



BHARAT HEAVY ELECTRICALS LIMITED  
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-18-Sep-19

CORRIGENDUM- 07

|                   |          |  |
|-------------------|----------|--|
| <b>PROJECTs</b>   | <b>:</b> | <b>1X660 MW UPRVUNL PANKI TPS EXT.</b>             |
| <b>PACKAGE</b>    | <b>:</b> | <b>GAS CHLORINATION PLANT</b>                      |
| <b>ENQUIRY NO</b> | <b>:</b> | <b>PE/PG/PKI/E-6271/2019 Dated 25.07.2019</b>      |
| <b>SUBJECT</b>    | <b>:</b> | <b>TECHNICAL AMENDMENT + PRE-BID CLARIFICATION</b> |

|                         |                                     |                          |                                     |
|-------------------------|-------------------------------------|--------------------------|-------------------------------------|
| Type of Corrigendum     |                                     |                          |                                     |
| Technical Corrigendum - | <input checked="" type="checkbox"/> | Commercial Corrigendum - | <input checked="" type="checkbox"/> |

In reference to the above mentioned tender enquiry for **GAS CHLORINATION PLANT** package

Please note the following.

1. Amendment #1 to Technical Specification - PE-TS-426-174-A001 Rev-00
2. Refer attached BHEL replies to Pre-Bid Queries dated 17.09.2019

All the other terms and conditions of the tender enquiry remain unchanged. All the bidders are requested to quote accordingly.

Yours faithfully,

For and on behalf of BHEL

Upendra Chaudhary  
Manager/BOP



**AMENDMENT ON TECHNICAL SPECIFICATION  
FOR  
GAS CHLORINATION PLANT  
1 x 660 MW PANKI TPS**

SPECIFICATION NO.: PE-TS-426-174-A001

AMENDMENT NO # 1

REV. NO. 00

DATE: 16.09.2019

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The following modifications with respect to Technical Specification for **GAS CHLORINATION PLANT**, BHEL's Technical specification no **PE-TS-426-174-A001** shall apply.

Bidder to note that existing clauses/ details as appearing in the specification stands deleted and clauses/details as mentioned in "Modified to or Read as" column shall be applicable and complied by the bidder as listed below in **SCHEDULE - A**.

In addition, new clauses and scope are also added as listed below in **SCHEDULE - B** and shall be a part of tender specification. Bidder to comply the same.

**SCHEDULE-A**

**MODIFIED CLAUSES/ PAGE NUMBERS:**

| S. No. | Vol. No. | Section/ Description   | Clause no | Page No.     | Existing clause/details   | Modified to or Read as   |
|--------|----------|--|-----------|--------------|---|--|
| 1.     | IIB      | SECTION – IA/<br>SPECIFIC<br>TECHNICAL<br>REQUIREMENTS<br>(MECHANICAL) | 34        | 13 OF<br>563 | Adequate number of Ventilation Fans with one (1) no. additional fan as standby (for CW and RW/ PW chlorination), each complete with electrical drive motor and all other accessories. The number of air changes per hour in Chlorination Plant Buildings shall be 30. | Adequate number of Ventilation Fans with one (1) no. additional fan as standby (for CW and RW/ PW chlorination), each complete with electrical drive motor and all other accessories. The number of air changes per hour in Chlorination Plant Buildings shall be 30.<br><br>1 no. common MCC room size of 18M (L) x 6M (W) x 4.5M (H) and battery room of 4M (L) x 8M (W) x 4.5M (H) size to be considered for Ventilation requirements. 1 no. common control room size of 8M (L) x 8M (W) x 4.5M (H) to be considered for AC requirements. MCC panel heat dissipation data and control panel heat dissipation data shall be provided to the successful bidder during detailed engineering. |



