भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(भारत सरकार का उपक्रम)
BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)

TCN – 03

Ref: PSER:SCT:DPL-M1283:TCN-03 Date: 16-01-2012

Sub	Tender change notice (TCN) 02.	
Job	Design, engineering, manufacturing, supply/delivery, erection, commissioning, trial run, handing over to customer etc of Fuel oil unloading & storage system and Miscellaneous tank system (1 no. condensate storage tank) Package for 1x250 MW Unit at DPL, Durgapur, WB.	
Ref	1.0	Tender no PSER:SCT:DPL-M1283:11
	2.0	BHEL's NIT, vide reference no PSER:SCT:DPL-M1283:2628, dated 08-12-2011.
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:DPL-M1283:TCN-01, dated 27-12-2011
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:DPL-M1283:TCN-02, dated 07-01-2012.
	5.0	All other pertinent issues till date.

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

1.0 Clarifications to bidder's queries as per attached Annexure-A, along with relevant enclosures.
2.0 Revised `No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.
3.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

ENGR (SCT)

Encl
1.0 As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)
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ANNEXURE-A TO TCN-03

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Job - Design, engineering, manufacturing, supply/delivery, erection, commissioning, trial run, handing over to customer etc of Fuel oil unloading & storage system and Miscellaneous tank system (1 no. condensate storage tank) Package for 1x250 MW Unit at DPL, Durgapur, WB.

BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
1			Capacity of Sump Pump.	Pl refer running page no 21 under cl no 1.4.0
2			Spares philosophy for pumps and instrumentation.	Bidder to refer specification.
3			As per the scope of work, Buried MS Pipes along with Wrapping, Coating &Cathodic Protection System are included but any underground piping has not been shown in the drawings.	Requirement of buried pipe shall be finalized during detail engg in case if required.
4			Kindly confirm about the requirement of Cathodic Protection at the bottom of Tank.	Not required for surface protection kindly refere painting schedule attached with specification.
5			Kindly confirm about the installation and Hook-up scope of OFC Cable between PLC & DCS.	Supply, laying and termination (both ends) of OFC shall be done by BHEL between PLC and DCS. Equipment required at PLC side for termination of OFC shall be provided by bidder.
6			Kindly confirm welded A106 Gr. B Sch-40 Pipe can be used for Pipe dia more than 300 NB.	All oil pipeline shall be seamless as per API 5L Gr B or ASTM A106 Gr B (as per specification), minimum thickness shall be as sepcified in the sheet 2 of this excel file. However please note that bidder shall submit the pipe selection calculations during contratc enginnering, if higher thickness is required as per approved calculation same shall be provided by bidder without any cost implication to BHEL/Customer.
7			Approved Vendor list for following items.	
			a) PLC Panels	List of BHEL approved sub vendors is attached for ref. However final approval of subvendors shallsubject to customer approval without cost implication.
			b) Pressure transmitter / Switch / DP Transmitter, Temperature Elements, Temperature Transmitter	
			c) Oil Skimmer	For oil skimmer Pipe shall be arranged from approved BHEL/Customer sources and further processing on pipe may be arranged from vendor proven soures.

