

**OWNER : INDIAN OIL CORPORATION LIMITED (IOCL)
PMC : ENGINEERS INDIA LIMITED**

CPP - PARADIP REFINERY PROJECT


VOLUME -III

**TECHNICAL SPECIFICATION
FOR
SPECIAL PROCESS HORIZONTAL PUMPS**

Specification No. : PE-TS-353-100-N001 (REV. 0)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI BUILDING, SECTOR 16 A
NOIDA - 201301**

	PREAMBLE	SPECN. NO.: PE-TS-353-100-N001	
		REV. NO.	0 DATE: 25.06.2010

1.0 The tender document contains three (3) volumes. The bidder shall meet the requirements of all the three volumes.

1.1 Volume -I CONDITIONS OF CONTRACT

This consists of four parts as below:

Volume - I A : This part contains instructions to bidders for making bids to BHEL.

Volume - I B : This part contains general commercial conditions of the tender and include provision that vendor shall be responsible for the quality of item supplied by their sub-vendors.

Volume - I C : This part contains special conditions of contract.

Volume - I D : This part contains commercial conditions for erection and commissioning site work, as applicable.

1.2 Volume - TECHNICAL SPECIFICATIONS

Technical requirements are stipulated in Volume II which comprises of:

Volume - II A : General Technical Conditions

Volume - II B : Technical specification including drawings, if any

1.2.1 Volume - II B :

This volume is sub-divided into following sections:

Section - A : This section outlines the scope of enquiry.

Section - B : This section provides "Project Information"

Section - C : This section indicates technical requirements specific to the contract, not covered in Section-D.

Section - D : This section comprises of technical specifications of equipments complete with data sheet A, B & C.

Data sheet - A specifies data and other requirements pertaining to the equipment.


Data sheet - B specifies data to be filled by the bidder (Data Sheet B is contained in Volume - III)


Data sheet - C indicates data documents to be furnished after the award of contract as per agreed schedule by the vendor (as applicable).

1.2.2 Volume - III TECHNICAL SCHEDULES

This volume contains technical schedules and Data Sheets - B, which are to be duly filled by the bidder and the same shall be furnished with the technical bid as per instructions given in Document No.PES-100-901 in Volume-III.

2.0 The requirements mentioned in Section C/Data Sheets-A of Section-D shall prevail and govern in case of conflict between the same and the corresponding requirements mentioned in the descriptive portion in Section -D.

	TECHNICAL SPECIFICATIONS	SPECN. NO.:		PE-TS-353-100-N001							
	SPECIAL PROCESS HORIZONTAL PUMPS	VOLUME:	III	SECTION:							
		REV. NO.	0	DATE:	25.06.2010						
<p style="text-align: center;">INDEX</p> <table><tr><td>SECTION</td><td>TITLE</td></tr><tr><td>A</td><td>DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER</td></tr><tr><td>B</td><td>DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI</td></tr></table>						SECTION	TITLE	A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER	B	DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI
SECTION	TITLE										
A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER										
B	DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI										

	TECHNICAL SPECIFICATIONS		SPECN. NO.:		PE-TS-353-100-N001	
	SPECIAL PROCESS HORIZONTAL PUMPS		VOLUME:	III	SECTION:	A
			REV. NO.	0	DATE:	25.06.2010

**DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER
AS PER ENCLOSED FORMATS**

A1 COMPLIANCE CERTIFICATE

A2 SCHEDULE OF DEVIATIONS

A3 SCHEDULE OF PERFORMANCE GUARANTEES

A4 SCHEDULE OF PRICES

A5 SCHEDULE OF UNIT PRICES

A6 TECHNICAL COMPLIANCE

A7 DATASHEET FOR VHP BFW/HPBFW (EXPORT) CENTRIFUGAL MULTISTAGE PUMP (ENCLOSED IN VOL.-IIB)

A8 DATASHEET FOR MPBFW (EXPORT) CENTRIFUGAL PUMP (ENCLOSED IN VOL.-II-B)

A9 DATASHEET FOR CENTRIFUGAL PUMP (HORIZONTAL SPECIAL PURPOSE PROCESS) SEPARATE DATASHEET TO BE FURNISHED FOR CONDENSATE TRANSFER PUMPS AND HRSG MUH TRANSFER PUMPS (ENCLOSED IN VOL.-IIB)

A10 DATASHEET FOR STEAM TURBINE (GENERAL PURPOSE) - SEPARATE DATASHEET TO BE FURNISHED FOR EACH TURBINE RATING (ENCLOSED IN VOL.-IIB)

A11 EXPERIENCE RECORD PERFORMA - CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE) ROTATING EQUIPMENT. SEPARATE SHEETS SHALL BE FURNISHED FOR EACH TYPE OF MULTISTAGE PUMP.

A12 EXPERIENCE RECORD PERFORMA - CENTRIFUGAL PUMP HORIZONTAL ROTATING EQUIPMENT - SEPARATE SHEETS SHALL BE FURNISHED FOR EACH TYPR OF PUMPS.

A13 EXPERIENCE RECORD PERFORMA - GENERAL PURPOSE STEAM TURBINE

NOTE: BIDDER SHAL FURNISH DOCUMENTARY EVIDENCE FOR THE QUOTED REFERENCES OF PAST SUPPLIES VIZ. ACCEPTABLE SITE PERFORMANCE FEEDBACK CERTIFICATE FROM END CUSTOMER ETC.

ADDITIONAL DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

+ P&ID WITH ALL T.P.'s INDICATED

+ PUMP PERFORMANCE CURVES

+ GENERAL ARRANGEMENT DRAWING OF PUMP & TURBINE/MOTOR ASSEMBLY INCLUDING FOUNDATION DETAILS & LOADING DATA (STATIC & DYNAMIC)

+ ELECTRICAL LOAD & UTILITY CONSUMPTION (VIZ. COOLING WATER, STEAM) REQUIREMENTS


+ INPUTS FOR HT MOTORS

+ PUMP SPEED TORQUE CURVE

+ LIST OF ITEMS TO BE IMPORTED

+ CATALOGUES

+ COMPREHENSIVE EXCLUSIONS LIST (ANY ITEM NOT MENTIONED HEREIN AND IF REQUIRED FOR COMPLETION OF PUMPS/TURBINE PACKAGE SHALL BE IN VENDOR'S SCOPE)

	TECHNICAL SPECIFICATIONS	SPECN. NO.:	PE-TS-353-100-N001		
	SPECIAL PROCESS HORIZONTAL PUMPS	VOLUME:	III	SECTION:	A1
	COMPLIANCE CERTIFICATE	REV. NO.	0	DATE:	25.06.2010

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

- 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.
- 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/ CONSULTANT/ 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.
- All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/ CONSULTANT/ CUSTOMER approval.
- There are no other deviation with respect to specification other than those furnished in the 'Schedule of Deviations'.
- Mandatory spares as indicated in Datasheet A shall be included in the base price

Any mandatory spares stated as not applicable, shall have to be supplied without any cost implication to BHEL in the event they are found to be applicable during detail engineering stage.
- The offered materials should be either equivalent or superior to those specified. Also for components where material is not specified it shall be suitable for intended duty. All materials shall be subject to approval in the event of order.
- Prices for recommended spares (if any) for 3 years operation shall be furnished separately & not included in the base price.
- 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).
- All sub vendors shall be as per BHEL/CONSULTANT/CUSTOMER approved list.
- Tests for noise, vibration, parallel running etc. for pumps, site performance test of drive turbine shall be conducted at site by Vendor and if the site performance is found not meeting the requirements in any respect as specified, then the equipment shall be rectified or replaced by the vendor, at his own cost.
- Any special tools & tackles, if required, shall be in bidder's scope.
- All models offered have been supplied by bidder in the past and are meeting the experience qualifying criteria of BHEL/CONSULTANT/CUSTOMER . Any deviation to this criteria shall be suitably highlighted in deviation schedule.
- All selected motor ratings have minimum margins as per Datasheet A, Section D1 of Vol IIB

We the undersigned hereby undertake to meet the compliance requirements as listed above on the conditions as elsewhere specified.