**AMENDMENT ON TECHNICAL SPECIFICATION  
FOR  
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|    |     |  |     |            |   |  |
|----|-----|--|-----|------------|---|--|
|    |     |  |     |            |   | AC and Ventilation System required for complete Gas Chlorination Plant is in Bidder's scope.   |
| 2. | IIB | SECTION – IC/<br>SPECIFIC<br>TECHNICAL<br>REQUIREMENTS<br>(CONTROL &<br>INSTRUMENTATION) | 5.0 | 258 of 563 | Bidder's presence is required for three Man-days (Excluding travel time) at EDN Bangalore during FAT of DDCMIS for certifying correctness & completeness of implementation of Control logic. Intimation to attend FAT shall be informed in 2 days advance. All the expenses like boarding, lodging and travel, Airfare etc. shall be in bidder's scope. | Bidder's presence is required for three Man-days (Excluding travel time) at EDN Bangalore during FAT of DDCMIS (DDCMIS/ DCS is in BHEL's scope) for certifying correctness & completeness of implementation of Control logic. Intimation to attend FAT shall be informed in 2 days advance. All the expenses like boarding, lodging and travel, Airfare etc. shall be in bidder's scope. |

**SCHEDULE - B**

**NEW CLAUSE/ SCOPE ADDED:**

| S. No. | Vol. No. | Section/ Description  | Clause no | Page no    | Description  |
|--------|----------|---|-----------|------------|--|
| 1.     | IIB      | SECTION – IC/ SPECIFIC TECHNICAL REQUIREMENTS (CONTROL & INSTRUMENTATION) | 4.0       | 258 of 563 | Redundancy criteria (Annexure-I) as mentioned in Cl. No. 4/ Page 258 of 563/ Section – IC is enclosed herewith for bidder's compliance. Bidder to follow the same. |

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**ANNEXURE - 1****(g) Redundancy requirements****i Triple Redundancy**

Triple Sensing device shall be provided for following applications:-

- a. **For** Binary and analog inputs required for protection of boiler , turbine and major auxiliaries of main plant whose non-availability may result in 50% loss of unit availability and loss of generation.
- b. Binary and analog inputs, which are, required for protection of more than one equipment as well as protection signals for important auxiliaries and HT Drives of main plant (fed by a supply feeder of ratings 3.3 kV onwards)/MDBP/TDBFP etc.,
- c. Separate triple sensors for Instruments required for auto starting of HT driven pumps or HT driven pump tripping due to very low level of water & discharge pressure very low.
- d. For binary and analog inputs which are also required for protection in addition to CLCS. The same shall include but not limited to the critical measurement used for following CLCS :-  
Furnace draft, main steam and reheat steam temperatures, feed-water flow, throttle pressure, turbine first stage pressure, separator level, LPH and HPH level, deaerator level, hotwell level, CEP minimum recirculation, BFP minimum recirculation etc.
- e. For lube oil protection of all the HT drives, 2 out of 3 logics and necessary pressure transmitters for lube oil pressure shall be provided by bidder accordingly. However for bearing / winding temperature of HT motor, refer Electrical subsections, Vol. IV.
- f. Left and right side shall be treated as individual path / individual parameter, and each side/path shall have own triple redundancy accordingly.

**ii Dual Redundancy**

Dual Sensing device shall be provided for following applications:

- a. For binary and analog inputs required for all other closed loop control system (CLCS), protection and interlock conditions purpose of other equipments.
- b. For Instruments required for auto starting of LT driven pumps or LT driven pump tripping due to very low level of water/discharge pressure very low.
- c. Dual redundant position transmitters shall be provided for Steam Admission Valves i.e. (Emergency Stop & Control Valves, Reheat Stop Valves & Control valves), Extraction steam QCNRV, CRH NRV.
- d. For instruments required for Heat rate measurements & PADO calculations.

- iii. For binary and analog inputs used for alarm and monitoring only, single sensor criteria shall be applicable.



