

**400 MW, MARIB GTPS, PHASE-II
PEC, MINISTRY OF ELECTRICITY AND ENERGY REPUBLIC OF
YEMEN**

VOLUME: II B & III

**TECHNICAL SPECIFICATIONS
FOR
VACUUM TRUCKING SYSTEM**

SPECIFICATION NO.: PE-TS-372-174-15000-A-A001



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, INDIA**



TITLE:
**TECHNICAL SPECIFICATION FOR
VACUUM TRUCKING SYSTEM**

**400 MW, MARIB GTPS, PHASE-II
PEC, MINISTRY OF ELECTRICITY AND
ENERGY REPUBLIC OF YEMEN**

BHEL DOCUMENTS NO.: PE-TS-372-174-15000-A-A001

VOLUME


SECTION

REV. NO. 00


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SECTION - A
(SCOPE OF ENQUIRY)

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1.0 SCOPE:

- 1.1 This specification is intended to cover design, engineering, manufacturing, painting, inspection & testing at manufacturer's works, complete with all accessories, and delivery to CHA Godown Mumbai Port for the **VACUUM TRUCKING SYSTEM for 400 MW, MARIB GTPS, PHASE-II. PEC, MINISTRY OF ELECTRICITY AND ENERGY, REPUBLIC OF YEMEN.** In addition, the bidder's scope shall also include supervision, site testing and performance demonstration. The scope of supply shall fully cover the requirement of the Design Criteria and Technical Specification of this specification.
- 1.2 It is not the intent to specify all the details of the design & manufacture. However, the equipment shall conform in all respect to high standard of design, engineering & workmanship and shall be capable of performing the required duties in a manner acceptable to Engineer / Purchaser, who will interpret the meaning of drawing & the specification & shall be entitled to reject any work or material, which is not in full accordance herewith.
- 1.3 Items though not specifically mentioned but needed to make the system complete as stipulated under these specifications are also to be furnished unless otherwise specifically excluded
- 1.4 Bidder's scope shall also include any other services etc, if called for in the succeeding section of the specification
- 1.5 In case of any clarification, the Bidder shall indicate the same clause by clause in the deviation / clarification schedule. In the absence of the same it will be construed that the bid conform strictly to the specification.
- 1.6 General terms & conditions, instructions to the bidder and other attachments referred to elsewhere, made part of tender specification. The bidder shall be responsible for all governed by requirements stipulated hereinafter.
- 1.7 Contradictions any portion of the specification, if any, shall be brought to the attention of the BHEL / customer by the bidder and the correct requirement shall be obtained.
- 1.8 In the event of any conflict between two clauses of specification bidder has to point out those points in pre award stage in clarification format attached with the specification. In absence of the same BHEL / customer interpretation will prevail after award of contract during detailed engineering.
- 1.9 Equipment's covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and shipping release issued by BHEL/Customer.
- 1.10 BHEL's/Customer's representative shall be given full access to the the shop in which the acquirments are being manufactured or tested and all test records shall be made available
- 1.11 Bidder may be required to depute his qualified personal to power station site to supervise / demonstrate the working of the system.
- 1.12 Unpriced copy of the price bid shall be furnished along with the technical bid.

BHEL – PS PEM- PPEI, SECTOR-16A, NOIDA, U.P. – 201301.

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SECTION – B


PROJECT INFORMATION



TITLE:
**TECHNICAL SPECIFICATION FOR
 VACUUM TRUCKING SYSTEM**
 400 MW, MARIB GTPS, PHASE-II
 PEC, MINISTRY OF ELECTRICITY AND
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 VOLUME **II-B**
 SECTION –B
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1.	Owner	PUBLIC ELECTRICITY CORPORATION, MINISTRY OF ELECTRICITY AND ENERGY , REPUBLIC OF YEMEN
2.	Project	400 MW MARIB GTPS PHASE-II
3.	Owner's consultant	The Kuljian corporation , Philadelphia , USA
4.	Location	Marib , Yemen
5.	Nearest Airport	El Rahaba Airport (SAH), Sana'a, Yemen
6.	Nearest Railway Station	No rail network in Yemen
7.	Access to site	<p>a. <u>Through sea</u>:</p> <ul style="list-style-type: none"> Distance of site: From Aden Port (Gulf of Aden): 419 Km <p>b. <u>By Air</u> : Sana'a Airport</p> <ul style="list-style-type: none"> Distance from site : 172 Km
8.	Site data	
A	Altitude	1100 m above Mean Sea Level
B	Ambient Air Temperature	45 °C
C	RELATIVE HUMIDITY	
	Design Relative Humidity	60%
D	RAINFALL	
1.	Average Rainfall per annum	< 100 mm
E	WIND VELOCITY & PRESSURE	
1.	Max. Design Wind Velocity	120 km/h
2.	Max. Barometric Pressure Barometric Pressure at sea level	1023.6 mbar 887.7 mbar
F	SEISMIC ZONE	UBC 1997,Zone-2 A
9.0		
A	Design Ambient temperature for Gas Turbine & Mechanical equipment	45 °C
B	Design Ambient temperature of electrical equipment	50 °C

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SECTION – C

SPECIFIC TECHNICAL REQUIREMENTS

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1. GENERAL

The **Vacuum Trucking System** and associated accessories shall conform to the technical specification.

2. DESIGN BASIS

The vacuum trucking system shall be designed to remove effluents from following sumps.

