E-TENDER SPECIFICATION NO

BHE/PW/PUR/WRB-BOILER/3233

Modification of Steam Generator (Boiler) of 210 MW for comprehensive work of availability and efficiency improvement through modification/Overhauling of Boiler back pass/ Boiler Pressure parts, fuel firing system, ducts, milling system & APH and flexible operation at 40% TMCR load without oil support at 210 MW , U#2, GSECL Wanakbori TPS, DIST – KHEDA, (GJ)

VOLUME I – TECHNICAL BID

THIS TENDER SPECIFICATION CONSISTS OF:

Notice Inviting Tender	
Volume-IA	**Technical Conditions of Contract**
Volume-IB	**Special conditions of Contract**
Volume-IC	**General conditions of Contract**
Volume-ID	**Forms & Procedures**
~~**Volume-IE**~~	~~**Technical Specifications**~~
Volume II	**Price Bid**

Bharat Heavy Electricals Limited
(*A Government of India Undertaking*)
Power Sector - Western Region
345-Kingsway, Nagpur-440001

CONTENTS		
Volume No	Description	Hosted in website bhel.com (Briefly) and detailed in BHEL e-Procurement Portal as files titled
NIL	Tender Specification Issue Details	(Part of **Vol-IA-3233**)
NIL	Notice Inviting Tender	(Part of **Vol-IA-3233**)
I-A	Technical Conditions of Contract	Vol-I-A-3233
I-B	Special Conditions of Contract	Vol-I-BCD-3233
I-C	General Conditions of Contract	(Part of Vol-I-BCD-3233)
I-D	Forms & Procedures	(Part of Vol-I-BCD-3233)
I-E	~~Technical Specifications~~	~~Vol-I-E-3233~~
II	Price Bid Specification as specified in E-Procurement Portal	Volume-II-Price Bid-3233

E-T E N D E R S P E C I F I C A T I O N

No. BHE/PW/PUR/WRB-BOILER/3233

Modification of Steam Generator (Boiler) of 210 MW for comprehensive work of availability and efficiency improvement through modification/Overhauling of Boiler back pass/ Boiler Pressure parts, fuel firing system, ducts, milling system & APH and flexible operation at 40% TMCR load without oil support at 210 MW , U#2, GSECL Wanakbori TPS, DIST – KHEDA, (GJ)

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION Refer Notice Inviting Tender .

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- II ARE ISSUED TO:

M/s. ……

……

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

GM (Purchase)

Place: Nagpur
Date:

3233

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED

Sl No	DESCRIPTION	Chapter
Volume-IA	Part-I: Contract specific details	
1	Project Information	Chapter-I
2	Scope of Works	Chapter-II
3	Special Terms and Other Conditions	Chapter-III
4	T&Ps and MMEs to be deployed by Contractor	Chapter-IV
5	Quality Requirements	Chapter-V
6	Time Schedule	Chapter-VI
7	Terms of Payment	Chapter-VII
8	Taxes and other Duties	Chapter-VIII
9	Facilities in the scope of Contractor/BHEL	Chapter-IX
10	Broad BOM	Annexure I
11	PPA of Boiler with Modification details	Annexure II
12	Erection welding schedule for pressure parts	Annexure III
13	GSECL General safety Rules/Norms	Annexure Iv

1.0 Project Information:

GUJRAT STATE ELECTRICITY CORPORATION LIMITED. (GSECL) WANAKBORI THERMAL POWER PROJECT LOCATED AT, DISTT. KHEDA IN GUJRAT STATE COMPRISING OF 08 UNITS OF DIFFERENT CAPACITIES. THE WORK/TENDER IS FOR UNIT-2 OF 210 MW. IN THIS UNIT, THE BOILER IS CE DESIGN AND TURBINE IS LMZ DESIGN MANUFACTURED BY BHEL AND COMNMISSIONED IN YEAR 1983.

Sl. No.	Description	Details
1.1	Location	Wanakbori
1.2	Nearest Railway Station	Godhara (30Kms)
1.3	Nearest Airport	Ahmedabad (100Kms)
1.4	Access By Road	Godhara (30Kms)
1.5	Major Towns/Cities	Godhara (30Kms) / Ahmedabad (100Kms)
1.6	Source of Water	Mahi River.
1.7	Maximum Temperature	45 degree Centigrade
1.8	Minimum Temperature	10 degree Centigrade

The Bidder shall visit site and get acquainted himself with the conditions prevailing at site before submission of the bid. The information given here in under are for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data/information as may be necessary shall have to be obtained /collected by the Bidder.

The Bidder shall visit site and get acquainted himself with the conditions prevailing at site before submission of the bid. The information given here in under are for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data/information as may be necessary shall have to be obtained /collected by the Bidder.

The work under the scope of these specifications is broadly as follows.

DISMANTLING WEIGHT: 2934 MT APPROX

ERECTION WEIGHT:

Sl.No.	Items	Weight In MT(approx.)
1	Pressure Parts	768
2	Non Pressure Parts	1367
3	Structure	232
4	Refractory & Insulation	480
5	Rotary Machines	450
6	Hangers & Supports	05
	Total	**3302**

- *This weight is indicative only and may differ as per actual shipping list. Any Quantity Variation shall be considered as per GCC.*

Bidders are requested to have pre-bid visit/ inspection of site to make them fully acquainted with the site situation & nature of job. No claim shall be entertained at later date on account of non-familiarization of site condition.

Contact Details of persons for Site Visit:

Sh Uma Kant Sharma
BHEL Site Office
U#1&2 Wanakbori TPS
Email: uks@bhel.in
Ph no: +91-9429198204

PRE SHUTDOWN WORK

1. Mobilization of site 45 days before the shutdown of the unit with adequate manpower and T&P for Erection of temporary structures/platforms, arrangement of electric winches, Hydra, cranes, lifting & transporting equipment as required for dismantling & erection activities and fabrication of ducts before the start of shutdown.
2. **Arrangement of 150-200 Ton capacity tire mounted Crane with adequate boom length or Jib arrangement for APH dismantling and erection purpose and other erection purposes.**

However, if higher capacity crane shall be required to complete the work, same shall be arranged by bidder at no extra cost. Bidder may visit the site for assessment of capacity & positioning of crane.

3. Identification/Verification of materials to be erected & also as per shipping list (APH, duct, mills &Boiler)
4. Arrangement of consumables like approved welding electrodes, filler wire, Argon, Oxy-acetylene gases, any other special electrode if required etc.
5. Arranging Gate pass & Accommodations for staff & workers to be deployed for the job.
6. Shifting of material to store and T&Ps. Temporary store shall be made/fabricate by contractor as space provided by GSECL
7. To obtain all required statutory approvals like labour license, safety training & insurance, etc.
8. To obtain IBR approvals for work execution & open/ground inspection of materials and work and endorsement of HP welders certificates.
9. Making arrangements for the stay of staff and workers at site.
10. Shifting of special T&Ps to Site.
11. Making arrangements for transportation of staff and workers at site.
12. Transportation Erection Material from BHEL/GSECL Store to Site.
13. Arrangement of hydra, crane, truck, trailer, trolley as required for work.
14. Heat treatment & radiography Facility shall be arranged by contractor in advance.
15. Sky climber/cup lock, if required, for the removal and installation of burner assembly and alignment of the burners, will be in vendor's scope.
16. Enerpac make close height Hydraulic jacks of 50T and 100T capacity - 4 nos. each shall be arranged by the contractor in 100 % working conditions, if required.
17. Removal and re-installation of structure or any other equipment for erection of new component is in bidder's scope.
18. The below Electrodes shall be provided by BHEL, rest other electrodes shall be procured by bidder as required.

DU	WBS Element	DU Desc	Unit	DU Area	DU Qty	DU Wt
F429311299 2001	R2/4293-HT-250-1-12-992	ER 70S-A1 GTAW ROD DIA2.4MM	KG	WTC	41.200	41.200
F429311299 2002	R2/4293-HT-250-1-12-992	ER80S-B2 GTAW ROD DIA.2.4MM	KG	WTC	12.900	12.900
F429311999 2001	R2/4293-HT-259-1-19-992	ER 70S-A1 GTAW ROD DIA2.4MM	KG	WTC	15.400	15.400
F429314299 2001	R2/4293-LU-230-1-42-992	ER 70S-A1 GTAW ROD DIA2.4MM	KG	WTC	10.000	10.000
P429318299 2001	R2/4293-HT-927-1-82-992	ER 70S-A1 GTAW ROD DIA2.4MM	KG	PCC	12.000	12.000

Note: Bidders are advised to make a site visit to have on hand information about the prevailing site conditions and also accommodation arrangements for his manpower, may meet concerned GSECL officials at site in this regard.

2. SCOPE OF WORK

2.1 Erection & Commissioning of Boiler Pressure parts i.e. Economizer, LTSH, Steam Cooled Wall, Headers, Back Pass roof and Buck Stay, Seal Boxes & Access Doors, Soot Blowers, Skin casing, Removal & application of Insulation of Boilers at Wanakbori TPS Unit No.2, 210 MW

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

(1) Replacement of existing economizer having staggered design by in-line plain tube economizer with tube size 44.5 X 4.5 mm thick, having the flexibility of provision for providing the erosion protection measures with inlet and intermediate headers. To enhance the heat recovery heating surface area of economizer is increased by providing additional bank of economizer coils and lowering the ring header of back pass and with modification of flue gas ducting keeping the ash extraction level of the eco hopper same. Re-routing of link piping from economizer outlet header to drum & change the elevation of eco feed line.
(2) Replacement of LTSH coils and re-location of LTSH inlet header in-line with rear wall of second pass and redesigning steam circuit of entire back pass including LTSH.
(3) Replacement of complete 2nd pass roof and rear steam cool wall and extension of length downwards up to 3 Meters, four side of steam cool wall in order to accommodate additional economizer bank.

BRIEF SCOPE OF WORK:

a. Replacement of Economizer inlet, intermediate & outlet Header and LTSH inlet & Outlet Header.
b. Replacement of complete set of Economizer Coils (Upper & Lower Bank) and LTSH Coils (Upper & Lower Bank).
c. Replacement of piping connecting Economizer Outlet Header to Drum (portion of the pipe to be replaced as per the items supplied).
d. Replacement of Boiler Back Pass Roof and Rear Wall Panels.
e. Replacement of Boiler Back Pass Bottom Ring Header.
f. Replacement of portion of Economizer feed line pipe.

DETAILED SCOPE OF WORK: -

A. ECONOMISER: -

1. Making of opening and erection of temporary platform to facilitate dismantling & erection of Economizer coils.

2. Making arrangements for Locking/supporting of LTSH coils, LTSH inlet header & other parts as required.
3. Dismantling and lowering of complete banks of Economizer coils along with headers to ground.
4. Erection, alignment & positioning of newly designed and supplied Economizer inlet, intermediate and outlet headers with its suspension systems & provision of additional bank of economizer coils.
5. Edge preparation of header stubs and terminal tubes
6. Air & steam cleaning of new coils before erection.
7. Fitting of Cassette baffle and various shielding at ground before lifting coils.
8. Erection, alignment & positioning of Economizer Hanger Tubes.
9. Erection, alignment & positioning of newly designed and supplied upper bank and lower bank of Economizer coils (tube size 44.5X4.5).
10. Erection, alignment, fitting & HP welding of all erection joints.
11. Re-routing of eco-link piping from economizer outlet header to drum (few portion of the pipe to be replaced as per the items supplied).
12. Re-routing of connection of boiler feed pipe to economizer inlet header from new elevation of header.
13. 100% radiography of welded joints and heat treatment as per IBR.
14. Closing/restoration of opening made for dismantling/Erection and dismantling of temporary Platforms after completion of replacement
15. Restoration of Insulation & refractory.
16. erection of the eco hopper as per drawing and modification of the existing ash pipe to suit it as per modified eco hopper.
17. Existing beam at 31 mtr elev. Near boiler axis to be removed and new support arrangement to be provided for the existing post.
18. SS Shielding for straight portions of top row (4 rows from either side) of both upper and lower banks

B. LTSH:

1. Making of opening and erection of temporary platform to facilitate dismantling & erection of LTSH coils.
2. Making arrangements for Locking/supporting of Economizer coils, LTSH inlet header & other parts as required.
3. Dismantling and lowering of complete banks of LTSH coils along with headers to ground.
4. Erection, alignment & positioning of newly designed and supplied LTSH inlet and outlet headers with its suspension systems & other supporting system.
5. Erection, alignment & positioning of LTSH Terminal Tube Panels (TT Panels).
6. Edge preparation of header stubs and terminal tubes.
7. Steam cleaning of new coils before lifting to position.
8. Fitting of Cassette baffle and various shielding at ground before lifting coils.

9. Erection, alignment & positioning of newly designed and supplied LTSH coils upper and lower bank.
10. Erection, alignment, fitting & HP welding of all erection joints.
11. Fitting of scalloped bar at top of LTSH top bank. If scalloped bar is not available with GSECL, same has to be fabricated at site by material given by GSECL.
12. Closing/restoration of opening made for dismantling/Erection and dismantling of temporary Platforms after completion of replacement.
13. 100% radiography of welded joints and heat treatment as per IBR.
14. Restoration of Insulation & refractory.

C. STEAM COOLED WALL AND BACKPASS ROOF:

1. Dismantling and lowering of back pass rear panels, back pass roof and lower ring header of back pass to ground.
2. Erection, alignment & positioning of addition Steam cooled wall panels/tubes of all four sides to extend the length of Steam Cooled Walls.
3. Erection, alignment & positioning of newly designed and supplied Lower Ring header of back pass as per Drgs. (Lowering of ring header of back pass for creating space for additional eco coil bank below the existing economizer coils).
4. Erection, alignment & positioning of newly designed and supplied Roof and Rear walls panels of back pass & fins welding of panels.
5. 100% radiography of welded joints and heat treatment as per IBR.
6. Restoration of Insulation & refractory.
7. Erection, alignment & positioning of spool pieces' insertion in SH. Screen tube, SH. Hanger tube and supply piping for extended side inlet pipes.
8. Erection, alignment, fitting & HP welding of all erection joints.
9. Replace the refractory and skin casing of radiant roof to ensure proper sealing.
10. Re-erection of existing buck stays if required.
11. Fitting/welding of loose attachment items like scalloped bars, fins, stirrups, stirrup connecting bolts to beams required for buck stay re-fixing works.
12. Erection of additional seal boxes and access doors.

D. Radiant Roof Skin Casing:

1. Replacement of Pourable refractory and skin casing of Radiant roof (I & II Pass).
2. Welding of skin casing of radiant roof by BHEL approved electrode and sealing should be leak proof.

E. Buck Stays &Grills:

13. Removal and re-fixing of the existing buckstay's for the work of replacement of back pass rear wall and additional length of SCW.
14. Erection, fitting & alignment of additional one elevation of Buck Stays in Boiler Back Pass.
15. Application of refractory between buck stay channel and beam.

16. Dismantling and re-installation of backstay, wherever required.
17. Removal & application of refractory, insulation & sheet of SCW for additional one elevation of buck stay.
18. Dismantling & re-installed of grill if required and additional installation of grills.

F. Seal Boxes & Access Doors:

1. Erection and fitting of new seal boxes and access door in back pass.
2. Removal & application of insulation and refractory.
3. Filling up refractory as required.

G. Soot Blowers:

1. Relocation of existing soot blowers to match the redesigned economizer coils bank.
2. Erection of piping and re-routing of piping as per new location of soot blowers in back pass.
3. Removal & application of insulation and refractory.
4. Insulation of soot Blowers steam piping.

H. Supporting structure and grills:

1. All grills at 18 mtr operating floor, APH surrounding area are to be completely replaced.
2. Additional approach to be provided in economizer and LTSH area.
3. Additional approach at other location to be done as per site requirement and modification/replacement R&M scope.

I. BOFA

1. Cutting of water wall panels in the Ist pass.
2. Welding of loose tubes of the BOFA panel.
3. Erection and fixing of the BOFA panel and its supporting.
4. Down comer to be suitably modified to avoid interference with BOFA duct.
5. Alignment of the BOFA panel to be checked.
6. Supporting of the BOFA panel.
7. Insulation in the front and side outer panel.
8. Sky climber to be installed to check +/- 30˚ movement of the tilt from inside. Contractor to arrange bevel protector to check the tilting angle.
9. Local structure strengthening to be done as per drawing.

J. Terminals Points: -

1. Feed water- Eco inlet pipe, Link Pipe from Eco outlet header.
2. LTSH- Outlet Header.

Note:-

- **Since APH work to be carried out parallel with boiler work, subcontractor has to Provide/fabricate platform or protection roof in bottom of Economizer so that APH work mat carry out safely.**

- **Removal and re-installation of any other component in order to the complete the job is in bidder's scope.**
- **Any minor modification required to complete the job is in bidder's scope.**
- **Any other work required to be done in order to complete the job will be in bidder's scope**

- *Quantity of Material Supplied for E&C: - Annexure-I*

2.2 Erection & Commissioning of Regenerative Air Preheaters and duct, dampers at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Replacement of existing air preheater having PA sector angle 50 degree by new air preheater having size 27.0 VIMT 2000 (72°) with Modification/replacement of required ducting , expansion joints and dampers as mentioned in scope of work

BRIEF SCOPE OF WORK:

- Regenerative APH: -

a. Dismantling of existing air preheater rotor and its Housing.
b. Dismantling of all sector plates (Hot/Cold), Seal plates, Drive arrangement including auxiliary drive, flue gas & Air (Hot/Cold) duct and dampers as applicable.
c. Removal and replacement of seals, heating element, cleaning & water washing device, fire sensing device, access door, deluge system, Element Handling arrangement, lubricating oil circulating system (Guide bearing and support bearing) etc.
d. Replacement APH rotor with new Modular rotor and heating elements.
e. Erection of new rotor housing, all sector plate (Hot/cold), seal plate, access door, Drive arrangement including auxiliary drive, flue gas & air (Hot/Cold) duct and damper as applicable.
f. Erection of new observation Port & Light assembly and deluge system, rotor stoppage alarm etc.
g. Erection of new bearing housing for guide bearing and support bearing.
h. Erection of Drive Mechanism including auxiliary Drive.
i. Carefully dismantling and storage of C&I items and instrument and re-installation of the same.

DETAILED SCOPE OF WORK: -

1. Preparation of arrangements like installation of electric winches, chain pulley blocks, structures for facilitating dismantling and erection of Air Pre-heater components.
2. Insulation removal and cut & removal of Hot Air /Cold Air ducts & expansion joints as required.