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BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
8	Vol.IIB, Section-C, Sheet 2 of 8Clause 1.1-(z), Scope of Supply		This clause stipulates requirement of MS buried pipe- Please indicate the extent of buried pipe, identifying the pipe line.	Requirement of buried pipe shall be finalized during detail engg in case if required.
9	Cl.1.4.0, Page 3 of 5, Doc.No.PE-TS-360-166-A001 (running page 21)	This clause refers that Oil water collected in storage tank dyke area, unloading pump house area & railway wagon unloading area will be collected in OWS pit either by gravity or by pumping. In case pumps are necessitated, the type, capacity & MOC of these pumps will be decided during detail engineering. However, there shall be no commercial implication on account of the same	We request BHEL to firm up the requirement of Oily water pumps during pre-bid stage only, as these pumps, if required during detail engineering will have commercial implication.	To be decided during details engg based on finalisation of layout. However bidder shall follow specification.
			And also specify the capacity of OWS pit.	OWS capacity shall be decided during detail engg for which bidder has to submit the design calculation subject to customer approval.
10	Cl.1.1.0, Page 1 of 5, LVFO System		Wagon capacity/dimensional details is not indicated in the tender specification. Please kindly provide the information of the same along with heating time required for oil in wagons.	BTPN wagon is to be considered by bidder for unloading of LVFO/LDO. Wagon capacity shall be 62 KL. Other details may be arranged from RDSO and copy of information may please be attached along with offer.
11	Vol.IIB, Section-B, Sheet 2 of 2 Project Information		Please specify the minimum temperature to be considered for oil handling during wagon unloading and tank initial heating.	Climatologically report is attached for bidder's reference.
12	Flow diagram for HFO System		It was observed that FM was not indicated in the P & I diagram of HFO system. Please confirm whether it has to be considered or not.	Not applicable for the tender.
13	Data Sheet of Suction Heater for LVFO storage tanks, running		Suction heater capacity indicated in the data sheet appears to be low. Kindly let us know whether there is Day Tank & Oil will be transferred to Day Tank.	Suction heater capacity has been rechecked, capacity indicated in data sheet is ok. No day oil tank has been envisaged for the project.

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BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
14	S. No. 2a), BHEL Specn. PE-TS-360-166-A001, Page 3 of 20 (running page 28)		In the data sheet for floor coil heater, it has been specified to raise the temperature of full tank capacity of LVFO from minimum ambient to 45 deg C in 72 hrs. However, minimum ambient temperature is not specified in Project Information. Pls. confirm the minimum ambient temperature of the project site.	Climatologically report is attached for bidder's reference.
15	S. No. 5 e), Page7 of 20 of BHEL Specn. PE-TS-360-166-A001 (running page 32)		The clause calls for heating of **6 Nos.** LVFO road tankers under simultaneous unloading.	LVFO shall be brought to site through rail wagons.
			As per specification, LVFO will be brought to site through 40 nos. railway wagons. Hence, we presume the above clause has been erroneously indicated as 6 nos. road tankers, in lieu of 40 nos. railway wagons under simultaneous unloading operation. Pls. confirm the actual requirement.	
16	S. No. 01, Page 8 of 20 of BHEL Specn. No. PE-TS-360-166-A001 (running page 33)		Duplex type strainer has been called for at the suction of each LVFO & LDO unloading pump. However, in the Flow Diagrams for HFO & LDO System, normal two way isolation valves have been shown at the inlet and outlet of each duplex strainer. In order to operate one of the duplex filter, these isolation valves should be 3-way diversion valves instead of two way valves shown. Also we recommend one (1) isolation valve at the suction of each pump for maintenance purpose. Kindly review and confirm.	Bidder's point noted, 3 way diversion valve instead of two way valve shall be considered by bidders in their offer. Further isolation valve across duplex stainers shall be provided, additional isolation valve at pump suction are not required.
17	Flow Diagram for HFO & LDO System		We recommend one (1) no. NRV before the isolation valve inside pump house in the inter tank transfer line for each LVFO & LDO service. This NRV will prevent flow of fluid in the inter tank transfer line in course of oil unloading operation. Please review and confirm.	Not required.