**Pre-bid Clarifications dated 17.09.2019**

| VOLUME                                 | SECTION            | CLAUSE No                        | PAGE NO             | SPECIFICATION REQUIREMENT   | CLARIFICATION  | BHEL Replies  |
|--|--------------------|----------------------------------|---------------------|---|--|---|
| VOLUME II B                            | ANNEXURE XIII      | ANNEXURE XIII                    | 206, 207 of 563     | P&I diagram for CW, RW and PW chlorination plant and absorption - Additional Tonner valve with Yoke SYSTEM  | We have considered the Additional Tonner valve with Yoke is only for working chlorine Ton containers, not required for storage chlorine Ton containers. We shall provide FRP hoods with caps for storage containers. For our standard practice of earlier projects of NTPC and BHEL, we have not supplied for storage containers. It is not required.  | Bidder to follow the technical specification requirements.  |
| VOLUME II B                            | ANNEXURE XIII      | ANNEXURE XIII                    | 206, 207 of 563     | P&I diagram for CW and RW chlorination plant and absorption - Blower suction duct   | We have considered the blower suction duct is 1 mtr for each chlorine Tonner and it comes 80 mtrs. If you need extra duct is in BHEL scope. No layout available.   | Technical specification requirements are clear. Bidder to follow the same.  |
| Volume III                             |                    | 27.3.5                           | 274,275 OF 563      | Material of construction for pipes  | We have considered the MOC of pipes for CW and RW system as per this clause only. As per CW and RW P&ID, there are mentioned two different MOC's. The CW makeup water line tapping is taking MS pipe only, based on we will provide MS pipe for water lines. Please note CW makeup water line size is 300NB, CPVC is not feasible for this pipe size.  | MOC for water lines shall be as per Chapter 27: LP Piping, Valves & Specialities enclosed in Section IIA/ Page No. 271 to 303 (of 563) of tech. specification.  |
| Volume II B                            | Sub Section – II A | 1.0, 3,4.0                       | 264,267, 269 of 563 | Actual dosing level shall be set by the operator based on residual chlorine measurement   | We have quoted semi automatic system only, Please note we have not considered any auto flow control valve. The flow hall be manually set by your operator.   | Bidder to please note that Chlorine dosing shall be auto-adjusted through Auto Flow Control Valve (FCV) of Chlorinators, based on the feedback from online free residual chlorine analyzers.  |
| Volume II B                            | Sub Section – I A  | 3.0 - 66                         | 14 of 563           | Potable water pumps total head shall be 62 MWC  | Not possible to provide. To dose against 62 MWC and pressure losses is impractical and not feasible for venturi based chlorination system. Also PW flow is not uniform and erratic during consumption. Venturi based system has to have continuous flow and back pressure less than 6 bar to create vacuum and operate consistently. Request you to provide alternate dosing point in PW sump location. This has been a issues in almost 5 projects of BHEL earlier and all altered suitably and successfully dosing in PW sump. | Bidder to follow the technical specification requirements.  |
| Volume II B                            | Sub Section – I A  | 60                               | 14 of 563           | Measuring & testing equipment   | Amperometer, titrator and pH meter etc are not considered in our scope of supply. Not part of our supply.  | Bidder to follow the technical specification requirements.  |
| Volume II B                            | Sub Section – I A  | 34                               | 13 of 563           | Adequate number of Ventilation Fans   | This is not possible to provide an adequate number of fans. We have considered approximately 10 number of ventilation fans for all system. If you need any extra ventilation fans are in BHEL scope. We don't have layout and we don't know about your chlorination building size. We are unable to calculate the same.  | Technical specification requirements are clear. Bidder to follow the same.  |
| VOLUME V                               |                    | 2.16.02                          | 462 of 563          | Residual Chlorine Analyser  | We have considered the Residual Chlorine Analyser as per our standard supplied for NTPC and BHEL of our earlier projects. As per your technical specifications, the price seems to be very high.   | Bidder to follow the technical specification requirements.  |
| VOLUME II B                            | SUB – SECTION I B  | 5                                | 230 of 563          | Any special type of cable like compensating, co-axial, prefab, MICC, optical fibre etc. Refer C&I portion of specification for scope of fibre Optical cables if used between PLC/ microprocessor & DCS.   | We have not considered in our scope of supply. Please note PLC/ microprocessor & DCS is not in our scope. There is no scope clarity in tender specifications.  | Tender specification is clear. Bidder to follow the same. However, please be clarified that PANKI Chlorination Plant is DDCMIS/ DCS (DCS is in BHEL's scope) controlled and hence, optical fiber cable between PLC/ microprocessor & DCS is not applicable. |
| VOLUME II B                            | SECTION D          | 6.11.00                          | 532 of 563          | Marshalling Panel   | We have not considered in our scope of supply. There is no scope clarity in tender specifications.   | Marshalling Panel is not in bidder's scope of supply.   |
| VOLUME II B                            | SUB – SECTION I B  |                                  | 230 of 563          | Electrical scope between BHEL and vendor  | Cable Trenches, RCC cover slab, sand filling, checkered plate, and Rubber mat, Support channel, UPS etc are not considered in our scope of supply. There is no scope clarity in tender specifications.   | Technical specification requirements are clear. Bidder to follow the same.  |
| VOLUME V                               |                    | 2.01.01                          | 454 of 563          | Hart protocol compatible  | We have not considered in our scope.   | Bidder to follow the technical specification requirements.  |
| GST Related Corrigendum to GCC Rev. 06 |                    | Clause No.9 of GCTC, 9.3 – 9.3.1 | 6 of 12             | Supply Payments for Turnkey projects – 85% Payment of basic price of materials Supplied, as per approved billing schedule, along with freight, taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rata basis. 15% of basic price of materials supplied will be retained as security deposit which will be released on pro –rata basis as follows: 5% will be released on pro-rata basis after submission of Material Receipt Certificate (MRC), 10% will be released after i) submission of all final documents as per Technical Specifications and ii) successful completion of Performance Guarantee (PG)/ Demonstration Test and handing over of the system/ package, if applicable, as per Order/ Contract. | We are unable to accept your payment terms. We shall accept 10% of basic price of materials on submission and approval of all basic design documents. 80% Pro-rata with 100% Taxes and Duties against dispatch documents on supply of materials at site. 5% of basic price against material received along with 100% freight and others against MRC. 5% on Pro-rata basis against Erection and Commissioning of the system.  | Payment terms shall be as per GST related corrigendum to GCC Rev-06   |

