TELANGANA STATE POWER GENERATION CORPORATION LTD

1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA

TECHNICAL SPECIFICATION
FOR
ULTRASONIC FLOWMETER

VOLUME II-B & III

SPECIFICATION No: PE-TS-410-145-I916

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

PREAMABLE

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-IA	:	This part contains instructions to bidders for making bids to BHEL.
Volume-IB	:	This part contains general commercial conditions of the tender & includes provision that vendor is responsible for the quality of item supplied by their sub-vendors.
Volume-IC	:	This part contains special conditions of contract.
Volume-ID	:	This part contains commercial conditions for erection & commissioning site work, as applicable.

1.2 **Volume-II TECHNICAL SPECIFICATIONS**

Technical requirements are stipulated in Volume-II which comprises of :-

Volume-IIA	:	General Technical Conditions
Volume-IIB	:	Technical Specification including Drawings, if any.

1.2.1 **Volume-IIB**

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 and 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. PE-SS-999-100-Q-002 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.

SECTION – A

SCOPE OF ENQUIRY

SCOPE OF ENQUIRY

1.0 SCOPE

1.1 This specification covers the Design, Manufacture, Inspection and Testing at manufacturer's works, proper packing for transportation and delivery to site of the Ultrasonic flow meter with accessories as mentioned in different sections of this specification for 1X800 MW KOTHAGUDEM Thermal Power Plant.

1.2 The quality plan enclosed, forms the minimum requirement but not limited to be adhered to by the bidder. Bidder to sign and stamp the same and submit along with the offer as an acceptance.

1.3 Scope of supply shall be Ultrasonic flow meter along with accessories. as indicated in specification.

1.4 Following formats to be signed, stamped with company seal and submitted :

a) Complete offer including calculation sheets, catalogues etc.
b) Quality Plan
c) Datasheets A & B, duly filled
d) Schedule of submission of drawings/documents, equipment manufacture inspection and dispatch.
e) Schedule of price, unit prices, inspection schedule.

2.0 GENERAL TECHNICAL INSTRUCTIONS

2.1 It is not the intent here to specify all the details of design and manufacture. However, the equipment shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to the customer / consultant, who will interpret the meaning of drawing and specification and shall be entitled to reject any component or material which in his judgment is not in full accordance herewith.

2.2 The omission of specific reference to any component / accessory necessary for the proper performance of the equipments shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.

2.3 BHEL's/Customer's representative shall be given access to the shop in which the equipments are being manufactured or tested and all test records shall be made available to him.

2.4 The equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by BHEL.

SECTION – B

PROJECT INFORMATION

VOLUME : IIA

SECTION-II

PROJECT SYNOPSIS AND GENERAL INFORMATION

CONTENT

VOLUME : IIA

SECTION-II

PROJECT SYNOPSIS AND GENERAL INFORMATION

1.00.00 INTRODUCTION

The proposed 1x800 MW Kothagudem Thermal Power Station (KTPS), Stage-VII, Unit-12 would be set up by Telangana State Power Corporation Ltd. (TSGENCO) at Kothagudem, Telangana. The proposed Power Plant will be installed adjacent to the existing D colony of Kothagudem Thermal Power Station, at Kothagudem.

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

2.00.00 APPROACH TO SITE

Site is located in the existing D Colony of Kothagudem Thermal Power Station, which is at a distance 30 km from temple town of Bhadrachalam and 300 km from Hyderabad by road. The Nearest railway station is Bhadrachalam Road (Known as Kothagudem) at a distance of 12 km. Kothagudem- Bhadrachalam National Highway branches off to the power station site near village Paloncha.

3.00.00 LAND

Land is primarily required for the main plant & auxiliaries (BTG) and balance of plant (BOP) like ash handling, coal storage, cooling tower, switchyard etc., which is available within the existing plant boundary.

The existing colony is to be dismantled, and the land of about 137 acres will be used for the main plant building, water facilities, switchyard, coal handling etc. The raw water reservoir will be located adjacent to the existing raw water reservoirs.

230 acres of land required for Ash Dyke will be procured. Land is available for staff colony, which is to be constructed by the EPC contractor.

4.00.00 SOURCE OF COAL

100% Imported and Blended coal (50% imported + 50% indigenous) will be used. Indigenous coal shall be sourced from Suliyari coal mines, Madhya Pradesh.