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BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
18	No. of oil (LVFO/ LDO), steam & condensate hose.		We understand BTPN wagons will be used for oil unloading. To the best of our understanding, each BTPN wagon is having two outlets. However, we are not sure about the no. & size of steam inlet and condensate outlet connections of each wagon. We apprehend that number of oil, steam and condensate hoses will be double the number of wagons. Kindly review and confirm.	40 unloading wagon points shall be considered by bidders.
19	Painting Schedule, Page 18 & 19 of 20 (running page 43 & 44) of Specn. PE-TS-360-166-A001		In the Painting Schedule, surface preparation on internal & external surface of tanks has been specified as SP3 with primer P1 (on external) & P4 (on internal) and finish paint 2F2 on external surface of LDO tank. However, all these have not been elaborated. Kindly furnish details of SP3, P1, P4 & 2F2.	Painting schedule attached in the specification from running page no 46 to 49 shall be referred by bidders.
	Painting Schedule, Section-C, Vol. IIB, Page 3 of 3 (running page 52) of Specn. PE-TS-360-166-A001		Pls. clarify whether the paints as specified under this painting schedule are same as indicated in the painting schedule in running page 43 & 44. If not, which painting schedule is to be followed. We understand the painting schedule as indicated in running page 52 applies to painting on tank externals. Pls. review and confirm.	
20	Cl. 2.01.01 c), running page 74		The clause calls for radar type level transmitter on tanks. Specification of radar type level transmitter is not furnished. Pls. furnish the same.	Radar type level transmitter specification is attached for reference and use.
21			We presume same radar type level transmitter will also be provided for drain oil tank and sump pits as shown in the flow diagrams. Kindly confirm.	Bidder to follow specification
22	Table showing pipe sizes and corresponding fluid velocities, Page 7 of 20, Doc. No. PE-TS-360-166-A001 (running page 32)		Velocity of steam has been indicated for pipe size below 50 NB. Pls. indicate the steam velocity for pipe sizes 50 NB & above in order to select steam pipe sizes.	Refer sheet 2 for steam velocities and pipe selection criteria

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BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
23	Sr. No. A a), Doc. No. PE-TS-360-166-A001, Page 13 of 20 (running page 38)		In the data sheet for Pipes & Fittings for Fuel Oil service, the pipe material has been specified as seamless carbon steel pipes to A106 Gr. B, Std. weight or Sch. 40 as available/ API 5L Gr B (with thicknesses corresponding those covered in other mentioned standards). Kindly confirm whether ERW pipes as per API 5L Gr. B is acceptable for Fuel Oil service or, not. If acceptable, pls. specify corresponding pipe thicknesses.	Kindly refere BHEL reply to point no 6 above.
24			Please refer clause 1.1.0 & 1.2.0, Annexure-I, page no. 19 of technical Specification. Kindly clarify type and capacity of Wagons to be unloaded. Further also clarify permissible healing time required to heat up total rake of 40 wagons for LVFO system.	BTPN wagon is to be considered by bidder for unloading of LVFO/LDO. Wagon capacity shall be 62 KL. Other details may be arranged from RDSO and copy of information may please be attached along with offer.
25			Please refer clause 1.1.0, Annexure-I, page no 19 & test report for LVFO. page no. 24 of technical Specification. Minimum temp at tanker outlet has been mentioned as 50 C, however pour point in test report has mentioned as 20 C. in this regard we would like to clarify that generally oil to be healed approx 10 C higher to the pour point 10 get the nowability of viscous oil. Kindly confirm the max, temp to be atained in the LVFO rail wagons.	Bidder' clarification noted, during unloading from wagon oil shall be heated above 10 deg C to the pour point.
26			Kindly provide min ambient temperature of site for various calculation purposes	Climatologically report is attached for bidder's reference.
27	Cl. No. 1.1.0. LVFO System, Pg. No. 19, Technical Specification (PE-TS-360-166-A001) Vol II B & III	……..	Both are contradicting. Please confirm the tank maintenance temperature.	Bidder to note that tank maintenance temprature shall be 45 deg C. In suction heater oil shall be heated by 10 deg C.