- Transformer Yard Fire Collection Sump 1 (common for two transformers) – RCC Sump with capacity of 130 cum.
- Transformer Yard Fire Collection Sump 2 (common for two transformers) – RCC Sump with capacity of 130 cum.
- GTG Area Waste Water Collection Sump 1 (common for two GTs) – RCC Sump with capacity 10 cum
- GTG Area Waste Water Collection Sump 2 (common for two GTs) – RCC Sump with capacity 10 cum
- Fuel Oil Area Waste Collection Sump – RCC Sump with capacity of 10 cum.
- Switchgear building waste water Collection Sump – RCC Sump with capacity of 10 cum.
- Near RO DM Plant transformer Fire water Collection Sump – RCC Sump with capacity of 10 cum.

Effluent shall have the following properties:

pH:	6.5 – 9.5
Total Suspended Solids:	500 ppm
Total Oil and grease:	100 - 1000 ppm

Vehicle mounted suction unit shall have a net capacity of 6000 liters for effluent storage. The unit shall be mounted on a truck chassis having Gross Weight Vehicle (GVW) not less than 16 tons. Collection of the effluent from the collection sumps will be carried out on the principle of generating high vacuum in the compartment for siphoning out effluents. The effluent will be extracted under high vacuum through a suction hose connected to the tank by a quick release hose coupling. The high performance exhauster / compressor shall be operated in both vacuum and pressure mode. Provision for blowing of pressurized air into the chamber for dislodging the sediments solids shall be provided, which combine with the liquid effluent to form sludge. This is then collected into the tank by operating the system in the vacuum mode.


The contents of the tank will then be transported to any desired destination for disposal and emptied by means of either hydraulic tipping of the tank or by pressurized discharge

3. SCOPE OF SUPPLY

Broad scope of work of this package includes all equipment and accessories for completion of the system in line with tender requirement.

Following are the broad scope of work in bidder's scope. In additional to the following please also refer other sections of specifications for bidder's scope of work. The Vacuum Trucking System, as specified in Technical data sheets shall consist of the followings:

- Chassis for mounting the system
- Collection and Storage Tank

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- Tank mounting
- Vacuum Pump (Exhauster / Compressor)
- Suction Hose
- Emptying System
- Spark Arrester
- Drive System
- Hydraulic Plant
- Control Valves and Indicators
- Accessories

Detailed description of each part is given below:

3.1 Chassis for mounting the system

The unit will be mounted on a HCV (Heavy Commercial Vehicle) Diesel Driven truck chassis having GCV (Gross Vehicle Weight) not less than 16 tons. The Truck Chassis shall be **diesel driven** with **left hand drive** power steering and have a driver's day cabin with provision for mounting **Power Take Offs (PTO)** unit. The Chassis shall be of make acceptable to customer and serviceable at Yemen Republic. The Chassis shall confirm to all local legislation rules and statutory requirements of Yemen Republic. The chassis should be as per the latest emission norms set by the RTO of Republic of Yemen. The supplier shall confirm that the chassis shall have service provider at Yemen Republic.

3.2 Collection and Storage Tank

The tank will be fabricated from minimum 6 mm thick Carbon Steel Plate confirming to IS-2062 Gr A standard or equivalent and will have a volumetric capacity of 6000 liters. The tank shall be designed to withstand conditions prevailing from the operating vacuum and pressure conditions.

The tank shall be of a cylindrical design with torrispherical-dished ends to ensure a complete and fast off-loading of the collected material. The tank will be supported at the rear end to facilitate its hydraulic tipping for unloading the collected material at appropriate disposal grounds. The tipping cylinder shall be front end mounted and shall be provided with multistage design to achieve the required tipping angle.


The tank shall have ladder for access to the top. The tank shall be fitted with a level indicators and drain-cum-suction valves. The tank shall be provided with a rear Door top hinged operable with a hydraulic cylinder. The door shall be allowed to remain in secure position in the raised position by incorporating pilot check valve in the hydraulic system. Adequate sealing and locking arrangement shall be provided to render the door leak proof.

3.3 Tank mounting

The tank shall be mounted on an auxiliary frame of ISMC 125 and shall be adequately strengthened to render it torque resistant. The auxiliary frame is manufactured to the size of the vehicle's chassis and shall be of an all electrically welded construction.

3.4 Vacuum Pump (Exhauster / Compressor)

The Equipment will be fitted with a Rotary Sliding Vane, positive displacement type Exhauster/Compressor. The exhauster / compressor supplied shall be of an imported make,

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having required capacity to meet system requirement. The exhauster Compressor shall be provided with:

- a. Air + water Cooling System
- b. Automatic lubrication oil pump
- c. Incorporated Check valve
- d. Incorporated 4 - way valve

Necessary arrangements shall be provided for changing from suction to pressure mode. A pump inlet Filter of adequate capacity shall be incorporated in the system for the protection of the pump against any ingress of foreign particles, in both the suction and the overpressure modes of operation. Pressure relief and vacuum relief valves shall be line mounted to protect the equipment and system from over pressure and excessive vacuum respectively.

3.5 Suction Hose

Non-collapsible, flexible PVC hose of 100 mm internal diameter 3 nos 1 of 50 m length and 2 of 25 m length with hose connectors shall be provided for sucking the effluent from a maximum depth 4 m and shall be fitted with quick connect hose couplings. A 100 mm suction hose end nozzle and suction strainer fabricated from mild steel and each fitted with quick release coupling shall be provided with each hose as a standard accessory. Two lockable hose trays for stowage of hoses shall be provided on either side of the equipment.

3.6 Emptying System

Provisions for emptying the effluents by both gravity via tipping and by pressurized discharge shall be provided. Adequate safety arrangements shall be provided to prevent the tank from creeping down while emptying via hydraulic tipping.