5.00.00 SOURCE OF WATER

Source of water (total quantity of water is 2192 m^3/hr) is Godavari River near Burgampahad & water will be pumped through existing GRP pipe line (of length approx. 26 km).

6.00.00 ASH DISPOSAL AREA

Ash shall be dumped in the ash dump area which will be about 9 km from plant. The ash dyke area of 230 acres is adequate for 1x800 MW unit as per MOEF norms.

7.00.00 SALIENT DESIGN DATA

7.01.00 Meteorological data of site is given below:-

Elevation above MSL	:	89 m
Monthly highest temperature	:	44.9 ºC
Monthly lowest temperature.	:	12.9 ºC
Rainfall		
Average.	:	1031 mm
Max.	:	100 mm/ hr
Mean Wind speed	:	44 m/sec
Relative Humidity		
Max	:	82%
Min	:	35%
Seismic Zone	:	Zone-III as per IS- 1893 (Part-IV)

[Climatological data of Khammam is attached for reference].

SECTION-C

SPECIAL TECHNICAL REQUIREMENT

SPECIFIC TECHNICAL REQUIREMENTS

The technical requirements in this section are specific for this project and shall override the specification under Section-D in case of any contradiction.

1.0 Bidder to note that duly filled up Data sheet-B, Quality Plan, Format "Schedule of submission of Drawings / Documents, Equipment Manufacture, Inspection and Dispatch" enclosed in Section-D of Volume IIB, to be signed and stamped and submitted with the bid.

2.0 Bidder Presence is required for 4 days for any site support requirement. All the expenses like boarding, lodging and travel, Air fare etc. shall be in bidder's scope.

3.0 DOCUMENTATION:

(A) **Along with the bids:** No separate documentation required at the time of bids except those specifically listed under Cl. No. 6.0 of Sec-D of Vol-II B.

(B) After the award of contract: 10 sets of the following documents to be enclosed along with the contract documents for approval:

a) Datasheet C completely filled-up.

b) Quality plan duly signed and stamped.

c) All Differential pressure vs Flow graphs.

d) Calculation Sheet.

e) Assembly dimensional drawings.

f) GA Drawing.

(C) Final documentation: The documentation as listed below shall be submitted as a part of final documentation.

1. Approved final drawings/data sheets, – 10 sets with 2 CD-ROMS
2. All Test certificates – 10 sets.
3. Operation & Maintenance Manuals for Ultrasonic flow meter – 10 sets
4. Assembly drawings and QP for approval – 10 sets.
5. "As built" drawings – 10 sets.

4.0 In case during erection/commissioning of the Ultrasonic flow meter, any spares are required which have not been specified in the Start-up/commissioning spares list, the same will have to be supplied by the vendor free of cost.

1.07.00 ULTRASONIC FLOW TRANSMITTER

1.	Type	:	Ultrasonic – Clamp On
2.	Accuracy	:	+/- 1 % of reading
3.	Repeatability	:	+/- 0.3 % of reading
4.	Rangeability	:	400 : 1
5.	Output Signal	:	4-20 mA DC with HART
6.	Measured Parameter	:	Volumetric flow, Totalized flow and flow Velocity
7.	Display	:	LCD with internal Key Pad (Flow rate & Totalization)
8.	Power Supply	:	24 V DC (2 Wire)
9.	Enclosure	:	SS (IP- 68 – Submersible)
10.	Mounting	:	SS Chain or Strap
11.	Accessories		1. Handheld calibrator 2. ½"NPT cable gland 3. Transducer cable 4. All mounting hardware (SS-316) 5. SS Nameplate
12.	Adjustment/Calibration/ /Maintenance	:	From handheld calibrator/ HART management system
13.	Applications	:	Plant water service

Note: ~~Multi-path insertion type (minimum 4 path) Ultrasonic Flow meter shall be provided for Raw water/ Cooling Water flow measurements.~~

2.00.00 **~~HART~~ HART HAND HELD CALIBRATOR**

Hand held calibrators (5 nos. ~~for each type~~) shall be provided for adjustment/ calibration/maintenance of the HART ~~compatible~~

SECTION – D

- **EQUIPMENT SPECIFICATION**
- **DATA SHEETS – A & B**
- **QUALITY PLAN**
- **BILL OF QUANTITY**
- **SPARES**
- **SCHEDULE OF SUBMISSION OF DRAWINGS/**
- **DOCUMENTS, EQPT. MANUFACTURE, INSPECTION**
- **AND DISPATCH**

SECTION-D

EQUIPMENT SPECIFICATION

1.0 SCOPE

This specification covers the Design, Manufacture, Calibration, Inspection and Testing at the manufacturer's works, proper packing for transportation and delivery to site of Ultrasonic Flow Meter for use in Utility/Captive Power Station/Combined Cycle Station.

