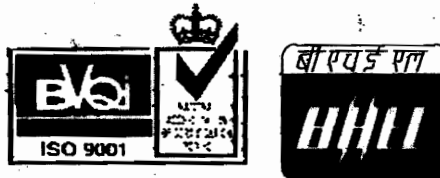


**2 x 600 MW SCCL, ADILABAD - TPP.
1 x 300 MW VISHAKHAPATNAM ABHIJEET TPP.**

VOLUME -III

**TECHNICAL SPECIFICATION
FOR
CONDENSER ON LOAD TUBE CLEANING SYSTEMS (COLTCS)
& DEBRIS FILTER (DF)**

Specification No. : PE-TS- 381/382-165-N001 (REV. 0)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI BLDG., SEC-16A, PLOT NO. 25
NOIDA - 201301 (UP)**



**TITLE : TECHNICAL SPECIFICATION
FOR
CONDENSER ON LOAD TUBE CLEANING
SYSTEMS (COLTCS) & DEBRIS FILTER (DF)
PREAMBLE**

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME : III

REV. NO. 0 DATE :12.04.2012

SHEET 1 OF 2

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 - II 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 standard 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).



**TITLE : TECHNICAL SPECIFICATION
FOR
CONDENSER ON LOAD TUBE CLEANING
SYSTEMS (COLTCS) & DEBRIS FILTER (DF)
PREAMBLE**

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME : III

REV. NO. 0 DATE :12.04.2012

SHEET2 OF 2

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.



**TITLE : TECHNICAL SPECIFICATION
FOR
CONDENSER ON LOAD TUBE CLEANING
SYSTEMS (COLTCS) & DEBRIS FILTER (DF)
PREAMBLE**

SPEC. NO. PE-TS- 381/382-165-N001


VOLUME : III

REV. NO. 0 DATE :12.04.2012

SHEET3 OF 2

INDEX

SECTION	TITLE
A	DETAILS TO BE FURNISHED ALONGWITH BID
A1.	COMPLIANCE CERTIFICATE
A2.	PERFORMANCE GAURANTEE SCHEDULE
A3.	TECHNICAL DEVIATION SCHEDULE
A4.	ELECTRICAL LOAD DATA
A5.	GA DRAWING OF COLTCS/DF
A6.	SCHEDULE OF PRICES
A7.	SCHEDULES OF UNIT PRICES
B	DOCUMENTS TO BE SUBMITTED ON PLACEMENT OF LOI
B1.	DATASHEET - B
B2.	SCHEDULES AS PER LIST.

	TITLE : COMPLIANCE CERTIFICATE FOR COLTCS & DF	SPEC. NO.	PE-TS- 381/382-165-N001
	PROJECTS: 2x 600 MW SCCL -Adilabad TPP 1 x 300 MW Vishakhapatnam Abhijeet TPP	DATE:	12.04.2012
		SHEE	1 OF 2


COMPLIANCE CERTIFICATE

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

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions with regard to same.
- b) There are no other deviations w.r.t. specification other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'
- c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ Customer/Customer's Consultant approval and 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. Charges for 3rd party inspection (TUV/ equivalent) for imported components wherever required shall be included by bidder in the base price itself.
- d) Any drawing/ document/ data-sheet/ calculation/ Quality plan/ Instrumentation etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ Customer/Customer's Consultant approval in the event of order.
- e) The offered materials shall be either equivalent or superior to those specified in the specification. For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.
- f) The commissioning spares including balls shall be supplied on 'As Required Basis' & prices for same included in the base price itself.
Prices for special tools & tackles, if any, shall also be included in the base price.
Recommended spares for 3 years shall be quoted separately with price indicated separately.
- g) Charges for Installation Checks, Commissioning of equipments, Trial runs and Performance Testing at site shall be included by bidder in the base price itself.
- h) All Instruments shall be located in the Instrument Rack to be supplied by bidder.

The instrument rack shall be installed on ball recirculation pump skid for COLTCS and DF for SC with impulse piping, root valves, fittings, accessories, valve manifolds mounted on gauge racks etc. supplied by bidder accordingly.
- i) The main flanges for Ball separator/ DF shall be suitable for the forces and moments as per the specification.
- j) Injection nozzles – 2/4 numbers of stubs of 100 NB or size as informed by bidder shall be provided by BHEL. The injection nozzles, counterflanges for the stubs alongwith nuts, bolts and gaskets shall be supplied by the bidder.
- k) Provision for future installation of Cathodic protection with sacrificial anodes.
- l) Number of balls (Normal as well as abrasive) for COLTCS shall be as specified i.e Number of balls per charge shall be @ 10% of no. of tubes and there shall be 13 charges per year.
- m) The hydrostatic test pressure shall be 1.5 times the design pressure.

(18)

	TITLE : COMPLIANCE CERTIFICATE FOR COLTCS & DF	SPEC. NO.	PE-TS- 381/382-165-N001
	PROJECTS: 2x 600 MW SCCL -Adilabad TPP 1 x 300 MW Vishakhapatnam Abhijeet TPP	DATE:	12.04.2012
		SHEE	2 OF 2

- n) All sub - vendors shall be subject to BHEL/ Customer/Customer's Consultant approval in the event of order.
- o) The Performance guarantees of equipments shall stand valid till the satisfactory completion of performance testing & its acceptance by BHEL/ Customer/Customer's Consultant.
- p) The offered COLTCS/ DF's have been supplied by bidder in the past meeting the customers qualifying criteria of its operation at two sites for minimum period of two years. Any deviation to this criteria shall be suitably highlighted in the deviation schedule.
- q) The orientation of piping around COLTCS and DF shall be finalised during detailed Engg.
- r) Electrical/ C&I :
- All selected motor ratings have minimum 15 % margin over maximum continuous demand of the driven equipment including voltage and frequency variations, temperature rise and other factors.
 - Supply of electrical viz. LT power cables, instrumentation and control cables, cable glands, lugs, cable trays etc. shall be as per specification. Their erection shall be done by BHEL
 - The junction boxes for termination of DPT/ DPS/ Actuator LS/ solenoid valves/ Ball oversize monitor/ Ball recirculating monitor are included in bidders scope. The instrumentation cable and cabling from instruments/ actuators to junction boxes is also included in bidders scope.
 - Valve actuators and controls shall be provided as specified in Data Sheet-A and Project specific requirements as specified in Section C-2 & Section C-3
 - Alarms/ annunciations/ instruments shall be finalised during detailed engineering in the event of order which shall be subject to BHEL/ Customer/Customer's Consultant approval and shall be without any commercial implications to BHEL.