3.7 Spark arrester


Spark arrester is to be provided at the exhaust of the vehicle to avoid sparks. The exhaust pipe of the vehicle is re-routed to bring the exhaust around the front wheels. The spark arrester shall be CCOE approved

3.8 Drive System

The exhauster / compressor utilized for creating vacuum or over pressure shall be driven by the factory fitted side PTO (Power Take OFF) of the vehicle. The PTO shall be independently engaged and disengaged for driving the exhauster/compressor. The output from the PTO shall be connected through an auxiliary propeller shaft to the exhauster / compressor. The PTO actuation can be effected by operating the lever provided in the vehicle cabin.

3.9 Hydraulic Plant

A hydraulic pump of required capacity shall be provided to be driven off by the factory fitted lateral PTO (Power Take OFF) of the vehicle to meet the operational requirements of the system. The hydraulic system is provided with an oil-storage tank of suitable capacity, suction and return line filters, direction control valves, flow control valves and counter balance valve for the tank tipping cylinder. All hydraulic connections shall be provided with a combination of high pressure seamless pipes and flexible hoses to facilitate easy replacement / repairs

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3.10 Control Valves and Indicators

All control Valves required for operation and monitoring will be grouped and installed on vehicle at rear convenient place for easy operation and monitoring, accessible for maintenance.


3.11 Accessories

The following accessories shall be installed /supplied along with the Chassis in addition to those normally fitted.

- Additional tyres (stepney) along with wheels and air filling nozzles : 2 Nos
- Additional Headlight bulb : 2 Nos
- Additional Backlight bulb : 2 Nos
- Driver and carriage seats
- Additional ignition keys : 2 sets
- Additional Fog lights powered by the batteries of the vehicle
- Additional Reversing light
- Additional Wind screen wiper (electrically operated)
- Additional Wind screen washer fitted at suitable location with controls in driver's cabin
- Tools and tackles required for maintenance
- A trickle battery charger for self-charging of batteries
- Suction filter (Element) 2 nos
- Rear Door Gasket 1 no.
- Primary Shut-Off Gasket 4 nos.
- Secondary Shut-Off Gasket 4 nos.
- Stainless Steel Ball 4" 1 no.
- Vacuum Pump Bearing 1 no.
- PVC Grey Hose (Suction) 4" x 15 mtrs. 4 nos.
- Stainless Steel Ball Valve 4" 1 no.
- Quick Release Coupling set 2 nos.
- Pressure Relief Valve 2" 2 nos.
- Vacuum Relief Valve-1-½" 2 nos.

4. ADDITIONAL SCOPE OF SUPPLY

- During detailed engineering, bidder to furnish complete and detailed scheme along with O&M manual complete in all respects including all valves, equipment's etc for smooth, safe, efficient and trouble free operation of the equipment meeting the specification requirement.
- All special tools necessary for proper maintenance or adjustment of the equipment packed in permanent box.
- Finish paints for touch up painting of equipment after erection at site in sealed container.
- Initial charge of all lubricants and grease.
- Monitoring gadgets, instruments and equipment/tools and consumables required for maintenance as per supplier recommendation
- Necessary spares for commissioning and O&M as per supplier recommendation.
- The vendor shall submit the overall dimension with weight etc of the system which is mandatory for export

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5. SCOPE OF SERVICE

The bidder's scope also includes following services:


- Supervision, site testing and performance demonstration at Marib site for four days.
- Painting as per enclosed painting schedule. However, any variation in the painting schedule as finally approved by customer shall be taken care of by the bidder without any commercial and delivery implication. Color-coding scheme shall be provided to vendor during detailed engineering.
- Touch up paint shall be on site under bidder's supervision.
- Performance Demonstration in India and at Marib site
- Type test and third party inspection as applicable
- Monitoring gadgets, instruments and equipment required for the trial run and Performance demonstration
- All personnel required during trial run and performance demonstration
- Registering the Chassis in the name of Customer, obtaining road permit and port clearance shall be in vendor scope
- All registration formalities including the submission of required documents for registration shall be in vendor scope. For registration of Chassis on Yemen client's name, the following documents will be required. Any additional documents required for registration shall be arranged by the vendor.
 - Original Invoice in the name of Marib Power Plant, Yemen.
 - Temporary Registration in the name of Marib Power Plant, Yemen.
 - Form no. 22 – Sales Certificate in the name of Marib Power Plant, Yemen.
 - Insurance Copy in the name of Marib Power Plant, Yemen.
 - Form no. 22A.
 - Trade Certificate. Form – 17 of Body builder.
 - G.A. drawing from body builder.
 - Certificate of origin.

6. QP AND SUB VENDOR APPROVAL

- Requirement of detailed QP, inspection checklist, certificate of conformance etc. for each equipment and sub-vendor shall be finalized during detailed engineering stage; decision of BHEL/customer shall be binding on vendor in this regard. Any changes/additional tests insisted upon by Owner during approval of QAP's shall be accepted by bidder without any commercial/delivery implication to BHEL/Owner. Bidder shall submit the quality plans in BHEL format during detailed engineering stage. Bidder to note further that during detailed engineering all the QAP's/check lists etc. shall be submitted to Owner/BHEL for approval. All inspection & testing etc. shall be carried out accordingly.
- List of sub vendors from which the bidder is planning to make purchase shall be submitted to BHEL/Customer for approval. Any sub vendor engaged by bidder for purchase of any part of system shall require prior approval from BHEL and Customer.