2.0 CODES AND STANDARDS

2.1 All the equipments specified herein shall comply with the requirements of the latest issue of the relevant National and International standards.

2.2 The Ultrasonic Flow Meters shall be of proven reliability, accuracy and repeatability requiring a minimum of maintenance. The Design and Materials used for the components shall also comply with the relevant National and International standards.

3.0 TECHNICAL REQUIREMENT

The Ultrasonic Flow Meters and the accessories shall be suitable for continuous operation under an ambient temperature of 0-55°C for Transmitter and (-) 20 to 100°C for Transducer and Relative Humidity of 0-95% unless specified otherwise in volume IIB Section-B or Section-C.

All accessories required for mounting/erection of these instruments shall be furnished as necessary for completeness of the system.

3.1 Flow measurement

The Ultrasonic Flow Transmitter shall be based on transit-time flow measurement technique uses a pair of transducers with each transducer sending and receiving coded ultrasonic signals through the fluid. When the fluid is flowing, signal transit-time in the downstream direction is shorter than in the upstream direction; the difference between these transit times is proportional to the flow velocity. The Ultrasonic Flow Transmitter measures this time difference and uses programmed pipe parameters to determine flow rate and direction. Ultrasonic Flow Transmitters are classified as either wetted or non-wetted (clamp-on). Clamp-on transducers are clamped onto the outside of the pipe and never come into contact with the process fluid. Wetted transducers are mounted into the pipe or flow cell in direct contact with the process fluid. Hart Compatibility for the transmitter shall be provided. In case of Intrusion type meter shall be provided with spool piece along with end Flange & counter Flanges (as applicable).

3.2 Accessories:

All mounting hardware like clamping fixtures, mechanism to remove the sensors on line, interconnecting screened cables between Transducer & Transmitter , Cable Glands etc. is required to be supplied. Weather canopy for protection from direct sunlight and direct rain shall also be offered as an option. Material of all fittings shall be SS-316.

4.0 GUARANTEE AND PERFORMANCE

The guarantee of flow measuring assembly shall be 18 months from the date of dispatch or 12 months from commissioning whichever is earlier.

5.0 TEST & INSPECTION

5.1 The bidder shall adopt suitable quality assurance plan to ensure that the equipments offered will meet the specification requirements in full.

5.2 The Quality Plan shall be discussed and finalized with the technically accepted bidders before opening the price bid. The stages where the purchaser would like to be associated for witnessing or verification would be indicated by the purchaser in the Quality Plan before approval.

5.3 Inspection will be conducted by BHEL and/or their authorized representatives as per the agreed inspection schedule. The inspection schedule will be submitted by the bidder for BHEL's approval at contract stage. The cost of all tests and inspections will be deemed to have been included in the bid. For all the type tests "Type Test Certificates" as per agreed Quality Plan shall be furnished. In the absence of the same, such Type Tests shall be arranged at the Vendor's works in the presence of BHEL and/or their authorized representatives or in independent Test House/Laboratory approved by BHEL.

6.0 SPARES AND CONSUMABLES

6.1 Commissioning Spares and consumables

As part of the main equipment supply, the bidder shall supply all commissioning spares and consumables required during Start-up,

6.2 Recommended Spares

The bidder shall furnish a list of Recommended Spares along with the normal service expectancy period and frequency of replacement; quantities recommended for 3 years operation along with unit rate against each item to enable BHEL/BHEL's Customer to place a separate order later, if required.

6.3 Special Tools & Tackles

The bidder shall furnish a list of Special Tools & Tackles included in the bid.

7.0 DRAWINGS & DOCUMENTS

7.1 The offer shall include the following in 4 copies each.

i. Technical data sheet for each flow measuring device assembly in the Pro forma enclosed under Data Sheet-B.
ii. Catalogue/Technical Literature.
iii. Assembly drawing with dimensional details.