49



**TITLE : SCHEDULE OF PERFORMANCE GUARANTEES
FOR
CONDENSER ON LOAD TUBE CLEANING SYSTEM (COLTCS)**

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME : III

Sheet 1 of 1

S.NO.	DESCRIPTION	UNITS	
1.	Pressure drop across the ball collecting Strainers (i.e. between inlet & outlet nozzle) under clean condition and Normal flow condition	MWC	1 x 300 MW VISHAKHAPATNAM ABHIJEET TPP
2	Percentage of ball recovery	%	2 x 600 MW SCCL- ADILABAD TPP
3	Life of sponge rubber balls	Weeks	

26

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE

NAME

DESIGNATION

SIGNATURE

DATE

COMPANY SEAL



**TITLE : SCHEDULE OF PERFORMANCE GUARANTEES
FOR
DEBRIS FILTER (DF)**

**SPECIFICATION
NUMBER : PE-TS- 381/382-165-N001**

VOLUME : III

Sheet 1 of 1

S.NO.	DESCRIPTION	UNITS	
1.	Pressure drop across the Debris Filter (i.e. between inlet & outlet nozzle) under clean condition and Normal flow condition	MWC	1 x 300 MW Vishakhapatnam Abhijeet TPP

43

PARTICULARS OF BIDDER/ AUTHORISED REPRESENTATIVE


NAME

DESIGNATION

SIGNATURE

DATE

COMPANY SEAL

	TITLE * SCHEDULE OF DEVIATIONS () From Conditions of Contract (Volume - 1) () From General Technical Conditions (Volume - II A) () From Technical Specifications (Volume -II B)	SPEC. NO. PE-TS- 381/382-165-N001
		VOL III
		SHEET..... OF.....

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

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

44



TITLE :

**PRICE SCHEDULE FOR
COLTCS
2 x 600 MW SCCL, ADILABAD - TPP.**

SPEC. NO. PE-TS-
PE-TS- 381/382-165-N001

VOLUME III

SECTION

REV. NO. 0

DATE 12.04.2012

SHEET 1 OF 1

- 1.0 Total price for design, manufacture, assembly, inspection, testing, packing for transportation and delivery, including final check up of installation, commissioning, trial run and PG testing of Eight (8) sets of COLTCS complete in all respect including all accessories & auxiliaries as specified in technical specification and as necessary including mandatory spares (if applicable), commissioning spares of COLTCS including commission balls for 24 months and special tools & tackles (as required) for erection & maintenance. Rs/USD/Euro (As applicable)
- 2.0 **Recommended spares** : Item-wise break up with item-wise price to be given as per "Schedule of Recommended Spares" enclosed under Vol. III of technical specification. Rs/USD/Euro (As applicable)

Note : Indicate all duties, taxes etc. stating whether included/ excluded in above price.



TITLE :

**PRICE SCHEDULE FOR
COLTCS
1 x 300 MW VISHAKHAPATNAM
ABHIJEET TPP**

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME III

SECTION

REV. NO. 0

DATE 12.04.2012

SHEET 1 OF 1

- 1.0 Total price for design, manufacture, assembly, inspection, testing, packing for transportation and delivery, including final check up of installation, commissioning, trial run and PG testing of Two (2) sets of COLTCS complete in all respect including all accessories & auxiliaries as specified in technical specification and as necessary including mandatory spares (if applicable), commissioning spares of COLTCS including commission balls for 24 months and special tools & tackles (as required) for erection & maintenance. Rs/USD/Euro (As applicable)
- 2.0 **Recommended spares** : Item-wise break up with item-wise price to be given as per "Schedule of Recommended Spares" enclosed under Vol. III of technical specification. Rs/USD/Euro (As applicable)

Note : Indicate all duties, taxes etc. stating whether included/ excluded in above price.

(21)



TITLE :
PRICE SCHEDULE FOR
DEBRIS FILTER
1 x 300 MW VISHAKHAPATNAM
ABHIJEET TPP

SPEC. NO. PE-TS- 381/382-165-N001	
VOLUME III	SECTION
REV. NO. 0	DATE 12.04.2012
SHEET 1 OF 1	

1.0 Total price for design, manufacture, assembly, inspection, testing, packing for transportation and delivery, including final check up of installation, commissioning, trial run and PG testing of Four (4) sets of DEBRIS FILTER complete in all respect including all accessories & auxiliaries as specified in technical specification and as necessary including mandatory spares (if applicable), commissioning spares and special tools & tackles (as required) for erection & maintenance. **Rs/USD/Euro (As applicable)**

2.0 **Recommended spares** : Item-wise break up with item-wise price to be given as per "Schedule of Recommended Spares" enclosed under Vol. III of technical specification. **Rs/USD/Euro (As applicable)**

Note : Indicate all duties, taxes etc. stating whether included/ excluded in above price.

40



TITLE :
UNIT PRICE SCHEDULE FOR
COLTCS
2 x 600 MW SCCL, ADILABAD - TPP.

