particular MMD is sent for calibration. Re-testing/ re-calibration shall also be arranged by the contractor at their own cost at regular interval during the period of use as advised by BHEL.
5.0	Sufficient measures shall be taken by the successful bidder to minimise the radiography test at site and maximise the use of Ultrasonic testing wherever applicable.
6.0	The above major T&P list is indicative only. Additional T&Ps, if required have to be mobilized by the successful bidder within the accepted rate.
7.0	In addition to the above necessary lifting tackles like slings, D-shackles, chain pulley blocks, tripods etc. are to be arranged by bidder. T&P shown in the above mentioned list are minimum requirement. Further requirement will be reviewed time to time at site and vendors will provide additional T&P/ equipments to ensure completion of entire work within schedule time without any financial implication to BHEL. Vendor will give advance intimation & certification regarding capacity etc prior to dispatch of heavy equipment.

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ANNEXURE-VI

TENTATIVE LIST OF CONSUMABLES /PROTECTIVE MATERIAL AS REQUIRED TO BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST

SL NO	DESCRIPTION OF ITEMS
01	Electrodes & Filler Wire for CS, SS, AS – As required except for the special electrodes supplied by BHEL manufacturing units.
02	Different gases like O2, CO2, Nitrogen, Argon, D/A, etc.
03	CTC, petrol, diesel, kerosene, Rustolene.
04	Lapping pastes.
05	NDE consumables.
06	Hoses and clamps of different sizes.
07	Touch-up paints, preservatives and other consumables.
08	Cotton wastes, jutes etc.
09	Primer and finish paint (To be sourced from BHEL approved manufacturer).
10	Grouting cement as applicable.
11	Other consumables to complete the job.
12	All materials including cement, reinforcement steel, structural steel, AC sheeting, Windows, doors, MS/ Aluminum fittings, plastering, painting, flooring, roofing, etc, complete as per drawings, specification, etc, as required for construction of the pit.

NOTE	
1.0	Bidder shall note that this list is not exhaustive and they may be required to provide additional consumables not stated in list for proper execution of job, at no extra cost to BHEL. Successful bidder may have to provide nut, bolt, washer, etc. as referred in exceptional cases in case of any shortage of supply from BHEL's end. Accordingly, total implication in this regard is insignificant in comparison to total magnitude of work and bidder may work out implication of these items base on their previous exposure.
2.0	Deployment plan of major consumables shall be jointly finalised based on project requirement prior to start of work. The plan might undergo revision depending on project requirement. Depending upon the jointly agreed deployment program, any additional consumables, if required for proper completion of job, shall have to be deployed by the successful bidder. Similarly, if any of the aforesaid items is not required for the job as per jointly agreed program, the successful bidder need not have to deploy the same.

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ANNEXURE-VII

SPECIFICATION OF PAINTING WORK

1.0	The following Indian Standards may be referred to for carrying out the painting job: IS - 1303, 2379, 1477, 2524, 2395, 2338, 6278, 3140, 158, 2074, 104, and 2932.
2.0	All surfaces to be painted shall be thoroughly cleaned of all grease, oil, loose mill scale, dust, rust and any other foreign matter by mechanical cleaning with power tool, scrapping with steel wire brushes, and sand scrapping with wire brush/emery paper as per requirement. Cleaning with solvents shall be adopted only after approval of the customer.
3.0	After the surface is prepared, one coat of Zinc Phosphate primer conforming to IS: 2074 shall be applied. After first coat is dried up completely, second coat of red oxide primer shall be applied by brushing to ensure continuous film. The dry film thickness of each coat shall be minimum 25 microns.
4.0	Synthetic enamel paint conforming to IS: 2932 shall be used for finish coats. The color/ shade shall be as approved by the customer. After cleaning the dust on the dried up primer, first coat of synthetic enamel shall be applied. After this first coat dries up hard, the surface should be wet scrubbed cutting down to smooth finish and ensuring that at no place the first coat is completely removed. After applying second coat, allowing the water to get evaporated completely, third finish coat of painting shall be applied.
5.0	For all electrical equipment, powder coating shall be done as per the relevant standard.
6.0	Painting and Marking/Labeling of the materials erected. Supply of paints is included in the Scope of Work of the Sub-contractor.

