



**BHARAT HEAVY ELECTRICALS LIMITED**  
**PROJECT ENGINEERING MANAGEMENT, NOIDA**

Date-19-Jul-19

**CORRIGENDUM- 02**

|                   |          |                                        |
|-------------------|----------|----------------------------------------|
| <b>PROJECTs</b>   | <b>:</b> | <b>1X660 MW UPRVUNL PANKI TPS EXT.</b> |
| <b>PACKAGE</b>    | <b>:</b> | <b>COMPRESSED AIR SYSTEM</b>           |
| <b>ENQUIRY NO</b> | <b>:</b> | PE/PG/PKI/E-6251/2019 Dated 03.07.2019 |
| <b>SUBJECT</b>    | <b>:</b> | <b>COMMERCIAL CHANGE</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 **COMPRESSED AIR SYSTEM** package

Please note the following.

1. Bidders to note that minimum local content requirement for subject package is 50% as per Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018.
2. Refer attached BHEL replies to pre-bid queries.

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

**1X660MW PANKI TPS - COMPRESSED AIR SYSTEM**

**TENDER ENQUIRY:- PE/PG/PKI/E-6251/2019**

**REPLIES TO PRE-BID QUERIES.**

| SL NO | VOULME/<br>SECTION | PAGE NO. | CLAUSE NO. | TECHNICAL SPECIFICATION/ TENDER DOCUMENT                                                                      | COMPLETE DESCRIPTION OF CLARIFICATION BY BIDDER                                                                                                                                                                                                                                                                                                                                                                     | BHEL REPLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------|--------------------|----------|------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | SECTION-I          | 4        | 1.1        | Spare for Erections, Startup & commissioning spares                                                           | Spare for Erections, Startup & commissioning spares are not required. Hence not considered in offer.                                                                                                                                                                                                                                                                                                                | As per specification, spares for erection, start up and commissioning as required are in bidder's scope of supply. Bidder to follow technical specification.                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2     | SECTION-I          | 12 & 13  | NA         | Climatological Condition                                                                                      | Compressor & Dryers are selected based on below mentioned condition in tender. Other site conditions mentioned in tender are not referred.<br>12.3 Design Inlet conditions for Compressor<br>a) Temp : 45.0 Deg C<br>b) Relative humidity : 75%<br>c) Altitude : 126.0 m above MSL<br><br>There is differnt altitude mentioned as 193 MSL on APge No 22. BHEL to confirm                                            | The design inlet condition for compressor shall be as mentioned at Cl no 12.3, Section IA, page 19 of 429 of technical specification.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3     | Section -I-A       | 15       | 1.1.1      | IA & SA Capacity                                                                                              | Air Compressor Capacity 40 nm3/min is subject to ISO 1217 Tolerances as per clause 2.1.2 & 2.1.5 Page no 22.                                                                                                                                                                                                                                                                                                        | Clause 1.1.1 of section IA page 15 of 429 of technical specification calls for compressor of minimum 40 Nm3/min capacity. Bidder to follow the same.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4     | Section -I-A       | 15       | 1.1.4      | Air Receiver apart from near to compressor House                                                              | BHEL to terminate Power cable for ADT. Piping around Air Receiver is not in bidder Scope. Only inlet & outlet valves with counter flanges shall be provided.                                                                                                                                                                                                                                                        | Bidder to follow technical specification.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5     | SECTION-IA         | 16       | 1.1.14     | Minor or Major Civil Work                                                                                     | Minor or Major Civil work/ design of civil structure etc is not in bidder scope of work.                                                                                                                                                                                                                                                                                                                            | Bidder to follow technical specification.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 6     | Section -I-A       | 16       | 3.1        | HT Motor                                                                                                      | BHEL to Select & design Main Motor of compressor inline with Bidder technical requirements provided during detail engineering. BHEL to supply all motors as per bidder production schedule to its factory for further assembly with Air compressor & package testing.<br>In case of any break down of motor then BHEL will take up this with end customer/ Motor Supplier, bidder will not be responsible for this. | Compressor HT Motor shall be free issued to successful bidder as per Motor inputs obtained form successful bidder during detailed engineering. Motor shall be issued as per project schedule for further assembly at successful bidder's works. Sucessfull bidder shall be provided with the motor related documents likes TDS, GA, QAP and Inspection reports, etc for their review and comments if any. Further in case of motor breakdown, post despatch, responsibility shall lies with sucessfull bidder. However BHEL shall provide required technical help in resolving the problem. |
| 7     | Section -I-A       | 17;399   | 11         | Operation & Maintenance Manual                                                                                | Bidder Standrad Operation & Maintenance manual (Instruaction Book Along with Spare Part list) shall be provided. This documents contains most of all information require during maintenance & operation.                                                                                                                                                                                                            | Successful bidder's format, if meritorious, shall be reviewed during detailed engineering and final O&M format shall be arrived mutually.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 8     | Section -I-A       | 19       | 12         | Cooling water                                                                                                 | Cooling water pressure drop across compressor & dryer is 1 kg/cm2 along with 10 Deg Temp rise approximately. Internal Design cannot be changed.                                                                                                                                                                                                                                                                     | As per technical specification, allowable pressure drop and temperature rise across CW ternimal points shall be 10 MWC (i.e. 1 kg/cm2) and 10 Deg C respectively.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 9     | Section -I-A       | 20       | 12.9       | Grouting of equipment's, like Air receiver, Air dryer & foundation bolts etc. are in the scope of the bidder. | Civil work is not in bidder scope of supply. Hence Grouting is in others scope of work.                                                                                                                                                                                                                                                                                                                             | Bidder to follow technical specification.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 10    | Section -I-A       | 20       | 12.12      | Air Receiver height-4 m                                                                                       | 4 M height can be maintain for 10 M3 Air Receiver, however for other Air receivers height of receiver shall be as per manufacturer.                                                                                                                                                                                                                                                                                 | Referred clause calls for 4M receiver height for 10 cum air receiver only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11    | Section -I-A       | 20;393   | 12.14      | KKS Tag                                                                                                       | KKS tagging philisophy shall be followed out side Compressor & dryer skid. KKS Tag shall be given as an entire equipment to Compressor & Dryer                                                                                                                                                                                                                                                                      | As per technical specification, KKS tagging for items and instruments inside compressor and dryer skid are not required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**1X660MW PANKI TPS - COMPRESSED AIR SYSTEM****TENDER ENQUIRY:- PE/PG/PKI/E-6251/2019****REPLIES TO PRE-BID QUERIES.**