7.2 4 copy each of the following along with 2 CDs to be furnished after award of contract for owner approval.

i. Technical Data Sheet-C.
ii. Sizing Calculations.
iii. Assembly drawing with dimensions.
iv. Installation drawing.

8.0 FOR INFORMATION

8.1 Storage and Commissioning Instruction
8.2 O&M are to be supplied as specified.

9.0 PACKING & MARKING

9.1 Each item shall be properly packed with adequate protection against friction, stresses, vibration & shock during transportation. Each packing box shall have marking as per Purchase Order.

9.2 Each assembly shall be identified with the following information.

- Tag No.
- Service.
- Line size & thickness.
- Direction of flow.

10.0 APPLICABLE DATA SHEETS

This document shall be read in conjunction with following data sheets.

1. Data Sheet - A & B : Data sheet no. PES-145-27-DS1-0

PRINCIPLE OF MEASUREMENT

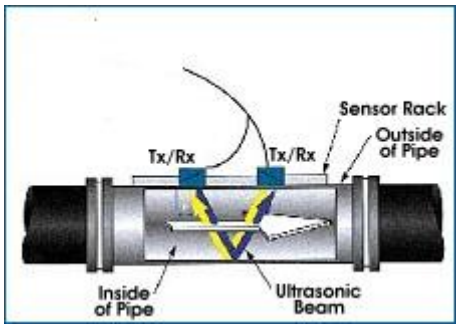

FIG.1

Transit-time flow meters measure the difference in travel time between pulses transmitted in a single path along and against the flow. Two transducers are used, one upstream of the other. Each acts as both a transmitter and receiver for the ultrasonic beam.

TYPICAL INSTALLATION (ASSEMBLY)

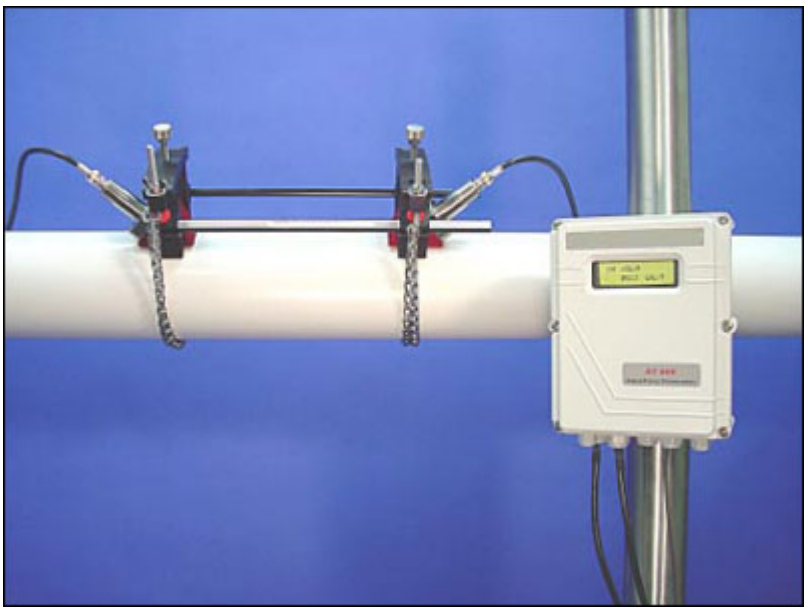

FIG.2

Ultrasonic flow meter suitable for clamp on flow measurement without modifications to pipe work.

SECTION-D

DATA SHEETS - A&B

BHEL	**DATA SHEET FOR UTRASONIC FLOW METER** **1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA**	SPEC NO.: PE-TS-410-145-I916 VOLUME II B SECTION D REV. NO. 00 DATE :05.06.15 SHEET 8 OF 17