3. Removal of existing structures/air lines, channel/beam support of APH etc. as per site requirement to facilitate dismantling and erection of Air Pre-heater components and rest.
4. Verification of APH components received from Ranipet and shifting of the same from stores/yard to work spot during execution of job. Storing the same after the completion of the work.
5. Dismantling of existing Rotary Air Pre-heaters. (2 Nos).
6. **Removal of dismantled materials /scrap and its transportation to scrap yard on day-to-day basis. No accumulation of scrap / cut materials at site will be allowed.**
7. Dismantling & Replace with New Material and assembly of APH drive unit.
8. Cut & removal of existing flue gas duct from economiser outlet to APH inlet.
9. Cut & removal of existing APH housing (air side & gas side).
10. Cut & removal of existing primary centre sections at both cold & hot ends.
11. Cut & removal of existing axial seal plate assembly (primary).
12. Cut & removal of existing floor grills to facilitate dismantling and erection of Air Pre-heater components.
13. Removal of all Seals, Bypass Angles, T-Bars, all Heating Elements at CE/HE etc.
14. Removal of HE& CE Conn plates & Primary Centre section.
15. Removal of Hot & Cold End Sector Plates.
16. Removal of Guide & Support Bearing assemblies.
17. Removal of Hot end, Cold end centre section & Rotor Post with Trunnion & removal of complete Rotor Assembly.
18. Removal of dismantled / cut materials and its deposition at an identified area within the plant after weighing.
19. Shifting of existing support beam as required for increase in the opening of PA sector angle.
20. Shifting/ relocate/dismantling /erection of support structure, column, beam or channels etc of APH which is essential for APH E&C including all associated item.
2. Complete Erection of Air Heater with all supplied materials. Details of materials supplied are enclosed. Total weight of the components to be erected: 500.000 M Tons. (10% variable in increasing order).
3. Installation of Cold End centre section, Guide brg., Rotor Post with support Trunnion, Hot End centre section & Support Brgs and alignment of Rotor Post.
4. Erection of Rotor Modules with Heating Element baskets.
5. Installation of CE &HE Primary centre section & Connecting plates.
6. Complete replacement of APH rotor housing, connecting plates, etc.
7. Erection of Rotor angles, T-bars, by pass angles etc. at Hot & Cold ends Housing panels.
8. Installation & setting of Pin-Rack assembly.
9. Installation & setting of all seals.
10. Replacement & erection of Lube oil system/ Seal Air lines and Soot Blowers/Water Washing system.
11. Replacement & erection of Lube oil system/ Seal Air lines and Soot Blowers/Water Washing system.
12. Erection of Drive Assembly, alignment and Trial run of APH.

13. Modifications to Primary Air ducts for both inlet & outlet of APH to match the new openings of Primary and Secondary Air ducts for both inlet & outlet of APH to match the new openings as per drawing.
14. Replacement of Expansion Joints at economiser outlet, APH inlet & outlet and also at inlet & outlet of SA and PA ducting along with dampers as supplied.
15. Replacement of Dampers with actuators, expansion joints at inlet & outlet of SA and PA ducting.
16. Modification / Replacement of Hot Air & Cold Air ducts to match new openings as per requirement.
17. Removal and Application of Insulation along with cladding of Air Pre-heater housing and Air & Gas ducting.
18. Application of Insulation and cladding of complete Air Pre-heater, hot air & cold air and flue gas ducting (to cover modification / replaced areas only).
19. Restoration of removed structures, ducts, floor grills, air lines, etc.
20. Dismantling of all temporary arrangements made for the job execution and area clearing.
21. Replacement of Louver Dampers with Actuator as supplied.
22. Seal welding of all APH split joints and complete ducting.
23. Carefully dismantling and storage of C&I items and instrument and re-installation of the same or new.
24. Providing assistance for carrying out testing and commissioning of Air Pre-heaters.
25. Providing assistance for all other testing conducted by BHEL.
26. **Painting of the components is in the bidder's scope, paint shall be supplied by BHEL.**
27. replacements of the duct/duct plates, repair/replacement of internal and external support members, stiffeners, internal bracings, repair of flow modification devices like turning vanes/ deflector plates/flow splitters/guide vanes/etc, gas flow control devices, access doors, ash evacuation doors, maintenance access doors, hoppers etc.
28. existing soot blower of APH and existing piping to be retained and re-used.
29. **Removal and re-installation of any other component in order to the complete the job is in bidder's scope.**
30. **Any minor modification required to complete the job is in bidder's scope.**
31. **Any other work required to be done in order to complete the job will be in bidder's scope**

Note:

- Total weight of materials to be erected**: 450 MT (approx.).**
- Bidder to arrange equipment for handling of heavy materials along with Hydra, truck, trailer, etc. As per site requirement to be arranged by the contractor.
- Availability of Oxy-acetylene gases & welding electrodes at all times is to be ensured by the contractor.
- Replacement / Repairs /Erection of any other components not specifically indicated above but essentially required for the completion of modification work.
- Arrangement of scaffolding materials.
- Welding of all APH split joints / ducting should be done with E-7018 & E-8018 electrodes. If required special electrode shall be arranged by contractor.
- KLT on welded joints of ground fabricated joint and ATT of complete duct system as per procedure after completion of erection and welding of the ducts.

- *Quantity of Material Supplied for E&C: - Annexure-I*

Terminals Points for duct replacement: -

Sl.No.	Area	Description
1	Secondary Air duct	FD fan Outlet to APH I/L
2	Secondary Air duct	Secondary air APH O/L to Windbox
3	Primary Air Duct	PA fan O/L to APH I/L
4	Primary Air Duct	Cold PA from PA O/L to Mills
5	Primary Air Duct	Hot PA APH O/L to Mills I/L
6	Flue gas duct	Eco O/L to APH I/L
7	Flue gas duct	APH O/L to BOF

Dampers to be replaced: (This list is indicative and actual quantity is as per shipping list/drawing)

Sl.No.	Area	Description
1	Secondary air system	SCAPH dampers
		SA APH I/L damper
		SA APH O/L damper
2	Flue gas system	Flue gas APH I/L damper
		Flue gas APH O/L damper
3	Primary Air system	PA APH I/L damper
		PA APH O/L damper
		All mills hot air gate
		All mills hot air damper
		All mills cold air gate
		All mills cold air damper

Bellows to be replaced: (This list is indicative and actual quantity is as per shipping list/drawing)

- All the bellows in the Air and Primary air circuit to be replaced along with the ducts.

2.3 Boiler Insulation and Refractory lining insulation at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Broad scope of work:

1. Removal and reapplication of refractory and skin casing in the 1st Pass roof.
2. Removal and reapplication of refractory and skin casing in the 2nd Pass roof.
3. Removal and application of supplied insulation along with cladding, as per insulation schedule and drawing, in the **complete back pass steam cooled walls** from back pass top to bottom ring headers including back pass headers.

4. Any attachment /pin/hook welding required for the application of insulation is in bidder's scope.
5. Bidder to consider additional 3000 sq m for the existing damaged area of boiler, duct, HP piping etc as mutually agreed with customer.
6. Removal and application of all the insulation along with cladding as per drawing, from the complete Secondary air and Primary air duct being modified/replaced.
7. Replacement of insulation of completed penthouse enclosure and refractory on top and inside of of enclosure
8. Refractory in all the buckstays, both re-erected after dismantling and newly erected.
9. Refractory in the top & bottom of the SOFA burners from inside.

Quantity of Material Supplied for E&C :- Annexure-I

2.4 Replacement of Ducts with interconnections including expansion bellows, flow meters, insulation, hangers, gates and dampers with all instruments at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Detailed scope of work:

a. Replacement of Hot Secondary air ducting from APH to Windbox.
b. Replacement of cold secondary air ducting from FD fan outlet damper to APH I/L.
c. Replacement of Hot Primary air ducting from APH outlet to individual mills inlet.
d. Replacement of cold primary air ducting from PA fan outlet damper to APH and PA fan Outlet to individual mill.
e. Replacement of flue gas ducting from Eco outlet to APH inlet.
f. Replacement of APH flue gas outlet to BOF (Boiler outlet flange).
g. Erection of Duct from SA duct to BOFA and its support.
h. Other than above, there will be other potential leakage area & erode section and shall be rectified /replaced during the execution of work. Bidder to consider 10 MT 5/6 mm plates & steel materials to attend such leakage per unit.
i. Complete SCAPH system including dampers.
j. Dismantling & re-installation of SCAPH piping as per drawing.
k. All the hangers and supports in SCAPH system to be erected and insulation to be applied.
l. Replacement of Hot secondary air duct damper & eco outlet to APH flue gas duct damper
m. Replacement of PA APH I/L and O/L damper
n. Replacement of HAD, CAD, HAG and CAG of the Primary air circuit of all mills along with its power cylinder and air receiver tanks placement.
o. Instrument air piping from the main header the individual newly replaced pneumatic item.
p. Replacement of all the expansion joint in the replaced portion of all ducting.
q. Providing support for re-routed link from eco to drum and for eco inlet piping.

r. Replacement of insulation (removal and application) of boiler component, ducting of flue gas, hot PA and Hot SA.

s. Duct kerosene leak test to be carried out in pre-fabricated ducts.

t. ATT of the complete ducts to be carried out using fans and blowers. (fan and blower in scope of customer)

u. Repairing of the Windbox LHS & RHS.

v. Carefully dismantling and storage of C&I items and instrument and re-installation of the same.

w. Modifications to Primary Air ducts for both inlet & outlet of APH to match the new openings of Primary and Secondary Air ducts for both inlet & outlet of APH to match the new openings as per drawing.

x. Replacement of Expansion Joints at economiser outlet, APH inlet & outlet. and also at inlet & outlet of SA and PA ducting along with dampers as supplied.

y. Replacement of Dampers with actuators, expansion joints at inlet & outlet of SA and PA ducting.

z. Modification / Replacement of Hot Air & Cold Air ducts to match new openings as per requirement.

aa. Removal and Application of Insulation along with cladding of Air Pre-heater housing and Air & Gas ducting.

bb. Application of Insulation and cladding of complete Air Pre-heater, hot air & cold air and flue gas ducting (to cover modification / replaced areas only).

cc. Restoration of removed structures, ducts, floor grills, air lines, etc.

dd. Dismantling of all temporary arrangements made for the job execution and area clearing.

ee. Removal and re-installation of any other component in order to the complete the job is in bidder's scope.

ff. All the support as per drawing to be installed.

gg. Any minor modification required to complete the job is in bidder's scope.

hh. Any other work required to be done in order to complete the job will be in bidder's scope

Note:

- the tentative tonnage for erection is around 450 tonnes for ducts and 275 tonnes for gates and dampers. (including 10 % extra).
- Duct KLT to be done, all internal support to be welded and DP to be done as per quality plan before erection of pre-fabricated ducts.
- ATT to be done for all the erected ducts after completion of the circuit.
- Hook/pin welding to be done wherever required for insulation.
- All the scaffolding arrangement for the duct erection, insulation, ATT to be arranged by vendor.
- Removal and re-installation of structure or any other equipment for duct erection is in bidder's scope.
- Tapping points for instruments installation to be installed by vendor.

2.5 Replacement of SH & RH control station at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Detailed scope of work:

a. Removal and re-installation of new supplied SH spray station including control valves, isolation valve, flow nozzle,
b. Removal and re-installation of new supplied RH spray station including control valves, isolation valve, flow nozzle,
c. Removal and re-installation of MS stop valve actuator.
d. Welding and NDT of all the components to be performed and per drawing, FQP and EWS.
e. Application of insulation and cladding on all the spray pipes and valves.
f. Removal and re-installation of any other component in order to the complete the job is in bidder's scope.
g. All the support as per drawing to be installed.
h. Any minor modification required to complete the job is in bidder's scope.
i. Any other work required to complete the job will be in bidder's scope.

Quantity of Material Supplied for E&C :- Annexure-I

2.6 Replacement of Fuel firing system at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Detailed scope of work:

a. Removal and re-installation of HEA ignitors system.
b. Removal and re-application of Scanner air system including complete piping i.e. from FD fan discharge in suction, seal air fan discharge, instrument tapping points, support.
c. Installation of an additional new air cooled oil burner at CD elevation.
d. Removal and installation of new Temperature control valve and pressure control valve in the fuel control station.
e. Removal and installation of new burner tilt power cylinder.
f. Removal of old SADC cylinders along with the vanes and installation of newly supplied SADC system with vanes. Cutting and welding of the mounting shaft will be in vendor's scope.
g. Removal of the old burner nozzle and installation of newly supplied modified coal burner assembly. (Coal nozzle, nozzle tips of coal, oil and air) low Nox. Insulation/refractory in the burner panel will be in vendor's scope. Sky climber/cup lock, if required, for the removal and installation of burner assembly and alignment of the burners, will be in vendor's scope.
h. Replacement of control valves and trip valves in HFO/and LDO station at operating floor. Before dismantling, all the oil to be drained and insulation to be removed. Vendor to carry out fuel oil flushing in supervision of BHEL and vendor to carry out necessary temporary piping arrangement for flushing. Lines to be normalised as per drawing.

i. Removal of all the corner fuel oil skids and installation of newly supplied fuel oil skids (all control, scavenging, air, steam valves, piping, and control instruments). All the cutting and welding will be in vendor's scope. Insulation of the corner skids to be done after re-installation.
j. Welding and NDT of all the components to be performed and per drawing, FQP and EWS.
k. Removal and re-installation of any other component in order to the complete the job is in bidder's scope.
l. All the support as per drawing to be installed.
m. Any minor modification required to complete the job is in bidder's scope.
n. Any other work required to complete the job will be in bidder's scope.

2.7 Replacement of Milling system at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Detailed scope of work:

a. **Classifier Assembly:**
   - Removal of the existing classifier assembly.
   - Installation of newly supplied dynamic/static classifier assembly.
   - Installation of MDV of mills.

b. **Mill Internal Component Replacement:**
   - Removal of existing and installation of new:
     - Inner cone with ceramic lining.
     - Journal opening frame liners and journal head liner assembly.
     - Mill top plates with liners.
   - Ensure sealing and proper orientation as per BHEL instructions.

c. **Mechanical Face Seal:**
   - Dismantling of existing mechanical face seal.
   - Installation of new design seal and modification of mounting, if required, including journal housing area preparation.

d. **Scraper Assembly:**
   - Removal of existing scraper assembly.
   - Installation of new scraper assembly along with spring and support block.
   - Replacement of scraper wear plates and bottom liners.
   - Gap setting and welding as per manual instructions.

e. **Mill Discharge Valve Assembly:**
   - Removal of existing discharge valve (knife gate type).
   - Installation of new discharge valve assembly or distance piece based on site condition.
   - Removal of any fouling of Air header, actuator wiring, and pneumatic tubing etc. as applicable and assistance in restoration.

f. **Coupling and Orifice:**
   - Replacement of vertical coupling.

- Removal/replacement of coal orifices to match modified configuration.

g. **Mill Body Repairs:**
   - Inside and outside repair by weld filling, hard facing or patchwork.

h. Electrode consumption limit: 15 KG per mill

i. **Coal Pipe Hanger Supports:**
   - Replacement of damaged coal pipe hanger supports — approx. **10% of total existing supports**.

j. **Coal Piping:**
   - Dismantling and replacement of approximately **150 meters of coal pipe**.
   - Replacement of **24 nos. mill discharge bends**, including matching flanges, gaskets, and Victaulic couplings.

k. **Grinding Elements / Vane Wheel:**
   - Inspection of vane wheel and grinding rolls.
   - Replacement or modification of vane wheel segments or grinding rolls if found excessively worn during disassembly.
   - Reassembly to ensure correct ring-to-roll and journal-to-spring assembly gaps.

o. **Gearbox (PGB) and Lubrication System**

   - Alignment and connection of PGB with motor.
   - Pre-commissioning checks and trial run of planetary gearbox.
   - Modification/repair in lube oil system
   - Support in Flushing, oil charging

p. **Seal Air System Checks**

   - Modification/repair of seal air availability at journal shaft, spring housing, and inner cone area to prevent coal dust ingress.
   - labyrinth seal checking/replacement if required.

q. **Journal Assembly (if required)**

   - Removal and reinstallation of journal assembly including trunnion shaft, bearings, grinding rolls.
   - Oil charging in journal housings as per recommended schedule.
   - Alignment and pre-torque tightening of journal bolts

r. **Replacement of bull ring assembly and bowl extension ring**

Note:

- **Removal and re-installation of any other component in order to the complete the job is in bidder's scope.**
- **Any minor modification required to complete the job is in bidder's scope.**

- **Any other work required to be done in order to complete the job will be in bidder's scope**

2.8 Commissioning of system/Boiler at Wanakbori TPS Unit No.2

It is not intent to list out complete scope of services. However, the broad scope of services shall include but not limited to the following: -

Detailed scope of work:

1. Provide manpower assistance during the commissioning of Boiler after the completion of restoration works.
2. Cutting and temporary piping arrangement of MS line for steam blowing of pipes and again restoration of MS pipes after completion of steam blowing.
3. Provide manpower assistance for safety valve floating of the boiler.
4. Provide manpower support for installation of instruments and other works during the conductance of PG test of Boiler.
5. **Bidder to provide assistance for Alkali boil-out of the boiler as per direction of BHEL personnel.**
6. **Bidder to arrange required quantity of Tri-sodium phosphate(TSP) and di-sodium phosphate(DSP) for the alkali boil-out of boiler. The material to be procured is in consultation with BHEL engineer. Test certificate of the same to be submitted by the vendor. The quantity of TSP 600 kg & DSP- 300 kg.**
7. **Bidder to procure around 10 ltrs of HCL and 50 ltrs of NaOH for the chemical cleaning of APH lube oil lines.**
8. Providing assistance for all other testing conducted by BHEL (PET, PG Test, Chemical Cleaning etc.)

2.9 Construction Power (Chargeable):

1. Construction Power shall be made available to the Contractor at 415 V feeders of LT substation located at Single point in the plant. Contractor shall be fully responsible to make all the arrangement beyond these LT feeder points for further distribution to meet all construction power requirements for the entire area in scope of this package.

2. Supply, erection, testing and commissioning of 415V switchboards, power and control cables, DC Systems etc. under the Contractor's scope. All necessary statutory requirements for charging construction power Contractor's network shall be in the Contractor's scope.

3. Contractor shall deploy and install required energy meter, cables, fuses, distribution boards, switchboards, bus bars, earthing arrangements, protection devices and any other installation as specified by statutory authority/act. Capacitor Bank is to be arranged by vendor for power factor improvement of the system as per I. E. Rule.

4. Contractor shall also obtain approvals of appropriate authority and pay necessary fees, levies etc towards the clearance of such installations, prior to use. Sufficient power factor compensation equipment's like capacitor shall be provided by contractor for reactive loads like welding machines etc. In case of any fine/penalty on account of low power factor, same shall be shared by contractor proportionately according to power consumption.

5. Contractor shall make necessary arrangements for onward distribution of construction power taking due care of surrounding construction activities like movement of cranes & vehicles, civil work, fabrication/construction/assembly/erection etc. and safety of personnel. It may become necessary to relocate some of the installations to facilitate work by other agencies or by him.

6. It shall be the responsibility of the Contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements. The installation and maintenance of this shall be done by licensed and experienced electrician.

7. While reasonable efforts will be made to ensure continuous electric power supply, interruptions cannot be ruled out and no claim from the Contractor shall be entertained on this account such as idle labor, extension of time etc. The Contractor shall adjust his working shift accordingly and deploy additional manpower, if necessary, so as to achieve the target.