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BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
28		…… The tank shall be provided with steam floor coil heaters to initially raise the temperature of oil from ambient temperature to the tank maintenance temp of 45 deg C in 72 hrs times..		
	Flow diagram for Steam, Condensate & Instrument air system, Dwg no. PE-DG-360-166-	FO storage tank maintenance temperature is indicated as 50 deg C.		
29	Data sheet for Pressure Reducing Station, Pg. No. 31, Technical Specification	2. Steam Pressure at inlet: 16 kg/cm2 (a)	Both are contradicting. Kindly confirm the aux. steam pressure and temperature given at terminal point.	BHEL shall provide aux steam at 11 ata, 210 deg C. Bidder to design their system accordingly
	Flow diagram for Steam,	Steam inlet Pressure indicated as11 kg/cm2 (a)		
30	Data sheet for Pressure Reducing Station, Pg. No. 31, Technical Specification	5. Configuration:	As per specification and P&ID, there is no road tankers. Please clarify.	LDO/LVFO shall be unloaded from rail tankers, as indicated in P&IDs.
		e) 6 No. LVFO road tankers with heating arrangement under simultaneous unloading.		
31	Flow diagram for HFO system, Dwg no. PE-DG-360-166-A001	Indicated as steam header for 40 Nos of rail tanker	Wagon capacity/dimensional details is not indicated in the tender specification. Please kindly provide the information of the same along with heating time required for oil in wagons and also mention the temperature rise of oil to be considered.	Climatologically report is attached for bidder's reference. BTPN wagon capacity shall be 62 KL. Information regarding dimensions and heating time may be collected from RDSO.

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Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
32	Flow diagram for HFO system, Dwg no. PE-DG-360-166-A001	Fluid for Pipe line is indicated as FO and service fluid is indicated as FO- HFO/LSHS/HPS	Both are contradicting. Please clarify type of oil to be considered for system design.	LVFO is the fuel which is to be used in DPL plant, however equipments/systems shall be sized/selected as per the criteria stipulated in data sheet/ design criteria.
	Bongaigaon Refinary & Petrochemicals Ltd., Pg. No. 24, Technical Specification	Detail Analysis - LVFO		
		Density at 15 deg C: 881.8 kg/m3		
33	Painting schedule, Pg. No. 45	Notes:	The referred clause (NTPL/MECON specification Vol II B, Sec 03.00.) is not found along with tender. Please furnish the same.	Painting schedule attached in the specification from running page no 46 to 49 shall be referred by bidders.
		2.Painting scheme like P1, SP3, F2, etc as indicated above shall be as per NTPL/MECON specification Vol II B, Sec 03.00.		
34	Data sheet for Floor Coil Heater, Pg. No. 28, Technical Specification (PE-TS-360-166-A001) Vol II B & III	2.a. Design Capacity:	Minimum ambient temp to be considered is not given along with specification. Kindly provide the same.	Climatologically report is attached for bidder's reference.
		To raise the temperature of full tank capactiy of LV fuel oil from **minimum ambient temperature** to 45 deg C in 72hrs for LVFO storage tank.		

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Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
35	Check list, Pg. No. 197, Technical Specification (PE-TS-360-166-A001) Vol II B & III	Manual calculation for Aux. steam requirement in case the maximum steam required is more than **3.5 T/hr**	Both are contradicting. Kindly clarify the same.	Pl clarify what is contradicting. Bidder to fulfill the specification requirement. Further BHEL clarifies that BHEL shall provide 9 T/Hr of aux steam at TP instead of 15 T/hr at 11 ata 210 C.
36	Cl no. 4.0. Terminal point, page no. 12., Technical Specification (PE-TS-360-166-A001) Vol II B & III	Aux. Steam: BHEL shall supply **15T/hr** of steam at this TP		
37	Velocities for selecting Piping, page no. 32., Technical Specification	Steam Pipe:	Velocity to be considered for above 50NB steam pipe lines are not indicated. Kindly provide the same.	Please refer point no 8
		Below 50mm pipe size-		
		Saturated steam-15 to 22 m/sec velcoty		
		Superheated steam- 20 to 30 m/sec velocity		
38	Cl no. 3.9. Power supply scheme, Pg. No. 159, Technical Specification (PE-TS-360-166-A001) Vol II B & III	3.9.1 …. Each UPS have 30mins back up…..	It says that UPS shall have 30mins back up and not mentioned about type of batteries. Please inform the type of battery if already finalised or shall be proceed with VRLA SMF battery.	Ni-Cd battries as per IS -10918 shall be provided by bidder for the package.
39	Scope of C&I for FO system Pg. No. 167, Technical Specification (PE-TS-360-166-A001) Vol II B & III	8. PLC shall be connected to DCS through OFC with MODBUS Protocal for monitoring.	As these referred clauses are contradicting each other, we have not considered the supply of OFC cables in our scope. Please confirm.	Kindly refer Point no 5 above.