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL



TITLE

• SCHEDULE OF DEVIATIONS

- () From Conditions of Contract (Volume - I)
 () From General Technical Conditions (Volume - II A)
 () From Technical Specifications (Volume - II B)

SPECIFICATION PE-TS-353-100-N001
NUMBER

VOLUME III SECTION A-2

SHEET OF

We the undersigned hereby certify that the above mentioned are the only deviations.

PARTICULARS OF BIDDER / AUTHORIZED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL



SCHEDULE OF PERFORMANCE GUARANTEES - PUMPS
CPP - PARADIP REFINERY PROJECT

SPECN. NO.: PE-TS-353 -100-N001

VOLUME: III SECTION: A3 Sheet 1 of 2

REV. NO. 0 DATE: 19.06.2010

Following parameters are guaranteed for following pumps

Sl. No.	Pump Description	Guaranteed Capacity	Guaranteed TDH	Guaranteed Pump Eff.	Guaranteed Motor	Guaranteed Power consumption at inlet to motor	Pump model	Motor Rating	Pump GD ² Value	Pump RPM	T/S Curve attached
		(M3/Hr)	(MWC)	%	%	(KW)		(KW)			
	HORIZONTAL PUMPS GROUP-I										
1	HP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	235	805								
2	HP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	235	805								
3	MP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	125	420								
4	MP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	125	420								
	HORIZONTAL PUMPS GROUP-II										
5	CONDENSATE TRANSFER PUMPS - TURBINE DRIVEN	600	140								
6	CONDENSATE TRANSFER PUMPS - MOTOR DRIVEN	600	140								
7	HRSG MAKE-UP TRANSFER PUMPS - MOTOR DRIVEN	395	165								

We the undersigned hereby undertake to meet the performance guarantees as listed in the table above on the conditions as elsewhere specified. Any variation of the specified conditions during official tests will be taken in account by the customer

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL
------	-------------	-----------	------	--------------



SCHEDULE OF PERFORMANCE GUARANTEES - TURBINES
CPP - PARADIP REFINERY PROJECT

SPECN. NO.: PE-TS-353 -100-N001

VOLUME: III SECTION: A3 Sheet 2 of 2

REV. NO. 0 DATE: 19.06.2010


Following parameters are guaranteed for following pumps


Sl. No.	Pump Description	Guaranteed Specific Steam Consumption at design condition (Kg/hr per KW)	Turbine Model	Turbine Rating	Turbine RPM
		Kg/hr per KW		(KW)	rpm
	HORIZONTAL PUMPS GROUP-I				
1	HP FEED WATER EXPORT PUMPS - TURBINE				
2	MP FEED WATER EXPORT PUMPS - TURBINE				
	HORIZONTAL PUMPS GROUP-II				
3	CONDENSATE TRANSFER PUMPS - TURBINE				

We the undersigned hereby undertake to meet the performance guarantees as listed in the table above on the conditions as elsewhere specified. Any variation of the specified conditions during official tests will be taken in account by the customer

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL
------	-------------	-----------	------	--------------

	TITLE:		SPECIFICATION NO.		PE-TS-353-100-N001																	
	SCHEDULE OF PRICES		VOLUME		III																	
			SECTION		A 4																	
	CPP - PARADIP REFINERY PROJECT		REV. NO.		00																	
				DATE		25.06.10																
				SHEET		1 OF 2																
SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT																					
1.0	<p>Total price for design, manufacture, assembly, inspection, testing, packed for transportation and delivery of Special Process Horizontal pumps including steam turbines, special tools/tackles, commissioning spares, including installation checks at site, site performance testing etc.all accessories, auxiliaries and mandatory spares as specified and necessary, as per Technical specification for :</p> <p>Horizontal Pumps Group - I</p> <table border="0"> <tr> <td>i.) HP FEED WATER EXPORT PUMPS - MOTOR DRIVEN</td> <td>Two (2) Nos.</td> <td rowspan="4">} Total Rs.</td> </tr> <tr> <td>ii.) HP FEED WATER EXPORT PUMPS - TURBINE DRIVEN</td> <td>One (1) No.</td> </tr> <tr> <td>iii.) MP FEED WATER EXPORT PUMPS - MOTOR DRIVEN</td> <td>Two (2) Nos.</td> </tr> <tr> <td>iv.) MP FEED WATER EXPORT PUMPS - TURBINE DRIVEN</td> <td>One (1) No.</td> </tr> </table> <p>Horizontal Pumps Group - II</p> <table border="0"> <tr> <td>v.) CONDENSATE TRANSFER PUMPS - TURBINE DRIVEN</td> <td>One (1) No.</td> <td rowspan="3">} Total Rs.</td> </tr> <tr> <td>vi.) CONDENSATE TRANSFER PUMPS - MOTOR DRIVEN</td> <td>Two (2) Nos.</td> </tr> <tr> <td>vii.) HRSG MAKE-UP TRANSFER PUMPS - MOTOR DRIVEN</td> <td>Three (3) Nos.</td> </tr> </table>						i.) HP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	Two (2) Nos.	} Total Rs.	ii.) HP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	One (1) No.	iii.) MP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	Two (2) Nos.	iv.) MP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	One (1) No.	v.) CONDENSATE TRANSFER PUMPS - TURBINE DRIVEN	One (1) No.	} Total Rs.	vi.) CONDENSATE TRANSFER PUMPS - MOTOR DRIVEN	Two (2) Nos.	vii.) HRSG MAKE-UP TRANSFER PUMPS - MOTOR DRIVEN	Three (3) Nos.
i.) HP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	Two (2) Nos.	} Total Rs.																				
ii.) HP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	One (1) No.																					
iii.) MP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	Two (2) Nos.																					
iv.) MP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	One (1) No.																					
v.) CONDENSATE TRANSFER PUMPS - TURBINE DRIVEN	One (1) No.	} Total Rs.																				
vi.) CONDENSATE TRANSFER PUMPS - MOTOR DRIVEN	Two (2) Nos.																					
vii.) HRSG MAKE-UP TRANSFER PUMPS - MOTOR DRIVEN	Three (3) Nos.																					
2.0	Recommended spares item-wise breakup with item-wise price to be given as per "Schedule of Recommended Spares" enclosed under Vol. III of Technical Specification.					Rs.																
3.0	Price for supervision at site (per manday basis) (Optional & additional, apart from those included in 1.0 above)					Rs.																
4.0	Optional Prices for Vibration & Bearing Temperature Monitoring System (for HP Feed Water Export Pumps - Motor Driven/Turbine Driven & MP Feed Water Export Pump - Motor Driven / Turbine Driven					Rs.																
NOTE:	Indicate all duties, taxes etc. stating whether included/ excluded in above price.																					
Bidder shall furnish this price Schedule in his price offer only																						
PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE																						
NAME		SIGNATURE		DATE		COMPANY SEAL																