7. DESIGN/CONSTRUCTION

- In addition to the requirements of Section-C the following shall also be complied under scope of this specification:
- The material of construction specified in Data Sheet-A are minimum requirements and material of construction for other components not specified shall be similarly selected by the bidder for intended duty which shall be subjects to customer approval during detailed engineering.

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8. PAINTING/FINISHING OF THE COMPLETE UNIT

Both the exterior and the interior of the tank shall be sanded prior to spray painting. The tank exterior shall be spray painted with two coats of superior quality, anti-Corrosive primer and two coats of enamel metal paint of a reputed make. The colour Shade will be that of the customer's choice. To resist corrosion, the tank interior will be coated with 2 coats of Anti-corrosive gray epoxy paint. To the maximum extent practicable the coats shall be applied as a continuous film of uniform thickness and free of pores. Overspray, skips, runs, sags and drips should be avoided. The different coats shall not be of the same colour. Each coat of paint shall be allowed to harden before the next is applied. Suppliers' recommendations regarding hardening time of epoxy paints must be followed. Particular attention must be paid to full film thickness at edges.

9. PACKING

The complete System will be shipped on a Flat track (Open Crate). The truck shall be covered with tarpaulin cover and the loose spares accompanying the system shall be packed in a corrugated wooden box as per seaworthy packing. The bidder shall submit the packing drawing details and is subject to approval by BHEL/Customer. Shipping instructions by the customer is attached as Annexure I.

10. DRAWING/DOCUEMNTS REQUIREMENT

After award of LOI, following drawing/documents shall be submitted by the bidder for BHEL/Customer approval. However, any additional drawing/documents if found necessary for completion of the engineering, the same shall be submitted by bidder without any commercial implication.


- a) GA of vacuum trucking system along with wiring diagram
- b) Operation & control philosophy of Vacuum Trucking System
- c) Technical data sheet - Vacuum Trucking System
- d) QAP / Inspection Check List for Vacuum Trucking System
- e) O&M manual for Vacuum Trucking System
- f) Packing drawing details
- g) Safety manual for the equipment

11. DRAWING/DOCUEMNTS REQUIRED ALONG WITH THE BID

- a) Clarification, if any, in the BHEL format only.
- b) Deviation schedule, if any, in the BHEL format only.
- c) Price Schedule duly filled.
- d) Compliance certificate.

NOTE-1: - Any item/work supply of equipment which have not been specifically mentioned in but are necessary to complete the woks for trouble free and efficient operation of the plant shall be deemed to be included within the scope of this specification. The bidder without any extra charge shall provide the same.

Note-2: All major drawings/documents shall be approved by BHEL/CUSTOMER during detailed engineering stage. Successful bidder shall comply with the observations of the BHEL/CUSTOMER without price & delivery implication.

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Note-3: Bidder to submit drg/doc through web based Document Management System. Bidder would be provided access to the DMS for drg/doc approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end.

- Internet explorer version – Minimum Internet Explorer 7
- Internet speed – 2 mbps (Minimum preferred)
- Pop ups from our external DMS IP (124.124.36.198) should not be blocked
- Vendor's internal proxy setting should not block DMS application's link.


(<http://124.124.36.198/wrenchwebaccess/login.aspx>)

NOTE-4: Bidder to note that specific technical requirements as per Section – C will prevail over general Technical requirements given elsewhere in this specification.

NOTE-5: The bidder shall arrange all the monitoring gadget/instruments/equipment required for performing demonstration. Site facility as available or as extended by owner shall only be provided.


12. DRAWING DOCUMENT DISTRIBUTION SCHEDULE- After placement of order

SNo.	Document Number	Document Title	No of Weeks for submission after placing LOI/PO	Size of document	No of copies
1.	PE-V6-372-174-15000-A-A001	GA of vacuum trucking system	4 weeks	A3	22
2.	PE-V6-372-174-15000-A-A002	Operation & control philosophy of Vacuum Trucking System	6 weeks	A4	22
3.	PE-V6- 372-174-15000-A-A003	Technical data sheet Vacuum Trucking System including all pumps and motors	6 weeks	A4	22
4.	PE-V6-372-174-15000-A-A004	QAP / ICL for Vacuum Trucking System	5 weeks	A3	22
5.	PE-V6-372-174-15000-A-A005	O&M manual for Vacuum Trucking System along with Catalogue	8 weeks	A4 with drawings in A3	22
6.	PE-V6-372-174-15000-A-A006	Safety Manual	8 weeks	A4	22

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DATA SHEET A

1. Chassis for mounting the system		
Number		One (1) number.
Effective Capacity		GVW not less than 16 tons
Make		Acceptable to customer and serviceable at Yemen Republic
Type		Left hand driven, diesel fuelled with power steering and PTO mounted
2. Collection and Storage Tank		
Numbers		One
Capacity		6000 liters
Construction		Cylindrical, shell with torrispherical dished ends, tank design as per IS 2825 or equivalent standard
Material of construction		6 mm thick Carbon steel plates for shell, dished end and internal compartment walls as per IS 2062 Grade-'A'
3. Vacuum Pump (Exhauster / Compressor)		
Numbers		One (1X100 %).
Make		Imported
Capacity		To meet system requirement
Type		Rotary vane compressor / vacuum pump
Material of construction		As per manufacturer's design
4. SUCTION HOSE		
Number		3 Nos
Size and Length		100 mm dia and 1 of 50 m length and 2 of 25 m length with hose connectors
Material		PVC
5. HYDRAULIC PUMP		
Number		One (1) number.
Make		As per supplier recommendation
Effective Capacity		To meet the operational requirements of the system
Material		As per manufacturer's design