8. Contractor shall be well equipped with back-up power supply arrangement like DG set and diesel operated welding machine etc. to tackle situations arising due to failure of supplied power, so as to ensure continuity and completion of critical processes that are underway at the time of power failure or important activities planned in immediate future.

9. BHEL is not responsible for any loss or damage to the Contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.

10. The charges for the actual energy consumed by contractor shall be recovered on relevant rate of Discom and as specified in specification.

11. For initial few month bidder may have to arrange DG with suitable capacity for construction power at its own cost.

GENERAL: -

If any other voltage level (other than normally available) is required, the same shall be arranged by the contractor from power supply as above by use of suitable electrical equipments. Contractor will have to provide at his own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized / accredited agency for working out the power

consumption. In case of recalibration required for any reason the necessary charges including replacement by calibrated meters is to be borne by the contractor. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules and Regulation as applicable. The contractor shall ensure usage of electricity in an efficient manner and the same may be audited by BHEL time to time. In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.

2.10 Construction Water:

BHEL will provide construction water at single location (Duty and taxes for water, if levied by the GSECL., shall be payable by the Bidder). Distribution will be in bidder scope.

Note: Due to any constraint at site if BHEL fails to provide construction water, contractor may have to arrange for construction water on its own. Any cost implication of the same shall be to the account of contractor and no extra payment shall be made for any such arrangements made by contractor (if required).

GENERAL SCOPE OF WORK:

1. Transportation of materials / spares from GSECL stores /yard to work site and removal of ash / debris / scrap materials from work site to ash disposal area / scrap yard / stores engaging contractors own vehicle.
2. Fabrication of site store near work site.
3. Fabrication / repair of spares.
4. Fabrication of fixtures and illumination of work zone.
5. Removal and relaying of insulation wherever applicable.
6. Old Boiler Scrap & removed insulation disposal shall be in the scope of bidder & to be disposed as directed by BHEL / GSECL.
7. Cleaning of work area during and after execution of work.
8. Minimum 10 curie (As per requirement) Radiography sources- 2 sources along with qualified personnel are to be arranged.
9. Bidder has to obtain IBR approval for works & HP welders approvals from the Boiler Directorate / Gujarat & Co-ordination with boiler inspector is the responsibility of the contractor.
10. Successful bidder has to arrange necessary labour licence, insurance etc. for their workmen at the start of work and other necessary statutory requirements are to be fulfilled.
11. **Welding of MTM pads by removing insulation on drum, SH headers and again applying the insulation for BOSMON system is in bidder's scope.**
12. **NDT of pressure parts will be as per Erection welding schedule is attached annexure and FQP. For the joints, not mentioned in EWS, will be 20% RT minimum/welder/shift for joint size 63 mm and below. For joints above 63 mm, RT will be 100 %. NDT for non-pressure parts will be as per FQP.**

NOTE:

- **Lack of supervision / resource mobilization will be viewed seriously.**

- **Carrying out work by BHEL**

  BHEL reserves the right to withdraw/restrict/alter the quantum of works as per clause No. 2.7 of GCC. BHEL may carry work through any other agency/purchase bought out items as per GCC and would levy and overhead charge of 5% on differential cost. In such cases due notice shall be given for a period of 2 (two) weeks.

- Contractor has to make him well conversant with the Customer specification. In case of ambiguity between BHEL and customer specification, customer specification shall prevail.

3.1 SPECIAL TERMS AND CONDITION

1. **The time schedule is essence of this contract. Subcontractor should complete the all works within (105+15) days of tight schedule. Total Completion period is 120 days.**
2. Successful bidder has to follow necessary safety regulations and Safety equipment/ accessories to be used and provided to the workers.
3. Illumination of working area is the responsibility of the contractor.
4. Cleaning, housekeeping and security arrangement for the equipment, T&P and materials/ spares is the responsibility of the contractor.
5. **The contractor has to sign "INDEMNITY BOND" for obtaining Form -V (required for Labour license) from the Principal Employer M/s GSECL on non-judicial stamp paper as per format provide by BHEL.**
6. **Form VI for interstate migrant workers will be provided. Bidder to obtain interstate migration labor license.**
7. **Police verification of all the persons engaged to be done for gate pass.**
8. Necessary workforce, tools and tackles, welding machines, cutting accessories, grinding machines, argon gas with all accessories/cutting accessories, TIG welding kits, TIG welding wires, etc. required for the job shall be arranged by the contractor at their own cost. Consumable, hacksaw blades, grinding/cutting wheels, emery paper, marking cloth, cotton waste, petrol, kerosene, wire brushes, etc. shall be arranged by Successful bidder.
9. **All consumables required for the job will be in bidder`s scope.**
10. **All consumables and welding electrodes as per EWS required for the job will be in bidder`s scope.**
11. **All technological wastes/wastes generated during execution of overhauling works at various places shall be removed by Contractor to a place identified by the Engineer in charge. The scrap disposal area is approx. 3 k.m from the site. The ducts are to cut before disposal. The insulation to be disposed in ash dyke are at a distance of approx. 3 k.m. The insulation is to be buried in ground. Bidder to arrange JCB for digging and filling of the pit.**
12. The work details are brief & for knowledge only and Successful bidder will have to do all the related works as per requirement.
13. Subcontractor should assure that the repair/modification of the equipment covered in the scope worker will be conducted with the best of skills and know how available with Subcontractor and in conformance with the clearances and adjustments set forth in manufacture ‘s drawing instruments and other information ‘s furnished to Subcontractor.
14. The various setting, clearances, adjustments and benchmarks will be restored to the extent possible during rectification to the condition as per the erection and commissioning log sheets available with customer. If however we are not able to produce erection / commissioning log sheets, efforts will be made to attend the best possible parameter or the conditions as observed at the time of dismantling of the equipment in consultation with us.
15. Subcontractor must prepare PERT CHART/BAR CHART. Daily monitoring will be done jointly and log sheets of important activities should be noted down and signed jointly. Daily progress reports shall be submitted to BHEL by contractor and involving in progress review meeting along with BHEL/GSECL official.

16. All the works shall be carried out as per the instructions and to the satisfaction of the Engineer In-charge.
17. The contractor will attend contributory to faulty and poor workmanship during commissioning and trial run of the equipment.
18. Round the clock working under expert supervision shall be ensured by the contractor deploying two equal parallel strength of group in 12 hrs. Shift with equal T&P for all the jobs so as to complete the work in stipulated period or earlier.
19. Adequate manpower along with T&P should be deployed at site. All the T&P required for the work shall be arranged by the contractor and all T&P should reach the site 30 days before the shutdown of the unit. All the measuring instruments shall be duly tested / calibrated and valid certificate to that effect should be submitted to our Site In-charge before start of the work.
20. A deployment plan along with experience and name of the Site In-charge, Engineers, Supervisors, Foreman and main technicians to be submitted on per shift basis.
21. LAP-TOP with latest configuration, DVD/CD writer, its peripherals including printer-scanner and one USB Modem for Internet connectivity to be provided for BHEL site office.
22. One office boys in each shift are to be provided for BHEL site office (which is not mentioned in List of Manpower required but for both work Two office boy arranged by contractor)
23. It is the responsibility of contractor to keep the plant, equipment, machinery and surrounding area clean.
24. The names of working persons like Site in-charge, supervisors, foreman, main fitters to be deployed during the job with full details has to be submitted stating their area of work and experience and specialization of the work to site in-charge before the start of work. BHEL may ask to change/delete the person not found suitable for the work at any point of time during execution of job. For any addition and deletion of the working person prior permission from BHEL shall be taken.
25. Subcontractor has to ensure that all the key persons must continue till completion of job i.e. machine comes on load. Subcontractor manpower should remain at site for a period of 10 days after machine comes on full load.
26. Work distribution sheet for all the workers/supervisors deployed shall be submitted to BHEL one day in advance on daily basis.
27. Subcontractor should mobilize additional resources such as plant, equipment 's, material as may be required by site in-charge to improve the progress of the work if the progress of the work is not satisfactory.
28. Subcontractor should get registered under GST, where the jobs are executed.
29. Radiography and stress relieving are in the scope of the contractor.
30. Scrap and insulation etc. is to be shifted to scrap disposal area as indicated by the Engineer-in-charge.
31. One administrative personnel to control the resources and attendance of the workers to be ensured.
32. Contractor shall arrange certified HP welder for welding job whose welding test will be conducted.
33. Contractor shall arrange skilled EOT crane operator for round clock job as required.

34. Argon, Oxy- Acetylene gas shall be arranged by the contractor with cutting/welding set / argon welding set and other welding appliances.
35. Enerpac make close height Hydraulic jacks of 50T and 100T capacity - 4 nos. each shall be arranged by the contractor in 100 % working conditions, if required.
36. Scaffolding material, Tarpaulin etc. will be arranged by the subcontractor on his own cost.
37. If the duration of work continues beyond stipulated period due to any reason, no claim for compensation will be entertained.
38. The work details are brief & for Subcontractor knowledge only. Subcontractor will have to do all the related works as per requirement.
39. The contractor will be responsible to pay the damages to the property of Board or individual caused by his worker during the course of contract. If the contractor fails to pay the same it will be recovered from his bill.
40. No compensation claimed for idle labor for any reason will be entertained by BHEL.
41. In normal course, the interpretation of the under signed on any matter or decision given by him on any disputable points will be final and binding on the contractor.
42. Accommodation for the sub-contractor 's manpower will be provided if made available by the customer as per the applicable charges. If not available contractor shall arrange at their own.
43. Contractor is to obtain labor license before the start of the work.
44. Workmen compensation policy to taken before the start of the work
45. Third party liability insurance to taken before the start of the work
46. The copy of registration of GST. If this is not applicable, then contractor shall submit an undertaking.
47. Copy of registration of EPF along with the PF account number of the employees. Challans for EPF for previous month shall be submitted along with subsequent RA bill
48. Partnership deed of firm in case of partnership firm or power of attorney of the representative in case of company to be submitted before the start of the work
49. Bank details, address & RTGS numbers etc. to be submitted
50. Copy of GST registration to be submitted before the start of the work
51. Copy of professional tax registration to be submitted before the start of the work (If required)
52. Copy of PAN card in the name of firm to be submitted before the start of the work
53. Copy of wage register witnessed by GSECL representative for the bill period & bank transfer details to be submitted
54. The contractor has to take clearance from HR group of BMD/GSECL before release of final bill.
55. The contractor has taken NO OBJECTION CERTIFICATE (NOC) from Safety section, stores, health physics section, HR/HS section & security section of GSECL before release of final bill.
56. Calibration certificate with validity for all measuring instruments and T&P should be submitted to GSECL before start of work.
57. Successful bidder has to extend manpower assistance for minor cleaning/scrapping, etc.
58. Transportation of manpower at Site shall be arranged by contractor.

59. Suitable (sufficient capacity) crane, Hydra, Trailer & lifting arrangement for transportation of material & E&C work shall be arrange by contractor.
60. Repair/replacement of materials/equipment's arising due to damages/pilferages during transit/storage/erection/commissioning shall be arranged by contractor well in time to ensure timely completion of work.
61. Dismantling works include weighing of dismantled materials and transportation of scrap material to scrap yard inside plant premises.
62. Transportation of all fabricated structure, pipes and other materials to erection location, handling, rigging, assembling, bolting, welding and satisfactory installation of new pipe rack and pipes in proper location according to approved layout/ approved erection drawings and/or as directed by Engineer in Charge.
63. Erection works include handling at site stores/storage yard, shifting to erection location, erection, providing temporary supports, alignment, welding and testing as per standard methods and specification/drawings/ FQP. If necessary suitable temporary approach roads or slabs over trenches shall be placed for transportation of fabricated materials to erection location.
64. For steam line /pressure Parts IBR approval is to be taken by Contractors and IBR procedure needs to be followed, including activities for welding etc.
65. The contractor shall be responsible for the necessary periodic testing, inspection during erection & commissioning of the equipment and shall carry out the work meet the specific requirements of relevant statutory regulation as necessary. All Fees, Charges etc payable to statutory authorities for carrying out such test shall be borne by the contractor.
66. Checking center lines, levels etc. including checking line, level position and plumb of all bolts and pockets. Any defect observed shall be brought to the notice of the engineer. The contractor shall fully satisfy himself regarding the correctness of the same before installing the fabricated steel structures.
67. Aligning, plumbing, leveling, bolting, welding and securely fixing the fabricated steel structures and equipment in accordance with the drawings or as directed by the Engineer.
68. Air-in Leakage test by arranging blanking all the leakages and pressurizing using blowers/fan etc. test equipment etc.
69. Removal & relocation of fouling to carry out subject work is in contractor scope.
70. Providing temporary supports for existing outlet ducts, gates etc. when the column are dismantled to facilitate the work. The work involves fabrication of supports, etc. as per the drawing/instruction of engineer in charge.
71. Adequate scaffolding and scaffolding material have to be arranged to complete the job stipulated time of shutdown.
72. The general purpose tools & tackles all testing equipment's, instruments etc. required for testing, erection & commissioning of work will be provided by the contractor at his own cost. Also necessary lifting tackles, tools, Wire rope slings of suitable capacities and other incidental to carry out this work shall have to be arranged by the contractor himself.
73. The contractor shall provide all the consumable during the erection, testing and commissioning of plants / equipment's.
74. The stores shall be handled with care and diligence, any loss to BHEL/GSECL due to contractor lapse shall have to be made good by contractor.

75. If the contractor or his workmen or employees shall break, deface, injure or destroy any part of the building, roads, fence, enclosures, water pipes, cable, drains, electric or telephone posts or wires, tree or any other property belonging to GSECL/BHEL or their client or to any part of erected equipment store component etc. the contractor shall make good the same at his own expenses or in default. The site engineer may cause the same to be made good workmen, or by other means and deduct the expense (Of which the site engineers decision is final) from any sums that may be then or at any time thereafter become due to the contractor or from his security deposit or any other money due.
76. Paintings as per specification/ instructions of exposed surfaces.

Note:

1. **The specific work which is not mentioned in the scope of work but required to be carried out for completion of subject work i.e. any minor modification is in the bidder's scope.**
2. **Decision of BHEL site in charge regarding interpretation of the scope of work shall be final.**
3. **In case of any work arising during the course of execution, which was not envisaged during the engineering phase and is not in the scope of work, will be treated as extra work and will be paid on man-hour basis.**

3.2. LAISION WITH ALL STATUTORY AUTHORITIES:

a) Compliance of statutory provisions, whether mentioned in this contract or not shall be binding on the contractor.
b) If there is any change in labour laws after the contract has been awarded, then the new law shall automatically be binding on the contractor.
c) No additional financial compensation shall be paid by BHEL to the contractor on account of increased expenditure caused by a) and b) above.

3.3 PAYMENT TO WORKERS:

1. Payment to workers shall be done in the presence of BHEL representative.
2. The contractor shall intimate the day of payment at least three days in advance in writing along with copy of the pay sheet and attendance cards.
3. All workmen shall be covered by PF Rules irrespective of their period of employment.
4. Payment shall be made inside the plant premises and during office hours.

3.4 SUBMISSION OF DOCUMENTS:

The contractor shall submit following documents at appropriate time either before or during the execution of the work and as directed by Site in-Charge.

1. Test certificates of Pulling and Lifting machines and appliances.
2. Details of workers to be deployed with name, address, category.
3. Details of supervisory staff to be deployed.

4. Authorization for receipt of materials and for signing of Measurement Books etc,
5. Labour license specific to the contract.
6. List of T&P brought into plant premises along with their serial numbers and dates/years of purchase.
7. All the Staff/Workers deputed for the Job should have Insurance Cover and document in this regard should be submitted along with 1st RA Bill.
8. List of consumables brought into plant premises along with their serial numbers and dates/years of purchase, along with test certificates wherever applicable.
9. Insurance policy for the workers to be deployed in this contract.
10. Safety undertaking.
11. Approval from IBR to work in Gujarat
12. Details of approved HP Welders with certificate copies.
13. Copy of ESI certificate to be furnished.
14. Proof of Payment of GST.
    a. (Sl.No.11 to 12 are required before final bill is processed)

The contractor shall submit following documents in report form within 15 days from commissioning of unit after the overhaul/shut down work is completed:

- Details of work executed.
- Measurements against different schedules in compiled form.
- Material issue details.
- Material consumption details.
- Material returns details.
- Details of settlement of accident benefits if any to workmen
- Copies of pay sheets to workmen.
- Details and proof of remittance of PF to workmen (before final bill).
- No dues clearance from different stores of customer/ GSECL
- Valid labour license

3.5 Statutory Inspection

Please refer General and Special Conditions of Contract. In addition to it the scope includes getting the approvals from the statutory authorities (like IBR, smoke nuisance inspector, Electrical Inspector, anti-pollution authorities, labor officials). This includes arranging for inspection visits of such authorities periodically as per requirement, submitting documents etc. and payment of fees connected with it.

1. Approvals from the statutory authorities shall be in the scope of bidder (like IBR, smoke nuisance inspector, Electrical Inspector, anti-pollution authorities, labor officials) and payment of fees connected with it
2. IBR approvals for work execution, hydro test & open inspection of materials (carried out with boiler inspector.) and work and endorsement of HP welder's certificates and payment of fees connected with it

3. Hydraulic Test of boiler in presence of boiler inspector & arrangement Hydraulic Test approval form Boiler inspectorate office and payment of fees connected with it
4. This includes arranging for inspection visits of such authorities periodically as per requirement, submitting documents etc. and payment of fees connected with it.
5. Arrangement of Labour license before start of work.
6. Arrangement of Interstate migrant worker license before start of work.
7. Arrangement of police verification of all the manpower employed for gate pass.
8. Arrangement of Insurance for gate pass and before start of work.

3.6 Safety:

Contractor should engage at least One Qualified Engineer in each shift during the contract period. Strict Safety measures have to be followed at Site. Contractor shall also adhere to all the safety provisions of our customer. In case violation of any provision at site fine of Rs.500/- to Rs.2000/- OR as per GSECL rules, at the discretion of our site in-charge, shall be imposed for each of such occasion and shall be recoverable from the contractor's bill.

1. The contractor should ensure the use of 24 volt hand lamps and 24 volt transformer by his workers. The all electrical gadgets shall have plug top & proper earthing.
2. All T&P like pulling and lifting machine, chain pulley blocks, slings, D-shackles should be maintained in proper working condition. Necessary test certificate has to be submitted by contractor for lifting tools & tackles.
3. The contractor shall be fully responsible for the safety of his workers.
4. The Use of ISI mark safety helmet, ISI mark safety shoes, Goggles, hand gloves, ear plugs and nose mask is a must. In addition to this, a full body (safety) harness, face shield must be provided to workers carrying out work at height &cutting/ welding/ grinding respectively. Gas cutting set with flash back arrester etc. should be provided by the contractor and should ensure the use of these safety equipment's, all PPE by his worker while working.
5. Scaffolding should be erected properly and strong enough with hand rails and it should not be used before getting it checked by Engineer-in-charge.
6. The contractor shall be solely responsible for the safety of his workers & employees. The contractor must ensure that the persons working in specialized nature jobs/ skilled jobs/ working with the welding machines, grinders, cutting set & other special T&P shall be having experience & expertise to perform that job. Contractor should engage physically and mentally fit manpower. The electrical connection / repair jobs shall be done only by the electricians.
9. The contractor shall ensure that prior to start of work all his workers shall get the safety training.
10. The contractor shall also take care for the safety of the equipment's & persons working in the vicinity.
11. Customer at its own discretion may decide to recheck / retest some or all of the T&P / machines of the contractor inside the plant premises.
12. The helmets, safety shoes and safety belts issued by the contractor shall be conforming to relevant IS standards.
12. The contractor shall maintain the first aid box at site.