SPEC. NO. PE-TS-381/382-165-N001

VOLUME III	SECTION
REV. NO. 0	DATE 12.04.2012

SHEET 1 OF 1

1.0 Unit Prices :

Unit price for design, manufacture, inspection and testing, packing and delivery of COLTCS for one set complete with all accessories except for clause no. 2 & 3 below. Rs/USD/Euro
(As applicable)

2.0 Lump sum price for 8 sets of COLTCS Rs/USD/Euro
(As applicable)

- Installation checks, Commissioning
- PG test

3.0 Mandatory Spares (If Applicable) Rs./USD/Euro
(If Applicable)

- Lump sum price (If Applicable)

Note :

- a) Total price based on unit prices as given above shall tally with the total price given in "Schedule of prices" elsewhere. In case of discrepancy the lowest of the two shall be considered for order. Bidder to note that the price mentioned in the "Schedule of prices" and "Schedule of unit prices" shall be binding for evaluation purpose.
- b) Unit prices quoted by the bidder, as above, shall be binding for any quantity variation which is at discretion of Purchaser.

(89)



TITLE :
UNIT PRICE SCHEDULE FOR
COLTCS
1 x 300 MW VISHAKHAPATNAM
ABHIJEET TPP

SPEC. NO. PE-TS-381/382-165-N001

VOLUME III	SECTION
REV. NO. 0	DATE 12.04.2012

SHEET 1 OF 1

1.0 Unit Prices :

Unit price for design, manufacture, inspection and testing, packing and delivery of COLTCS for one set complete with all accessories except for clause no. 2 & 3 below. Rs./USD/Euro (As applicable)

2.0 Lump sum price for 2 sets of COLTCS

Rs./USD/Euro (As applicable)

- Installation checks, Commissioning
- PG test

3.0 Mandatory Spares (If Applicable)

Rs./USD/Euro (If Applicable)

- Lump sum price (If Applicable)

Note :

- Total price based on unit prices as given above shall tally with the total price given in "Schedule of prices" elsewhere. In case of discrepancy the lowest of the two shall be considered for order. Bidder to note that the price mentioned in the "Schedule of prices" and "Schedule of unit prices" shall be binding for evaluation purpose.
- Unit prices quoted by the bidder, as above, shall be binding for any quantity variation which is at discretion of Purchaser.



TITLE :
UNIT PRICE SCHEDULE FOR
DEBRIS FILTER
1 x 300 MW VISHAKHAPATNAM
ABHIJEET TPP

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME III

SECTION

REV. NO. 0

DATE 12.04.2012

SHEET 1 OF 1

1.0 Unit Prices :

Unit price for design, manufacture, inspection and testing, packing and delivery of Debris Filter for one set complete with all accessories except for clause no. 2 & 3 below. **Rs/USD/Euro (As applicable)**

2.0 Lump sum price for 4 sets of Debris Filter

- Installation checks, Commissioning

Rs/USD/Euro (As applicable)

- PG test

Rs/USD/Euro (As applicable)

3.0 Mandatory Spares (If Applicable)

Rs./USD/Euro (If Applicable)

- Lump sum price (If Applicable)

Note :

- Total price based on unit prices as given above shall tally with the total price given in "Schedule of prices" elsewhere. In case of discrepancy the lowest of the two shall be considered for order. Bidder to note that the price mentioned in the "Schedule of prices" and "Schedule of unit prices "shall be binding for evaluation purpose.
- Unit prices quoted by the bidder, as above, shall be binding for any quantity variation which is at discretion of Purchaser.



TITLE :
**TECHNICAL SPECIFICATION FOR
COLTCS AND DF**

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME III

SECTION

REV. NO. 0

DATE 12.04.2012

SHEET 1 OF 1

SECTION B

SHALL BE FURNISHED IN EVENT OF ORDER

- **DATASHEET B**
- **LIST OF SCHEDULES**

36



TITLE :
TECHNICAL SPECIFICATION FOR
COLTCS AND DF

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME III

SECTION

REV. NO. 0

DATE 12.04.2012

SHEET 1 OF 1

SECTION B1
DATASHEET B



Title
DATA SHEET - B
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO.
PE-TS-999-165-N001

VOLUME	III	PART	A
SHEET	I	OF	13

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D; Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT
1.0	General :	
1.1	Number of Tube Cleaning System sets being supplied.	Nos.
1.2	Type	
1.3	Liquid handled	
1.4	Manufacturer	
1.5	Country of origin	
2.0	Design :	
2.1	Design Pressure	Bar (g)
	a) Ball Separator	
	b) Ball Recirculating Pump	
	c) Ball Collector	
	d) Piping	
	e) Valves	
	f) Distributors	
	g) Injection Nozzles	
2.2	Design Temperature	°C
2.3	Operating pressure at condenser inlet	Bar (g)
2.4	Design differential pressure	Bar (g)
2.5	Flow rate through ball separator	M ³ /hr
	a) Normal	
	b) Maximum allowable	
2.6	Flow rate through ball collector	M ³ /hr
	a) Normal	
	b) Maximum allowable	

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					
Date					



Title **DATA SHEET - B**
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
 (SPONGE RUBBER BALL TYPE)

SPECIFICATION NO. **PE-TS-999-165-N001**
 VOLUME III PART A
 SHEET 2 OF 13

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - IIB.
 2. Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO. PARTICULARS	ITEM	UNIT
3.0	Guaranteed Performance	
3.1	Whether condenser back pressure/ overall heat transfer coefficient is guaranteed that it will be permanently maintained as long as the tube cleaning system is in operation.	YES/NO
3.2	Pressure drop across the ball separator (i.e., between inlet and outlet connections): a) Normal flow condition b) Maximum allowable flow condition	
3.3	Power consumption by ball recirculating pump during: a) Normal operation b) Ball collection operation c) Ball sorting operation	KW
3.4	Quantity of cleaning balls required per set for an operating period of one year	Nos.
4.0	Operation: Whether tube cleaning system is designed for the following operation modes:	
4.1	Automatic start-up initiated by push button.	YES/NO
4.2	Automatic shut-down with ball collection effected by: a) Push button b) Adjustable timer Ball monitoring system	YES/NO YES/NO YES/NO