	TITLE:		SPECIFICATION NO. PE-TS-353-100-N001	
	SCHEDULE OF UNIT PRICES		VOLUME	III
	CPP - PARADIP REFINERY PROJECT		SECTION	A 5
			REV. NO.	0
		DATE	19.06.10	
		SHEET	1 OF 2	
SL. No.	DESCRIPTIONS OF WORKS OR EQUIPMENT		PRICE (In Rs.)	
1.0	Unit price for Design, manufacture, inspection and testing, packed for transportation and delivery for following Pumps including Steam Turbines as specified in the Technical specification covering complete scope including installation checks at site, site performance testing, accessories etc. and mandatory spares.			
1.1	Pumps and Motor/Turbine Unit price (Horizontal Pumps Group - I):			
a)	HP FEED WATER EXPORT PUMPS - MOTOR DRIVEN			
	Pump price:	Rs.		
	Motor price:	Rs.	BHEL SCOPE	
	Mandatory Spares:	Rs.		
b)	HP FEED WATER EXPORT PUMPS - TURBINE DRIVEN			
	Pump price:	Rs.		
	Turbine price:	Rs.		
	Mandatory Spares:	Rs.		
c)	MP FEED WATER EXPORT PUMPS - MOTOR DRIVEN			
	Pump price:	Rs.		
	Motor price:	Rs.	BHEL SCOPE	
	Mandatory Spares:	Rs.		
d)	MP FEED WATER EXPORT PUMPS - TURBINE DRIVEN			
	Pump price:	Rs.		
	Turbine price:	Rs.		
	Mandatory Spares:	Rs.		
1.1	Pumps and Motor/Turbine Unit price (Horizontal Pumps Group - II):			
e)	CONDENSATE TRANSFER PUMPS - TURBINE DRIVEN			
	Pump price:	Rs.		
	Turbine price:	Rs.		
	Mandatory Spares:	Rs.		
f)	CONDENSATE TRANSFER PUMPS - MOTOR DRIVEN			
	Pump price:	Rs.		
	Motor price:	Rs.	BHEL SCOPE	
	Mandatory Spares:	Rs.		
g)	HRSG MAKE-UP TRANSFER PUMPS - MOTOR DRIVEN			
	Pump price:	Rs.		
	Motor price:	Rs.	BHEL SCOPE	
	Mandatory Spares:	Rs.		
2.0	Recommended spares list with item-wise break-up to be given separately as per respective price schedule in Volume-III.		Rs.	
3.0	Optional Prices for Vibration & Bearing Temperature Monitoring System for following pumps :			
	HP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	Rs.		
	HP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	Rs.		
	MP FEED WATER EXPORT PUMPS - MOTOR DRIVEN	Rs.		
	MP FEED WATER EXPORT PUMPS - TURBINE DRIVEN	Rs.		
4.0	Others, if any (please specify)		Rs.	
5.0	NOTES:			
	a) Total price of Unit Prices given above should tally with Total price given in Sl. No. (1) of "Schedule of Prices" . In case of discrepancy, the lowest of two shall be considered for order. Bidder to note that prices mentioned in the "Schedule of prices" and "Schedule of Unit Prices" shall be binding for evaluation purposes.			
	b) Unit price quoted by bidder, as above, shall be binding for any quantity variation, which is at the discretion of purchaser.			
	c) Price of commissioning & erection spares and other accessories not listed above shall be included in the price of pump & shall be supplied with the pump.			
	d) Indicate all taxes, duties etc. stating whether included/ excluded in above prices.			
Bidder shall furnish this price Schedule in his price offer only				
PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE				
NAME		DESIGNATION	SIGNATURE	DATE
				COMPANY SEAL

TECHNICAL CONFIRMATION LIST (ROTATING EQUIPMENT) CAPTIVE POWER PLANT

PROJECT : CPP-PARADIP REFINERY PROJECT

OWNER : INDIAN OIL CORPORATION LIMITED

PMC : ENGINEERS INDIA LTD.

Job No. : A011

Bidder's Signature and
Stamp

0	24/07/2009	Issued for Bids	AK	SM
Rev. No	Date	Purpose	Prepared by	Checked & Approved by

	COMPLIANCE STATEMENT / QUERY	BIDDER'S CONFIRMATION / ANSWER
1	<p>BIDDER IS INFORMED THAT THE DETAILED OFFER FOR ANY ROTATING EQUIPMENT, i.e. FILLED-IN EQUIPMENT DATA SHEETS, PERFORMANCE CURVES, VENDOR'S SELECTED EQUIPMENT MODELS ETC. IS NOT REQUIRED AT THE STAGE OF BIDDING AND SHALL NOT BE REVIEWED OR TAKEN COGNIZANCE OF AT THIS STAGE. ACCORDINGLY, THE BIDDER SHALL FURNISH ONLY THE FOLLOWING DOCUMENTS ALONGWITH THE BID:</p> <p>a) This Technical Compliance with categorical confirmation against each of the clauses</p> <p>b) Deviations, if any against the equipment data sheets, Engineering Design Basis, applicable job specifications and standard specifications shall be duly consolidated at one place (under exceptions/ deviation list). In case no deviations are furnished, it shall be construed that bidder's proposal is in total compliance to bid document requirements.</p> <p>Bidder shall note that vendor specific deviations to design codes (API/NEMA/ASME/TEMA etc.) shall not be considered at this stage and shall be subject to review and approval of Owner/PMC during detail engineering. However bidder shall note that deviations to only those requirements of design codes, which are technically infeasible to meet, shall be permitted provided suitable justification for the same is furnished. Deviations, which can be withdrawn with extra cost and or time implication, shall not be permitted.</p>	
2	<p>Any deviations/deletions/corrections made elsewhere in the body of the bid (on equipment data sheet, specs etc.) will not be taken cognisance of and all such deviations shall be deemed to have been withdrawn by the bidder.</p> <p>Confirm compliance.</p>	