Tag No. PAB10BP001 Data Sheet No. PES-145-27-

DATA SHEET – A & B

	DATA SHEET – A (TO BE FILLED BY PURCHASER)		DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL	PROJECT	**4X270 MW BHADRADRI TPS**	.....
	OFFER REFERENCE	Bidder to indicate	.....
	TAG NO. : QUANTITY	PAB10BP001: QTY = 1NO.	.....|.....
	SERVICE :	CW HEADER TO CONDENSER	.....
	MAKE : MODEL	Bidder to indicate	.....|.....
TECHNICAL	TYPE	■ CLAMP-ON (SINGLE PATH) [] INSERTION	.....
	MOUNTING	■ PIPE MOUNTED [] WALL MOUNTED	.....
	FLOW MEASUREMENT	Instantaneous flow rate as well as totalized flow	.....
	OUTPUT	Isolated 4-20 mA DC with HART for volumetric flow and velocity	.....
	ACCURACY	± 1%	.....
	SENSOR HOUSING MATERIAL	SS	.....
	REPEATABILITY	± 0.3% of reading	.....
	RANGEABILITY	400:1	.....
	TURN DOWN RATIO	40:1	.....
	RESPONSE TIME	USER PROGRAMMABLE	.....
	LOAD	600 Ohms(min) at 24 V DC	.....
	BINARY	Contact Relay output for alarm [] YES ■ NO	
	OUTPUT CONTACTS	2 NO & 2 NC POTENTIAL FREE CHANGEOVER CONTACTS @5A 230 V AC FOR EACH SET POINT	.....
	DISPLAY/INDICATION	LCD with Internal keypad (Flow rate of totalization). Flow meter with LCD screen backlight based local display and keypad. If required, Transmitter shall be suitably located away from the sensor for better access and visibility.	.....
	OPERATING VOLTAGE	[] 240V AC(UPS) ■ 24 VDC [] 110 VAC(UPS)	
	TOTALIZING FACILITIES	■ YES [] NO	
	VELOCITY MEASUREMENT	■ YES [] NO	
	FLOW VELOCITY	■ YES [] NO	
	ENCLOSURE	SS (IP-68 – Submersible)	
	MOUNTING	SS Chain or Strap or Welded	
	POWER SUPPLY	■ 24 V DC (2 WIRE) [] SEPARATE POWERED	

	DATA SHEET FOR UTRASONIC FLOW METER 1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA	SPEC NO.: PE-TS-410-145-I916	
		VOLUME II B	
		SECTION D	
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PROCESS DATA	FLUID	CLARIFIED WATER	.....
	RATE OF FLOW (T/HR)	NORMAL : 84210 M^3/HR	.....
		MAXIMUM : 110000 M^3/HR	.....
	UPSTREAM WORKING PRESS (Kg/cm2g)	2.65 KG/CM^2 (G)	.....
	DESIGN PRESS (Kg/cm2g)	5.5 KG/CM^2 (G)	.....
	NORMAL TEMP (Deg C)	33 DEGC	.....
	MAXIMUM TEMP (Deg C)	Bidder to indicate	.....
	PIPE LOCATION	■ UNDERGROUND []OVERGROUND	
PIPE LINE DATA	PIPE SIZE (OD x THK) mm	3840MM X 20MM	.....
	PIPE MATERIAL	CS TO IS 2062 (GR. B)CONFORMING TO IS 3589	.....
	AVAILABLE PIPE STRAIGHT LENGTH	UPSTREAM : 10D	.....
		DOWNSTREAM : 5D	.....

NOTE:- 1) Accessories like ½" NPT cable gland, Transducer cable, All mounting hardware (SS-316), SS nameplate etc. shall be provided.

2) Double compression type nickel plated brass cable gland.

3) Transducer cable min length shall be mentioned as per GA of Pit and location of transmitter.

4) Remote Transmitter:

i) Enclosure Material – Die Cast Aluminium (incase PP offered, suitable metal enclosure/housing shall be provided. Since it is located in the field.

BHEL	**DATA SHEET FOR UTRASONIC FLOW METER** **1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA**	SPEC NO.: PE-TS-410-145-I916 VOLUME II B SECTION D REV. NO. 00 DATE :05.06.15 SHEET 10 OF 17