| SL NO | VOULME/<br>SECTION | PAGE NO. | CLAUSE NO.                                  | TECHNICAL SPECIFICATION/ TENDER DOCUMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | COMPLETE DESCRIPTION OF CLARIFICATION BY BIDDER                                                                                                                                                                                                                                                                                                                   | BHEL REPLY                                                                                                                                                                                                                  |
|-------|--------------------|----------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12    | Section -I-A       | 20       | 12.12                                       | Access Platform                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Access platform is not applicable for single drum HOC type dryer as all instruments shall be provided on Man height. Also there is no provision is available.                                                                                                                                                                                                     | Access paltform is not required if all instruments and operable items are approachable from ground.                                                                                                                         |
| 14    | Section -IA        | 23       | 2.4.5                                       | Air Receiver- minimum 500 mm dia. manhole for inspection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Handhole applicable for small capacity of receivers as per Industry Guideline.                                                                                                                                                                                                                                                                                    | Bidder to follow technical specification.                                                                                                                                                                                   |
| 15    | Section -IA        | 24       | 2.6                                         | The compressed air pipe joints will be screwed type. valve body material shall be stainless steel.                                                                                                                                                                                                                                                                                                                                                                                                                                        | The compressed air pipe joints will be butt welded. Screw Joints experienced leakages. Valve internal trim SS410, however body shall be WCB. For Butterfluy valev body Cast iron & disc CF8M, seat Nitrile. End Connection threaded up to 50 NB Valve & above flange End. Same is suitable in subject application & inline with previous supplies to Power Plants | For compressed air application, valve body material shall be cast carbon steel or forged carbon steel for sizes 65 mm NB & above and Gun metal for sizes 50 NB and below. Compressed air pipe joints shall be screwed type. |
| 16    | Section -IA        | 27; 95   | 23.3; 41                                    | Codes & Standrads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mentioned codes and standard is generalised and Bidder shall follow manufacturer design and testing standard as per previous executed Projects. Compressor Performace shall be measured as per ISO1217, Ed3, Annexure-C, '96 at Bidder's work test bed.                                                                                                           | For compressor performance, ISO1217, Ed3, Annexure-C, is acceptable. Codes and standards mentioned in specification shall be followed, if applicable.                                                                       |
| 17    | Section -IA        | 29       | 23.4.6                                      | Noise Measurement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Noise of compressor & dryer shall be 85 db & measured according to ISO2151: 2004 using ISO 9614/2                                                                                                                                                                                                                                                                 | Acceptable.                                                                                                                                                                                                                 |
| 18    | Section -IA        | 30       | 23.4.9                                      | Each air compressor shall have its own control panel with indication lights for power on; service hour-run meter; load hour-run meter; inlet air filter differential pressure high; outlet air pressure & temperature (analogue gauge); oil filter differential pressure high; separator element differential high; motor overload; low oil level; compressor temperature high; oil temperature before and after oil cooler (analog gauge). The compressor should trip on motor overload; low oil level; and compressor temperature high. | No gauges are forseen inside compressor skid. Instrumentation within compressor skid as per bidder design same in line with previous supplied equipments to BHEL                                                                                                                                                                                                  | Bidder to follow technical specification.                                                                                                                                                                                   |
| 19    | Section -IA        | 31       | 23.4.15                                     | The temperature of air at outlet of after cooler shall not exceed 8°C above the cooling water inlet temperature.                                                                                                                                                                                                                                                                                                                                                                                                                          | Air Outlet temp of Compressor is approx 8-10 deg above CW inlet temp                                                                                                                                                                                                                                                                                              | Bidder to follow technical specification.                                                                                                                                                                                   |
| 20    | Section -IA        | 31       | 23.4.17                                     | Each Air Receiver shall be so sized that even in the event of total stoppage of air inflow to the same, the pressure in the Air Receiver shall not fall below 5.5 kg/cm2 (g) within two (2) minutes of such stoppage,                                                                                                                                                                                                                                                                                                                     | Air Receiver Capacity are considered as mentioned in tender document. Page No 15 Caluse no 1.1.4. Changes in capacities shall affect commercial offering                                                                                                                                                                                                          | Air receivers numbers and quantities shal be as mentioned at clause no 1.1.4, section IA, page 15 of 429 of technical specification.                                                                                        |
| 21    | Section -IA        | 31       | 23.4.21                                     | ACcess Platform- Air receiver                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Access platform is not applicable as all instruments/safety Valves shall be provided on Man height.                                                                                                                                                                                                                                                               | Bidder to follow technical specification.                                                                                                                                                                                   |
| 22    | Section -IA        | 32       | 23.4.26                                     | Pre & post Filters for Air dryer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Pre & post Filters for Air dryer are not require for Single drum HOC type Air dryer                                                                                                                                                                                                                                                                               | Bidder to follow technical specification. Applicability shall be decided during detailed engineering only after review of relevant documents.                                                                               |
| 23    | Section -IA        | 34       | 23.5.3                                      | Hoist/Cranes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Same is not in bidder's scope of supply & erection.                                                                                                                                                                                                                                                                                                               | Hoist / cranes are clearly mentioned under exclusion at clause no 3.5, section IA, page 16 of 429 of technical specification.                                                                                               |
| 24    | Section -IA        | 34,44,52 | 23.6.1 & Compressor & Dryer data sheet A& B | Design & Construction of Compressor & Dryer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Internal design, MOC, inprocess testing (Electrical, Instrumentation, Mechanical) of compressor & dryer shall be as per Bidder's design. Same is inline with previous supplied equipments to BHEL projects. Lubricant used in compressor shall be bidder's branded oil.                                                                                           | Bidder to follow technical specification. OEM proven design meeting the functional requirement of technical specification is also accepted subject to approval by customer during detailed engineering.                     |
| 25    | Section -IA        | 41       | 23.7.1                                      | Audio Alarm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | On Compressor & Dryer controller only Visual is available. Same is inline with previous supplied equipments to Power Plants                                                                                                                                                                                                                                       | Bidder to follow technical specification. OEM proven design meeting the functional requirement of technical specification is also accepted subject to approval by customer during detailed engineering.                     |