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BHEL REPLY TO BIDDER'S PRE BID QUERIES FOR DPL MT & FOS

Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
	Scope of C&I for FO system Pg. No. 152, Technical Specification (PE-TS-360-166-A001) Vol II B & III	4. Fibre Optic Cable from PLC to DCS is excluded from Bidder scope.		
40	Scope of C&I for FO system Pg. No. 152, Technical Specification (PE-TS-360-166-A001) Vol II B & III	15. Flow meter shall be turbine type with flow totaliser.	As per P&ID furnished to us, there is no flowmeter representation. Please confirm if any flow meter involved in this project or not. However turbine type flow meter is suitable for water/LDO application.	Not required.
41	Scope of C&I requirements, Pg. No. 17, Technical Specification	14. LT mounted on tanks shall be DP type with chemical/diaphragm seal.	Both are contradicting. Kindly clarify whether we have to consider LT as DP type or top mounted type.	Guided wave radar type level transmitter shall be considered by bidder. Specification is attached with calrification.
	Flow diagram for HFO system, Dwg no. PE-DG-360-166-A001	Indicated as top mounted type LT for tanks		
42	Sec C6, Technical specification-Instruments and systems, Pg. No. 187		The referred clause (pg. no, 187, 188, 189 and 190) in the specification is not visible clearly. Kindly furnish the same.	Attached with pre bid clarification reply.
43	Plot plan (BHEL-Scope), Dwg no. PE-DG-360-100-M001		Wagon Unloading header location is not indicated. Kindly furnish the plot plan with unloading header location, to calculate the NPSH requirement.	Rail unloading track has been marked in the attached drg with start point and end point (tentative). This may be used for NPSH calculation
			Minimum 4m elevation is required between tanker oultet to pump inlet for getting the required NPSH. Purchaser shall confirm the same.	

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Sl. No.	Reference clause	Specification requirement	Bidder's clarifications	BHEL's REPLY
44	Bongaigaon Refinary & Petrochemicals Ltd., Pg. No. 24, Technical Specification	7. Kinematic viscosity @ 50 deg C is 80 cSt	Both are contradicting. Please confirm which viscosity to be considered for system design.	Equipments/systems shall be sized as per the criteria stipulated in data sheet/ design criteria.
	Feul Oil (Low viscosity Furnace Oil-LVFO) Characteristics (Tentative), Pg. No. 25, Technical Specification	2. Viscosity at 37.8 deg C is 101SSU		
GENERAL POINT				
1				BIDDER SHALL CHECK THE REQUIREMENT OF NON RETURN VALVE IN UNLODING HEADER BEFOR PUMP SUCTION BOTH FOR LDO AND LVFO LINES, DEPENDING ON ACTUAL LAYOUT AND LEVEL OF THE PUMP HOUSE.

Steam pipe		Saturated steam M/s	Superheated steam M/s
	Below 50	15 – 22	20 – 30
	50 – 150	20 – 33	25 – 40

PIPE THICKNESS

Pipes used in the oil lines shall have minimum following thickness:

NB mm (inch)	15 (1/2)	20 (3/4)	25 (1.0)	40 (1.5)	50 (2.0)	65 (2.5)	80 (3.0)	100 (4.0)	150 (6.0)
Min Thick mm	2.77	2.87	3.38	3.68	3.91	3.96	3.96	3.96	4.78
NB mm (inch)	200 (8.0)	250 (10.0)	300 (12.0)	350 (14.0)	400 (16.0)	450 (18.0)	500 (20.0)	600 (24.0)	
Min Thick mm	5.56	5.56	6.35	6.35	8	8	8	8	