	COMPLIANCE STATEMENT / QUERY	BIDDER'S CONFIRMATION / ANSWER
3	Confirm that the equipment supplied shall be from one of the approved vendors given in the APPROVED VENDOR LIST attached elsewhere in the bid document.	
4	Confirm that the Scope of supply and work considered in the Bid proposal is in total compliance to the Bid specification requirement including Scope of Work/Supply, Data Sheet, Job specs, Process Package, Engineering Design Basis and attendant specification with respect to all rotating equipment.	
5	Note & confirm that purchaser's requirement for GTGs, STGs, BFW pumps, FD fans for HRSGs shall be subject to Owner/ PMC's approval during detailed engineering stage. These PRs shall comply to all the technical requirements of bidding documents (experience requirements & operating conditions) and the decision of Owner/ PMC shall be final which shall be complied by contractor without any time/ cost implication to the owner.	
6	Duly filled in equipment data sheets, characteristic curves for the selected vendor/equipment model shall be subject to Owner / PMC's approval/review to ensure compliance to bid specification during detailed engineering stage. (Refer VDR, Rot. Equipment section) Confirm compliance.	
7	Confirm that wherever the <u>Material Of Construction</u> of equipment components have been specified in the Bid specification, same or superior MOC shall be offered.	
8	Confirm that all <u>Inspection & Tests</u> as required for each equipment, as per the Data sheets, Job specs, Engineering Design Basis, Bid Package and as per specification & Codes attached or referred to, have been included by the bidder in his proposal.	
9	Confirm that the Bidder has included in his scope all the Mandatory spares (insurance spares) as specified in the Bid specification for all the Rotating	

	COMPLIANCE STATEMENT / QUERY	BIDDER'S CONFIRMATION / ANSWER
	Equipment (Note: Insurance spares as defined in Table-2 of Engineering Design Basis for rotating equipment shall be considered as mandatory spares)	
10	Bidder shall obtain and submit a list of Operation and Maintenance spares required for Two Year Normal Operation (indicating the price against each spare) as recommended by the equipment manufacturer / bidder over and above the mandatory spares specified in the bid specification during detailed engineering stage. Confirm Compliance.	
11	Confirm that all <u>Erection & Commissioning Spares</u> as required for each equipment shall form part of bidder's scope and detailed list shall be submitted for each rotating equipment during detail engineering stage. In case any spare is consumed over and above the quoted commissioning spares during start-up/commissioning, the same shall be supplied by bidder at no extra cost to the purchaser/owner.	
12	Confirm that <u>Special Tools & Tackles</u> , as required for each equipment shall form part of bidder's scope and the list shall be reviewed by the purchaser at detailed engineering stage in view of standard practices of equipment manufacturing.	
13	Confirm that all consumables, chemicals, lubricants etc. for initial charge and for commissioning and site performance guarantee run have been included in the Bidder's proposal. Also comply to the requirements, elsewhere in the bid documents.	
14	Confirm that all Drawings / Data requirements as per specifications and codes attached and referred to has been included in the bidder's proposal.	

EXPERIENCE RECORD - CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE)

ITEM. :

ITEM NUMBER. :

VENDOR. :

INSTRUCTIONS TO BIDDERS :

1. This proforma duly filled in shall be submitted for each item separately, alongwith the bid.
2. Since the information requested in this proforma will be utilised to assess provenness of offered model, it is in the interest of the equipment manufacturer to pick up those cases out of total list of references which most closely match with the offered model. The equipment manufacturer shall also ensure that each & every information asked for is furnished and the same is correct and complete in all respects.
Incorrect information furnished in this proforma shall render the bid liable for rejection.
3. While furnishing the materials, where asked for, the equipment manufacturer shall furnish ASTM equivalents also.
4. For the referred installations, the equipment manufacturer shall indicate the name of the person (alongwith his address, telephone no., fax no./email-id etc.) who may be contacted by the Purchaser / his representative, if felt necessary.
5. The equipment manufacturer shall also furnish along with the bid his standard reference list for the offered equipment model manufactured and supplied by him.
6. The equipment manufacturer shall clarify the meaning of each letter / digit used in the model designation below:

Description of Model designation system:



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA -
CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE)
Rotating Equipment
((CAPTIVE POWER PLANT))**

REV.

A011-00-16-45-ER03

0

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-151 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
1	GENERAL					
1.1	Cross reference to manufacturer's Standard Reference list	----				
1.2	Make					
1.3	Model Number					
1.4	Number of units supplied					
1.5	Type of driver (Electric Motor / Steam Turbine / Gas Turbine / IC Engine)					
1.6	Driver rated kW / Speed(rpm)					
1.7	Drive (Fixed Speed / Variable Speed / Variable Frequency)					
1.8	Shop where pump is designed, manufactured, packaged, tested & supplied with address					
2	OPERATING CONDITIONS					
2.1	Fluid handled					
2.2	Fluid temperature (Min / Max) °C					
2.3	Capacity (m ³ /hr)					
2.4	Maximum Suction pressure (kg/cm ² ,a)					
2.5	Differential Pressure, Rated (kg/cm ²)					
2.6	NPSHR (m)					
2.7	Efficiency					
2.8	BKW					
2.9	Minimum Continuous Stable Flow, (m ³ /hr)					
2.10	Rated Speed					



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA -
CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE)
Rotating Equipment
((CAPTIVE POWER PLANT))**


A011-00-16-45-ER03

REV.

0

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-151 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
2.11	Speed range for variable speed drive					
2.12	MAWP outer casing (kg/cm ² G) @ 15EC @ pumping temperature					
3	CONSTRUCTION					
3.1	No. of stages					
3.2	Casing split - Outer casing (Axial / Radial)					
3.3	Casing split - Inner casing (Axial / Radial)					
3.4	First Impeller Type (Single flow / Double flow)					
3.5	Impeller diameter - Rated/ Maximum / Minimum (mm)					
3.6	Impeller mounting (Inline / Back to back)					
3.7	Balancing Device used (Balance drum / Balance disc / Others)					
3.8	Type of Radial Bearings (Antifriction / Sleeve / Tilting Pad / Others)					
3.9	Type of Thrust Bearings (Taper land / Tilting Pad / Others)					
3.10	Span between bearings (mm)					
3.11	Shaft diameter under: Seals / Bearings (mm)					
3.12	Whether rotor is rigid or flexible?					
3.13	Shaft Sleeve provided between impeller (interstage bushings) - Yes / No					
3.14	Shaft Sleeve provided under seals - Yes / No					
3.15	Whether the proposed model and reference models have identical hydraulic design (for impeller / diffuser / volute)					

 ENGINEERS INDIA LIMITED NEW DELHI	EXPERIENCE RECORD PROFORMA - CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE) Rotating Equipment ((CAPTIVE POWER PLANT))		REV.
		A011-00-16-45-ER03	0
		Page 3 of 5	

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-151 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
3.16	Type of lubrication (Pressurised / Splash / Ring / Oil mist / Grease)					
3.17	Lubrication system (API-610 / API-614 / Manufacturer Standard)					
3.18	Type of mechanical seal (Single / Double)					
3.19	API Sealing Plan No.					
3.20	API Cooling Plan					
4	MATERIAL OF CONSTRUCTION					
4.1	Outer Casing					
4.2	Inner Casing					
4.3	Impellers					
4.4	Shaft					
4.5	Shaft Sleeves - interstage					
4.6	Shaft Sleeve under seals					
5	OTHER INFORMATION ON INSTALLATIONS					
5.1	Date of supply of entire unit					
5.2	Date of commissioning of entire unit					
5.3	No. of operating hours completed as on the date of issue of material requisition					
5.4	Major Problems encountered					
5.5	Name of plant					
5.6	Purchaser's Name and Address					
	Name (Company / Organization)					



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA -
CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE)
Rotating Equipment
((CAPTIVE POWER PLANT))**

REV.