13. Safety Violation penalty as per extant GSECL norms will be applicable. In case of any penalty levied on BHEL by customer due to any safety violation/lapses by sub-contracting agency, the same will be debited to the sub-contracting agency.
14. All the dial gauges & flash back arrestors of Gas cylinder should be ISI marked. Test certificates of all the gas cylinders should be available.
15. All the scaffolding pipes should be in good condition and all the planks should be metallic with hooks for coupling with tubes or scaffolding coupler pipes.
16. All the lifting and shifting equipment's should have valid test certificate by competent authority of Gujarat state.
17. All the switch boards being used at individual jobs to have ELCB's for the protection.
18. Vendor to arrange 5 numbers of type A and type B safety nets each as per the details below:

a. Safety Net Type-A - 5 Nos (Double Layer)

- Size: 10Mtr X 5Mtr
- Mesh Size: 25mm
- Mesh Rope: 2mm rope double cord
- Border / Tie Cord. Rope: 12mm dia Polypropylene rope (tested as per IS: 5175) 2 Mtr Length shall be provided at all four corners.
- 1st layer – Hdpe 2mm double cord
- 2nd layer – Hdpe Overlay Containment HDPE Blue Nets 15-22 mm

b. Safety Net Type-B – 5 Nos (Double Layer)

- Size: 10Mtr X 10Mtr
- Mesh Size: 25mm
- Mesh Rope: 2mm rope double cord
- Border / Tie Cord. Rope: 12mm dia Polypropylene rope (tested as per IS: 5175) 2 Mtr Length shall be provided at all four corners.
- 1st layer – Hdpe 2mm double cord
- 2nd layer – Overlay Containment HDPE Monofilaments Nets.

- ***THE PRESENT SAFETY NORMS, APPLICABLE SAFETY STANDARD AND FINES FOR SAFETY VIOLATIONS AT GSECL WANAKBORI ARE ATTACHED AS ANNEXURE - IV***

3.7 PROVISION OF PPEs

- Personnel Protective Equipment (PPEs), in adequate numbers, will be made available at site & their regular use by all concerned will be ensured
- The following matrix recommends usage of minimum PPEs against the respective job.

SI.NO	Type of Work	PPEs
1	Concrete and asphalt mixing	Nose mask ,hand glove ,apron and gum boot
2	Welders/Grinders/Gas cutters	Welding/face screen, apron, hand gloves, nose mask and ear muffs if noise level exceeds 90dB. Helmet fitted with welding shield is preferred for welders
3	Stone /concrete breakers	Ear muffs, safety goggles, hand gloves

4	Electrical Work	Rubber hand glove, Electrical Resistance shoes
5	Insulation Work	Respiratory mask, Hand glove, safety goggles
6	Work at height	Double lanyard full body harness, fall arrestor (specific cases)
7	Grit/Sand blasting	Blast suit, blast helmet, respirator, leather gloves
8	Painting	Plastic glove, Respirators (particularly for spray painting)
9	Radiography	As per BARC guidelines

- The PPEs shall conform to the relevant standards as below and bear ISI mark.

Relevant is-codes for personal protection

IS:2925-1984	Industrial safety Helmets
IS:4770-1968	Rubber gloves for electrical purpose.
IS:6994-1973(Part-I)	Industrial safety Gloves(Leather & Cotton Gloves)
IS:1989-1986	Leather Safety boots and shoes.
IS:5557-1969	Industrial and safety rubber knee boots.
IS:6519-1971	Code of practice for selections care and repair of Safety foot wear.
IS:11226-1985	Leather Safety footwear having direct molding sole.
IS:5983-1978	Eye protectors.
IS:9167-1979	Eye protectors.
IS:1179-1967	Eye & face protection during welding
IS:3521-1983	Industrial Safety Belt and Harness
IS:8519-1977	Guide for selection of industrial Safety equipment for body protection
IS:9473-2002,14166-1994, 14746-1999	Respiratory Protective Devices

The list is not exhaustive. The safety officer may demand additional PPEs based on specific requirement.

NOTE: All employee of vendor should wear company uniform along with company logo at work place.

Minimum PPEs required:

1. Safety Shoes conforming to relevant IS standard.
2. Safety Helmet conforming to relevant IS standard.
3. Full body harness with double lanyard conforming to relevant IS standard.
4. Rope grab fall arrestor with ladder rope conforming to relevant IS standard.
5. Retractable fall arrestor conforming to relevant IS standard.
6. Safety goggles and reflective jacket conforming to relevant IS standard.
7. Rigging Hand gloves (cotton)
8. Safety net as per SCC clause 3.6.18.
9. Nose mask conforming to relevant IS standard.

3.8 OTHER TERMS AND CONDITIONS

1.0 Successful bidder has to extend manpower assistance for minor cleaning/scrapping, etc.

2.0 ~~A copy of tender document with each page duly signed and stamped shall be submitted along with your offer as a token of your unconditional acceptance to this tender condition.~~ Also any deviation to the tender conditions shall be submitted in a separate paper duly signed by the bidder, any overwriting / correction by the bidder on the tender will not be recognized and the offer may be rejected on this ground.

3.0 General and special conditions of contract' enclosed herewith will be fully applicable, except otherwise stated in this enquiry. In case of any conflict, the conditions specified in this enquiry letter will prevail over that of the 'General and special conditions of contract'.

3.7 Security Deposit

Please refer our "General and special conditions of contracts".

3.8 Other terms and conditions

1.0 Successful bidder has to extend manpower assistance for minor cleaning/scrapping, etc.

2.0 A copy of tender document with each page duly signed and stamped shall be submitted along with your offer as a token of your unconditional acceptance to this tender condition. Also any deviation to the tender conditions shall be submitted in a separate paper duly signed by the bidder, any overwriting / correction by the bidder on the tender will not be recognized and the offer may be rejected on this ground.

3.0 General and special conditions of contract' enclosed herewith will be fully applicable, except otherwise stated in this enquiry. In case of any conflict, the conditions specified in this enquiry letter will prevail over that of the 'General and special conditions of contract'.

4. LIST OF MANPOWER REQUIRED

Erection & Commissioning of Boiler Pressure parts i.e. Economizer, LTSH, Headers, Back pass, Radiant roof 1&2 pass and Buck Stay, Seal Boxes & Access Doors, Soot Blowers, Skin casing, Removal & application of Insulation of Boilers, replacement of mill components and coal pipe **AND** Erection and Commissioning of APH and Duct & Dampers at Wanakbori TPS Unit No.2

Sl. No.	Manpower	Category	Area						
			Ducting	Mill	APH	SOFA	Scanner Air	Burner	Back pass
1	Site-in charge	Site-in charge	1						
2	Engineer	Graduate	1	1	1				2
3	Supervisor	Graduate	2	1	2	1	1		3
4	Store Keeper	Non-Graduate	2						
5	Time-Keeper	Non-Graduate	1						
	Fore man	skilled	2		1				2
6	HP Welder	IBR							10
7	Welder (Non-IBR)	Skilled	15						5
8	Gas cutter	Skilled	4	1	1				2
9	Scaffolder	Semi-Skilled	20						
10	Fitter	Skilled	8	1	2	1	1	1	9
11	Electrician	Semi-Skilled	3						
12	Jr. Filter	Semi-Skilled	4	1	2	1	1	1	3
13	Insn. Lagger/Carpenter	Semi-Skilled	40						
14	Grinder Man	Semi-Skilled	1			2	1		5
15	Rigger	Semi-Skilled	55	8	15	15	3	14	60
16	Helper/Cutter	Un-Skilled	15	7	10	10	4	6	25
17	Office boy	semi - skilled	2						
TOTAL								416	

This is an indicative list; the sub-contractor shall deploy adequate manpower to carry out the work round the clock and as per requirement of the site during execution of the Job.

4.1 Man power & T&P:

a) Adequate manpower, T&P along with consumables should be deployed at site and should reach the site **30 days before the shutdown of the unit.** All the lifting tools /measuring instruments shall

be duly tested /calibrated and valid certificate to that effect should be submitted to BHEL Site In-charge before start of the work.

b) A deployment plan along with experience and name of the Site In-charge, Engineers, Supervisors, Foreman and main technicians to be submitted on per shift basis.

c) Successful bidder has to arrange a LAPTOP at site with latest configuration, USB Modem for Internet connectivity, DVD/CD writer, multimedia and its peripherals including printer.

d) One office boy to be provided for BHEL site office.

e) **Successful bidder has to engage 03 Expert Manpower for full duration of work in consultation with BHEL Engineer. Deployment of Experts shall be as follows :**

01 well experienced expert Engineer, who has experience in erection and overhaul of APH & auxiliaries & 01 well experienced expert Engineers who have experience in erection and overhaul of Boiler pressure parts and burner system & 01 well experienced expert Engineers who have experience in erection and overhaul of Mills during entire overhauling period in consultation with BHEL. Payment of Expert Engineers shall be done by contractor.

f) **Contractor Should Engage at Least 04 (1-ducting + 1-pressure parts+ 1-APH + 1-night shift) Qualified Safety Engineer in Each Shift During the Contract Period in Consultation with BHEL Site-In-Charge. Safety Engineer Should Be Qualified from Approved Institute.**

g) **Contractor Should Engage at Least 02 Qualified Quality Engineer in Each Shift During the Contract Period in Consultation with BHEL Site-In-Charge.**

h) **This is an indicative list; the sub-contractor shall deploy adequate manpower to carry out the work round the clock and as per requirement of the site during execution of the Job.**

4.2 LIST OF T& P AND MEASURING INSTRUMENTS TO BE DEPLOYED

A. Erection & Commissioning of Boiler Pressure parts i.e. Economizer, LTSH, Headers, Back pass, Radiant roof 1&2 pass and Buck Stay, Seal Boxes & Access Doors, Soot Blowers, Skin casing, Removal & application of Insulation of Boilers, replacement of mill components and coal pipe at Wanakbori TPS Unit No.2

Sl.No.	Description	Quantity
01.	Welding Generator / Rectifier	45 nos.
02.	Portable Grinding Machines of assorted sizes / types	35 nos.
03.	Welding cable	1500 Mtr.
04.	Gas cutting set	25 sets
05.	Chain pulley blocks 3MT/5MT/10MT cap.	100
06.	Lifting tackles including slings of assorted sizes	As per requirement
07.	Pulling Machines / Hook chooks	06 nos.
08.	24V lamps with cable and plug tops	10 nos.

09.	Crane 12 T/15 T	02 + 02 no.
10.	Tractor / Trailor 20 T cap.	02 no.
11.	Electric Winch 5T/10T cap.	08 nos./1 NOS.
12.	Torque Wrench with Torque Multiplier	01 no. each (35 kg.M/65 kg.M)
13.	Slogging spanners 52 mm & 54 mm	4 nos. each.
14.	Master Level of 0.02 mm LC	02 nos.
15.	Vernier calipers 0-150 m 0-300 M 0-600 M	 02 nos. 02 nos. 01 no.
16.	Inside Micro-meter up to 600 mm	01 no.
17.	Outside Micro-meter up to 600 mm range	01 no.
18.	Measuring Tape up to 15 M length	04 nos.
19.	Dial Gauges	03 nos.
22.	Tap set M 39 x 3	1 set.
23.	Filler gauge (loose) 200 mm long	4 nos.

B. Erection & Commissioning of Regenerative Air Preheaters and duct/dampers at Wanakbori TPS Unit No.2

Sl.No.	Description	Quantity
01.	Welding Generator / Rectifier	15 nos.
02.	Portable Grinding Machines of assorted sizes / types	10 nos.
03.	Welding cable	500 Mtr.
04.	Gas cutting set	12 sets
05.	Chain pulley blocks 3MT/5MT/10MT cap.	20 nos./10 nos./10 nos.
06.	Lifting tackles including slings of assorted sizes	As per requirement
07.	Pulling Machines / Hook chooks	06 nos.
08.	24V lamps with cable and plug tops	10 nos.
09.	Crane 12 T	01 no.
10.	Tractor / Trailor 10 T cap.	01 no.
11.	Electric Winch 5T/10T cap.	04 nos./2 NOS.
12.	Torque Wrench with Torque Multiplier	01 no. each (35 kg.M/65 kg.M)

13.	Slogging spanners 52 mm & 54 mm	4 nos. each.
14.	Master Level of 0.02 mm LC	02 nos.
15.	Vernier calipers 0-150 m 0-300 M 0-600 M	 02 nos. 02 nos. 01 no.
16.	Inside Micro-meter up to 600 mm	01 no.
17.	Outside Micro-meter up to 600 mm range	01 no.
18.	Measuring Tape up to 15 M length	04 nos.
19.	Dial Gauges	03 nos.
20.	Grinding Machine AG-7 & GQ 4	8 nos. / 4 nos.
21.	Diesel grinders	2 nos.
22.	Tap set M 39 x 3	1 set.
23.	Filler gauge (loose) 200 mm long	4 nos.

NOTE:

1. The above list is only indicative and not exhaustive. Arrangement for any other T and P required for completion of the job shall be the responsibility of the contractor and shall be arranged by him.
2. All the tools and tackles/measuring instruments shall be duly tested/calibrated and valid certificate to that effect should be submitted to our site in-charge before the start of work.
3. Arrangement of 150-200 Ton capacity tire mounted Crane with adequate boom length or Jib arrangement for APH dismantling and erection purpose and other erection purposes. However, if higher capacity crane shall be required to complete the work, same shall be arranged by bidder at no extra cost. Bidder may visit the site for assessment of capacity & positioning of crane.
4. Sky climber/cup lock, if required, for the removal and installation of burner assembly and alignment of the burners, will be in vendor's scope
5. **Hydro test pump of capacity 250 kg/cm² for boiler hydro test.**

4.3 CONSUMABLES TO BE ARRANGED BY CONTRACTOR

(The list is indicative only and not exhaustive)

List of anticipated consumables are as indicated as follows:-

LIST OF CONSUAMBLES OF REQUIRED QUANTITY

1. Kerosene/Diesel
2. Rustolene
3. CTC
4. Waste cloth/Cotton

5. Marking cloth
6. Cutoff wheels / Grinding wheels
7. Mounted wheels/ rotary cutters
8. Insulation tape / Johnson tape
9. Sander discs and wheels
10. Polyethylene sheets
11. Electric fuse wire and cables
12. Cutting Electrodes
13. Welding Electrodes (E7018, 8018, 9018 & filler wire as per requirement)
14. Argon, DA and Oxygen gases

NOTE:
The above list is only indicative & not exhaustive. Arrangement for any other consumables required for completion of the job shall be the responsibility of the contractor & shall be arranged by him.

4.4 Facilities to be provided by GSECL/BHEL

A. Free of cost: -

1. Free supply of service water will be made available for construction & drinking purposes as a single point at work site to be decided by GSECL.
2. Free supply of service air shall be provided at one point at works site to be decided by GSECL.
3. The contractor shall advise GSECL within 3 weeks from the zero date about his exact requirement of space for his office, storage area, pre assembly and fabrication areas etc. above requirements shall be reviewed by GSECL's engineer and space as decided by GSECL will be allotted to the contractors for construction of his temporary structures, facilities like offices, storage shades pre assembly & fabrication areas etc for Contractor's as well as his sub-contractors use.

B. On chargeable Basis: -

1. **The contractor shall submit GSECL within 3 weeks from the zero date about his electrical power requirement for the works to allow the planning of the same by GSECL. The LT electric power will be made available at single point. Further extension will have to be carried out by the contractor as per requirement at their cost. The necessary charges will be recovered as per the tariff rate of Dakshin Gujarat VIJ Company LTD. (DGVCL) from time to time.**
2. Area lighting shall be provided by GSECL as per its existing lighting scheme. However, any additional lighting required for the safe execution of the work shall be arranged by the contractor. Any damage cause due to inadequate lighting shall be made good by the contractor at his own cost.
3. GSECL will provide un-furnished bachelor qtrs./Hostel to contractor, if available. the contractor shall have to pay the rent of quarter/hostel as GSECL rules. Contractor to carry out minor repairs

in the qtr, if required. Land for staff and labor colony shall not be provided by GSECL and Contractor has to make his own arrangement for the same at his own cost.

4. The medical facilities to the contractor personnel shall be provided on chargeable basis at the GSECL hospital.

4.5 Contractor responsibility: -

a. Contractor has to be deployed two equal parallel strength of group in 12 hrs. Shift with equal T&P for all the jobs so as to complete the work in stipulated period or earlier.
b. Steam dumping activity if required is in contractor scope.
c. Vendor to take job to facility outside the site for minor machining/modification.
d. Contractor to arrange MCCB/ELCB for the point from where the supply distribution has to be taken.
e. Providing assistance for carrying out testing and commissioning of Air Pre-heaters & Boiler.
f. Bidder to make any temporary arrangement for the flushing of lube oil system of equipment and fuel oil system.
g. Bidder to cut the Main steam line at a location decided as per the procedure to facilitate the steam blowing and again the normalization of the line.
h. **Bidder to provide assistance for Alkali boil-out of the boiler as per direction of BHEL personnel.**
i. **Bidder to arrange required quantity of Tri-sodium phosphate(TSP) and di-sodium phosphate(DSP) for the alkali boil-out of boiler. The material to be procured is in consultation with BHEL engineer. Test certificate of the same to be submitted by the vendor. The quantity of TSP 600 kg & DSP-300 kg.**
j. **Bidder to procure around 10 ltrs of HCL and 50 ltrs of NaOH for the chemical cleaning of APH lube oil lines.**
k. **Providing assistance for all other testing conducted by BHEL (PET, PG Test, Chemical Cleaning etc.)**
l. 100% radiography is done by contractor if repair required after radiography and hydraulic test shall be conducted presence of boiler inspector and during hydro test if found leakage in pressure part shall be repaired by contractor free of cost (contractor own cost) with 100% radiography.
m. Transportation of material from BHEL/GSECL store to site and back after completion of work contractor scope and Hydra crane, tractor, truck, trolley shall be arranged by contractor
n. Water Washing/air cleaning of Second Pass.
o. All consumables required for modification work is in the scope of bidder.
p. Bidder to arrange 2500 Scaffolding pipes & clamps.
q. Safety penalties and inspection of all T & Ps to be as per guidelines of GSECL Wanakbori. All daily formats and inspection related to safety are to be complied with as per customer safety policy.