A. COAL ANALYSIS REPORT
(As fired)

DESCRIPTION	DESIGN COAL	RANGE OF COAL	WORST COAL
Moisture Total	8%	5 – 10%	10%
V.M. (As received)	20%	15 – 25%	15%
Ash (As received)	40%	25 – 45 %	45%
F.C. (As received)	32%	By Difference	By Difference
Carbon (As received)	42%		
Hydrogen (As received)	3%		
Nitrogen (As received)	0.9%		
Sulphur (As received)	0.3%		
Oxygen (As received)	5.8%		
Gross C.V. Kcal/kg	4000	3500-5500	3500
HGI	48	50-60	

Coal Size : (-) 20 mm

Note: Boiler MCR shall be achievable with the Design Coal as well as the Range of coal analysis tabulated above. Performance guarantee will be based on design coal.

B. TENTATIVE FLY ASH ANALYSIS

Chemical Composition		**Range in Percentage** (%)
Silica (SiO_2)	:	55 – 60
Aluminium Oxide (AL_2O_3)	:	21 – 25
Iron Oxide (Fe_2O_3)	:	8 – 11
Calcium Oxide (CaO)	:	1.8 – 3.5
Magnesium Oxide (MgO)	:	0.5 – 1.0
Titanium Oxide (TiO_2)	:	0.5 – 0.8
Alkali Oxide	:	0.3 – 0.5
P_2O_5	:	0.3 – 0.4
SO_3	:	0.3 - 0.5
Fusion Temperature	:	1300 – 1400 ^{0}C

A. FUEL OIL (LDO) CHARACTERISTICS (TENTATIVE)

	DESCRIPTION	LIGHT DIESEL OIL (LDO)
1.	Specification	IS – 1460 (Latest Revision)
2.	Acidity (inorganic)	Nil
3.	Ash Content	0.02% (Maximum) by weight
4.	Flash point (Pensky Martens, closed)	66 ^{o}C
5.	Pour Point (Winter)	12 ^{o}C
	Pour Point (Summer)	18 ^{o}C
6.	Kinematic viscosity in Centi-stokes at 38 Deg.C	2.5 to 15.7
7.	Sediment by weight (Max.)	0.10%
8.	Water content by Volume (Max.)	0.25 %
9.	Sulphur by Weight (Max.)	1.8%
10.	Carbon residue (Ramsbottom) by Weight (Max.)	1.5%
11.	Gross calorific value	10,000 Kcal/Kg.
12.	Specific gravity	0.85 at 15 ^{o}C

FUEL OIL (LOW VISCOSITY FURNACE OIL -LVFO) CHARACTERISTICS (TENTATIVE)

DESCRIPTION	LIGHT DIESEL OIL (LVFO)
1. Specific Gravity	0.910 – 0.925
2. Viscosity at 37.8 deg C	101 SSU
3.Calorific Value, Kcal/Kg	10500 - 10600

A. DAMODAR RIVER WATER ANALYSIS (TENTATIVE)

Sl. No.	CHEMICAL COMPOSITION	UNIT	AVERAGE VALUE
1.	Total Alkalinity as $CaCO_3$	ppm	100
2.	Chlorides as $CaCO_3$	ppm	30
3.	Sulphates as CaCO3	ppm	120
4.	Mg Hardness as $CaCO_3$	ppm	60
5.	Ca Hardness as $CaCO_3$	ppm	115
6.	Total Hardness as $CaCO_3$	ppm	175
7.	Turbidity	NTU	50 - 2500
8.	Suspended matters	ms/L	25
9.	pH value	No.	7.2 – 9.1
10.	Silica as SiO_2	ppm	25
11.	Iron as Fe	ppm	0.4 – 0.6
12.	Organic matter	ppm	4.0 – 10.0