Name of Bidder/ Vendor _____

Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					



Title
DATA SHEET - B
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO.
PE-TS-999-165-N001

VOLUME	III	PART	A
SHEET	3	OF	13

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PES-179-01. Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	PARTICULARS	ITEM	UNIT
4.3	Automatic backwashing of ball separator with ball collection effected by :		
	a) Differential pressure measuring system		YES/ NO
	b) Adjustable timer		YES/ NO
	c) Push button		YES/ NO
4.4	Automatic emergency backwashing of ball separator effected by differential pressure measuring system.		YES/ NO
4.5	Automatic flushing of differential pressure measuring system.		YES/ NO
4.6	Automatic ball sorting initiated by push button.		YES/ NO
4.7	Whether provision for manual operation of the complete tube cleaning system is made in case of control system failure.		YES/ NO
5.0	Ball Separator :		
5.1	Make		
5.2	Nos. provided per set	Nos.	
5.3	Code/ Standard		
5.4	Body outer diameter	mm	
5.5	Body thickness	mm	
5.6	Manhole type & size	mm	
5.7	Whether sight glass is provided		
5.8	No. of screens/ strainers provided per each ball separator	Nos.	
5.9	Type of arrangement provided to prevent lodging of the debris at the entrance of ball extraction pipes.		

Name of Bidder/ Vendor _____

Revision Number	0	1	2	3
-----------------	---	---	---	---

Signature of Bidder/ Vendor authorised Representative _____

Date _____

-28-

21

32



Title DATA SHEET - B
**CONDENSER ON LOAD TUBE
 CLEANING SYSTEM**
 (SPONGE RUBBER BALL TYPE)

SPECIFICATION NO. PE-TS-999-165-N001

VOLUME III **PART** A
SHEET 4 **OF** 13

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - III.
 2. Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO. PARTICULARS	ITEM	UNIT
5.10	Clearance between screen/ strainer bars.	mm
5.11	Materials : a) Body/ Housing b) screen/ Strainer section c) Screen/ Strainer shaft d) Hardware for fixing the screen/ Strainer e) Other internal hardware f) External hardware	
5.12.	Lining material (if applicable)	
6.0	Ball Recirculating Pump :	
6.1	Make	
6.2	Nos. provided per set	Mos.
6.2	Design discharge flow	M ³ /hr
6.4	Design discharge pressure.	Bar
6.5	Design pump Speed	RPM
6.6	Design pump efficiency	%
6.7	Seal for the pump	
6.8	Materials : a) Casing b) Impeller c) Shaft	
7.0	Ball Collector :	
7.1	Nos. provided per set	Nos.

Name of Bidder/ Vendor

Revision Number	0	1	2	3
Signature of Bidder/ Vendor Authorised Representative				

(31)



Title **DATA SHEET - B**
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO. **PE-TS-999-165-N001**

VOLUME	III	PART	A
SHEET	5	OF	13

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - IIB
 2. Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO. PARTICULARS	ITEM	UNIT
7.2	Code/ Standard	
7.3	Whether inspection window/ sight glass is provided.	YES/ NO
7.4	Materials : a) Shell/ Body b) Internals	
7.5	Lining material (if applicable)	
7.6	Whether provision for separating and collecting the undersized balls, is made	YES/ NO.
8.0	Differential Pressure Measuring System:	
8.1	Differential Pressure Switch/ Transmitter a) Type b) Make and Model c) Range d) Accuracy e) Material of sensing element f) No. of contacts g) Contact rating h) Enclosure i) Mounting	Nos.
8.2	Whether differential Pressure gauge is provided for manual observation.	
8.3	Differential Pressure Gauge : a) Type b) Make and Model c) Range	

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					

24

23

30



Title **DATA SHEET - B**
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
 (SPONGE RUBBER BALL TYPE)

SPECIFICATION NO. **PE-TS-999-165-N001**
 VOLUME III PART A
 SHEET 6 OF 13

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D. Volume - IIB.
 2. Items which deviate from Specification shall be marked with an asterisk (*)

SL NO.	PARTICULARS	ITEM	UNIT
	d) Accuracy		
	e) Material of sensing element		
	f) No. of contacts	Nos.	
	g) Dial size	mm	
	h) Enclosure		
	i) Mounting		
8.4	Whether the contacts for differential pressure gauge and switch/ transmitter are independent.		YES/ NO
9.0	Timer for Backwashing		
9.1	Timer make		
9.2	Range of duration setting		
9.3	Range of frequency		
10.0	Ball Monitoring System :		
10.1	Type		
10.2	Maake & Model		
10.3	Whether ball monitoring system is designed to perform the following functions :		YES/ NO
	a) Continuously counting the balls in circulation and giving an alarm calling for investigation of ball losses, when the number of circulating balls falls below a set value		
	b) Continuously measuring the size of the balls in circulation and initiating the shut-down of the tube cleaning system with alarm calling for replacement of balls, when the number of oversized balls falls below a set value.		