4.6 Co-operation with other Contractors: -

Contractor shall agree to co-operate with the other contractor (TG , Civil C&I Agencies) for associated Equipment as during their work it may happen that other work contractor is also working nearby or parallel to his work and all the work to be completed in stipulated time only.

QUALITY REQUIREMENT

- Various inspection/ quality control / quality assurance procedure/ methods at various stages will be as per BHEL/ customer quality control procedure/ codes/ IBR and other statutory provisions and as per BHEL Engineer's instructions.
- Preparation of quality assurance log sheets and protocols with customer's engineers, welding logs, other quality control and quality assurance documentation as per BHEL Engineer's instructions, is within the scope of work/ specification.
- A daily log book should be maintained by Area In-charge of contractor on the job incorporating erection / alignment / welding clearance /radiography / progress of work etc. and the same shall be submitted to BHEL. Also, daily reports shall be submitted to BHEL.
- All the important measurements like pre-assembly checking of alignment leveling/ centering work etc. shall be recorded in the daily log book with sketches based on BHEL drawings indicating readings/ measurements actually taken and signed by BHEL/ Customer/ Contractor representatives.
- The inspection/measuring and testing equipments should be of brand, quality and accuracy, as specified by BHEL engineer and should have valid calibration certificates traceable to national/international standards.
- Total quality is the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He will follow the instructions as per BHEL drawings and quality standards.
- The welder's performance will be reviewed from time to time as per the BHEL/ IBR standards and any welder not performing to the standards set by BHEL/ IBR standards will be removed from working, Contractor shall arrange for the alternate welders immediately.
- All the welders including HP welders shall carry identity cards. Only welders duly authorized by BHEL/ Boiler inspector/ customer / consultant shall be engaged on the work.
- STAGE INSPECTION BY BHEL / CUSTOMERS ENGINEERS
  Apart from day-to-day inspection/ stage inspection of equipments by BHEL engineers, the equipments may be checked at various stages by customer's engineers and quality assurance teams. Contractor shall arrange all labour, tools/tackles etc. for such inspections free of cost.

6.1 TIME SCHEDULE & MOBILIZATION

6.1.1 INITIAL MOBILIZATION

After receipt of fax LOI, Contractor shall discuss with Project Manager / Construction Manager/BHEL Site In charge regarding initial mobilization. Full-fledged team consisting of riggers, welders, fitters, helpers along with T& P has to be mobilized as per directives given by BHEL after issue of LOI so that the work can be started from day one with full force. Successful bidder has to attend Kick-off meeting at Wanakbori site & mobilize the site within 07 days after receipt of LOI.

6.1.2 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING, OVERHAULING ETC.

The activities for Overhauling/Modification shall be started as per directions of Site In charge of BHEL. Contractor shall mobilize further resources (in addition to those required for activities under clause no. 6.1.1) as per requirement to commence the subject work and progressively augment the resources to match schedule of the project.

Entire E&C works are to be completed within 105 days from the date of start of work. Any other testing of Boiler/APH and completion of all other residual work shall be completed in these 15 days i.e. Total Work completion time shall be **120 days (from the date of Shut down till Unit full load).**

It is to be noted that time is essence of the contract and the job should be completed to the fullest satisfaction of BHEL within the specified time period. In the event of delay in completion of the job, action will be taken as per relevant clauses of contract.

The tentative shutdown of Boiler is scheduled from **24 Jun 2026** and work on all fronts to be started immediately thereafter. **Successful bidder has to mobilize 45 days prior to shutdown of the unit for the pre-fabrication of ducts , as per the directives given by BHEL.**

7.1 Payment Terms: -

Monthly RA billing shall be done as per the break-up given below:-

Sch. No.	Description of Work	Unit	Qty	Percentage of Overall (LS) Quoted Price
	R&M OF Boiler U#3, 200 MW Wanakbori			
A	**Dismantling of Boiler Parts including Removal of Insulation - 2934 MT (22.92232%)**			
1	Dismantling of Boiler Parts (80%)	MT	2934	18.33786%
2	Milestone Activities to complete Boiler R&M Work (20%)	MT	2934	4.58446%
B	**Erection & Commissioning of Boiler Pressure parts i.e. Economizer, LTSH, Steam Cooled Wall, Headers, Radiant roof 1&2 pass and Buck Stay, Seal Boxes & Access Doors, Soot Blowers - 768 MT (20.24309%)**			
1	Erection of component (25%)	MT	768	5.06077%
2	Alignment, welding of the component (35%)	MT	768	7.08508%
3	NDT of the component (20%)	MT	768	4.04862%
4	Milestone Activities to complete Boiler R&M Work (20%)	MT	768	4.04862%
C	**Erection & Commissioning of Structure - 232 MT (5.417338%)**			
1	Erection of component (25%)	MT	232	1.51685%
2	Alignment, welding of the component (35%)	MT	232	1.73355%
3	NDT of the component (20%)	MT	232	1.08347%
4	Milestone Activities to complete Boiler R&M Work (20%)	MT	232	1.08347%
D	**Erection & Commissioning of Regenerative Air Preheaters (Rotary) - 450 MT (7.032791%)**			
1	Module loading 0f APH A (20%)	MT	450	1.40656%
2	Module loading of APH B (20%)	MT	450	1.40656%
3	APH A alignment & Trial Run (20%)	MT	450	1.40656%
4	APH B alignment & Trial Run (20%)	MT	450	1.40656%
5	Milestone Activities to complete Boiler R&M Work (20%)	MT	450	1.40656%
E	**Erection & Commissioning of Non Pressure Parts - 1367 MT (33.58509%)**			
E-1	**Replacement of Milling system (NPP) (6.000000%)**			
1	Classifier replacement work (5.5% for each mill X 6 mills)-proportionally (33%)	MT	105	1.98000%

2	Liner replacement and repairing of mills(5.5% for each mill X 6 mills) - proportionally (33%)	MT	105	1.98000%
3	Mills trial run (14%)	MT	105	0.84000%
4	Milestone Activities to complete Boiler R&M Work (20%)	MT	105	1.20000%
E-2	**Replacement of Duct system, dampers & gates (NPP) (18.000000%)**			
1	Erection of duct (25%)	MT	1100	4.50000%
2	Alignment, welding & NDT (30%)	MT	1100	5.40000%
3	Duct Support (10%)	MT	1100	1.80000%
4	ATT completion (15%)	MT	1100	2.70000%
5	Milestone Activities to complete Boiler R&M Work (20%)	MT	1100	3.60000%
E-3	**Replacement of roof & penthouse enclosure refractory and skin casing, coal pipes, burner & fuel oil works (NPP) (9.58509%)**			
1	Replacement of coal nozzle, coal pipe & bends (20%)	MT	162	1.91702%
2	Replacement of scanner air system (20%)	MT	162	1.91702%
3	Replacement of valves & corner skids in fuel firing system and SADC/burner tilt mechanism (20%)	MT	162	1.91702%
4	Replacement of SH & RH spray valves (20%)	MT	162	1.91702%
5	Milestone Activities to complete Boiler R&M Work (20%)	MT	162	1.91702%
F	**Erection & Commissioning of Hangers & Supports - 5 MT (0.14921%)**			
1	Erection & Commissioning of Hangers & Supports (80%)	MT	5	0.11937%
2	Milestone Activities to complete Boiler R&M Work (20%)	MT	5	0.02983%
G	**Application of Insulation - 480 MT (10.65017%)**			
1	Application of Insulation including Cladding & Refractory (80%)	MT	480	8.52014%
2	Milestone Activities to complete Boiler R&M Work (20%)	MT	480	2.13003%
		Total %		100.00000%

NOTE : Further Break-Up of Milestone Activities to complete Boiler R&M Work are described below :-

Sch. No.	Description of Work	Unit	Qty	Percentage
	Milestone Activities to complete Boiler R&M Work (20.00000%)			
1	4% on Mobilization of site with T& P	LS	1	4.000000%
2	5% on Boiler light-up & commissioning.	LS	1	5.000000%

3	5% On completion of all the other activities like performance test, punch point & commissioning, removal of scrap etc. from site and on submission of documents like No Dues certificate from Customer, EPF challan, Insurance, Labour License and Labour Payment sheets etc.	LS	1	5.000000%
4	4% for deployment of Safety Engineer, PPE & Safety Equipment's, Experts & Quality Engineers			
(i)	1 % for deployment of 4 numbers of safety engineer/supervisors	Nos	4	1.000000%
(ii)	1 % for deployment of PPEs, safety equipment's (safety nets, rope grab fall arrestor, life lines etc.)	LS	1	1.000000%
(iii)	1 % for deployment of 3 experts for boiler & rotary equipment	Nos	3	1.000000%
(iv)	1 % for deployment of 2 numbers of quality engineers	Nos	2	1.000000%
5	1.0 % for completion of insulation disposal at designated place	LS	1	1.000000%
6	1.0 % for completion of scrap disposal at designated place	LS	1	1.000000%

Note:

1. LD/Penalty of 1% per day of the total contract value will be levied for improper mobilization of man power and 1% per day for T & P and consumables separately subject to maximum 10% of the contract value shall be deducted from contractor 's bill
2. While submitting the invoices, Vendor should mention their Bank Account No. on each of their invoices for the purpose of making e-payment. Invoice should be sent in triplicate form.
3. If the sub-contractor fails to successfully Install & commission the Boiler within the time period of **105 days** from the date of commencement of shutdown due to reasons solely attributable to sub-contractor, then a liquidated damage and not as penalty shall be levied on vendor, at the rate Half per-cent (0.5%) of Total Contract price for each day of delay, subjected to maximum of Ten per-cent (10%) of Total contract price.
4. Payment shall be made on actual executed quantity of each BOQ certified by BHEL Engineer.
5. Actual quantity shall be calculated as per shipping list.
6. Payment against Quantity Variation shall be calculated as per GCC.

8.0 TAXES, DUTIES, LEVIES (Rev 14 dated 09/10/2020)

1. All taxes excluding GST, GST Cess **& BOCW** Cess **but including, Royalties, fees, license, deposits, commission, any State or Central Levy and other charges whatsoever, if any, shall be borne by you and shall not be payable extra.**
2. Any increase of the taxes excluding GST, GST Cess & BOCW **Cess**, at any stage during execution including extension of the contract shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. Please note that since GST on output will be paid by BHEL separately as enumerated below, your quoted rates/ price should be after considering the Input Credit under GST law at your end.
3. **GST :**

   The successful bidder shall furnish proof of GST registration. GST along with Cess (as applicable) legally leviable & payable by the successful bidder as per GST Law, shall be paid by BHEL. Hence Bidder shall not include GST along with Cess (as applicable) in their quoted price.
4. GST charged in the Tax Invoice/Debit note by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5. E-invoicing under GST has been implemented with effect from 1st October 2020 for all the taxable persons having turnover more than the threshold limit in any preceding financial year from 2017-18 onwards. Therefore, for all the taxable persons falling under the purview of E-invoice, it is mandatory to mention a valid unique Invoice Reference No. (IRN) and QR code as generated from E-Invoicing portal of the Government for the purpose of issuing a valid Tax Invoice. Only an E-invoice issued in the manner prescribed under rule 48(4) of CGST Rules shall be treated as valid invoice for reimbursement of GST amount.

   If the successful Bidder is not falling under the purview of E-Invoicing then he has to submit a declaration in that respect along with relevant financial statements.
6. 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 will as below:

   BHEL GSTN – As per **Annexure -1**

   NAME -- Bharat Heavy Electricals Limited

   ADDRESS – Site address
7. Bidder to immediately intimate 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 to below email ids to enable BHEL to meet its GST related compliances :-

   Email id ---- to be intimated later on.

   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 not attributable to BHEL.
8. 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 Rule 53.
9. 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 not attributable to BHEL, GST amount shall be recoverable from the vendor along with interest levied / leviable on BHEL, as the case may be.

10. 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.
11. Way Bill: Successful Bidder to arrange for 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.
12. **New taxes and duties**:-Any New taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period including extension, if the same is not attributable to you, shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
    Benefits and/or abolition of all existing taxes must be passed on to BHEL against new Taxes, if any, proposed to be introduced at a later date.
    In case any new tax/levy/duty etc. becomes applicable after the date of bidder's offer but before opening of the price bid, the bidder must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of the price bids. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

13. For transportation work, bidder shall declare in his quotation whether he is registered under GST, if yes, whether he intends to claim GST on forward charge basis. In absence of this declaration, BHEL will proceed further with the assumption that bidder intends not to claim GST on forward charge basis. However, in case of GST registered transporter, the amount to the extent of goods and service tax will be retained till BHEL avails the credit of GST. Further, transporter shall issue tax invoice which inter alia includes gross weight of the consignment, name of the consigner and the consignee, registration number of vehicle in which the goods are transported, details of goods transported, details of place of origin and destination, GSTIN of the person liable for paying tax whether as consigner, consignee or goods transport agency, and also containing other information as mentioned under rule 46.

14. **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.**
15. **TDS under GST shall be deducted at prevailing rates on applicable value from the running bills.**
16. **TCS under Income Tax 1961 has been implemented with effect from 1st October 2020 for every seller having turnover more than threshold limit during financial year immediately preceding financial year in which the sale of goods is carried out, who receives any amount as consideration for sale of any goods of the value or aggregate of such value exceeding threshold limit other than export of goods or who is already covered under other provision of section 206C, collect from the buyer, TCS as per applicable rates of the sale consideration exceeding threshold limit subject to following conditions**

i. Buyer shall be as per clause (a) of section 206C- (1H)
ii. Seller shall be as per clause (b) of section 206C- (1H)
iii. No TCS is to be collected, if the seller is liable to collect TCS under other provision of section 206C or the buyer is liable to deduct TDS under any provision of the Act and has deducted such amount.

If Successful Bidder is falling under the purview of TCS then he has to submit a declaration in that respect along with relevant financial statements before the start of work or if bidder is falling under preview of TCS during the work in progress then bidder is compulsorily required to submit relevant financial statement in the beginning of the respective FY.

For TCS claim, vendor has to submit relevant documents required as per Income Tax Act.

17. Refer Annexure – 2 for BOCW Act & Cess Act.

ANNEXURE-1

State wise GSTIN no.s of BHEL

Sl. No	Projects under state	GSTIN
1	Andhra Pradesh	37AAACB4146P7Z8
2	Bihar	10AAACB4146P1ZU
3	Chhattisgarh	22AAACB4146P1ZP
4	Gujarat	24AAACB4146P1ZL
5	Jharkhand	20AAACB4146P5ZP
6	Madhya Pradesh	23AAACB4146P1ZN
7	Maharashtra	27AAACB4146P1ZF
8	Orissa	21AAACB4146P1ZR
9	Telangana	36AAACB4146P1ZG

Facilities in the scope of Contractor/BHEL

Sl. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
9.1	ESTABLISHMENT			
9.1.1	FOR CONSTRUCTION PURPOSE:			
a	Open space for office (as per availability)	Yes		BHEL may provide free of charge limited open space for office and store as and where made available by its customer.
b	Open space for storage (as per availability)	Yes		
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipments, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Firefighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
9.1.2	FOR LIVING PURPOSES OF THE BIDDER			
	Open space for labour colony (as per availability)		Yes	Customer may provide qtrs. For labor & staff on chargeable basis, of available. Otherwise Contractor has to make his own arrangement. Any minor repair in the qtrs. if provided, to be done by contractor.
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
9.2.0	ELECTRICITY			

Sl. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
9.2.1	**Electricity for construction 415 V (To be specified whether chargeable or free)**			
a	Single point source of 415 V	Yes		**Chargeable to bidder.** Bidder to make its own arrangement of distribution of electricity at its own cost.
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
9.2.2	**Electricity for the office, stores, canteen etc of the bidder(to be specified whether chargeable or free)**			
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
9.2.3	**Electricity for living accommodation of the bidder's staff, engineers, supervisors etc**		Yes	Customer may provide qtrs. For labor & staff on chargeable basis, of available. Otherwise Contractor has to make his own arrangement. Any minor repair in the qtrs. if provided, to be done by contractor.
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	

Sl. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
9.3.0	**WATER SUPPLY**			
9.3.1	**For construction purposes:**			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
9.3.2	**Water supply for bidder's office, stores, canteen etc**			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
9.3.3	**Water supply for Living Purpose**			Contractor has to make his own arrangement.
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
9.4.0	**LIGHTING**			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
9.5.0	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**			
a	Téléphone, fax, internet, intranet, e-mail etc.		Yes	

Sl. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
9.6.0	COMPRESSED AIR wherever required for the work		Yes	
9.7.0	Demobilization of all the above facilities		YES	
9.8.0	TRANSPORTATION			
a	For site personnel of the bidder		Yes	
b	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

Sl. No.	Description PART II 3.9.0 ERECTION FACILITIES	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
9.9.1	Engineering works for construction:			NOT APPLICABLE
a	Providing the erection/constructions drawings for all the equipment covered under this scope	Yes		
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL
c	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		Yes	Changes are to be marked in drawing & handover to BHEL on completion of work.
d	Shipping lists etc for reference and planning the activities			NOT APPLICABLE
e	Preparation of site erection schedules and other input requirements		Yes	In consultation with BHEL
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
g	Weekly erection schedules based on Sl No. e		Yes	In consultation with BHEL
h	Daily erection / work plan based on Sl No. g		Yes	In consultation with BHEL
i	Periodic visit of the senior official of the bidder to site to review the progress so that works is completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	

Sl. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
j	Preparation of preassembly bay			NOT APPLICABLE
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself			NOT APPLICABLE
L	Arranging the materials required for preassembly			NOT APPLICABLE

9.9.2 BHEL may provide free of charge limited open space, for office & storage shed, as and where made available by Customer. It is the responsibility of the contractor to construct sheds, provide all utilities and dismantle and clear the site after completion of work or as and when required, as a part of his scope of work.

Note: Due to space constraint at site, contractor may have to arrange for disposal of scrap and insulation wast. outside the plant premises. Any cost implication of the same shall be to the account of contractor and no extra payment shall be made for any such arrangements made by contractor (if required).