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Annexure-VIII

TENTATIVE UNIT WISE COMPLETION SCHEDULE (IN DAYS) FOR DE-NOX SYSTEM OF U#5,6&7(3X500 MW) AT
NTPC KAHALGAON STPS

SI No	Description of area/major milestones	U#5		U#6		U#7	
		Start	Finish	Start	Finish	Start	Finish
1.	Material Handling	July'2020 till commissioning of Unit & reconciliation of Material					
2.	Pre Shutdown Activities (25 Days/ Unit)	26/08/2020	19/09/2020	16/10/2020	09/11/2020	29/03/2021	21/04/2021
3.	Shutdown/Renovation activities of Boiler De-Nox System (35 Days/Unit)	20/09/2020	24/10/2020	10/11/2020	14/12/2020	22/04/2021	26/05/2021
4.	Post Shutdown Commissioning Activities/Completion of All facilities (60 Days/Unit)	25/10/2020	23/12/2020	15/12/2020	13/02/2021	27/05/2021	25/07/2021

Note:

1. The above schedule is tentative only. The shutdown month/date, Unit number may get pre-ponnd/post pond, vendor will have to arrange full mobilization as per intimation of BHEL site I/C.
2. "Finish" means last day of completion of the period of particular activity.
3. Agency has to deploy resources to carry out parallel work in all units (if needed).
4. Agency should also be geared up to take up shut down works in both units/multiple units simultaneously, if such need arises.

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Annexure -IX

Receipt, unloading, storage, Dismantling, material transportation (store/yard to site)New Material Erection, Re-Erection of Old Items, Modification of existing Items, Rstoration, Commissioning,Testing & PG Test etc.of Combustion modification system for Nox mitigation at U#5,6&7 at NTPC –KAHALGAON SSTPS (3x500 MW).			
List of tentative manpower required for the job is mentioned below. Contractor is to depute sufficient manpower to ensure round the clock working			
MANPOWER	CATEGORY	MINIMUM NO. OF MANPOWER PER BOILER	
		DURING SHUTDOWN	DURING PRE-SHUTDOWN
Safety Engr	Highly Skilled	1	1
Quality Engr/Quality Supervisor	Skilled	1	1
Engineer/Supervisor(Mechnaical)	Skilled	3	1
Engineer/Supervisor(C&I)	Skilled	1	1
HP Welder(IBR)	Highly Skilled	3	1
Welder(Non-IBR)	Skilled	4	1
Structural welder	Skilled	2	2
fitter(Pressure parts)	Highly Skilled	2	1
fitter(Ducts)	Skilled	2	2
fitter(Structures)	Skilled	2	1
Gas cutter	Skilled	4	2
Sarang	Skilled	2	2
Electrician	Skilled	4	1
Jr. Fitter	Semi-Skilled	4	2
Electrical & C&I Technician	Skilled	6	2
Grinder	Semi-Skilled	4	2
Rigger	Un-skilled	21	8
Helper	Un-skilled	30	8
Expert for Boiler Pr Parts&Burner	Expert	1	0
	Total	97	38
Site In Charge	Highly skilled	1 no. (for three units)	
MM – supervisor	skilled	1 no. (for three units)	
Store keeper	Semi skilled	1 no. (for three units)	

Note: 1) The above list is for tentative minimum required manpower for the subject job. During execution, as per requirement vendor has to mobilize sufficient manpower to complete the job as per shutdown schedule. In case vendor failed to mobilize sufficient manpower, BHEL shall arrange the same at the risk & cost of the vendor with applicable Overhead.

2) Time is the essence of this contract. Hence contractor must mobilize site with adequate manpower for round the clock 12 hours shifts work during the entire duration.