**1X660MW PANKI TPS - COMPRESSED AIR SYSTEM**

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| SL NO | VOULME/<br>SECTION | PAGE NO. | CLAUSE NO. | TECHNICAL SPECIFICATION/ TENDER DOCUMENT | COMPLETE DESCRIPTION OF CLARIFICATION BY BIDDER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | BHEL REPLY                                                                                                                                                                                              |
|-------|--------------------|----------|------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 26    | Section -IA        | 43       | 23.7.2.5   | alarms and shutdown                      | Below Signals are not avaiable in bidder's compressor control panel-<br>d. High Oil filter differential pressure - Alarm & trip<br>e. Low Lube oil level in lube oil sump - Alarm & trip                                                                                                                                                                                                                                                                                                                                                                                                                      | Bidder to follow technical specification. OEM proven design meeting the functional requirement of technical specification is also accepted subject to approval by customer during detailed engineering. |
| 27    | Section -IA        | 43       | 23.7.3.1   | ADP                                      | As per Mentioned on Page no 41, Manufacturer Standrad design of Single drum HOC Type dryer is acceptable. For this technology these instrumentations are not aplicable                                                                                                                                                                                                                                                                                                                                                                                                                                        | Bidder to follow technical specification. Applicability shall be decided during detailed engineering only after review of relevant documents.                                                           |
| 28    | Section -IA        | 46       | 5.5        | PH Value                                 | For Compressor ph Valvue 6.8 to 8.5 should be for better performance of equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bidder to follow technical specification.                                                                                                                                                               |
| 29    | Section -IA        | 47;193   | 8.1.8; 1.2 | Efficiency of Filter                     | Efficiency, Capacity of filter cannot be measured. Same is not required as per testing standrad & being followed in all BHEL projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bidder to follow technical specification.                                                                                                                                                               |
| 30    | Section -IA        | 54       | 9          | Max operating air Pressure-16 Bar        | Max operating pressure is 14 Bar for Air dryer which is suitable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Bidder to follow technical specification.                                                                                                                                                               |
| 31    | Section -IA        | 66       | 8.3.4      | 3D Modeling                              | All Drawings shall be provdied in 2D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3D model shall be prepared by BHEL, bidder to provide all necessary inputs during detailed engineering.                                                                                                 |
| 32    | Section -IA        | 73       | 13         | Lubricant , Servo fuilids & Chemicals    | For Compressor bidder's brended oil shall be used for satisfactory performance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Bidder's scope of supply shall be as mentioned in specification. Bidder's recommended oil / lubricant for its offered compressor is noted.                                                              |
| 33    | Section -IA        | 75       | 17         | Tools & Tackles                          | Special tools and tackles not required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Bidder to follow technical specification. Applicability shall be decided during detailed engineering only after review of relevant documents.                                                           |
| 34    | Section -IA        | 87       | 26         | Pre Commissioning , Commissioning        | Pre Commissioning , Commissioning at site for compressor and dryer shall be as per bidder's check list. All Commissioning engineers are trained accordingly. Bidder shall ensure sucessful commissioning of equipments                                                                                                                                                                                                                                                                                                                                                                                        | Bidder to follow technical specification.<br>Successful bidder's commissioning check-list, if meritorious, shall be reviewed during detailed engineering.                                               |
| 35    | Section -IA        | 89       | 28         | Training of owners Personnel             | Total 2 days training (for All decipline at site, classroom, on job etc) is considered which is sufficient to understand working of equipment from operation & maintenance point of view. Hence 6 man Months training is not considered as per tender requiriment. Traing days above 2 days will be charged extra on perday basis & shall be quoted separately<br>Bidder's Standrad training material (if require) shall be provided on successful completion of training.                                                                                                                                    | Bidder to consider two days training at bidder's work and two days training at owner's site.                                                                                                            |
| 36    | Section -IA        | 92       | 31         | Packing & Transportation                 | Packing , Marking & protection of compressor , Dryer & accessories shall be as per bidder standrad packing procedure. Bidder shall ensure delivery of material at site with proper identification & without damage                                                                                                                                                                                                                                                                                                                                                                                            | Bidder to follow technical specification.                                                                                                                                                               |
| 37    | Section -IA        | 179      | 2          | PG test at Site                          | Compressor shall be tested for its performance (Pressure, Flow, power consumption etc) at bidder's work according to ISO 1217, Annexure-C, ed3, '96. Same is requirie specialised test bed which cannot be created at site. This test can be witness by BHEL, NTPC, RRVUNL , TPI during final inspection at bidder's test bed. So there will be no seperate performance test at site.<br>Test mentioed in 2.5 a,b,c,d shall be done at bidder's Test bed & 2.5 e,f,g shall be at site.<br>h) Instrument air quality is not applicable since offred compressor is oil free. Dew point can be observed at site. | Tests to be conducted at site and at manufacturer's work are clearly mentioned at clause no 3.2, section IA, page 179 of 429.<br>Bidder to follow the same.                                             |