Annexure I

PG	Description	No.off/Boiler	Weight per Boiler in Kg
	Insulation (Air ducts and Flue gas duct)		
32,33	Air and flue gas ducts mineral wool and Fixing components		217500
	Ducts and Expansion joints		
48	Ducting - APH outlet to BOF, Primary air duct (Cold, hot and tempering), Secondary air duct (Cold & hot) along with expansion joints and supports		463000
	Scanner air system		
43	Complete Scanner Air Fan With AC & DC Motors & Accessories - Butterfly valves & expansion joints, piping & strcutural itemsAssy comp Scanner & Gun Air system (Duplex Air filter)		11000
	HEA Ignitors		
41	HEA IGNITOR ASSY.	12	
	FUEL OIL SYSTEM		
41	Complete Air cooled oil gun assembly with pneumatic fittings	12	2500
45	Burner Tilt power cylinder	4	
45	SADC power cylinder	12	
	Modified Burner assy and coal piping		
45	Coal Nozzle and nozzle tips, oil nozzle tips and air nozzle tips	24	16500
47	Coal piping		25000
	SPRAY SYSTEM PIPING AND FITTINGS		
24	SH and RH spray control station with complete piping and valves		25100
	Back pass modification - efficiency improvement		
	Buckstays, Seal boxes & Access doors		
8	II pass Buckstay assy (at 1 elevation)		8100
9	Seal Boxes For Furnace Opening		1400
28	Access doors		1500
	Pressure Parts II Pass		
10	LTSH Inlet and outlet headers		13600
11	LTSH coil assy		205000
11	Shielding plate for LTSH coils		36500

12	LTSH Terminal Tubes		26500
12	SH Desh Links		3300
10	Backpass Front, side wall and roof junction Headers		14500
11	Back pass Steam cooled wall panels		59950
12	Suspension of Backpass headers		8100

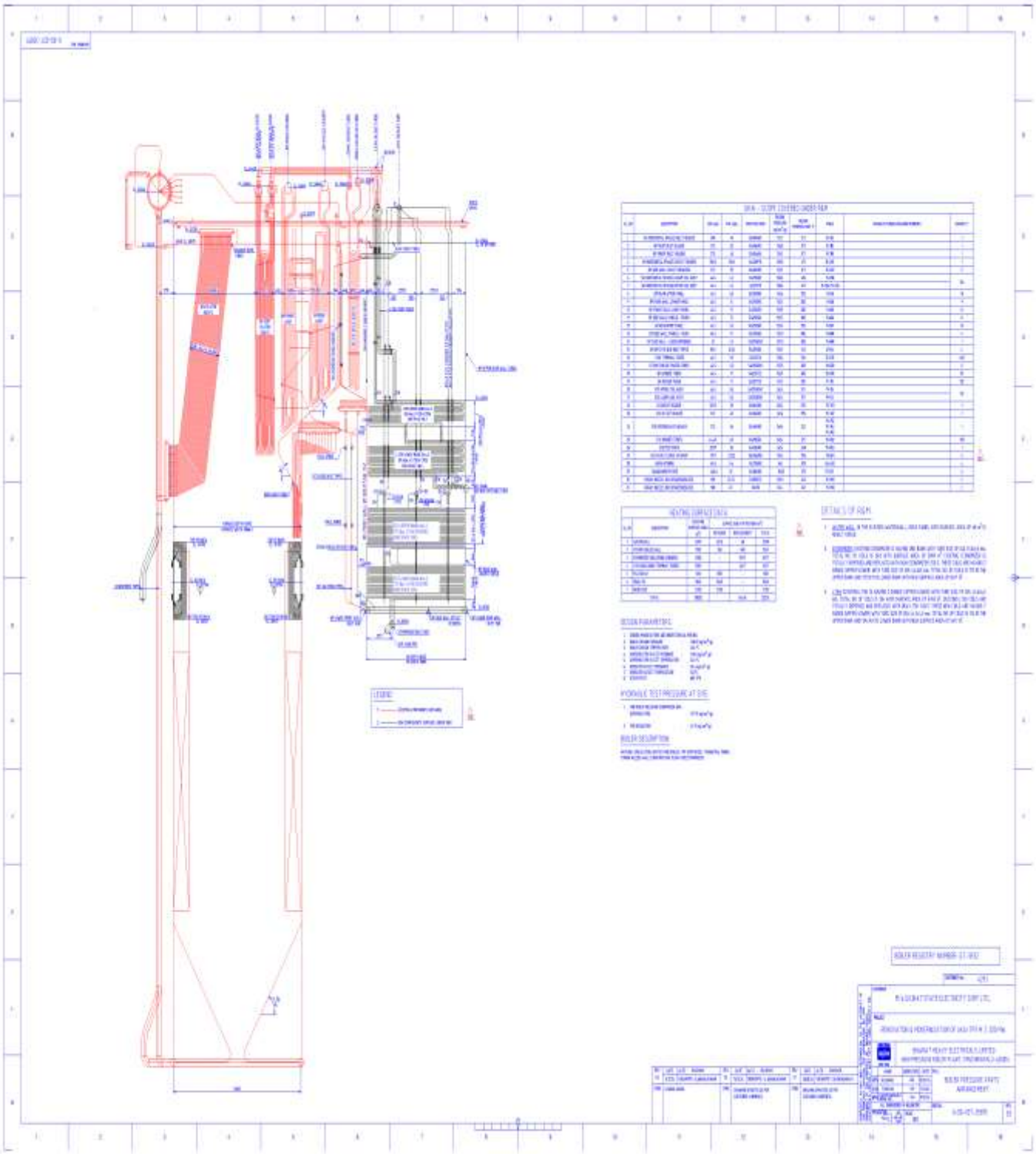
	Economiser		
19	Economiser coil assy & supports		330000
19	Eco Inlet, inter and outlet headers		17400
19	Eco hanger tubes		16500
19	Feed Pipe and support		2500
19	Eco links to drum		1650
30	Anti vibration baffles for eco		8000
19	Eco supports aboveand below roof		21500
	Soot Blower Piping		
21	Soot blower piping & supports		1500
	II Pass Insulation		
18	Furnace Roof Skin casing, II pass skin casing		23600
33	Main Boiler castable refractory and insulation		95000
	Insulation (Air ducts and Flue gas duct)		
32	Insulation and Fixing components for air and flue ducts		130500
	Supporting Structures (For Eco redesign, LRSB & others)		
36	Platforms (Channels, beams etc.,), floor grills, handrails, posts etc.,		139000
	Ducts and Expansion joints		
48	Eco duct to APH, other ducts and supports		161000
	Combustion modification -DeNOx		
6	WW panel (Rifled Tube) for BOFA		5500
32	BOFA duct insulation and fixing components		25450
33	Main Blr castable Refractory		11660
36	Structural flooring and corner platforms and Furnace Buckstay modification		38000
36	Support beams for ducts		20000
45	Windbox (SADC) damper assembly and Plates modification		7000
45	Pneumatic actuators with conventional positioners (for BOFA)	12	
45	BOFA compartment assembly at 4 corners		11900
45	Tilt power cylinder with conventional positioners (for BOFA)	4	
48	BOFA ducting, expansion joints and supports		32000
			2238710

Erection weight per boiler

A.	Grinding elements and vane wheel -36 Tons	36
B.	Mechanical face seal – 6 Tons	6
C.	Regulating type RC valve – 1.5 Tons	1.5
	Erection Weight	43.5
	Dismantling weight	43.5

	Erection Weight	Dismantling Weight
APH - Wanakbori-3	450	450
Gate & Damper - Wanakbori-3	275	275
Mills	50	50
Coal pipes & bends	65	65

ANNEXURE II



ANNEXURE III

ERECTION WELDING SCHEDULE

Name of Contractor/Subcontractor

FIELD WELDING SCHEDULE

PG(S) : 19
PG NAME : ECONOMISER (PP)

PROJECT : WANAKBORI 1&2 R&M & UKAI 3&5 R&M,(CUST.NO.: 4291 TO 4294)
CONTRACTOR : BHEL
PACKAGE :
SYSTEM : ECONOMISER SYSTEM

FWS NO. :
REV.NO. : 00
WELDING CODE : IBR/ASME
PAGE NO. : 1/1

SL. NO.	PPA DRAWING DESCRIPTIONS	DESCRIPTION OF PARTS TO BE WELDED	MATERIAL SPEC.	DIMENSIONS SIZE	DIMENSIONS THICK	PROCESS OF WELDING	TYPE OF WELD QTY	ELECTRODE FILLER SPEC. TIG Wt.(gms)	ARC SPEC. QTY ø2.5	ø3.15	ø4.0	WPS NO. REV. NO.	MIN. PRE. HEAT TEMP	HEAT TREATMENT TEMP °C	HOLD. TIME	NDT METHOD / QUANTUM	REF. SPEC. NO.	ACC NORM REF	REMARKS
01	0-00-027-35817 TO 0-00-027-35820	ECO. FEED PIPE + ECO. I/L HDR	SA106GRC + SA106GRC	ø323.9	38	GTAW & SMAW	31.5▽ 2	ER70S-A1 202	E 7018-A1 48	78	140	1304/04	100°C	595 TO 625	90 MINS	20%RT MIN 2 WELD /WELDER /SHIFT	*	*	
02	0-00-027-35817 TO 0-00-027-35820	ECO. I/L HDR + ECO.(L) COIL	SA210GRA1/GRC + SA210GRA1/GRC	ø44.5	5.0	GTAW & SMAW	5.0▽ 172	ER70S-A1 1548	E 7018-1 1204			1303/04	NIL	–	–		*	*	
03	0-00-027-35817 TO 0-00-027-35820	ECO.(L) COIL + ECO.(U) COIL	SA210GRA1/GRC + SA210GRA1/GRC	ø44.5	5.0	GTAW & SMAW	5.0▽ 172	ER70S-A1 1548	E 7018-1 1204			1303/04	NIL	–	–		*	*	
04	0-00-027-35817 TO 0-00-027-35820	ECO.(U) COIL + ECO.INTER.HDRS	SA210GRA1/GRC + SA210GRA1/GRC	ø44.5	5.0	GTAW & SMAW	5.0▽ 172	ER70S-A1 1548	E 7018-1 1204			1303/04	–	–	–		*	*	
05	0-00-027-35817 TO 0-00-027-35820	ECO.INTER.HDRS/ RANGER TUBES + ECO.HGR.TUBES	SA210GRC + SA210GRC	ø44.45	6.6	GTAW & SMAW	6.6▽ 201	ER70S-A1 1628.1	E 7018-1 1809			1303/04	–	–	–		*	*	
06	0-00-027-35817 TO 0-00-027-35820	ECO.HGR.TUBES + ECO.HGR.TUBES	SA210GRC + SA210GRC	ø44.45	6.6	GTAW & SMAW	6.6▽ 469	ER70S-A1 3788.9	E 7018-1 4221			1303/04	–	–	–		*	*	
07	0-00-027-35817 TO 0-00-027-35820	ECO.HGR.TUBES + ECO.O/L HDR	SA210GRC + SA210GRC	ø44.45	6.6	GTAW & SMAW	5.0▽ 201	ER70S-A1 1628.1	E 7018-1 1809			1303/04	–	–	–		*	*	
08	0-00-027-35817 TO 0-00-027-35820	ECO.O/L HDR + ECO.O/L LINKS	SA106GRC/WPC + SA106GRC	ø219.1	22.23	GTAW & SMAW	22.2▽ 6	ER70S-A1 406	E 7018-A1 192	150	128	1304/04	NIL	595 TO 625	90 MINS		*	*	

PREPARED	CHECKED (DESIGN)	CHECKED (W.T.C)	APPROVED	DATE	DRAWING NO:	REV.NO.
DEVINDRA	DEVINDRA	MANIKANDAN	ANAND KUMAR	07.04.25	4-19-992-08473	00

Name of Contractor/Subcontractor

FIELD WELDING SCHEDULE

PG(S) : 11/12/19
PG NAME : ECONOMISERS (NON-PP)

PROJECT : WANAKBORI 1&2 R&M & UKAI 3&5 R&M,(CUST.NO.: 4291 TO 4294)
CONTRACTOR : BHEL
PACKAGE :
SYSTEM : ECONOMISER SYSTEM

FWS NO. :
REV.NO. : 00
WELDING CODE : IBR/ASME
PAGE NO. : 1/1

SL. NO.	PPA DRG. DESCRIPTIONS	DESCRIPTION OF PARTS TO BE WELDED	MATERIAL SPEC.	DIMENSIONS SIZE	DIMENSIONS THICK	PROCESS OF WELDING	TYPE OF WELD QTY	ELECTRODE FILLER SPEC. GTAW Wt.(gms)	SMAW SPEC. QTY ø2.5	ø3.15	ø4.0	WPS NO. REV. NO.	MIN. PRE. HEAT TEMP	HEAT TREATMENT TEMP °C	HOLD. TIME	NDT METHOD / QUANTUM	REF. SPEC. NO.	ACC NORM REF	REMARKS
01	0-19-905-02595	PLATE + PLATE	SA387GR.22 + CL2 SA387GR.22 CL2	—	12 + 12	SMAW	10 ⊾ 17.8 m	— —	E 9018 B3			1215/03	150°C	–	–	10%MPI OR LPI /SHIFT	*	*	
02	0-19-905-02595	PLATE + ROD	SA387GR12 + CL2 SA182F12CL2	—	5 + ø32	SMAW	5 ⊾ 78 m	— —	E 8018 B2			1205/04	150°C	–	–	100% LPI	*	*	
03	0-19-905-02595	PLATE + ROD	SA387GR12 + CL2 SA182F12CL2	—	5 + ø40	SMAW	5 ⊾ 14 m	— —	E 8018 B2			1205/04	150°C	–	–	100% LPI	*	*	
04	0-00-027-34346	PLATE + PLATE	SA240TYP304 + SA240TYP304	—	6 + 6	SMAW	5 ⊾ 9.2 m	— —	E 308			1217/08	NIL	–	–	100% LPI	*	*	
04	0-00-027-34346	PLATE + ROD	SA240TYP304 + SA240TYP304	—	10 + ø10	SMAW	5 ⊾ 129 m	— —	E 308			1217/08	NIL	–	–	100% LPI	*	*	
05	1-12-927-01801 1-12-927-01802	PLATE + PLATE	SA387GR.12 + CL2 SA387GR.12 CL2	—	6 + 12	SMAW	5 ⊾ 34 m	— —	E 8018-B2			1205/04	150°C	–	–	10%MPI OR LPI /SHIFT	*	*	

PREPARED	CHECKED (DESIGN)	CHECKED (W.T.C)	APPROVED	DATE	DRAWING NO:	REV.NO.
DEVINDRA	DEVINDRA	MANIKANDAN	ANAND KUMAR	07.04.25	4-19-992-08474	00

TIRUCHY

SUMMARY LIST OF SITE ELECTRODES

PROJECT: WANAKBORI 1&2 R&M & UKAI 3&5 R&M,
(CUST.NO.: 4291 TO 4294)
PROJECT: 4291,4292,4293&4294
P.G: NO : 19
P.G. NAME : ECONOMISER SYSTEM.

SL. NO	TYPE OF ELECTRODE / WIRE	SIZE & QTY (Nos)				GTAW WIRE WT (gm)	REMARKS
		ø2.5	ø3.15	ø4.0	ø5.0		
01	ER70S-A1	–	–	–	–	15386.3	–
02	E 7018-A1	199	285	332	–	–	–
03	E 7018-1	14314	–	–	–	–	–
04	E9018-B3	–	–	–	–	–	–
05	E 308	–	–	–	–	–	–
06	E 8018-B2	–	–	–	–	–	–

NOTES:–
1. RESERVE 25% ADDED.
2. QUANTITY GIVEN IS PER BOILER
3. THIS ERECTION WELDING SCHEDULE IS FOR REFERENCE PURPOSE ONLY.

ENCL : ERECTION WELDING SCHEDULE SHEETS
4-19-992-08473 & 4-19-992-08474

CC: 1. PROJECT CO-ORDINATOR/CONTRACTS
2. SR.MANAGER/WTC
3. WELDING SCHEDULE FILE

DATE : 12.04.25

PREPARED	CHECKED(DESIGNS)	APPROVED(WTC)	DRAWING NO.
DEVINDRA	DEVINDRA	ARIVAZHAGAN	4-19-992-08475

Name of Contractor/Subcontractor

FIELD WELDING SCHEDULE

PG(S) : 06,07,10,11,12
PG NAME :SUPERHEATER SYSTEM

PROJECT : WANAKBORI 1&2 R&M & UKAI 3&5 R&M,(CUST.NO.: 4291 TO 4294)
CONTRACTOR :BHEL
PACKAGE :
SYSTEM :SUPERHEATER SYSTEM

FWS NO. :
REV.NO. :00
WELDING CODE :IBR/ASME
PAGE NO. :1/3

SL. NO.	PPA DRAWING DESCRIPTIONS	DESCRIPTION OF PARTS TO BE WELDED	MATERIAL SPEC.	DIMENSIONS SIZE	DIMENSIONS THICK	PROCESS OF WELDING	TYPE OF WELD QTY	ELECTRODE FILLER SPEC. GTAW Wt.(gms)	SMAW SPEC. QTY ø2.5	SMAW QTY ø3.15	SMAW QTY ø4.0	WPS NO. REV. NO.	MIN. PRE. HEAT TEMP	HEAT TREATMENT TEMP °C	HEAT TREATMENT HOLD. TIME	NDT METHOD/ QUANTUM	REF. SPEC. NO.	ACC NORM REF	REMARKS
01	0-00-027-35817 TO 0-00-027-35820	LTSH I/L HDR + LTSH LOOSE TUBES	SA210GRC + SA210GRC	ø44.5	4.5	GTAW & SMAW	4.5▽ 402	ER70S-A1 3698.4	E 7018-1 2814			1003/04	–	–	–	20%RT MIN 2 WELD /WELDER /SHIFT	*	*	
02	0-00-027-35817 TO 0-00-027-35820	LTSH LOOSE TUBES + LTSH (L) BANK	SA210GRC + SA210GRC	ø44.5	4.5	GTAW & SMAW	4.5▽ 402	ER70S-A1 3698.4	E 7018-1 2814			1003/04	–	–	–		*	*	
03	0-00-027-35817 TO 0-00-027-35820	LTSH (L) BANK + LTSH (U) BANK	SA210GRC + SA213T11	ø44.5	4.5	GTAW & SMAW	4.5▽ 402	ER70S-A1 3698.4	E 7018-1 2814			1003/04	150	–	–		*	*	
04	0-00-027-35817 TO 0-00-027-35820	LTSH (U) BANK + LTSH TERMINAL TUBES	SA213T11 + SA213T11	ø44.5	4.5 5.9	GTAW & SMAW	4.5▽ 402	ER80S-B2 3698.4	E8018-B2 2814			1009/03	150	–	–		*	*	
05	0-00-027-35817 TO 0-00-027-35820	LTSH TERMINAL TUBES + LTSH O/L HDR	SA213T11 + SA213T11	ø44.5	5.9	GTAW & SMAW	5.9▽ 402	ER80S-B2 3336.6	E8018-B2 3618			1008/03	150	–	–		*	*	
06	0-00-027-35817 TO 0-00-027-35820	BP FRONT WALL EXTN+BP FRONT I/L HDR	SA210GRC + SA210GRC	ø44.5	7.1	GTAW & SMAW	7.1▽ 181	ER70S-A1 1375.5	E 7018-1 1810			1003/04	–	–	–		*	*	
07	0-00-027-35817 TO 0-00-027-35820	BP FRONT WALL EXTN+BP FRONT WALL	SA210GRC + SA210GRC	ø51	4.5	GTAW & SMAW	4.5▽ 181	ER70S-A1 1954.8	E 7018-1 1448			1003/04	–	–	–		*	*	
08	0-00-027-35817 TO 0-00-027-35820	BP (L) SIDE WALL EXTN +BP SIDE I/L HDR	SA210GRC + SA210GRC	ø44.5	7.1	GTAW & SMAW	7.1▽ 132	ER70S-A1 1003.2	E 7018-1 1320			1003/04	–	–	–		*	*	