Name of Bidder/ Vendor _____

Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					
Date					

29



Title
DATA SHEET - B
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO.
PE-TS-999-165-N001

VOLUME	III	PART	A
SHEET	7	OF	13

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT
PARTICULARS		
10.4	Whether electronic processor of the ball monitoring system is provided with the following a) Indicators for <ul style="list-style-type: none"> ◆ Required basic ball charge ◆ Recirculating Ball quantity ◆ Oversized ball quantity b) Time counters for <ul style="list-style-type: none"> ◆ Total cleaning system operating hours ◆ Cleaning system operating hours with sufficient number of oversized balls c) Recorder for ball consumption	YES/ NO YES/ NO YES/ NO YES/ NO YES/ NO YES/ NO
10.5	Whether provision for Self-testing and Self Calibration are made	YES/NO
11.0	Cleaning Balls :	
11.1	Type	
11.2	Size	mm
11.3	Specific gravity	
11.4	Material	
11.5	Hardness	
11.6	Total Ball recirculation quantity per set	Nos.
11.7	abrasive coated ball recirculation quantity per set - (if any)	No.s
12.0	Piping :	
12.1	Ball Extraction Piping	

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					



Title **DATA SHEET - B**
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
 (SPONGE RUBBER BALL TYPE)

SPECIFICATION NO. **PE-TS-993-165-N001**

VOLUME III PART A
 SHEET 8 OF 13

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO. PARTICULARS	ITEM	UNIT
12.2	Ball Transport Piping a) OD x thickness b) Material c) Length of piping being supplied	mm x mm M
12.3	Differential pressure measuring system flushing piping. a) OD x thickness b) Material c) Length of piping being supplied	mm x mm M
2.4	Any other	
3.0	Valves (Indicate Type of Valves)	
3.1	Sizes	: mm
3.2	Nos. provided per set	Nos.
3.3	Materials a) Body b) Disc/ Trim c) Shaft	
3.0	Distributors	
3.1	Nos. provided per set	Nos.
3.2	Materials : a) Body b) Sight glass c) Sight glass flanges d) Internal parts	

Name of Bidder/ Vendor					
Division Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorized Representative					
Date					



Title
DATA SHEET - B
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO.
PE-TS-999-165-N001

VOLUME III PART A
SHEET 9 OF 13

INSTRUCTION TO BIDDER

1. This data sheet shall be read in conjunction with Specification No. PES-179-0) Section - D, Volume - IIB.

2. Items which deviate from Specification shall be marked with an asterisk (*)

SL. NO.	ITEM	UNIT
14.3	Lining material (if applicable)	
15.0	Injection Nozzles :	
15.1	Nos. provided per each CW inlet pipe	Nos.
15.2	Size of the stubs to be provided in CW inlet pipe for installing the injection nozzles.	mm
15.3	Material	
15.4	Lining material (if applicable)	
16.0	Actuators :	
16.1	Actuators for ball separator :	
	a) Nos. provided per ball separator	No.s
	b) Type & make	
	c) Motor rating	KW
16.2	Actuators for ball collector	
	a) Nos. provided per ball collector.	No.s
	b) Type & make	
	c) Motor rating	KW
16.3	Actuators for Valves:	
	a) Nos. provided per set	No.s
	b) Type & motor	
	c) Motor rating	KW
16.4	Any other.	

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					
Date					

96



Title
DATA SHEET - B
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO.
PE-TS-999-165-N001

VOLUME	III	PART	A
SHEET	10	OF	13


INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PES-179-0: Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL. NO.	PARTICULARS	ITEM	UNIT
17.0	Electric Drive Motors		
17.1	Drive motor for recirculating pump :		
	a) Type and make		
	b) Rating	KW	
17.2	Drive motor for differential pressure measuring system flushing pump (if applicable)		
	a) Type and make		
	b) Rating	KW	
17.3	Any other.		
18.0	Control Panel		
18.1	Type		
18.2	Model & Manufacturer		
18.3	Operating Voltage/ frequency	V/ Hz	
18.4	Control Voltage/ frequency	V/ Hz	
18.5	Materials of housing and door		
18.6	Protections/ interlocks provided for :		
18.7	Class of Protection		
18.8	Control Hardware		
18.8	Alarms/ Annunciations provided for :		
18.9	Indicators provided for :		
18.10	Whether interconnecting control and power cabling between the control panel and various drive is included in the offer.		
19.0	Pressure gauges :		
19.1	Manufacturer & Type, Model		

Name of Bidder/ Vendor				
Revision Number	0	1	2	3
Signature of Bidder/ Vendor Authorized Representative				
Date				

25

	Title DATA SHEET - B CONDENSER ON LOAD TUBE CLEANING SYSTEM (SPONGE RUBBER BALL TYPE)	SPECIFICATION NO. PE-TS-999-165-N001	
		VOLUME II	PART A
		SHEET 11	OF 13

INSTRUCTION TO BIDDER

1. This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - IIB.

2. Items which deviate from Specification shall be marked with an asterisk (*)

SLNO.	PARTICULARS	ITEM	UNIT
19.2	Nos. provided per set	Nos.	
19.3	Location		
19.4	Dial size	mm	
19.5	Range & Accuracy		
19.6	Materials of construction :		
	a) Sensing element		
	b) Movement		
	c) Casing		
19.7	Enclosure		
19.8	Mounting		
20.0	Counter Flanges :		
20.1	Whether counter flanges complete with gaskets, bolts and nuts etc. for all terminal points are included in the offer.		YES/ NO
20.2	Type		
20.3	Rating		
20.4	Materials		
	a) Flanges		
	b) Bolts and Nuts		
	c) Gaskets		
20.5	Code/ Standard		
21.0	Whether lifting arrangement is provided for various equipments.		YES/ NO.
22.0	Whether ball recirculating pump, ball collector with interconnecting piping and valves are mounted on a single frame.		YES/ NO
23.0	Whether supports (wherever necessary) complete with foundation plates, bolts, nuts, inserts etc. are included in the offer.		YES/ NO

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					
Date					

(21)



Title
DATA SHEET - B
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO.
PE-TS-999-165-N001