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ANNEXURE I

SHIPPING INSTRUCTIONS

Bharat Heavy Electricals Limited International Operations - Projects Division Integrated Office Complex, Lodhi Road New Delhi -110003			
400 MW MARIB GAS TURBUINE POWER STATION PHASE-II			
Following dispatch instructions for effecting supplies under the above contract are being issued for compliance by all the units involved in this project.			
Sr. No.	Item No.	Details	Action By
01	01	<u>Purchaser's Name and Address:</u> Public Electricity Corporation Airport St P.O. Box 178 Sana'a Republic of Yemen Attention: Eng. Abdul Mumen M. Mutaheer Managing Director Tel : (967 1) 328 141-142 Fax : (967 1) 328 150 E-mail : YPECNT@Y.net.ye	For information
02	01	<u>Delivery Terms:</u> DAP (Marib Site YEMEN) Public Electricity Corporation Airport St P.O. Box 178 Sana'a Republic of Yemen	Units to ensure proper marking on the boxes so as to Identify the final destination clearly.
03	01	<u>Seller's Name and Address:</u> Bharat Heavy Electricals Limited International Operations Division Lodhi Road Integrated Office Complex New Delhi –110003, INDIA	For information
04	01	<u>Payment Terms for Equipment Supply:</u> <u>Contract Terms:</u> Advance - 10% of the Contract price. Supply– 80% on submission of shipping documents 5% on the receipt of Taking over and Acceptance Certificate and 5% on the receipt of Final Acceptance Certificate	All Units
05	01	<u>Shipping Marks :</u> As Per LC (Copy Enclosed)	All Units
06	01	<u>Consignee:</u> As per LC (Copy Enclosed)	All Units
07	01	<u>Notifying Party :</u> As Per LC (Copy Enclosed)	All Units

08	Packing Instructions & Inspection Prior to Dispatch by Supplying Units/Sub-Vendors:		All Units & Suppliers
01	Packing (tare) shall be part of the Equipment cost and shall not be subject to return. The packing should ensure integrity and cohesiveness of each delivery batch of Equipment during transportation. In case of Equipment assemblies and unit's delivery in the packing of glass, plastics or paper the specification of packing with the material and weight characteristics are to be indicated.		All Units/Suppliers
02	<u>Special instructions from PEC Yemen :</u>		
02.1	All equipment and instruments should be fully packed and protected from damage during transportation and field storage. All machine surfaces should be protected with planks or similar materials and reinforced with metal strips or plates from the outside.		All Units/Suppliers
02.2	All electrical / electronics equipment such as motor, switch, control device, instrument and component should be sealed with polyethylene insulation and a corresponding drying agent should be provided.		All Units/Suppliers
02.3	For all piping ends as well as pipes and tanks, the openings should be protected from damage and sealed to avoid getting affected by particulates, moisture and air. These Protection measures should be kept intact before the start of installation or moving for periodic inspection. The cost spent for the moving, modification and replacement of the packing and protection device would be paid by the BHEL.		All Units/Suppliers
02.4	A waterproofed packing list should be provided in each planks or packing case. The name of articles in the packing case should be marked clearly on the packing list so as to be identified easily.		All Units/Suppliers
02.5	The articles in the case should be supported by wooden bars in order to be fixed safely and it should not be wedged individually with wooden pad. The marks outside the case should be printed with climate proof materials or paints so as to be protected from being removed during transportation.		All Units/Suppliers
02.6	All materials and equipment should be packaged according to the typical environmental conditions during storage. In case of severe conditions, these materials and equipment should be packaged carefully by taking a full and appropriate preventive measure to protect from any damage or wear. The marks should be painted or printed clearly and durably with characters of 40 mm height at minimum on both ends of the packing case. The labels should be well protected to prevent loss / tempering.		All Units/Suppliers
02.7	A mark indicating the correct lifting position should be shown by an arrow on the packing case.		All Units/Suppliers
02.8	<u>Preparation for Shipment of Operational Spare Parts</u>		
02.8.1	Shipping preparations shall be of export quality and crating shall adequately protect the items against injurious corrosion, dampness, breakage, or vibration that might be encountered in their transportation and handling. BHEL to submit a detailed packing and crating procedure to PEC on a parent equipment basis at least sixty calendar days prior to shipment.		All Units
02.8.2	Operational spare parts shall be crated on a parent equipment on exclusive basis and there shall be no common crating of unrelated spare parts. For items too small to be individually crated, they have to be crated on the same kind of equipment basis under condition that they are classified and packed in a vinyl bag or small box on a parent equipment basis.		All Units