Tag No. PCB20BP001 Data Sheet No. PES-145-27-DS1-0

DATA SHEET – A & B

	DATA SHEET – A (TO BE FILLED BY PURCHASER)		DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL	PROJECT	**4X270 MW BHADRADRI TPS**	.....
	OFFER REFERENCE	Bidder to indicate	.....
	TAG NO. : QUANTITY	PCB20BP001 : QTY = 1 NO.	.....|.....
	SERVICE :	ACW SUPPLY HEADER	.....
	MAKE : MODEL	Bidder to indicate	.....|.....
TECHNICAL	TYPE	■ CLAMP-ON (SINGLE PATH) [] INSERTION	.....
	MOUNTING	■ PIPE MOUNTED [] WALL MOUNTED	.....
	FLOW MEASUREMENT	Instantaneous flow rate as well as totalized flow	.....
	OUTPUT	Isolated 4-20 mA DC with HART for volumetric flow and velocity	.....
	ACCURACY	± 1%	.....
	SENSOR HOUSING MATERIAL	SS	.....
	REPEATABILITY	± 0.3% of reading	.....
	RANGEABILITY	400:1	.....
	TURN DOWN RATIO	40:1	.....
	RESPONSE TIME	USER PROGRAMMABLE	.....
	LOAD	600 Ohms(min) at 24 V DC	.....
	BINARY	Contact Relay output for alarm [] YES ■ NO	
	OUTPUT CONTACTS	2 NO & 2 NC POTENTIAL FREE CHANGEOVER CONTACTS @5A 230 V AC FOR EACH SET POINT	.....
	DISPLAY/INDICATION	LCD with Internal keypad (Flow rate of totalization). Flow meter with LCD screen backlight based local display and keypad. If required, Transmitter shall be suitably located away from the sensor for better access and visibility.	.....
	OPERATING VOLTAGE	[] 240V AC(UPS) ■ 24 VDC [] 110 VAC(UPS)	
	TOTALIZING FACILITIES	■ YES [] NO	
	VELOCITY MEASUREMENT	■ YES [] NO	
	FLOW VELOCITY	■ YES [] NO	
	ENCLOSURE	SS (IP-68 – Submersible)	
	MOUNTING	SS Chain or Strap or Welded	
	POWER SUPPLY	■ 24 V DC (2 WIRE) [] SEPARATE POWERED	

	DATA SHEET FOR UTRASONIC FLOW METER 1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA	SPEC NO.: PE-TS-410-145-I916	
		VOLUME II B	
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PROCESS DATA	FLUID	CLARIFIED WATER (ANALYSIS ATTACHED)	.....
	RATE OF FLOW (T/HR)	NORMAL : 3420 M^3/HR	.....
		MAXIMUM : 4450 M^3/HR	.....
	UPSTREAM WORKING PRESS (Kg/cm2g)	3.3 KG/CM^2 (G)	.....
	DESIGN PRESS (Kg/cm2g)	7.5 KG/CM^2 (G)	.....
	NORMAL TEMP (Deg C)	33 DEGC	.....
	MAXIMUM TEMP (Deg C)	Bidder to indicate	.....
	PIPE LOCATION	■ UNDERGROUND []OVERGROUND	
PIPE LINE DATA	PIPE SIZE (OD x THK) mm	914MM X 10MM	.....
	PIPE MATERIAL	CS TO IS 2062 (GR. B) CONFORMING TO IS 3589	.....
	AVAILABLE PIPE STRAIGHT LENGTH	UPSTREAM : 10D	.....
		DOWNSTREAM : 5D	.....

NOTE:- 1) Accessories like ½" NPT cable gland, Transducer cable, All mounting hardware (SS-316), SS nameplate etc. shall be provided.

2) Double compression type nickel plated brass cable gland.

3) Transducer cable min length shall be mentioned as per GA of Pit and location of transmitter.

4) Remote Transmitter:

i) Enclosure Material – Die Cast Aluminium (incase PP offered, suitable metal enclosure/housing shall be provided. Since it is located in the field.

SECTION-D

BILL OF QUANTITY

BILL OF QUANTITY

S. No.	KKS	SERVICE/ ITEM DESCRIPTION	QTY
1	PAB10BP001	CW HEADER TO CONDENSER	1
2	PCB20BP001	ACW SUPPLY HEADER	1

SECTION-D

QUALITY PLAN

Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency $			Remarks
									P	W	V	
1	Standard Certificates	Certificate of Compliance, Warranty Certificate,	Major	Visual	As applicable	Technical documents/Approved documents	Technical catalogue/Approved documents	Technical catalogue/ Approved documents	2/3	---	2, 1	
2	Visual Check	Mechanical	Major	Visual	100%	Technical catalogue/Approved documents	Technical catalogue/Approved documents	Technical catalogue/ Approved documents	2/3	1	1	
3	Functional test & power ON	Electrical	Major	Visual	100%	Functional test report for meter & transducer	Approved documents	Technical catalogue/ Approved documents	2/3	-	1	
4	HART Communication	Electrical	Major	---	100%	Technical catalogue/Approved documents	Technical catalogue/Approved documents	Technical catalogue/ Approved documents	-	-	1	

LEGEND:

$
P - Agency Performing the Test.
W - Agency Witnessing the Test.
V - Agency Verifying the Test.