VOLUME	III	PART	A
SHEET	12	OF	13

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No PES-179-01 Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	PARTICULARS	ITEM	UNIT
24.0	Shop Inspection and Tests		
24.1	Whether all the tests and inspections as detailed in the specification/ quality plan are carried out.		YES/NO
24.2	Hydrostatic Test :		
	a) Test Pressure	Bar (g)	
	<ul style="list-style-type: none"> ◆ Ball Separator ◆ Recirculating Pump ◆ Ball Collector ◆ Distributors ◆ Injection nozzles ◆ Piping & Valves 		
	a) Test duration	Minutes	
24.3	Leakage Test :		
	a) Test Pressure	Bar (g)	
	b) Test duration	Minutes	
25.0	Painting :		
25.1	External Surfaces :		
	a) Surface Preparation		
	b) Primer		
	a) Finish		
25.2	Internal Surfaces :		
	a) Surface Preparation		
	b) Primer		
	a) Finish		
26.0	Weights :		
26.1	Empty Weight		Kg.
	a) Ball Separator		

Name of Bidder/ Vendor _____

Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					

-31-

30

(23)

23



Title **DATA SHEET - B**
CONDENSER ON LOAD TUBE
CLEANING SYSTEM
(SPONGE RUBBER BALL TYPE)

SPECIFICATION NO. **PE-TS-999-165-N001**


VOLUME III PART A
 SHEET 13 OF 13

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PES-179-01 Section - D, Volume - IIB.
 2. Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM PARTICULARS	UNIT
26.2	b) Recirculating pump c) Ball collector d) recirculating unit Operating weight	kg
26.3	a) Ball Separator b) Recirculating pump c) Ball collector d) recirculating unit Weight of the heaviest equipment/ assembly to be handled.	kg.
27.0	Overall Dimensions	
27.1	Ball Separator	
27.2	Recirculating Unit	
28.0	Other information (if any)	
G:\MSEVASH\IDS-COTCS.RTF		

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					

(22)


	Title DATA SHEET - B DEBRIS FILTER (BACKWASH TYPE)	PECIFICATION NO. PE-TS-999-165-N003
		VOLUME III PART A
		SHEET I OF 9

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT	PARTICULARS
1.0	General :		
1.1	Number of Debris Filter being supplied:	Nos.	
1.2	Type & Model (on-line/off-line)		
1.3	Manufacturer		
1.4	Country of origin		
1.5	Capacity, each	M ³ /hr	
1.6	Size		
	a) Inlet connection	mm	
	b) Outlet connection	mm	
1.7	Liquid to be filtered		
2.0	Design :		
2.1	Design Pressure	Bar (g)	
2.2	Design Temperature	°C	
2.3	Flow rate through the Filter :	M ³ /hr	
	a) Normal		
	b) Maximum allowable		
	c) Minimum		
2.4	Design differential pressure for filter section/ screen	bar (g)	
3.0	Guaranteed Performance		
3.1	Pressure drop across the Filter (i.e., between inlet and outlet connections) at normal flow rate.	Bar	
	a) Clean condition		
	b) 50% choked condition		
	c) During flushing operation		
	d) After flushing operation		
3.2	Debris discharge flow during flushing operation.	M ³ /hr	
3.3	Flushing period	Minutes	

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					
Date					

	Title	DATA SHEET - B DEBRIS FILTER (BACKWASH TYPE)	PECIFICATION NO.	PE-TS-999-165-N003
			VOLUME	III
			PART	A
			SHEET	2 OF 9


INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
2. Items which derive from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT	PARTICULARS
3.4	Minimum pressure differential to cause flushing/ backwashing		
3.5	Maximum size of Particle/ debris which can be safely handled by the filter.		
3.6	Power consumption during flushing	KW	
	a) Flushing Valves(s) b) Debris Discharge Valve c) Debris Extractor d) Water Injector Pump (if any) e) Any other f) Total		
4.0	Operation :		
4.1	Whether automatic flushing/ backwashing operation effected by the following		
	a) Differential pressure		YES/NO
	b) Adjustable timer		YES/NO
	c) Push button		YES/NO
	d) Any other		YES/NO
4.2	Whether provision for manual flushing / backwashing operation is made in the event of control system failure.		YES/NO
5.0	Filter Housing Body :		
5.1	Code/ Standard		
5.2	Outer diameter	mm	
5.3	Thickness	mm	
5.4	Materials		
	Housing/ Body		
	Internal Hardware		

Name of Bidder/ Vendor				
Revision Number	0	1	2	3
Signature of Bidder/ Vendor Authorised Representative				

-24-
33

(20)

	Title DATA SHEET - B DEBRIS FILTER (BACKWASH TYPE)	PECIFICATION NO. PE-TS-999-165-N003	
		VOLUME III	PART A
		SHEET 3 OF	9

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
 2. Items not specified in the Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT	PARTICULARS
	External hardware		
5.5	Lining materail (if applicable) and thickness		
5.6	Inspection Hole :		
	a) Type		
	b) Size	mm	
5.7	Whether sight glass is provided		YES/ NO
6.0	Filter Section/ Screen Assembly :		
6.1	Perforation/ mesh size	mm	
6.2	Free filter surface area	m ²	
6.2	Total surface area	M ²	
6.4	Thickness	mm	
6.5	Materials :		
	a) Filter section/ scree		
	b) Supporting cage		
	c) Hardware for fixing the filter section/ screen		
7.0	Flushing/ Backwashing Unit :		
7.1	Type		
7.2	Flushing Valves (if applicable)		
	a) Nos. provided	Nos.	
	b) Type		
	c) Materials		
	• Body		
	• Disc/ Flap		
	• Shaft		
	d) Tag Number		

Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					

35

34

19

27



Title **DATA SHEET - B
DEBRIS FILTER
(BACKWASH TYPE)**

PECIFICATION NO. **PE-TS-999-165-N003**
VOLUME **III** PART **A**
SHEET **4** OF **9**

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
2. Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT	PARTICULARS
7.3	Debris Extractor (if applicable) a) Type b) Materials		
7.4	Debris discharge/ backwash outlet valves a) Type b) Size c) Materials • Body • Disc/ Trim • Shaft d) Tag Number	mm	
7.5	Size of Debris discharge/ backwash outlet valves is greater than pipe line size		YES/NO
7.6	Any water injection is required		YES/NO
7.7	Whether Pump, valves and piping for water injection is included in the offer.		YES/NO.
7.8	Debris discharge/ backwash outlet pipe a) Material b) O.D. and thickness	mm	
8.0	Differential Pressure Measuring System:		
8.1	Differential Pressure Switch/ Transmitter a) Type b) Make and Model c) Range d) Accuracy		