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| SL NO | VOULME/<br>SECTION | PAGE NO. | CLAUSE NO.       | TECHNICAL SPECIFICATION/ TENDER DOCUMENT                                                                                                                      | COMPLETE DESCRIPTION OF CLARIFICATION BY BIDDER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | BHEL REPLY                                                                                                                                                                                                                                                                          |
|-------|--------------------|----------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 38    | Section -IA        | 180      | Chapter-11       | Quality assurance requirement, Inspection & testing                                                                                                           | In case NTPC is approving authourity after BHEL, then NTPC pre approved RQP shall be followed for all major items like Compressor, Receiver, Dryer, valves, Cables, etc. if not then inspection & testing of compressor & dryer shall be as per bidder Standrad QAP which is being followed in BHEL/RRVUNL/Power Plant projects. Previous approved FQP by BHEL/consultant will be followed for site activities. For instrumentations, Pipe, Fittings etc outside compressor and dryer skid manufacturer test reports shall be provided for MDCC. | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 39    | Section -IA        | 197      | Annexure-I       | Subvendor list                                                                                                                                                | Bidder Shall supply material as per its approved source for items which are not covered in subvendor list.<br>Being very small qty of Pipes , bidder shall purchase material from delears & with available makes (may be other than listed) which is suitable for application.                                                                                                                                                                                                                                                                   | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 40    | Section -IA        | 213      | Annexure-III     | MDL With Submission schedule                                                                                                                                  | MDL is acceptable. Documents Mentioned in tender other than this list are not considered for submission.                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 41    | Section -IA        | 218      | P&ID DMCW System | P&ID DMCW System                                                                                                                                              | Same is not in bidder's scope of supply & erection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Bidder's scope of supply shall be as per section IA, page 14 - 20 of 429. Information mentioned in DMCW PID is for bidder to understand cooling water system.                                                                                                                       |
| 42    | Section -IA        | 220      | 14A14-DWG-M-037  | P&ID Compressor System                                                                                                                                        | One SA & One IA will be connected to Single drum HOC type dryer as indicated in PE-DG-426-555-A018                                                                                                                                                                                                                                                                                                                                                                                                                                               | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 44    | Section -IA        | 227      | Annexure VI      | Painting Specification                                                                                                                                        | Painting & colour code of Air compressor and dryer shall be as per bidder's Standrad painting procedure. Same is suitable for subject enviornment & inline with previous supplied equipments to BHEL Projects                                                                                                                                                                                                                                                                                                                                    | Bidder to follow technical specification. Successful bidder's standard painting procedure, if meritorious, shall be reviewed during detailed engineering.                                                                                                                           |
| 45    | Section -IA        | 246;370  | NA               | Electrical Equipment Specification/ Local Control Panel & Quality plan                                                                                        | HT Motor is in BHEL Scope. Electrical Panel, internal wiring etc of compressor and dryer shall be as per bidder's standrad design since the panel is part of skid. Testing of panel shall be as per Compressor approved NTPC RQP or QAP.                                                                                                                                                                                                                                                                                                         | As per technical specification HT motors are excluded form bidder's scope. Other details like panel, wiring shall be as per technical specification. Based on technical specification, successful bidder shall further prepare wiring details document during detailed engineering. |
| 46    | Section -IA        | 316      | NA               | Technical Specification C&I                                                                                                                                   | Instrumentation within compressor and dryer skid shall be as per Manufacturer standrad. Field instruments cannot be conncted to Compressor & dryer controller. All field instruments shall be connected to common field mounted JB. Further cabling from JB to DCS is in BHEL scope.                                                                                                                                                                                                                                                             | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 47    | Section -IA        | 317      | 10               | Redundancy of sensors shall be provided, irrespective of instrumentation shown in the PID, by bidder as per sheet attached in the specification. (ANNEXURE A) | Annexure-A is not available. However all instrumentations considered in Package are not redundant.                                                                                                                                                                                                                                                                                                                                                                                                                                               | For annexure A, bidder to follow page 321 of 429. Instrument redundancy shall be provided as per page 321 of 429.                                                                                                                                                                   |
| 48    | Section -IA        | 317      | 11               | LIE/LIR                                                                                                                                                       | All field instruments (Gauges, Transmitters, switches etc) shall be mounted locally directly on Pipe Line with stnadrad hookup. Hence LIE/LIR is not applicable.                                                                                                                                                                                                                                                                                                                                                                                 | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 49    | Section -IA        | 317      | 12               | UPS Supply                                                                                                                                                    | UPS Supply for Supplied Compressor & dryer (Panel ) is not required. Hence UPS DB is not considered in bidder's Scope of supply. BHEL/Others shall supply & terminate Power cable for Panel directly from feeder.                                                                                                                                                                                                                                                                                                                                | Bidder to follow technical specification.                                                                                                                                                                                                                                           |
| 50    | Section -IA        | 317      | 13               | All transmitters & electronics items including JB's will be explosion proof / intrinsically safe as per hazardous area classification.                        | All instruments considered are suitable for safe area installation. Compressor House is safe area.                                                                                                                                                                                                                                                                                                                                                                                                                                               | Compressor house is non hazardous area.                                                                                                                                                                                                                                             |
| 51    | Section -IA        | 317      | 18               | Vibration sensors                                                                                                                                             | As HT Motor is in customer scope , Vibration monitoring system & Key Phaser shall be in Customer scope of supply & erection. Same cannot be connected to Compressor controller                                                                                                                                                                                                                                                                                                                                                                   | VMS for compressor motor is not in bidder's scope of supply.                                                                                                                                                                                                                        |