A011-00-16-45-ER03

0

Page 4 of 5

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-151 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
	Name of Contact Person					
	Address					
	Telephone No.					
	Fax No.					
	email-id					



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA -
CENTRIFUGAL PUMP (HORIZONTAL MULTISTAGE)**
Rotating Equipment
((CAPTIVE POWER PLANT))

REV.

A011-00-16-45-ER03

0

Page 5 of 5

EXPERIENCE RECORD - CENTRIFUGAL PUMP (HORIZONTAL)

ITEM. :

ITEM NUMBER. :

VENDOR. :

INSTRUCTIONS TO BIDDERS :

1. This proforma duly filled in shall be submitted for each item separately, along with the bid.
2. Since the information requested in this proforma will be utilised to assess provenness of offered model, it is in the interest of the equipment manufacturer to pick up those cases out of total list of references which most closely match with the offered model. The equipment manufacturer shall also ensure that each & every information asked for is furnished and the same is correct and complete in all respects. **Incorrect information furnished in this proforma shall render the bid liable for rejection.**
3. While furnishing the materials, where asked for, the equipment manufacturer shall furnish ASTM equivalents also.
4. For the referred installations, the equipment manufacturer shall indicate the name of the person (alongwith his address, telephone no., fax no./email-id etc.) who may be contacted by the Purchaser / his representative, if felt necessary.
5. The equipment manufacturer shall also furnish along with the bid his standard reference list for the offered equipment model manufactured and supplied by him.
6. The equipment manufacturer shall clarify the meaning of each letter / digit used in the model designation below:

Description of Model designation system :



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA
CENTRIFUGAL PUMP (HORIZONTAL)
Rotating Equipment
(CAPTIVE POWER PLANT)**

EXPERIENCE RECORD PROFORMA NO. REV.

A011-00-16-45-ER11

0

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-101 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
1	GENERAL					
1.1	Cross reference to manufacturer's Standard Reference list	----				
1.2	Make					
1.3	Model Number					
1.4	Number of units supplied					
1.5	Type of driver (Electric Motor / Steam Turbine / Gas Turbine / IC Engine)					
1.6	Driver rated kW / Speed(rpm)					
1.7	Drive (Fixed Speed / Variable Speed / Variable Frequency)					
1.8	Edition of API Std - 610 to which the pump conforms (6th/7th/8th)					
1.9	Shop where pump is designed, manufactured, packaged, tested & supplied with address					
2	OPERATING CONDITIONS					
2.1	Fluid handled					
2.2	Fluid temperature (Min / Max) °C					
2.3	Capacity (m ³ /hr)					
2.4	Maximum Suction pressure (kg/cm ² ,a)					
2.5	Differential Head, Rated (m)					
2.6	Differential Pressure, Rated (kg/cm ²)					
2.7	NPSHR (m)					
2.8	Efficiency					



ENGINEERS INDIA LIMITED
NEW DELHI

EXPERIENCE RECORD PROFORMA
CENTRIFUGAL PUMP (HORIZONTAL)
Rotating Equipment
(CAPTIVE POWER PLANT)

EXPERIENCE RECORD PROFORMA NO.

A011-00-16-45-ER11

REV.

0

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-101 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
2.9	BKW, Rated					
2.10	Minimum Continuous Stable Flow, (m ³ /hr)					
2.11	Rated Speed					
2.12	Speed range for variable speed drive					
2.13	MAWP casing (kg/cm ² G) @ 15EC @ pumping temperature					
3	CONSTRUCTION					
3.1	No. of stages (single / two)					
3.2	Casing split (Axial / Radial)					
3.3	Impeller diameter - Rated/ Maximum / Minimum (mm)					
3.4	Whether the proposed model and reference models have identical hydraulic design (for impeller / diffuser / volute)					
3.5	Sealing Element (packing / mechanical seal)					
3.6	Type of mechanical seal (Single / Double)					
3.7	API Sealing Plan No.					
3.8	API Cooling Plan					
4	MATERIAL OF CONSTRUCTION					
4.1	API - 610 Material Code					
4.2	Casing					
4.3	Impellers					
4.4	Shaft					



ENGINEERS INDIA LIMITED
NEW DELHI

EXPERIENCE RECORD PROFORMA
CENTRIFUGAL PUMP (HORIZONTAL)
Rotating Equipment
(CAPTIVE POWER PLANT)

EXPERIENCE RECORD PROFORMA NO.

REV.

A011-00-16-45-ER11

0

Page 3 of 4

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-101 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
5	OTHER INFORMATION ON INSTALLATIONS					
5.1	Date of supply of entire unit					
5.2	Date of commissioning of entire unit					
5.3	No. of operating hours completed as on the date of issue of material requisition					
5.4	Major Problems encountered					
5.5	Name of plant					
5.6	Purchaser's Name and Address					
	Name (Company / Organization)					
	Name of Contact Person					
	Address					
	Telephone No.					
	Fax No.					
	email-id					



ENGINEERS INDIA LIMITED
NEW DELHI

EXPERIENCE RECORD PROFORMA
CENTRIFUGAL PUMP (HORIZONTAL)
Rotating Equipment
(CAPTIVE POWER PLANT)

EXPERIENCE RECORD PROFORMA NO.

A011-00-16-45-ER11

REV.

0

EXPERIENCE RECORD - STEAM TURBINE (GENERAL PURPOSE)

ITEM. :

ITEM NUMBER. :

VENDOR. :

INSTRUCTIONS TO BIDDERS:

1. This proforma duly filled in shall be submitted for each item separately, alongwith the bid.
2. Since the information requested in this proforma will be utilised to assess provenness of offered model, it is in the interest of the equipment manufacturer to pick up those cases out of total list of references which most closely match with the offered model. The equipment manufacturer shall also ensure that each & every information asked for is furnished and the same is correct and complete in all respects. **Incorrect information furnished in this proforma shall render the bid liable for rejection.**
3. While furnishing the materials, where asked for, the equipment manufacturer shall furnish ASTM equivalents also.
4. For the referred installations, the equipment manufacturer shall indicate the name of the person (alongwith his address, telephone no., fax no./email-id etc.) who may be contacted by the Purchaser / his representative, if felt necessary.
5. The equipment manufacturer shall also furnish along with the bid his standard reference list for the offered equipment model manufactured and supplied by him.
6. The equipment manufacturer shall clarify the meaning of each letter / digit used in the model designation below:

Description of Model designation system :



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA-
STEAM TURBINE (GENERAL PURPOSE)**
Rotating Equipment
(CAPTIVE POWER PLANT)

REV.