Name of Bidder/ Vendor _____

Revision Number

0	1	2	3	4
---	---	---	---	---

Signature of Bidder/ Vendor Authorised Representative _____

Date _____

-36-

35

10



Title DATA SHEET - B
DEBRIS FILTER
(BACKWASH TYPE)

PECIFICATION NO. PE-TS-999-165-N003
VOLUME III **PART** A
SHEET 5 OF 9

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
2. Items which are optional shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT	PARTICULARS
	c) Material of sensing element		
	f) No. of contacts	Nos.	
	g) Contact rating		
	h) Enclosure		
	i) Type of Mounting		
8.2	Whether differential Pressure gauge is provided for manual observation.		YES/NO
8.3	Differential Pressure Gauge :		
	a) Type		
	b) Make and Model		
	c) Range		
	d) Accuracy		
	e) Material of sensing element		
	f) No. of contacts	Nos.	
	g) Dial size	mm	
	h) Enclosure		
	i) Mounting		
8.4	Whether built in flushing arrangement complete with flushing pump, valves, and associated piping, is provided.		YES/NO
8.5	Whether remote seal type D.P. Transmitter		YES/NO
9.0	Timer for Flushing Operation		
9.1	Timer make		
9.2	Range of duration setting		
10.0	Actuators :		
10.1	Actuators for flushing valves :		

Name of Bidder/ Vendor _____
 Revision Number 0 1 2 3 4
 Signature of Bidder/ Vendor _____
 Authorised Representative _____

-34-

12



Title **DATA SHEET - B
DEBRIS FILTER
(BACKWASH TYPE)**

PECIFICATION NO. **PE-TS-999-165-N003**
VOLUME **III** PART **A**
SHEET **6** OF **9**

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
2. Items which deviate from Specification shall be marked with an asterisk (*)

SL.NO.	ITEM	UNIT	PARTICULARS
10.2	a) Type and make b) Nos. provided c) Motor rating Actuators for debris discharge/ backwash outlet valves	KW	
10.3	a) Type and make b) Motor rating Actuator for Debris Extractor	KW	
10.4	Type & make Nos. provided Motor rating Any other		
11.0	Electric Drive Motors		
11.1	Drive motor for water injection pump (if applicable) a) Type and make b) Rating	KW	
11.2	Drive motor for debris extractor a) Type and make b) Rating	KW	
11.3	Drive motor for differential pressure measure, measuring system flushing pump (if applicable). a) Type and make b) Motor rating	KW	

Name of Bidder/ Vendor _____

Revision Number 0 1 2 3 4


Signature of Bidder/ Vendor _____
Authorised Representative

Date _____

38

37

1.6

	Title DATA SHEET - B DEBRIS FILTER (BACKWASH TYPE)	PECIFICATION NO PE-TS-999-165-N003	
		VOLUME III	PART A
		SHEET 7 OF	9

INSTRUCTION TO BIDDER

1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D. Volume - IIB.

2. Items which deviate from Specification shall be marked with an asterisk (*)

SL. NO.	ITEM	UNIT	PARTICULARS
11.4	Any other		
12.0	Counter Flanges for inlet & outlet :		
12.1	Nos. provided	Nos.	YES/NO
12.2	Type		
12.3	Size		
12.4	Rating		
12.5	Materials		
	a) Flanges		
	b) Bolts and Nuts		
	c) Gaskets		
12.6.	Code/ Standard		
12.7	Counter flanges for all other terminal points are provided.		YES/NO
13.0	Control Panel		
13.1	Type		
18.2	Model & Manufacturer.		
13.3	Operating Voltage/ frequency	V/ Hz	
13.4	Control Voltage/ frequency	V/ Hz	
13.5	Materials of housing and door		
13.6	Protections/ interlocks provided for :		
13.7	Alarms/ Annunciations provided for :		
13.8	Indicators provided for :		

Name of Bidder/ Vendor				
Revision Number	0	1	2	3
Signature of Bidder/ Vendor				
Authorised Representative				
Date :				

39

38

15

31



Title DATA SHEET - B
DEBRIS FILTER
(BACKWASH TYPE)

PECIFICATION NO. PE-TS-999-165-N003

VOLUME III **PART A**

SHEET 8 OF 9

INSTRUCTION TO BIDDER 1. This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
2. Items which deviate from Specification shall be indicated in the offer.

SL.NO.	ITEM	UNIT	PARTICULARS
13.9	Whether counter to register number of flushing operations; is provided.		YES/ NO
13.10	Whether interconnecting control and power cabling between the control panel and filter is included in the offer.		YES/ NO
14.0	Whether lifting lugs are provided.		YES/ NO.
15.0	Whether supports complete with foundation plates, bolts, nuts, etc. are included in the offer (wherever required).		YES/ NO
16.0	Shop Inspection and Tests		
16.1	Whether all the tests and inspections as detailed in the specification/ quality plan are carried out.		YES/ NO
16.2	Hydrostatic Test :		
	a) Test Pressure	Bar (g)	
	b) Test duration	Minutes	
17.0	Painting :		
17.1	External Surfaces :		
	a) Surface Preparation		
	b) Primer		
	c) Finish		
17.2	Internal Surfaces :		
	a) Surface Preparation		
	b) Primer		
	c) Finish		
18.0	Weights :		


Name of Bidder/ Vendor					
Revision Number	0	1	2	3	4
Signature of Bidder/ Vendor Authorised Representative					

-40-

39

(14)