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|-------|--------------------|----------|-------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 52    | Section -IA        | 322      | Part-D                        | Hardware Interface                       | <p>For HT Unidirectional Drive- Motor Bearing/winding RTD shall be connected to individual compressor microprocessor panel for Monitoring. Spare RTD /BDT shall be available in Motor TB. Further connection to DCS is in others scope of supply. Communication between Compressor(microprocessor panel), HT Switchgear &amp; DCS will be as below</p> <p>DCS To microprocessor panel- Start/Stop Command</p> <p>microprocessor panel to HTSWGR- Start Command, Stop Command</p> <p>HTSWGR to microprocessor panel- Starter Feedback, Motor fault feedback</p> <p>microprocessor panel to DCS- Compressor Running, General warning, General shutdown feed back.</p> <p>Above signals are available inline with all projects executed with BHEL/RRVUNL</p> <p>Additional signals cannot be generated due to hardware limitation.</p> | <p>Bidder to follow technical specification.</p> <p>Hardware interface is for the safety of compressor only.</p> |
| 53    | Section -IA        | 404      | Site Storage and Preservation | Site Storage and Preservation            | <p>Material Storage &amp; preservation (as per bidder's Guideline) at site in closed storage room is in Others scope of work. Bidder Shall unload and transfer material to Others store.</p> <p>Bidder's Contractor will request for material release as and when require during site erection.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Bidder's scope include storage and in-site transportation also.</p>                                           |