1 - Custmer
2 - Vendor
3 - Sub-vendor

SCHEDULE OF SUBMISSION OF DRAWINGS/ DOCUMENTS, EQPT. MANUFACTURE, INSPECTION AND DISPATCH

	Technical specification for **ULTRASONIC FLOW METER** **1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA**	SPECIFICATION NO**. PE-TS-410-145-I916** VOLUME **II-B** SECTION **D** REV. NO. 00 | DATE: 05/06/2015 SHEET 17 OF 17

SCHEDULE OF SUBMISSION OF DRAWINGS / DOCUMENTS, EQUIPMENT MANUFACTURE INSPECTION AND DESPATCH

1.	**ZERO DATE**	**DATE of LOI / FOI / TOI**
2.	Submission of Data Sheets / documents / catalogues for approval.	2 Weeks from the Zero date.
3.	Technical finalisation, freezing of inputs of manufacture by way of vetting of documents and technical discussions and resubmissions of documents (if required)	6 Weeks from the Zero date.
4.	Inspection of Equipment as per Approved (Category-I) drawings / documents.	18 Weeks from the Zero date.
5.	Release of MDCC by BHEL	19 Weeks from the Zero date.
6.	Dispatch (Packaging & Dispatch)	20 Weeks from the Zero date.
7.	Final documents submission as per Contract	24 Weeks from the Zero date.

NOTE: Delays due to non-fulfillment of the requirements of approved Quality Plan and approved Data sheets, Drawings, Catalogues and Sizing Calculations observed during inspection shall be to the Vendor's account.

Delays due to INCOMPLETE (Partly) submission of Data sheets, Drawings, Catalogues and Sizing Calculations also be considered as **"DOCUMENTS NOT SUBMITTED"**

(Signature and Stamp of the Bidder)

VOLUME-III

COMPLIANCE CERTIFICATE
For

ULTRASONIC FLOWMETER

(To be Signed & Stamped by the Bidder)

Project: **1X800 MW KOTHAGUDEM TPS STAGE-VII, UNIT#12, PALONCHA**

Specification no.: PE-TS-410-145-I916

We shall comply with the following:-

1. All the requirements as stated in Technical Specification / Specific Technical requirement / Data sheets / Drawings, BHEL quality plan etc as enclosed in the tender, shall be fully complied **without any deviation**.

2. BHEL Quality Plan (enclosed with the specification) duly signed and stamped is submitted herewith **without any deviation.**

Signature with date	
Name	
Company seal	

CONTENTS

VOL-III

SCHEDULE OF PRICES

S.NO.	ITEM DESCRIPTION	QTY	UNIT PRICE
[A]	**ULTRASONIC FLOW METER**		

S. No.	KKS NO.	SERVICE/ ITEM DESCRIPTION		
1	PAB10BP001	CW HEADER TO CONDENSER	1	
2	PCB20BP001	ACW SUPPLY HEADER	1	

[B]	**SUPERVISION OF ERECTION & COMMISSIONING**			
S. No.	**KKS NO.**	**SERVICE/ ITEM DESCRIPTION**		**PRICE PER ITEM**
1	PAB10BP001 & PCB20BP001	SUPERVISION OF INSTALLATION (FOR 2 MAN DAYS PER TAG)	1	

PARTICULARS OF THE BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

SCHEDULE OF UNIT PRICES

ULTRASONIC FLOW METER

S. No.	ITEMS	UNIT PRICE
1.	SENSOR	
2.	TRANSMITTER	
3.	CABLE BETWEEN SENSOR TO TRANSMITTER (PER METER)	
4.	SUPERVISION OF INSTALLATION PER MAN DAYS	

PERTICULARS OF THE BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

INSPECTION SCHEDULE

(PLACE & ADDRESS OF TESTING/ INSPECTION AND ITS SCHEDULE DATE & DURATION IN NUMBER OF DAYS ITEM/COMPONENTWISE TO BE LISTED)

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

INSPECTION SCHEDULE

(PLACE & ADDRESS OF TESTING/ INSPECTION AND ITS SCHEDULE DATE & DURATION IN NUMBER OF DAYS ITEM/COMPONENTWISE TO BE LISTED)

PARTICULARS OF THE BIDDER / AUTHORISED REPRESENTATIVE				
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