32

	Title DATA SHEET - B DEBRIS FILTER (BACKWASH TYPE)	SPECIFICATION NO. PE-TS-999-165-N003	
		VOLUME III	PART A
		SHEET 9 OF 9	

INSTRUCTION TO BIDDER

- This data sheet shall be read in conjunction with Specification No. PE-TS-999-165-N003 Section - D, Volume - IIB.
- Items which deviate from Specification shall be marked with an asterisk (*)

SL. NO.	ITEM	UNIT	PARTICULARS
18.1	Empty Weight	Kg.	
18.2	Operating	kg	
19.0	Overall Dimensions		
	a) Debris Filter		
	b) Flushing skid		
	c) D.P. measuring system skid		
20.0	Weight of heaviest unit/ component to be handled.		
21.0	Space required for removal.		
22.0	Headroom required during installation at site.		
23.0	Other information (if any)		
	G:\MSEASHDS-DF.RTF		

Name of Bidder/ Vendor				
Revision Number	0	1	2	3
Signature of Bidder/ Vendor Authorized Representative				
Date				



TITLE :
**TECHNICAL SPECIFICATION FOR
COLTCS AND DF**

SPEC. NO. PE-TS- 381/382-165-N001

VOLUME III

SECTION

REV. NO. 0

DATE 12.04.2012

SHEET 1 OF 1

SECTION B2

LIST OF SCHEDULES


12

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 Occurrence 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 Occurrence 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-6057	Schedule of Daily & Overtime Rates.	
23.	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.

FORM NO PEM 6024-1


	SCHEDULE OF DRAWINGS/CATALOGUES SUBMITTED WITH BID	SPECIFICATION NO: VOL III SHEET..... OF.....
---	---	--

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

(10)

	SCHEDULE OF EQUIPMENT, MANUFACTURE, DESPATCH AND SHIPMENT TO SITE			SPECIFICATION NO:	
				VOL III	
				SHEET..... OF.....	
Equipment/Major Bought-out items	Time for Manufacture/ Procurement from Date of issues of Letter of intent (Weeks)	Time for Test Dismantling Packing & Ready for Despatch (Weeks)	Time required fro Shipment to Site (Weeks)	Total Time from Date of Issue of Letter of intent to Shipment to Site (Weeks)	
<p>We, the undersigned hereby undertake to meet the schedule in weeks fro manufacture, dispatch and shipment of each equipment and procurement of major boughtout items as listed above.</p>					


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

	<h3>SCHEDULE OF WEIGHTS & DIMENSIONS</h3>	SPECIFICATION NO: VOL III SHEET OF
---	---	--

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

Description of Package(S)	Dimension (in meters)	Weight (in tones)

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

	<h2 style="margin: 0;">INSPECTION SCHEDULE</h2>		SPECIFICATION NO	
			VOL III	
			SHEET..... OF.....	
S No.	ITEM/COMPONENT	PLACE & ADDRESS OF TEST / INSPECTION	SCHEDULE D DATE OF INSPECTION	DURATION OF TEST / INSPECTION (IN DAYS)
<p>This schedule shall be in the line with specification and quality plan requirements. The information in this form shall be furnished after receipt of LOI/PO.</p>				

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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000

FORM NO. 101-1-1964

	SCHEDULE OF BIDDER'S MAN POWER FOR SUPERVISION OF E & C AND THEIR CHARGES	SPECIFICATION NO. PE-126-178-N003 VOLUME III SHEET NO. 48
--	--	---

Indicate below, designation-wise, the personnel required for supervision and their charges.

SUPERVISION OF ERECTION		
Designation	Normal rate per day of 8 hours	Overtime rate per hour

SUPERVISION OF COMMISSIONING			
Sl. No.	Designation	Normal rate per day of 8 hours	Overtime rate per hour

PARTICULARS OF BIDDER (AUTHORIZED REPRESENTATIVE)			
NAME	DESIGNATION	SIGNATURE	COMPANY NAME

24

6

	TITLE	SPECIFICATION NO
	* SCHEDULE OF PRICE FOR ERECTION AND MAINTENANCE TOOLS & TACKLES	VOL III
		SHEET..... OF.....

***Unpriced schedule shall also be furnished along with Part A- Schedule in technical bid**
 The bidder shall be given below the list of erection and maintenance tools and tackles as offered by him. This shall also include the customer's list of maintenance tools. If specified in Section - C / Section - D

S. No	DESCRIPTION OF TOOLS & TACKLES	QUANTITY OFFERED	UNIT PRICE (Rs.)	TOTAL PRICE (Rs.)

NOTE : The hire charges for vendors equipment called for in this schedule shall include the cost of consumables, operation services, descriptions, wear and tear as well as vendor's over head and profit (These rates will be payable by customer to the vendor, only if the customer's requires the use of this equipment for carrying out his own work out side the scope of this contract).

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

	*SCHEDULE OF PRICES FOR COMMISSIONING AND MANDATORY SPARES	SPECIFICATION NO VOL III SHEET..... OF.....
---	---	---

***Unpriced schedule shall also be furnished along with Part A- Schedule in technical bid**
 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 Recommended	If Set, Nos. Per Set	Delivery Period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
Erection & Commissioning									
Mandatory Spares									
Additional Spares Mandatory Erection / Commissioning									

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



QUALITY PLAN		CUSTOMER		PROJECT TITLE		SPECIFICATION NUMBER				
		BIDDER/VENDOR	SYSTEM	QUALITY PLAN NUMBER	ITEM	SPECIFICATION TITLE	SECTION	VOLUME III		
S. No.	COMPONENT / OPERATION	CHARACTERISTIC CHECK	CAT	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY	REMARKS
									P W V	
1	2	3	4	5	6	7	8	9	10	11
BHEL										
PARTICULARS										
NAME										
SIGNATURE										
DATE										
BIDDER/VENDOR COMPANY SEAL										