02.8.3	To the extent that BHEL intends to utilize containers in the shipment of operational parts, BHEL shall utilize good quality shipper owned or nonreturnable containers which should be conveyed to Owner before its receipt at the Site.	All Units/ROD
02.8.4	All shipments of operational spare parts shall be consolidated prior to shipment and shall be transported to the Site in accordance with the contractual shipping schedule. BHEL shall not make partial or multiple shipments of operational spare parts for the same parent equipment item without prior approval of Owner.	All Units
02.8.5	BHEL shall submit schedules identifying completion of fabrication, ship date and site delivery dates for the operational spare parts on a parent equipment basis.	All Units
02.8.6	To the greatest extent practicable , BHEL shall individually tag each Operational Spare Part. The tagging data shall include the Contract number, Item number and the part identification number. Where such individual tagging is impracticable due to the size or quantity of certain operational spare parts the tagging data shall be fixed to the permanent packing of these operational spare parts.	All Units/Suppliers
02.8.7	BHEL shall prepare packing lists in strict accordance with the tagging requirements and shall reference the Exhibit C, Section 3. Item numbers of the individual operational spare parts including required quantities. Contractor shall include on the packing list the net weight of operational spare parts exceeding 300 Kg. Packing lists shall also provide a certification verifying that the packing list quantities constitute "Partial" or "Complete" shipment of all required quantities of operational spare parts.	All Units/Suppliers
02.8.8	All packages to be wrapped in <u>Sealed transparent polythene</u> inside the crates for effective weather proofing	All Units/Suppliers
03	Each package should have the following inscriptions and signs stenciled with an indelible ink legibly and clearly: Destination Package number: BHEL/YMN/XXX/YYY/ZZZZ where XXX stands for Unit abbreviation e.g. HWR , HYD ,EDN, PEM, RPT etc YYY stands for Vendor abbreviation Following series of ZZZZ should be used by Different Units HWR (10000) ,HYD (20000),PSNR (30000),PEM (40000),BPL(50000),RUD(60000), TBG(70000),TRY(80000),EDN(90000) i.e. first package dispatched from HWR should be numbered : BHEL/YMN/HWR//10001 . Gross and Net weight Dimensions Lifting places Handling marks and the following delivery marking: CONTRACT Nr. 12/2008 PURCHASER: PEC YEMEN	All Units/Suppliers
04	<u>Completeness of Contents of each packing case:</u>	
04.1	Concerned CQA/Unit QC/Third Party Inspection Agency shall verify the completeness of contents of each package w.r.t packing list both in terms of quality and quantity before authorising dispatch of the consignment.	All Units/Suppliers
04.2	Packing commensurate with international standards and accepted norms will be ensured by CQA/ Unit QC/Third Party Inspection Agency. Packing has to be sea-worthy and secure. As far as possible, the packing has to be rectangular in shape for optimum space utilization in the ship and economize on shipping costs. Projections on packages are prohibited.	CQA/All Units


04.3	The packing list has to be checked and certified by the Inspection agency (ies) with due signatures. All packages shall be enclosed in suitable GI sheets on all sides.	CQA/All Units
04.4	No loose items / Gunny bag packing are allowed for shipment. Proper pallets and crates are to be used for packing of Oil drums and Structures.	CQA/All Units
05	<u>Routing of Packing Lists:</u> Packing list is an extremely important document, which forms a part of export documentation in connection with the processing of customs formalities. Packing List has to be generated by units/Unit vendors and sent to IO and ROD, Mumbai (both at the same time), two weeks in advance, for processing and obtaining shipping bills' clearances and avoiding octroi payment through 'N' form at Mumbai.	All Units/ suppliers
06.1	<u>Advance intimation to ROD, Mumbai & IO</u> All supplying units/vendors will give at least 15 days advance intimation to ROD, Mumbai & IO along with package details before actual dispatches to arrange for storage/shipping arrangements by ROD Mumbai and customs invoicing by IO. <u>Information must be sent to consolidate the details and arrange for shipments in time.</u>	All Units
06.2	<u>Telephonic Intimation to ROD Mumbai of Movement of Vehicles:</u> Vehicle drivers to be instructed by the units to contact ROD regarding movement of vehicles on daily basis for heavy lifts, especially 2 days before arrival at Mumbai so that suitable directives can be given to the driver of the vehicle for further transportation of the goods either to docks or godown.	All Units
07	<u>Excise Attestation at Works:</u> To avoid opening of big cases for examination by customs at port of shipment, the supplying unit may arrange to get the packing cases sealed by local excise authorities/ self certification and to get the relevant invoices and packing lists endorsed from Superintendent, Central Excise. For this purpose, Units should send the packing lists to IO at least 2 weeks in advance to enable prepare Shipping Invoices for furnishing to the units for requisite attestation and sending the same to ROD Mumbai through fastest means for a smoother and faster customs clearance. Also Units to provide "specification of packing with the indication of the number of cargo packages, type of packing and weight of packing in English" along with the packing list.	All Units/ suppliers
08	<u>Provision of Inspection Windows on Packages:</u> Unit/Vendors should provide inspection window of size 6" x 4" (glass perplex) for customs examination for all packages (above 1.5 x 1.5 x 1.5 cu m) involving panels of any kind. Care would be taken to ensure that all packages are properly sealed to avoid ingress of moisture, rodents etc. Packing slip folders shall be attached in each box.	All Units/ Suppliers
09	<u>Transportation Drawings for Heavy Weight/ODC consignment: For any package/item weighing above 20000 kgs and/or size greater than 2.5 X 2.5 X 4 m :</u> Detailed engineering documents (at least 4 sets) for all items of the above category shall be furnished by respective units to issue shipment enquiries in a proper manner. This would include Gas Turbine ,Transformers, Lube Oil tanks,Storage Tanks (Oil and Water) and Generator . The drawing has to include center of gravity of the item clearly (Units to identify such items and notify IO as soon as the engineering documents are released).	All units