A011-00-16-45-ER06

0

Page 1 of 4

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-401 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
1	GENERAL					
1.1	Cross reference to manufacturer's Standard Reference list	----				
1.2	Model Number					
1.3	Type (Condensing / Backpressure)					
1.4	Number of stages					
1.5	Number of units supplied					
1.6	Type of drive arrangement (Direct / Thru gear box etc.)					
1.7	Type of driven equipment					
1.8	Type of lubrication system : API 611 / API 614					
1.9	Shop where turbine is designed, manufactured & tested with location & complete address					
2	OPERATING CONDITIONS					
2.1	Inlet pressure: rated/design (kg/cm ² A)					
2.2	Inlet temperature: rated/design (°C)					
2.3	Exhaust pressure: rated/design (kg/cm ² A)					
2.4	Exhaust temperature: rated/design (°C)					
2.5	Turbine rating (kW)					
2.6	Rated speed of turbine (rpm)					
2.7	Turbine efficiency (%)					
2.8	MAWP (kg/cm ² G)					
2.9	Hydrostatic test pressure (kg/cm ² g)					



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA-
STEAM TURBINE (GENERAL PURPOSE)**
Rotating Equipment
(CAPTIVE POWER PLANT)

A011-00-16-45-ER06

Page 2 of 4

REV.

0

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-401 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
3	CONSTRUCTION					
3.1	Casing Split: Axial/radial split					
3.2	Casing support: Centerline/Foot					
3.3	Wheels: Simply supported / Overhung					
3.4	Wheel diameter (mm)					
3.5	Rotor: Solid / Built up					
3.6	Number of blades per stage					
3.7	Tip speed					
3.8	Bearings Type: Journal: Thrust:					
3.9	Type of bearing lubrication: Ring oiled/Pressurised					
3.10	Span between bearing centres (mm)					
3.11	Shaft diameter under Bearings (mm)					
3.12	Whether quoted model and reference model : a. has identical mechanical design b. has identical thermodynamic design					
4	MATERIALS OF CONSTRUCTION					
4.1	Casing : Inlet / Exhaust					
4.2	Stationary Blading					
4.3	Moving Blading					
4.4	Shaft					
4.5						



ENGINEERS INDIA LIMITED
NEW DELHI

**EXPERIENCE RECORD PROFORMA-
STEAM TURBINE (GENERAL PURPOSE)**
Rotating Equipment
(CAPTIVE POWER PLANT)

REV.

A011-00-16-45-ER06

0

Page 3 of 4

The drawing, design and details given on this format are the property of ENGINEERS INDIA LIMITED. They are merely loaned on the borrower's express agreement that they will not be reproduced, copied, exhibited or used, except in the limited way permitted by a written consent given by the lender to the borrower for the intended use. EIL-1645-ERP-401 Rev.0 210 X 297

SL. NO.	PARAMETER	INFORMATION ON PROPOSED MODEL	INFORMATION ON REFERRED EXISTING INSTALLATIONS			REMARKS
			Ref.- 1	Ref.-2	Ref.-3	
1.	2.	3.	4.	5.	6.	7.
5	OTHER INFORMATION ON INSTALLATIONS					
5.1	Date of supply of entire unit					
5.2	Date of commissioning of entire unit					
5.3	No. of operating hours completed as on the date of issue of material requisition					
5.4	Major Problems encountered					
5.5	Name of plant					
5.6	Purchaser's Name and Address					
	Name (Company / Organization)					
	Name of Contact Person					
	Address					
	Telephone No.					
	Fax No.					
	email-id					



ENGINEERS INDIA LIMITED
NEW DELHI


**EXPERIENCE RECORD PROFORMA-
STEAM TURBINE (GENERAL PURPOSE)**
Rotating Equipment
(CAPTIVE POWER PLANT)

REV.

A011-00-16-45-ER06

0

Page 4 of 4

	TECHNICAL SPECIFICATIONS	SPECN. NO.: PE-TS-353-100-N001		
	SPECIAL PROCESS HORIZONTAL PUMPS	VOLUME:	III	SECTION: B
		REV. NO.	0	DATE: 25.06.2010

DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI

- B1 DOCUMENTS/DRAWINGS FOR OWNER'S/PMC'S REVIEW (ROTATING EQUIPMENT)
- B2 DOCUMENTS AS PER DATASHEET-C (ENCLOSED IN VOL.-IIB, SECTION D)
- ~~B3 DATA SHEET - B SPECIAL PURPOSE PUMPS~~
- B4 ELECTRICAL LOAD DATA
- B5 SCHEDULES AS PER LIST

DOCUMENTS/DRAWINGS FOR OWNER'S/PMC'S REVIEW

ROTATING EQUIPMENT

CAPTIVE POWER PLANT

PROJECT : CPP-PARADIP REFINERY PROJECT

OWNER : M/S IOCL

PMC : ENGINEERS INDIA LTD.

Job No. : A011

0	24/07/09	Issued for Bids	AK	SM
Rev. No	Date	Purpose	Prepared by	Checked and Approved by

S No.	Description	Review	Records	Remarks
1.	DRAWING SUBMISSION SCHEDULE		√	In the kick of meeting (Post Order stage)
2	PURCHASE REQUISITION: Each Purchase Requisition shall have following as a minimum: a) Completely filled in Experience Record format / reference list b) Fully filled in Mechanical datasheets for equipment, driver, auxiliaries & instruments c) Performance curves /Correction Curves d) Agreed Deviation List e) Insurance Spare Parts List f) Special Tools & Tackles List g) Type Test certificate for Electrical Equipments h) Sub vendor list for Electrical & Instrumentation Items i) Write up for Instrumentation philosophy, inclusive of philosophy of logics & interface to DCS / PLC j) Detailed Vendor Data Requirement/ Schedule			
2A	PURCHASE REQUISITION for all Rotating Equipment (Critical item like GTG Package, STG Package, Multistage pump trains e.g. Boiler Feed Water Pumps)	√		(Note-2)
2B	PURCHASE REQUISITION for all other equipment not covered in 2A above.		√	
3	FOLLOWING VENDOR DRAWINGS/ DATA for all Rotating Equipment			
3.1	General Arrangement & footprint drawing for each Skid of Multistage Pump Train /GT Generator/ ST Generator and their respective auxiliary systems	√		

S No.	Description	Review	Records	Remarks
3.2	Plot plan showing layout of all skids with shelter, elevation, column Locations, Crane size access and maintenance space	√		Review by multi disciplines Rotating Eqpt /Piping /Structures /PED
3.3	P&I Diagram with bill of material for Process fluid, lubrication & sealing systems, Nitrogen, instrument air, cooling water, steam systems.	√		Review by multi disciplines Rotating Eqpt./ Process
3.4	Eqpt start up / normal operation /normal & emergency shutdown block sequence diagrams for Multistage Pumps, GTG & STG		√	
3.5	Mechanical, performance, functional and string test procedures	√		
3.6	GA drawings and front facia of all panels and gauge boards			
3.7	Logic Diagram			
3.8	Instrument Specifications & Data Sheets			
3.9	General Arrangement & footprint drawing for each Equipment / Skid (Applicable for all equipment except Multistage pump Train, GTG & STG)			
3.10	Utility consumption list (start up, normal operation & shutdown)		√	
3.11	Cross-sectional drawings with bill of materials (driven eqpt, driver, gear box, couplings, seal assemblies)			
3.12	Complete instrument & annunciation list (eqpt start / stop, protection & monitoring)			