PREPARED	CHECKED (DESIGN)	CHECKED (W.T.C)	APPROVED	DATE	DRAWING NO:	REV.NO.
DEVINDRA	DEVINDRA	MANIKANDAN	ANAND KUMAR	07.04.25	4-12-992-15723	00

Name of Contractor/Subcontractor

FIELD WELDING SCHEDULE

PG(S) : 06,07,10,11,12
PG NAME :SUPERHEATER SYSTEM

PROJECT : WANAKBORI 1&2 R&M & UKAI 3&5 R&M.(CUST.NO.: 4291 TO 4294)
CONTRACTOR :BHEL
PACKAGE :
SYSTEM :SUPERHEATER SYSTEM

FWS NO. :
REV.NO. :00
WELDING CODE :IBR/ASME
PAGE NO. :2/2

SL. NO.	PPA DRAWING DESCRIPTIONS	DESCRIPTION OF PARTS TO BE WELDED	MATERIAL SPEC.	DIMENSIONS SIZE	DIMENSIONS THICK	PROCESS OF WELDING	TYPE OF WELD	ELECTRODE GTAW	FILLER SPEC. SMAW SPEC. QTY #2.5	#3.15	#4.0	WPS NO. REV. NO.	MIN. PRE. HEAT TEMP.	HEAT TREATMENT TEMP °C	HEAT TREATMENT HOLD TIME	NDT METHOD/ QUANTUM	REF. SPEC. NO.	ACC. NORM REF	REMARKS
08	G-00-027-30817 TO G-00-027-30820	BP LOWER SIDE WALLS EXTN+ SIDE PANEL	SA210GRC + SA210GRC	ø51	4.5	GTAW & SMAW	4.5 DTY	ER70S-A1	E 7018-1				–	–	–	200PT MIN 2 WELD /WELDER /SHIFT	*	*	
							132	1435.5	1086										
10	G-00-027-30817 TO G-00-027-30820	BP (L) REAR PANEL +LTSH (L)&(D)/L HDR	SA210GRC + SA210GRC	ø44.5	5	GTAW & SMAW	6 DTY	ER70S-A1	E 7018-1				–	–	–		*	*	
							160	1330	2160										
11	G-00-027-30817 TO G-00-027-30820	LTSH (/L HDR + BP (U) REAR PANEL	SA210GRC + SA210GRC	ø44.5	5.6	GTAW & SMAW	5.6 DTY	ER70S-A1	E 7018-1				–	–	–		*	*	
							136	1183.2	1088										
12	G-00-027-30817 TO G-00-027-30820	BP (U) REAR PANEL+ BP REAR ROOF	SA210GRC + SA210GRC	ø44.5	5.6	GTAW & SMAW	5.6 DTY	ER70S-A1	E 7018-1					–	–		*	*	
							136	1183.2	1088										
13	G-00-027-30817 TO G-00-027-30820	BP REAR ROOF + BP JUNCTION HDR	SA210GRC + SA210GRC	ø44.5	5.6	GTAW & SMAW	5.6 DTY	ER70S-A1	E 7018-1				–	–	–		*	*	
							136	1183.2	1088										
14	G-00-027-30817 TO G-00-027-30820	SH HANGER TUBES INSERT	SA213T12 + SA213T22	ø44.5	11.0	GTAW & SMAW	5.6 DTY	ER90S-B2	E9018-B2				150	690/ 720	30		*	*	
							118	1038.8	944										
15	G-00-027-30817 TO G-00-027-30820	SH HANGER TUBES INSERT	SA213T12 + SA210GRA1	ø51	4.5	GTAW & SMAW	4.5 DTY	ER70S-A1	E 7018-1				150	–	–		*	*	
							118	1274.4	944										
16	G-00-027-30817 TO G-00-027-30820	SH SCREEN TUBES INSERT	SA213T12 + SA213T22	ø44.5	11.0	GTAW & SMAW	5.6 DTY	ER90S-B2	E9018-B2										
							244	2133.8	1952										

PREPARED	CHECKED (DESIGN)	CHECKED (W.T.C)	APPROVED	DATE	DRAWING NO:	REV.NO.
DEVINDRA	DEVINDRA	MANIKANDAN	ANAND KUMAR	07.04.25	4-12-992-15724	00

Name of Contractor/Subcontractor

FIELD WELDING SCHEDULE

PG(S) : 06,07,10,11,12
PG NAME :SUPERHEATER SYSTEM

PROJECT : WANAKBORI 1&2 R&M & UKAI 3&5 R&M.(CUST.NO.: 4291 TO 4294)
CONTRACTOR :BHEL
PACKAGE :
SYSTEM :SUPERHEATER SYSTEM

FWS NO. :
REV.NO. :00
WELDING CODE :IBR/ASME
PAGE NO. :1/3

SL. NO.	PPA DRAWING DESCRIPTIONS	DESCRIPTION OF PARTS TO BE WELDED	MATERIAL SPEC.	DIMENSIONS SIZE	DIMENSIONS THICK	PROCESS OF WELDING	TYPE OF WELD	ELECTRODE FILLER SPEC. GTAW	ELECTRODE FILLER SPEC. SMAW SPEC.	WPS NO. REV. NO.	MIN. PRE. HEAT TEMP	HEAT TREATMENT TEMP °C	HEAT TREATMENT HOLD. TIME	NDT METHOD/ QUANTUM	REF. SPEC. NO.	REF. ACC NORM REF	REMARKS
							QTY	Wt.(gms)	QTY ø2.5 / ø3.15 / ø4.0								
17	0-00-027-35817 TO 0-00-027-35820	SH BP EXT SIDE NLET PIPES	SA106GRC + SA106GRB	ø127	12.5	GTAW & SMAW	12.5 (V)	ER70S-A1	E7018-1	1003/04	–	–	–		*	*	
							8	212.8	96 136								
18	0-00-027-35817 TO 0-00-027-35820	SH BP EXT SIDE NLET PIPES	SA106GRC + SA106GRB	ø88.9	13.3	GTAW & SMAW	13.3 (V)	ER70S-A1	E7018-1	1003/04	–	–	–		*	*	
							8	134.4	64 80								
19	0-00-027-35817 TO 0-00-027-35820	SH HANGER TUBES INSERT	SA213T12 + SA210GRA1	ø51	4.5	GTAW & SMAW	4.5 (V)	ER70S-A1	E 7018-1	1017/04	150	–	–		*	*	
							244	2635.2	1952								
20	0-00-027-35817 TO 0-00-027-35820	BOFA PANEL	SA210GRC + SA210GRC	ø63.5	5.6	GTAW & SMAW	5.6 (V)	ER70S-A1	E 7018-1	1003/04	–	–	–		*	*	
							296	3966.4	3256								
21	0-00-027-35817 TO 0-00-027-35820	DOWNCOMERS	SA106GRC + SA106GRC	ø406.4	40	GTAW & SMAW	40 (W)	ER70S-A1	E 7018-1	1004/04	150	595 TO 625	100MINS		*	*	
							24	3024	720 1200 3216								

PREPARED	CHECKED (DESIGN)	CHECKED (W.T.C)	APPROVED	DATE	DRAWING NO:	REV.NO.
DEVINDRA	DEVINDRA	MANIKANDAN	ANAND KUMAR	07.04.25	4-12-992-15725	00

TIRUCHY

SUMMARY LIST OF SITE ELECTRODES

PROJECT: WANAKBORI 1&2 R&M & UKAI 3&5 R&M,
(CUST.NO.: 4291 TO 4294)
PROJECT: 4291,4292,4293&4294
P.G: NO : 06,07,10,11&12
P.G. NAME : SUPERHEATER SYSTEMS.

SL. NO	TYPE OF ELECTRODE / WIRE	SIZE & QTY (Nos)				GTAW WIRE WT (gm)	REMARKS
		ø2.5	ø3.15	ø4.0	ø5.0		
01	ER70S-A1	–	–	–	–	41227.5	–
02	E 7018-1	33165	1770	4020	–	–	–
03	ER80S-B2	–	–	–	–	12855.5	–
04	E8018-B2	11660	–	–	–	–	–

NOTES:–
1. RESERVE 25% ADDED.
2. QUANTITY GIVEN IS PER BOILER
3. THIS ERECTION WELDING SCHEDULE IS FOR REFERENCE PURPOSE ONLY.

ENCL : ERECTION WELDING SCHEDULE SHEETS
4-12-992-15723 TO 4-12-992-15725.

CC: 1. PROJECT CO-ORDINATOR/CONTRACTS:
2. SR.MANAGER/WTC
3. WELDING SCHEDULE FILE

DATE : 12.04.2025

PREPARED	CHECKED(DESIGNS)	APPROVED(WTC)	DRAWING NO.
DEVINDRA	DEVINDRA	ARIVAZHAGAN	4-12-992-15726

ANNEXURE -IV

All the contractors working in **Gujarat State Electricity Corporation Limited Factory like Coal/Lignite/Gas/Hydro/Pumping Station** shall have to strictly observe the following Safety Rules. Concern principle contractors are responsible for informing & observance of these rules by their supervisors/contract workers as well as the owner/supervisors/ workers of sub-Contractors engaged, if any, by them for the work contract awarded to them. Prior to commencement of the work, Contractor shall have to submit a written assurance on their letterhead to the concerned Sectional Head / Engineer-in-charge that they have thoroughly gone through these Rules, have educated their employees / workers of their sub contractor and will strictly observe the said Rules while execution of work under work contract awarded to them. They will have to indemnify the company for any loss or damage / accident / injury to the company's property / employee or employee of their own in default of non - observing these rules.

(01) Contractor should issue photo gate pass for their workers from GSECL Factory Manager as per Gujarat Factories rules, 1963 & details shall be filled up in GSECL gate pass format as per Aadhar card /Election card id proof & to follow the gate pass issue procedure through concern department EE & SE, Security Officer, LWO/IRO/DGM, Factory Medical Officer, Safety Officer/Dy. Safety Officer & Factory Manager.

(02) In case of emergency, temporary photo gate pass shall be issued by Security Officer only for three days with prior permission of Factory Manager only. More than three days, Permanent photo gate pass procedure shall be completed by contract agency for their contract workers.

(03) Certificate of Fitness of employment in hazardous process & operations in form no.33 of Gujarat Factories rules, 1963 shall be issued by GSECL Factory Medical Officer for all contractor workers before commencement of work & examination responsibility shall be taken by contractor as well as concerned Head of Department .Pre-employment & Periodical medical examination of contractor workers shall be carried out in form no.32 from GSECL Factory Medical Officer after every six (06) months of contractor with their contractor workers. Contractor shall be fulfilled all health requirements before commencement of work. After completion of medical examination in form no.32/33, GSECL Factory Medical Officer shall be signed in contract worker gate pass procedure format.

(04) Contract worker gate pass will issue after completion of safety induction 3D animation movie & Training record is to be maintained in IMS/OHSAS training format by TK Office/LWO.

(05) As per Gate pass format of GSECL, Safety Officer/Dy. Safety Officer shall be checked the issue PPE to contract workers as per nature of job, Form no.10 of lifting tools and tackles, Driving license, Electrical contractor license, Electrical trade qualifications, Safety induction training, SOP, supervisor qualifications etc. After fulfillment of all Safety compliances, Safety Officer/Dy. Safety Officer shall be signed in Contract worker Gate pass procedure format.

(06) Work Contract shall be completed by principle contractor/agency/person who is awarded the work order. Subletting of contract shall be allowed only if prior approval of Power station chief before execution of work. Contractor/agency shall be submitted the entire subletting contract documents with gate pass application through concern department EE & SE, LWO/DGM, Safety Officer/Dy.Safety Officer & Factory Manager.

(07) Under The Conditions Framed Under Rule-45 Of The Indian Electricity Rules, 1956,

Valid Electrical contractor License shall be submitted to concern electrical department EE/SE/Electrical Safety Officer/ Safety Officer/Factory Manager at the time of apply gate pass by agency/party with latest renewal from Chief Electrical Inspector, Gandhinagar-Gujarat. Electrical License photocopy shall be checked by Concerned HOD of Electrical Department/Electrical Safety Officer/Dy.Safety Officer/ Safety Officer/Factory Manager.

(08) As per nature of job/work, Qualified supervisor (Diploma (Electrical/ Mechanical/Civil/C&I) + 3 years experiences or ITI + 10 years) shall be engaged by contract agency & qualification certificate with experience certificate shall be submitted to concern EE/SE/LWO/IRO/DGM/ Dy.Safety Officer /Safety Officer/Factory Manager at the time of apply gate pass.

(09) As per rule 3 of CEA regulation ,2010: **Designating person(s) to operate and carry out the work on electrical lines and Apparatus,** Contract person/worker possesses a certificate of competency or electrical work permit, issued by the Appropriate Government. That means, Electrical trade Qualification of contract worker/person like ITI-wireman/ Electrician, Diploma (Elect), BE/B. TECH (Elect), ME/ M. TECH (Elect) shall be submitted to concern EE/SE/LWO/IRO/DGM, Dy.Safety Officer/ Safety Officer/Factory Manager at the time of apply for photo gate pass procedure.

(10) As per nature of job/work & during capital overhauling work /Annual overhauling work /24X7 round the clock work/major shut down work, Qualified Safety Officer/Manager/Supervisor (BE/Diploma (Elect/Mech/Civil) + PDIS-Post Diploma in Industrial Safety) shall be engaged by contractor during dangerous operations/dangerous works as well as day to day dangerous activities, safety supervision, tool box talk, Safety awareness programme, SOP preparation with hazards & its control measures with each step , checking of lifting tools & tackles, hydra mobile crane, Safety precautions, coordination with Safety Department etc.

(11) License of driver shall be submitted with gate pass issue application as per nature of vehicles & to follow the Motor vehicle Act,1988,the Central Motor Vehicles (Amendment) Rules,2016 as well as Gujarat Motor Vehicles rules,1989 & driver license shall be checked every day by security shift in charge before entry in the Factory premises.

(12) SOP with JSA (Job Safety Analysis) shall be prepared by contractor through competent person as per GFR, 1963 or Qualified Safety Officer as per GFR, 1963 with 05 years experiences. SOP will review & approve by concern JE/DE/EE/SE/Elect. Safety Officer/Dy. Safety Officer /Safety Officer/Factory Manager before execution of work.

(13) It is compulsory to use standard make Personal Protective Equipments (P.P.Es.) as per the job requirement. Do not work without use of required P.P.Es. Contractor is responsible to provide standard make (ISI/DGMS/CE/EN/ANSI approved) & to checked standard/make in PPE issue format by concern JE/DE/EE/SE/Safety Officer/Factory Manager. Personal Protective Equipments / Safety Gadgets suitable to give sufficient protection against hazards involved in their work / job to their staff, as per the job requirement and insist / enforce their workers to put on the same while at works.

Party has to submit PPE under taking in attached annexure. During technical scrutiny of work tender , Undertaking for PPEs shall be checked by Safety officer and if PPEs mention in tender are not as per standard Safety Officer & Factory Manager shall disqualify bidder technically.

The ongoing work is liable to be stopped at any time if your contract workers/staffs found working without P.P.Es. Following is the list of various P.P.Es (as per ISI/DGMS/CE/ EN/ ANSI approved only) to be used for various works / worksites.

In any work, Contractor shall be issued the minimum 05 nos. of PPEs like Safety Shoes, Safety Helmet, Safety goggles, Mask & Reusable Ear plug to their workers/supervisor compulsory & it will check by concern section HOD & Dy.Safety Officer /Safety Officer at the time of gate pass procedure.

List of safety equipments

Industrial Safety Helmet	For protection of head against falling objects or during fall of person from height. **Yellow Colour helmet is used for contract worker with agency logo.**
Safety Goggles/welding goggles/chemical splash goggles	For protection of eyes against flying particles / dust, chemical splash, welding spark, arc, flashover etc.
Full Face shield	For protection of face against flying particles / dust, chemical splash, spark, arc, flashover etc.
Reusable Earplug / Ear muffs.	For ear / hearing system protection while working in high noise level area.
Chemical suit/Gas tight suit /Fire proximity suit/FR Boiler Suit	For body protection against chemicals, oils, sharp edged objects, heat, hot objects etc.
Safety Hand Gloves	For protection of hands against chemicals, oils, sharp edged objects, heat, hot metals/objects, electricity etc.
Safety shoes/ Gum Boots with Oil/Chemical/water/heat/Electrical resistance etc.	For protection of leg/feet against falling objects, sharp edged objects, heat, hot metals/objects, electricity etc..

Safety Belt(full body hardness with double lanyard & shock absorber) / Rope / Life line / Fall arrestor etc.	For fall prevention while working at heights or in depth, working in vessel or in confined space.
Dust Mask/Respirator with valve (FFP2)	Protection of respiratory system against dust.
Chemical Cartridge Respirator with full face mask type A2B2E2K2	Protection against toxic chemical fumes / gases/vapors/dust etc.
Trolley mounted Air line respirators with full face mask	Working in oxygen deficient zone or confine space area
Portable Single gas detector like Chlorine, Ammonia, Hydrogen, etc	Working in hazardous storage/process area
Portable Multi gas Detector (LEL,O2,CO,H2S,SO2, etc)	Working in oxygen deficient zone & use in entry of confine space & Major fire
Automatic voltage detector	To check the present voltage or induction voltage of electrical equipments/ bus/switch gears from 01 (one) feet distance before starting the any electrical work .
Auto darkening welding helmet (EN 379 & EN 175 Level-B) with PAPR as per EN 12941:1998, class TH2 and AS/NZS 1716	The new auto darkening welding helmet combines legendary Speed glass quality and auto darkening technology with an innovative wide-view grinding visor to give welders an all-in-one solution for more flexibility, precision, and efficiency. Respiratory System is a combined face and breathing protection device, for increased comfort and safety in welding. The unit is equipped with a particle filter which removes particles from the air. The unit provides a constant airflow independent of filter combinations and clogging. The unit can also be equipped with a gas filter (for example A1B1E1). The unit supplies air to the head top via the connecting breathing tube. The airflow creates a slight positive pressure which together with the sealing to the face prevents particles and other contaminants from entering the head top.

(14) All PPEs (as per ISI/DGMS/CE/EN/ANSI approved only) Should issued by party/agency/contractor to their contractor workers as per nature of job and allotment of PPE list shall be submitted to Safety Officer on his letter head as per below mentioned format by Contractor before commencement of work through concerned JE,DE,EE/SE

.

Sub: Issue of PEE to Contractor workers
Sub of work Order:
Work order no.
Name of Agency:
Date of Commencement:
Time limit for work order:

Sr. no.	Name of workers	Designation	Name of Section under work execution	Name of PPE	IS :Code no. of PPE	Make of PPE	Qty	Unit	Date of issue	Receiving signature
A	B	C	D	E	F	G	H	I	J	K
01				Safety Helmet				Nos.		
				Safety goggles				Nos.		
				Reusable Ea Plug				Pair		
				Dust Mask				Nos.		
				Safety Shoes				Pair		

(15) Shift Security Inspector/Security Officer shall be checked Safety Shoes & Safety Helmet of all contractor workers at entry gate of Factory Premises & shall entered contractor workers with Safety Shoes & Safety Helmet with photo ID Gate Pass.