	10	<u>Lifting Beams:</u> All heavy lifts for which safe handling is essential at the port of dispatch shall be accompanied by lifting beam on non-returnable basis	All Units
09	01	<u>Marking for Safe Handling:</u> To ensure safe handling, packing case shall be marked to show the following: <ul style="list-style-type: none"> • Upright position. • Sling position and Centre of Gravity position. • Storage category. • Fragile components (to be marked properly with a clear warning for safe handling). 	All Unit
10	01	<u>Marine Insurance Policy:</u> Insurance Policy for 110 percent value of the contract covering all risks including war and SRCC from Port of shipment in India/Third country direct dispatches, to site shall be taken by IO Insurance Policy and it shall indicate PEC as co-insured.	IO Projects
11	Shipping Documentation including those covered by customs requirements:		
	01	Customs Invoices: Values to be allocated by IO (Alternatively, Excise attested invoices where the package is sealed and dispatched by the units)	ROD/ IO Projects/ All Unit
	02	Packing List	All Units /Sub-vendors of units
	03	ARE1 forms/Excise Invoice corresponding to Unit invoice values and Delivery challans.	All Units /Sub-vendors of units
	04	Chartered Engineer's Certificate, applicable to be arranged by Units. Care should be taken to ensure that usage of the materials shown in C.E. certificate out of DEPB goods is not disproportionate.	All Unit/ROD
	05	Catalogues/literature/write-up in case of customs endorsement for discharging exports obligation in case of DEEC imports to be made available to ROD before arrival of goods in the city of port of dispatch.	All Unit
	06	Unit's sub-vendors, whose responsibility of supply is upto FOB, can make their own arrangements of Customs House Agents as well as Octroi clearance, apart from physical examination of the cargo at the port of dispatch and make arrangements of loading on BHEL's nominated vessel. BHEL, in such a case, through ROD would arrange to furnish a copy of the shipping invoice to CHA of sub-vendors. All units to keep ROD Mumbai informed in this regard about the arrangements made with sub-vendors.	All Units/ Suppliers/ROD
	07	To avoid any problem with Octroi post at Mumbai & Customs, the values appearing in Unit invoice sent with the cargo shall be preferably within $\pm 10\%$ of IO-Projects shipping invoice value.	All Units/Rod
	08	Octroi Clearance: Drivers/Escorts carrying the export cargo for this project on behalf of the units to be advised to contact the agents at Octroi Naka:(To be intimated by RODMumbai) Copies of the dispatch documents must be sent to ROD Mumbai by i) Fax ii) e-mail through scanning of the documents with copy to IO	All Units/Rod
12		<u>Full Set of Clean Multimodal Transport Document:</u> Complete set of shipping B/L showing freight prepaid as per the rates of regular shipping lines. In case of Air Freight consignment, one original of AWB is required together with three copies of the same.	ROD/ IO Projects


13		<u>Certified Inspection Certificate Approved by Customer:</u> The certificate signed by PEC inspector (if equipment tested in presence of PEC representative) is to be provided to IO . In case the Certificate is signed by BHEL/Third Party Inspection Agency, it is to be provided by Units/ suppliers to IO and IO will get it approved from PEC.	All Units/ Suppliers
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14	Shipping Carrier Specification and related Requirements:		
	01	Certificate of Freight having been pre-paid as per the regular shipping lines is required on MTDs.	ROD/ IO Projects
	02	Subject cargo would be generally shipped under the deck. Specific confirmation/clearance of IO is needed for shipment on deck.	ROD/ IO Projects
	03	Vessel age to be restricted as per insurance policy in force Buyer's Reference (Contract No.) is required on B/Ls.	ROD/ IO Projects
	04	For Third Country Supplies , concerned units will ensure all the above certificates in addition to Certificate of Origin.	All Units/ Suppliers
15	Guidelines for Dispatches from Units/Indian Vendors:		
	01	Vehicle drivers shall carry ARE1 in photocopy (3 originals to be sent to ROD). Each consignment carried by the vehicle shall have a separate ARE1 and it must be ensured that materials under one ARE1 get transported in the same truck/trailer. In order to avoid any problems at port of dispatch from the point of view of i) shipping bill preparation and passing thereof ii) 'N' form at Octroi check post and iii) control and movement of cargo within Mumbai and iv) physical examination of cargo by customs, the materials under the same category e.g. a) DEEC cargo b) Free shipping bill cargo c) DEPB (duty entitlement pass book scheme) and d) duty drawback must be sent in the same truck/trailer. Units to ensure that ROD is communicated very clearly the type of shipping bills to be prepared, well before the materials are dispatched from the works.	All Units
	02	<u>All materials to be dispatched under intimation to:</u> Senior Manager(Exports) Bharat Heavy Electricals Limited Regional Operations Division 14th Floor, World Centre 1, Cuffe Parade Mumbai-400005 Attention: Mr.Sanjeev Shikhare Telephone No.: 22171302 (Mumbai)	All Units/Rod
	03	<u>Clearing Agents:</u> All materials to be dispatched to Mumbai on door delivery basis, freight prepaid to the address of the clearing agents(to be specified by ROD, from time to time)	All Units/Rod
16	01	<u>Customs formalities Period:</u> Packages arriving at the port shall have a minimum time of 3 working days for customs examination and other related formalities in respect of the cargo under shipment. The goods received after arrival of the ship may not be loaded if either sufficient time does not exist or space available in the ship is booked by the carrier for other exporters due to lack of availability of the goods at the port in time for shipment from BHEL. In cases, where the committed cargo to the carrier based upon information received from all the units does not reach in time of scheduled shipment at the port of dispatch, IO-Projects would be within its right to decide the priority of loading as per the project schedule requirements given the condition that adequate space in the ship is not available to accommodate the cargo.	For information
17	01	<u>Triplicate ARE1 forms for Cancellation of Bonds:</u> It is necessary that the units ensure that ARE1 forms are sent in Triplicate to ROD Mumbai. After ROD Mumbai effects the shipment, endorsement of customs on triplicate copy of ARE1 form would be obtained by ROD Mumbai and sent to the concerned unit within 6 to 8 weeks for cancellation of the excise bond.	Units/ ROD Mumbai