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| VOLUME                                 | SECTION | CLAUSE No                                      | PAGE NO  | SPECIFICATION REQUIREMENT  | CLARIFICATION   | BHEL Replies  |
|--|---------|--|----------|--|---|---|
| GST Related Corrigendum to GCC Rev. 06 |         | Clause No.9 of GCTC, 9.4 – 9.4.1, 9.4.2, 9.4.3 | 6 of 12  | Eighty percent (80%) payment on prorata basis for the work completed, as per approved billing schedule, shall be released by Site authorities/ Region on submission of protocols, duly signed by BHEL Site/ Owner. Ten percent (10%) of the total value shall be released by Site authorities/ Region on successful commissioning of the complete system/ package. Ten percent (10%) of the total value shall be released by Site authorities/ Region on successful completion of PG/ Demonstration test(s) and handing over system/ package to the Owner, as applicable.  | We are unable to accept your payment terms. We shall accept 90% payment on pro-rata basis for the work completed, as per approved billing schedule, shall be released on submission of protocols, duly signed by BHEL Site / Owner. 5% of the total value shall be released on successful commissioning of the complete system. 5% of the total value shall be released on successful completion of PG/ Demonstration test(s) and handing over system/package to the Owner. | Payment terms shall be as per GST related corrigendum to GCC Rev-06 |
| GST Related Corrigendum to GCC Rev. 06 |         | Clause No.16 of GCTC                           | 11 of 12 | Purchaser reserves the right to recover from the Seller/ Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent plus applicable GST of the total contract price per week or part thereof, subject to a maximum of ten (10) percent of the total contract price excluding elements of taxes, duties and freight, if the Seller/ Contractor fails to deliver any part of the ordered stores within the period stipulated in the Order/ Contract. For Turnkey packages (Supply and E&C in vendor's scope), Liquidated Damages shall be levied on the total contract value of both Supply and E&C orders (excluding taxes, duties and freight) if E&C completion of the package is delayed beyond the contractual completion date or extension thereof. Liquidated Damages will not be withheld from supply payment. | We request you to consider LD of 0.5% per week to a maximum of 5% on contract basic value of unsupplied portion value excluding taxes and duties only.  | LD shall be as per GST related corrigendum to GCC Rev-06            |
| GCC Rev. 06                            |         | Clause No.11 – 11.2                            | 11 of 22 | Contract Performance Bank Guarantee for 10% of Order/ Contract value (excluding taxes, duties & freight) before first submission of documents for payment to cover the due performance of Order/ Contract and to fulfill the guarantee conditions stipulated in the Order/ Contract.   | We request you to retain one 10% of basic contract value of (CPBG cum PBG) last supply bill valid upto the Guarantee period + 1 month claim period. This means that you will have one 10% of basic contract value retains money till Guarantee Period.  | CPBG shall be as per NIT  |