(16) Shift Security Inspector/Security Officer shall be checked validity of Gate pass of all contractor workers on daily basis.

(17) During the work execution, one trained & competent supervisor of agency should always remain present at work site. Concern JE/DE of GSECL shall be supervised the contract work as per SOP .

(18) Approved NABL laboratory calibration certificates of electrical/mechanical/Civil/C&I/Environment survey/Chemical etc measuring /testing equipments/instruments which are used during contract work shall be submitted before starting the work & shall be checked by concern JE/DE/EE before starting work & it's record shall be maintained in concern section.

(19) The contractor shall take all the required safety measures prior to commencement of work on dangerous substances, machineries or area at which cautionary notice is displayed and obtain "Line Clear" or "Work Permit" through the concern Department / Section JE/DE and shall be informed to concern section JE/DE for closed/ returned after completion of work.

(20) Safety talk/Safety work instructions shall be given to contractor workers by concern JE/DE regarding hazards of specific work, risk & it's control measure (mentioned in HIRA) before starting the job work and records shall be maintained for each & every job works. (21) Display Safety instructions shall be strictly followed by all workers who are working in factory premises.

(22) Material Safety Data Sheet (MSDS) of each chemical shall be available with Chief Chemist/Control room & work related Chemical information shall be taken by contractor & contractor workers from Concern EE/Chief Chemist before starting of chemical handling work.

(23) The contractor shall be checked & securely covered or securely fenced any opened fixed vessel, sump, tank, pit or opening in ground or in floor which, by reason of its depth, situation, construction or contents ,is or may be a source of danger before starting the work each & every days or after interval/recess. Contractor supervisor shall be informed to concerned HOD regarding any unsafe conditions.

(24) Prohibition of smoking, fires, lights, spontaneous ignition substance, matches; fuses, mobile phone etc are to be strictly followed by all workers who are working in factory premises.

(25) Prior to carrying out welding, gas cutting, furnace heating or any other hot work job, remove all the inflammable material lying at or nearby worksite or cover it properly by suitable protective covering. Also, special care shall be taken before carrying out such job & see that all possible contributing factors to set fire shall be removed / vanished prior to commencement of the work. Advance intimation shall be given to concerned section / fire section to commence the work in fire prone areas. They should also keep ready all the First Aid Fire Extinguishers / equipments & fire extinguishing media / material like sand / water buckets or other appropriate equipment at such place.

(26) While carrying out work in confined space or inside vessel, obtain necessary **"Confined Space / Vessel Entry Permit"** from concerned department prior to commencement of the work. For lighting in such areas, only 24-volt (ISI certified & with proper guard) hand lamp shall be used. For taking care of the persons working inside the confined space / vessel, a supervisor / person capable to keep continuous watch on person(s) working inside, assist them in case of emergency or arrange to get immediate outside help, shall remain present at entry point. Use full body safety belt without failed. While working inside sewage, trench or in-depth, a person to warn outsiders / entrants / passers etc shall remain available near entry point or the entry point shall be cordoned by a barricaded tape with a cautionary notice. After completion of the works, all the lids / covers / grills / grits opened, shall be refixed / re-placed

in the original position as it were prior to commencement of the work and leave the work place in safe condition in all respect, so as to prevent accident to fellow workers.

(27) The contractor shall see that he / his persons do not work on or block (by stacking material, spare parts, tools-tackles, equipments etc), any passages / walkways / gangways / aisles / staircases / ladders / lifts or any other approaches / roads leading to plans or its auxiliaries, on which there is traffic movements or possible traffic movements in case of emergency. Such passages are meant for safe escape in the event of emergency. If it is utmost necessary to carry out work in such area with blocking of passage, prior permission of Competent Authority or the Engineer-In-Charge shall be obtained. To demarcate / declare the area as **"UNSAFE"**, cordon it using barricading tape & display suitable caution notice or keep a person to restrict / divert the traffic on this route through other safe passage.

(28) Prior to use power / electrically operated hand tools / equipments / machines / gadgets like welding machine, hand grinder, hand drill etc, ensure for its safe operation & use it only if it is found safe to use. Do not use defective, unsafe or improperly maintained equipments.

The electrical power supply required to run such equipments shall not be taken directly at their own but shall be obtained through concerned Electrical Maintenance Departments or their authorized persons or under their observations / guidance only. The Electrical Section shall provide temporary electrical connection up to contractor's Mains Board on which it is compulsory to install mains switch, ELCB & fuses of adequate capacity. All such equipments shall invariably be earthed adequately to prevent electrical shock, sparking, short circuit etc. Power cord to be used shall be of adequate capacity, without any joint & shall consist of earth wire also. Hence, it is necessary to use adequate capacity 3-wire power cord for single & 5-wire power cord for three phase power connections. The plugs, receptacles, pins, holders etc shall be of adequate capacity & safe to use.

All electrical & mechanical equipments / tools-tackles viz. welding machine, cutting machine, Grinder, Drill, Chain Pulley Blocks, Hook chooks etc required to be used during work execution shall be of standard make & bear ISI certification mark on it. The consumables like welding electrodes, grinding wheels / discs etc which has specific prescribed life span shall not be used in any case if its expiry date is over.

(29) Non-Sparking Non-Magnetic electrical hand tools and tool kits shall be used by Electrical contractor for safe use in areas where hazardous, flammable, or combustible vapors, liquids, dusts, or residues may be present in Gas Based power plant and list of tools and tackles shall be submitted with technical bid.

Non-Sparking Non-Magnetic electrical hand tools and tool kits shall be checked by JE/DE before commencement of Electrical work.

(30) Before using lifting machines / tackles (like C.P.Bs., Hook chooks, winch, forklift, mobile crane, EOT crane etc) & its attachments (like D-shackles, slings, U-clamps, Eye bolts or any fixtures), it shall be checked and used only if found safe to use. Also, ensure that these are tested, examined & certified in form no.10 by Competent Person as per the Factory act-1948

& Gujarat Factories Rules and its validity do not expire. Further, it shall be fixed properly and firmly prior to lifting the weight. **Valid Test certificate of all Lifting machines used by Contractor to be submitted to** Dy.Safety Officer/ **Safety Officer before commencement of work through concerned EE/SE.**

(31) Metal Scaffoldings to be used for working at height shall be of adequate size & capacity. Obtain the work permit when working at height. While climbing on such scaffolding or working on any structure at height, use of full body safety belt /full body hardness with double lanyard & Fall arrestor & Helmet is compulsory. It is also necessary to fasten chinstraps of the helmet.

(32) Contractor or their employee shall not interfere in day-to-day routine plant activities / works except the work assigned to them, shall not loiter in the areas other than their work jurisdiction, as well as shall not temper / operate / touch the machineries/equipments/auxiliaries with which they are not concerned. Also, the contractor shall strictly instruct their staff for not to sit or take rest at/near/below running plants, auxiliaries, systems or any place which is risky, hazardous & prone to accident.

(33) The cylinders containing poisonous / toxic or inflammable / explosive gas like Oxygen, Acetylene, LPG, Hydrogen, Ammonia, Chlorine, CO_2 etc shall be handled safely taking due care. To handle / shift such cylinders a special trolley /cage meant for it must be used but in no case it should be rolled.

(34) In Gas Based Power station/Hydrogen storage area /Hydro carbon fumes-vapour generated area, Spark arrestor (as per approved manufacturer of CCOE, Nagpur) shall be provided on each vehicle by party/agency and it will check by shift security in charge before entry of vehicles in the factory premises.

(35) No women or young person shall be employed or permitted to work in Lead-compound area like battery room etc. as per schedule VI of GFR 1963.

(36) No women or young person shall be allowed to clean, lubricate or adjust any part of a prime mover or of any transmission machinery while the prime mover or transmission machinery is in motion. Examination or operation of motion machinery shall be made or carried out only by a specially trained adult male worker wearing tight fitting clothing as per section 22 of factories act 1948.

(37) In all risky job, before start the work, contractor should obtain General Safety Work Permit through concerned section from Shift –in-charge well in advance.

(38) In case of noticing smoke or fire during their work execution, they shall make immediate efforts to extinguish / control it and simultaneously inform the Fire Station Mobile No as well as Station Fire Officer or Emergency Control room no which is displayed at prominent place of factory like Main Security Gate, All unit control room, Canteen area, Safe Assembly points, Fire Station, All security gates, Occupational Health Centre.

(39) In case of any injury / accident while working, it shall immediately be reported to Safety Department through concerned Sectional Head / Engineer. The prescribed **Form No. 21 & ANNEXURE** may be obtained from concerned section or Dy.Safety Officer/Safety Officer.

In case of any electrical accident, it shall immediately be reported to Electrical Safety Officer through concern Sectional Head / Engineer. The prescribed **Electrical accident form no. A as per electricity act-2003 & Form No. 21 & ANNEXURE as per Gujarat Factories** rules shall be filled up by concern department JE/DE with written consent of contractor. The Form may be obtained from concerned Electrical section or Electrical Safety Officer. Electrical accident investigation shall be carried out by Electrical Safety Officer with Factory Manager.

After any reportable accident, Contract agency shall be submitted the fitness certificate of injured person with endorsement of GSECL factory Medical Officer to LWO/Dy.Safety Officer/Safety Officer/Electrical Safety Officer then after injured person may allow for work.

(40) For any incident occurred but have no injury to any persons should also reported as per GSECL format and informed to Dy.Safety Officer/Safety Officer **as Near Miss Incident.**

(41) **Safety penalty shall be imposed against Offences by contract workers:** If any contract worker worked in a factory contravenes any provision of Factories act or any rules or orders made there under ,imposing any duty or liability on workers, contractor/agency shall be punishable with fine which mentioned as under.

Sr. No.	Description of penalty	Amount
(i)	Work without PPEs	Rs.300/- per person
(ii)	Work without work Safety permit like working at height, confine space entry, hot work etc.	Rs.1000/- per day
(iii)	License of driver as per type of vehicles not registered.	Rs.750/- per person
(iv)	Welding work without flashback arrestor/double gauge regulator set	Rs.1000/- per set
(v)	Operate Portable power tool without ELCB	Rs.1000/-per equipment
(vi)	Work without qualified Supervisor as per nature of job like mechanical, electrical, civil, C&I, chemical etc.	Rs.1000/-per day
(vii)	Work without SOP & JSA	Rs.2000/-per day
(viii)	Work without test report of lifting machines / tackles (like C.P.Bs., Hook chooks, winch, forklift, mobile crane, EOT crane etc) & its attachments (like D-shackles, slings, Uclamps, Eye bolts or any fixtures) in Form No.10 of Gujarat Factories Rules,1963	Rs.2000/- per equipment
(ix)	Work without Double lynyer Safety belt during working at Height work, work without anchoring in hook/line line	Rs.3000/-per person

(x)	Work without 24 Volt supply in Confine space area	Rs.3000/-per person
(xi)	(a)Grinding machine used without safety guard/machine guard . (b)Unsafe welding machine like open body, knob without insulation, connection without lug. Damaged welding cables / gas pipelines. Welding work doing without welding blanket. Electrical supply without 3 pin plug/ industrial plug. Use of damaged electrical wires for lighting /equipments.	Rs.500/- per equipment /per set
	(g) Use of lighting lamp without cage. (h)Use of open halogen tube. (i)Use of damaged PPEs/ non standard PPEs. (j)Unsafe lifting and handling of gas cylinders. (k)Cylinder handling without cap. (l)Temporary connection without ELCB etc.	

During plant visit / supervision of concern JE/DE/EE, SE, Dy. Safety Officer/Safety Officer, Electrical Safety Officer, Factory Manager, If they will observed any safety violations as per CO circular/statutory requirements then they must impose Safety Penalty through office note directly against contract workers /contract agency and office note process through proper channel to concern Sectional Head and Account head for recovery purpose. Photograph/CCTV camera footage is to be put up with penalty note by imposing officer.

(42) Party will damage any fire equipments or property or machinery in factory during execution of work, total damage cost will be recovered from party RA bill and recovery Office note put up by concern HOD. (43) All the relevant labour and industrial laws shall also be followed compulsorily.

(44) After completion of work, cotton waste, grease, oil, unused material, welding rod pieces, scrap etc. are to be removed by contractor and scrap shall be deposited to scrap yard of Main Store.

(45) For performance evaluation of contractor, safety factors of work accident, fire incident & near miss accident will be considered. Steps can be taken to review the job assignment up to cancellation for negligence.

(46) Over & above these, contractor shall have to follow all the safety requirements /rules & regulations / norms and legal provisions laid down in various statutes. Particularly the provisions of The Factories Act-1948 & the Gujarat State Factories Rules-1963 (Amended up to date), The Electricity Act-2003 & rules, BOCW Act/Rules shall be followed strictly. The

contractor shall also obey the rules / regulations / instructions of the local Competent Authority for safety & health requirements.

(47) The above rules shall be scrupulously followed and where required, Contractor /contractor workers may contact to the Dy.Safety Officer/Safety Officer/Electrical Safety Officer in case of any ambiguity or needs further guidance in this regard.

Chapter X- BOQ Percentage

Broad Scope of job	BHE/PW/PUR/WRB-BOILER/3233
E Tender Specification No	Modification of Steam Generator (Boiler) of 210 MW for comprehensive work of availability and efficiency improvement through modification/Overhauling of Boiler back pass/ Boiler Pressure parts, fuel firing system, ducts, milling system & APH and flexible operation at 40% TMCR load without oil support at 210 MW / U#2, GSECL Wanakbori TPS, DIST – Kheda, (GJ)

TOTAL Lumpsum value to be quoted by the bidder in VOL II Price Bid at E portal						
Sl no.	**Despcirption of Work**	**Unit**	**Qty**	**Percentage**	**Unit Rate (Rs)**	**Amount (Rs.)**
A	**Dismantling of Boiler Parts including Removal of Insulation - 2934 MT (22.92232%)**					
1	Dismantling of Boiler Parts (80%)	MT	2934	18.34%	₹ 0.00	₹ 0.00
2	Milestone Activities to complete Boiler R&M Work (20%)	MT	2934	4.58%	₹ 0.00	₹ 0.00
B	**Erection & Commissioning of Boiler Pressure parts i.e. Economizer, LTSH, Steam Cooled Wall, Headers, Radiant roof 1&2 pass and Buck Stay, Seal Boxes & Access Doors, Soot Blowers - 768 MT (20.24309%)**					
1	Erection of component (25%)	MT	768	5.06%	₹ 0.00	₹ 0.00
2	Alignment, welding of the component (35%)	MT	768	7.09%	₹ 0.00	₹ 0.00
3	NDT of the component (20%)	MT	768	4.05%	₹ 0.00	₹ 0.00
4	Milestone Activities to complete Boiler R&M Work (20%)	MT	768	4.05%	₹ 0.00	₹ 0.00
C	**Erection & Commissioning of Structure - 232 MT (5.417338%)**					
1	Erection of component (25%)	MT	232	1.36%	₹ 0.00	₹ 0.00
2	Alignment, welding of the component (35%)	MT	232	1.89%	₹ 0.00	₹ 0.00
3	NDT of the component (20%)	MT	232	1.08%	₹ 0.00	₹ 0.00
4	Milestone Activities to complete Boiler R&M Work (20%)	MT	232	1.08%	₹ 0.00	₹ 0.00
D	**Erection & Commissioning of Regenerative Air Preheaters (Rotary) - 450 MT (7.032791%)**					
1	Module loading Of APH A (20%)	MT	450	1.41%	₹ 0.00	₹ 0.00
2	Module loading of APH B (20%)	MT	450	1.41%	₹ 0.00	₹ 0.00
3	APH A alignment & Trial Run (20%)	MT	450	1.41%	₹ 0.00	₹ 0.00
4	APH B alignment & Trial Run (20%)	MT	450	1.41%	₹ 0.00	₹ 0.00
5	Milestone Activities to complete Boiler R&M Work (20%)	MT	450	1.41%	₹ 0.00	₹ 0.00
E	**Erection & Commissioning of Non Pressure Parts - 1367 MT (33.58509%)**					
E-1	**Replacement of Milling system (NPP) (6.000000%)**					
1	Classifier replacement work (5.5% for each mill X 6 mills)- proportionally (33%)	MT	105	1.98%	₹ 0.00	₹ 0.00
2	Liner replacement and repairing of mills(5.5% for each mill X 6 mills) - proportionally (33%)	MT	105	1.98%	₹ 0.00	₹ 0.00
3	Mills trial run (14%)	MT	105	0.84%	₹ 0.00	₹ 0.00
4	Milestone Activities to complete Boiler R&M Work (20%)	MT	105	1.20%	₹ 0.00	₹ 0.00
E-2	**Replacement of Duct system, dampers & gates (NPP) (18.000000%)**					
1	Erection of duct (25%)	MT	1100	4.50%	₹ 0.00	₹ 0.00
2	Alignment, welding & NDT (30%)	MT	1100	5.40%	₹ 0.00	₹ 0.00
3	Duct Support (10%)	MT	1100	1.80%	₹ 0.00	₹ 0.00
4	ATT completion (15%)	MT	1100	2.70%	₹ 0.00	₹ 0.00
5	Milestone Activities to complete Boiler R&M Work (20%)	MT	1100	3.60%	₹ 0.00	₹ 0.00
E-3	**Replacement of roof & penthouse enclosure refractory and skin casing, coal pipes, burner & fuel oil works (NPP) (9.58509%)**					
1	Replacement of coal nozzle, coal pipe & bends (20%)	MT	162	1.92%	₹ 0.00	₹ 0.00
2	Replacement of scanner air system (20%)	MT	162	1.92%	₹ 0.00	₹ 0.00
3	Replacement of valves & corner skids in fuel firing system and SADC/burner tilt mechanism (20%)	MT	162	1.92%	₹ 0.00	₹ 0.00
4	Replacement of SH & RH spray valves (20%)	MT	162	1.92%	₹ 0.00	₹ 0.00
5	Milestone Activities to complete Boiler R&M Work (20%)	MT	162	1.92%	₹ 0.00	₹ 0.00
F	**Erection & Commissioning of Hangers & Supports - 5 MT (0.14921%)**					
1	Erection & Commissioning of Hangers & Supports (80%)	MT	5	0.12%	₹ 0.00	₹ 0.00
2	Milestone Activities to complete Boiler R&M Work (20%)	MT	5	0.03%	₹ 0.00	₹ 0.00
G	**Application of Insulation - 480 MT (10.65017%)**					
1	Application of Insulation including Cladding & Refractory (80%)	MT	480	8.52%	₹ 0.00	₹ 0.00
2	Milestone Activities to complete Boiler R&M Work (20%)	MT	480	2.13%	₹ 0.00	₹ 0.00