S No.	Description	Review	Records	Remarks
3.13	Lateral & torsional analysis reports		√	
3.14	Sizing Calculations for safety valves, control valve & flow element			
3.15	Inspection & test reports (all tests)			
4	GENERAL: Final Mechanical document containing i) All certified as built documents along with Final Documentation covered under 2 & 3 above ii) All inspection & test records iii) Operation and maintenance manuals iv) Spare parts manual and Tools & Tackles List v) Catalogue information of accessories and instruments		√	

NOTE:

1. The above tabulated Vendor Data and Drawings shall be marked on the Transmittal sheet to “**ROTATING EQUIPMENT DEPARTMENT**” by the Contractor, while submitting for Review/Record.
2. CONTRACTOR shall first submit the completely filled-in PURCHASE REQUISITION for review. No vendor Data/Drawings shall be reviewed before submission of the Purchase Requisition.
3. Each vendor Drawing/Data (listed under Review & Record) shall have been reviewed by the Contractor for ensuring strict compliance to the Bid Specification requirements and shall carry the Reviewer's signature/seal of the Contractor, prior to submission for PMC's Review and as Final Documentation. Drawings submitted without Contractor's review shall be returned. Any Deviation to Purchase Specifications shall be clearly brought out through Deviation Waiver's Permits for PMC's Review.

LOAD TITLE	RATING (KW / A)		UNIT (U)/STN (S)	Nos.		VOLTAGE CODE*	FEEDER CODE**	EMER. LOAD (Y)	CONT.(C)/ INTT.(I)	STARTING TIME >5 SEC (Y)	LOCATION	BOARD NO.	CABLE		BLOCK CABLE DRG. No.	CONTROL CODE	REMARKS	LOAD No.
	NAME PLATE	MAX. CONT. DEMAND (MCR)		RUNNING	STANDBY								SIZE CODE	Nos				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

ANNEXURE-II

NOTES: 1. COLUMN 1 TO 12 & 18 SHALL BE FILLED BY THE REQUISITIONER (ORIGINATING AGENCY); REMAINING COLUMNS ARE TO BE FILLED UP BY PEM (ELECTRICAL)
2. ABBREVIATIONS : * VOLTAGE CODE (7):- (ac) A=11 KV, B=6.6 KV, C=3.3 KV, D=415 V, E=240 V (1 PH), F=110 V (cc): G=220 V, H=110 V, J=48 V, K=+24V, L=-24 V
: ** FEEDER CODE (8):- U=UNIDIRECTIONAL STARTER, B=BI-DIRECTIONAL STARTER, S=SUPPLY FEEDER, D=SUPPLY FEEDER (CONTACTER CONTROLLED)



LOAD DATA
(ELECTRICAL)

JOB NO.	353	ORIGINATING AGENCY		PEM (ELECTRICAL)	
PROJECT TITLE	PARADIP REFINERY CPP	NAME		DATA FILLED UP ON	
SYSTEM	MISC. PUMPS	SIGN.		DATA ENTERED ON	
DEPTT. / SECTION	ELECTRICAL	SHEET 1 OF 1	REV. 00	DE'S SIGN. & DATE	

CHECKLIST — LIST OF SCHEDULES

Sl. No.	Form No.	Description	Tick Applicable Forms
1.	PEM-6024	Schedule of Drawings / Catalogues submitted with Bid	✓
2.	PEM-6025@	Schedule of Occurance of Key Events of Delivery, Erection & Commissioning	
3.	PEM-6026	Schedule of Equipment Manufacture, Despatch and Shipment to Site.	✓
4.	PEM-6027	Schedule of Weights & Dimensions	
5.	PEM-6028@	Schedule of Performance Guarantee	
6.	PEM-6030	Inspection Schedule	✓
7.	PEM-6031	Schedule of Cement and Steel and Quarterly Cement Requirement	
8.	PEM-6032	Schedule of Quarterly Requirement of Reinforcing Bars and Structural Steel	
9.	PEM-6033@	Bill of Quantities (Civil Works)	
10.	PEM-6035	Schedule of Bidder's Proposed Construction / Site Fabrication Facilities.	
11.	PEM-6036	Schedule of Deviations	✓
12.	PEM-6040	Schedule of Declaration	✓
13.	PEM-6041	Quality Plan	✓
14.	PEM-6042	Vendor's Drawings / Documents Schedule	✓
15.	PEM-6043@	Schedule of Occurance of Key Events for Civil / Structural Works	
16.	PEM-6046	Inspection Request	✓
17.	PEM-6051	Schedule of Prices	✓
18.	PEM-6052@	Schedule of Unit Prices	✓
19.	PEM-6053	Schedule of Prices for Commissioning & Mandatory Spares	✓
20.	PEM-6054	Schedule of Prices for Recommended Spares	✓
21.	PEM-6055	Schedule Prices for Erection and Maintenance Tools & Tackles	✓
22.	PEM-6056	Schedule of Bidder's Man-power for Supervision of E & C and their Charges.	✓
23.	PEM-6057	Schedule of Daily & Overtime Rates	
24.	PEM-6058	Schedule of Hire-charges for Construction / Site Fabrication Facilities	
For Forms marked with @ certain information to be filled by DEs - before issuing to bidder.			



TITLE

* SCHEDULE OF DECLARATION

SPECIFICATION NUMBER

VOLUME III PART - A

SHEET OF

DECLARATION

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

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

Bidders Company Name

Authorised representative's
Signature


Name

Bidder's Intent

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

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	ADDRESS	TELEPHONE	COMPANY SEAL

	TITLE SCHEDULE OF DRAWINGS / CATALOGUES SUBMITTED WITH BID	SPECIFICATION NUMBER VOLUME III PART - A SHEET 01
Section C/D enclosed with the specification indicate the drawings / catalogues to be furnished with the bid. The bidder in addition to furnishing the same, can also include any other drawings / catalogues which he may desire to submit with the bid. This schedule duly lists out such drawings as enclosed by the bidder with the bid.		
DRAWING / CATALOGUE NUMBER	DESCRIPTION	NUMBER OF SHEETS
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE		
NAME	DESIGNATION	SIGNATURE
DATE	COMPANY SEAL	



**VENDOR's
DRAWINGS/DOCUMENTS SCHEDULE**
(Information in this form is to be furnished
only after receipt of LOI/IPO)

SPECIFICATION NO

VOLUME **III**

SECTION **PART-A**

REV NO. **0**

SHEET **1 OF 1**

TITLE OF SPECIFICATION

S. NO.	Vendor's Drawing/Document No. (VDN)	PEM's Drawing/Document No. (PDN)	First Submission Date
	TITLE		Final Approval Date
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		
	VDN	PDN	
	TITLE		

PARTICULARS OF VENDOR's/AUTHORISED REPRESENTATIVE

NAME	SIGNATURE	DATE	COMPANY SEAL



TITLE :
SCHEDULE OF OCCURRENCE OF KEY EVENTS
OF DELIVERY ERECTION AND
COMMISSIONING

SPECIFICATION NUMBER:

VOLUME III **PART-A**

Sheet of

EQUIPMENT/SYSTEM.