18	01	<p><u>Formalities in Connection with 'N' Form:</u> After the shipment is effected, requisite formalities indicating physical export of the goods earlier exempted from payment of Octroi at Mumbai will have to be ensured. Units to ensure this from their sub-vendors because In past , Octroi notices from Mumbai municipal corporation were received and 'N' form facilities were withdrawn at times.</p>	Units
19	01	<p><u>Shipping Procedures and ROD Responsibilities:</u> Consolidation of Packages and Storage in Warehouse: ROD Mumbai either themselves or through their CHA would ensure following:</p> <ul style="list-style-type: none"> • Proper storage of goods at an elevated level if store is in open to avoid damages to the consignment during rainy season (All the packages to be covered with a proper tarpaulin in open storage). • All Electrical and C&I items to be stored indoors. • Consolidation of the goods as per summary packing lists. • Check marks and numbers on packages. Carry out the corrections, if necessary. • Label the packages linking to the proposed shipping carrier to ensure that package does not get left out. 	ROD

	TITLE: TECHNICAL SPECIFICATION FOR VACUUM TRUCKING SYSTEM 400 MW, MARIB GTPS, PHASE-II PEC, MINISTRY OF ELECTRICITY AND ENERGY REPUBLIC OF YEMEN	BHEL DOCUMENTS NO.: PE-TS-372-174-15000-A-A001	
		VOLUME III	
		REV. NO. 00	

VOLUME III

	TITLE:	BHEL DOCUMENTS NO.: PE-TS-372-174-15000-A-A001
	TECHNICAL SPECIFICATION FOR VACUUM TRUCKING SYSTEM	VOLUME III
	400 MW, MARIB GTPS, PHASE-II PEC, MINISTRY OF ELECTRICITY AND ENERGY REPUBLIC OF YEMEN	REV. NO. 00

SCHEDULE OF CLARIFICATION

All clarification from the Technical Specification shall be filled in by the BIDDER clause by clause in this format only.

Volume	Section	Clause No.	Page No.	Specification Requirement	Clarification	Reasons For Clarification



SCHEDULE OF DEVIATIONS WITH COST OF WITHDRAWAL

PROJECT:-400 MW, MARIB GTPS, PHASE-II

PACKAGE:- VACUUM TRUCKING SYSTEM

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWAL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWAL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWAL OF DEVIATION (POSITIVE/ NEGATIVE)	REASON FOR QUOTING DEVIATION
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TECHNICAL DEVIATIONS


COMMERCIAL DEVIATIONS

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATIONS	SIGN & DATE

NOTES:

- For self manufactured items of bidder, cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
- For directly dispatchable items, cost of withdrawal of deviation will be applicable on the basic price including taxes, duties & freight.
- All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
- Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
- Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.
- Bidder shall furnish price copy of above format along with price bid.
- The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
- Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
- For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.
- Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
- All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
- Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
- In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
- In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

	TITLE:	BHEL DOCUMENTS NO.: PE-TS-372-174-15000-A-A001	
	TECHNICAL SPECIFICATION FOR VACUUM TRUCKING SYSTEM	VOLUME III	
	400 MW, MARIB GTPS, PHASE-II PEC, MINISTRY OF ELECTRICITY AND ENERGY REPUBLIC OF YEMEN	REV. NO. 00	

*** Bidder shall include this schedule both in technical and Price offers**

DECLARATION

Icertify that all the technical data and information pertaining to this specification are correct and are true representation of the equipment/system covered by our format proposal number Dated and there is no deviation to the specification.

I hereby certify that I am duly authorized representative of the Bidder's company whose name appears above my signature.


Bidders Company Name
.....

Authorised representative's
Signature
.....

Name
.....

Bider's Name
with

The bidder hereby agrees to fully comply
the requirements and intent of this
specification for the price indicated

	TITLE:	BHEL DOCUMENTS NO.: PE-TS-372-174-15000-A-A001	
	TECHNICAL SPECIFICATION FOR VACUUM TRUCKING SYSTEM	VOLUME III	
	400 MW, MARIB GTPS, PHASE-II PEC, MINISTRY OF ELECTRICITY AND ENERGY REPUBLIC OF YEMEN	REV. NO. 00	

FORM NO PEM 6040-1

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate and furnishing same with the offer:

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions/ deviations with regard to same.
2. QP/ test procedures shall be submitted in the event of order based on the guidelines given in the specification & QP enclosed therein.
QP will be subject to BHEL/Customer approval in the event of order & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc.
The charges for 3rd party inspection (Lloyds, TUV or equivalent) for imported components shall be included in the base price of the equipment by the bidder.
3. All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/Customer review/ approval. GA drawings, as submitted with offer at tender stage are for reference purpose only and shall be subject to approval during contract stage.
4. There are no other deviations with respect to specification other than those furnished in the 'Schedule of Deviations'.
5. The offered materials shall be either equivalent or superior to those specified. Also for components where material is not specified it shall be suitable for intended duty, materials shall be subject to approval in the event of order.
6. The commissioning spares (if any) are supplied on 'As Required Basis' & prices for same included in the base price (If bidders reply to this is "No commissioning spares are required" and if some spares are actually required during commissioning same shall be supplied by bidder without any cost to BHEL).
7. All sub vendors shall be subject to BHEL/CUSTOMER approval.
8. Any special tools & tackles, if required, shall be in bidder's scope.
9. Performance guarantee test parameters shall stand valid till the satisfactory completion of Performance guarantee test and its acceptance by BHEL/Customer.