DESCRIPTION OF KEY EVENTS

MONTHS FROM
(DATE OF LOI)

We the undersigned hereby undertake to meet the schedule of occurrence of the key event as listed above regarding the delivery, Erection & Commissioning of Equipment/System

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

SCHEDULE OF EQUIPMENT, MANUFACTURE, DESPATCH AND SHIPMENT TO SITE

SHEET _____ OF _____

We, the undersigned hereby undertake to meet the above time schedule in weeks for manufacture, despatch and shipment of each equipment and procurement of major boughtout items as listed above.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE



TITLE

SCHEDULE OF WEIGHTS & DIMENSIONS

SPECIFICATION NUMBER

VOLUME III PART - A

SHEET OF

The bidder shall state below the weights and dimensions of various packages for shipment covering the complete scope.

Description of Package(s)	Dimensions (in meters)	Weight (in tonnes)

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

FORM No. PEM - 6030-0



INSPECTION SCHEDULE

SPECIFICATION NUMBER _____

P.O.
NUMBER _____

VOLUME - III PART-A

SHEET OF _____

S. No.	ITEM/COMPONENT	PLACE & ADDRESS OF TEST / INSPECTION	Scheduled Date of Inspection	Duration of Test / Inspection (in days)

This schedule shall be in line with specification and quality plan requirements. The information in this form shall be furnished after receipt of LOI / PO.

PARTICULARS OF VENDOR's / AUTHORISED REPRESENTATIVE			COMPANY SEAL
NAME	SIGNATURE	DATE	

(Form No. PEM-6042-0)

[illegible]

Entry	'3' in column 'P'	means test/inspection to be performed by sub-Vendor's QC
Entry	'2' in column 'W'	means test/inspection to be witnessed by Vendor's QC
Entry	'1' in column 'V'	means verification shall be done by BHEL and next stage to be started only after the hold point is cleared by BHEL
Column II-	Remarks - Any special remarks shall be given here.	

1. In absence of correlation with the test certificate(s) (e.g. material identification) samples shall be drawn by BHEL and all tests as per relevant specifications shall be carried out in their presence or in recognized Government Laboratory.
2. When materials and components are initially identified and stamped by BHEL QS engineer, the identification marks shall be preserved till despatch. Wherever this is not possible, the identification mark shall be transferred to the components in the presence of BHEL QS Engineer unless other wise agreed.
3. For castings and forgings integral test specimens shall be provided. When this is not possible for casting, they shall be poured in the presence of BHEL QS Engineer unless otherwise, if witnessing of test by BHEL is called for.
4. When welders qualified by reputed inspection agencies or statutory bodies are not available, qualification tests shall be conducted in the presence of BHEL QS Engineer.
5. This Quality Plan is liable to be modified as per the requirements of approved drawings and changes in technical specifications/drawings. If there are contradictions in respect of column 7 & 8 between this Quality Plan and the approved drawings specifications, the latter shall prevail.
6. Wherever inspection by BHEL's Purchaser/Third Party/Statutory authorities are mandatory, this shall be complied with.
7. Inspection reports, log sheets, test reports/certificate, etc. shall be furnished to BHEL at the appropriate stage or at the time of final inspection, as required.
8. This Quality Plan is also applicable to spares, if any, under scope of supply of Vendor.
9. The quality plan shall be submitted in septuplicate (7 Copies).

INSPECTION REQUEST
(From Vendor to BHEL Inspection Agency)

1. PROJECT TITLE

2. NAME OF VENDOR

3. BHEL'S LOI/PO NO

DATE

4. SYSTEM/ITEM DESCRIPTION

5. ITEM BEING OFFERED FOR INSPECTION WITH SL. NO. AS PER LOI/PO/BILLING SCHEDULE

6. DESCRIPTION AND SL. NO. OF INSPECTION AS PER QUALITY PLAN

7. QUANTITY OFFERED FOR INSPECTION

8. PLACE OF INSPECTION (FULL ADDRESS AND NAME OF SUB-VENDOR, IF ANY)

PLACE

ADDRESS

9. CONTACT PERSON (FOR SL. NO. 8 ABOVE)-

NAME

DESIGNATION

TELEPHONE

FAX

TELEGRAM

TELEX

10. THE FOLLOWING DOCUMENTS ARE APPROVED BY BHEL AND AVAILABLE AT PLACE OF INSPECTION :

(A). QUALITY PLAN (B) DRAWINGS (C) DATA SHEETS, CHARACTERISTIC CURVES ETC.

(D). PLANT STANDARDS

11. REQUIRED DATE OF INSPECTION : LIKELY DURATION(No.of working days).....
WEEKLY OFF DAY WORKING HOURS

(At least 15 days prior notice shall be given by the Vendor to Inspection Agency)

We hereby certify that the above items are complete in all respects and have been fully inspected/tested by us and are found to be as per technical specification/approved drawings/data sheets/characteristic curves and are acceptable to our QC department. The detailed inspection and test reports of our QC department are enclosed.

VENDOR'S PARTICULARS

Name	Designation	Signature	Place	Date	Seal



TITLE

*** SCHEDULE OF PRICES FOR
COMMISSIONING AND MANDATORY
SPARES**

SPECIFICATION NUMBER

VOLUME III

SHEET OF


The bidder shall indicate here the quantity required for erection / commissioning and mandatory spares for equipment as listed in Section-C / Section - D. If the listed spares are not adequate, then the bidder shall indicate those and additional spares considered necessary by him.

Type	Manufacturer's Drawing No. / Part of spare	Description	Material	Quantity per Unit / Equipment	Quantity Required	If set, Nos Per set	Delivery period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
Erection and Commissioning									
Mandatory Spares									
Additional Spares Mandatory Erection / Commissioning									

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME

COMPANY SEAL

		TITLE * SCHEDULE OF PRICES FOR RECOMMENDED SPARES					SPECIFICATION NUMBER VOLUME III SHEET _____ OF _____		
The bidder shall give below a list of spares recommended for three years (or as otherwise specified in section - C) for trouble free performance of the equipment / system offered.									
S. No.	Manufacturer's Drawing No. / Part of spare	Description	Material	Quantity per Unit / Equipment	Quantity recommended	It set. Nos. Per set	Delivery period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE									
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL					

SCHEDULE OF PRICE FOR ERECTION AND MAINTENANCE TOOLS & TACKLES

SPECIFICATION NUMBER

VOLUME III

SHEET _____ OF _____

S. No	Description of Tools & Tackles	Quantity offered	Unit Price (Rs.)	Total Price (Rs.)

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

COMPANY SEAL

**SCHEDULE OF BIDDER'S MAN POWER
FOR SUPERVISION OF E & C
AND THEIR CHARGES**

SHEET _____ OF _____

SUPERVISION OF ERECTION

SUPERVISION OF COMMISSIONING

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

Discussion

COMPANIES