B. CLARIFIED WATER ANALYSIS (TENTATIVE)

Sl.No	Constituents	As	Analysis

1.	Calcium	$CaCO_3$	169 ppm
2.	Magnesium	$CaCO_3$	60 ppm
3.	Sodium & Potassium	$CaCO_3$	75 ppm
	Total Cations	**$CaCO_3$**	**304 ppm**
4.	Bicarbonates	$CaCO_3$	111 ppm
5.	Carbonates	$CaCO_3$	-
6.	Chloride	$CaCO_3$	37 ppm
7.	Sulphate	$CaCO_3$	156 ppm
	Total Anions	**$CaCO_3$**	**304 ppm**
8.	Dissolved Silica	SiO_2	25 ppm
9.	Total Iron	Fe	0.1ppm
10.	Turbidity	NTU	20
11.	Free Chlorine	Cl_2	Less than 1
12.	pH		7.5

STATION : Durgapur 32734 LAT: 23 29 N LONG: 87 19 E HT. ABOVE M.S.L. 69 METERS DATA 1957 TO 1980

		Mean Temperature		Extremes						Cloud				Rainfall						
MN	SLP	DB	WB	MAX	MIN	HIGH	LOW	MAX DT	MIN DT	RH	VP	TOT	LOW	TOT	RAINY	WET	DRY	HEAVY	DAY	WS
1		18.1	14.4	25.0	11.6	28.9	7.7	32.2 13	5.1 05	65	13.4	1.2	0.6	11.4	1.1	64.4	0.0	53.6	04	7.7
		21.7	16.3					1964	1978	54	14.2	1.0	0.5			1966			1966	
2		21.1	16.0	28.6	14.0	34.2	9.5	37.4 23	7.2 12	57	14.2	1.1	0.6	14.4	1.3	81.1	0.0	63.5	13	7.4
		25.5	18.2					1964	1974	47	15.0	1.1	0.6			1961			1959	
3		26.2	19.7	34.2	18.4	38.6	13.9	40.7 31	10.8 11 *	54	17.9	1.5	0.7	15.0	1.2	79.3	0.0	42.5	27	8.6
		30.4	20.9					1970	1979	41	17.3	1.3	0.7			1980			1980	
4		30.4	23.7	38.3	23.2	42.5	18.6	46.0 22	13.4 01	57	24.0	1.4	0.7	34.5	2.0	122.8	0.0	52.5	17	11.5
		34.6	24.1					1973	1966	40	21.0	1.6	0.7			1967			1977	
5		31.3	25.8	39.3	25.2	43.9	20.1	46.1 14	16.5 16	65	28.8	1.9	1.0	55.6	3.4	157.4	0.0	92.0	07	13.5
		34.6	25.7					1970	1968	50	25.8	2.3	0.9			1977			1977	
6		30.3	26.7	36.4	25.5	41.9	21.6	46.4 05	16.1 28	75	32.1	4.1	2.0	226.9	10.4	472.2	72.6	211.0	26	12.9
		31.8	26.6					1958	1961	67	30.6	4.6	1.9			1968	1976		1978	
7		28.8	26.6	32.7	25.0	36.3	23.1	38.5 05	21.3 18	84	33.2	5.9	3.2	277.3	15.0	556.3	86.6	115.5	30	12.1
		29.5	26.9					1979	1978	81	33.1	5.7	2.7			1975	1969		1975	
8		28.7	26.6	32.1	24.8	35.2	22.8	37.2 19	20.8 02	84	33.0	6.1	3.4	283.2	14.6	481.8	92.6	133.5	27	11.1
		29.3	26.8					1959	1978	82	33.1	5.9	2.9			1959	1963		1980	
9		28.7	26.3	32.1	24.4	35.1	22.4	36.8 01	19.8 27	82	32.3	5.2	2.7	251.6	11.4	847.1	78.8	387.7	27	10.4
		28.9	26.4					1968	1978	81	32.3	5.3	2.8			1978	1971		1978	
10		27.4	24.3	31.7	21.9	34.5	18.6	36.0 13	16.6 30	76	28.0	2.5	1.4	110.3	5.0	371.8	0.0	139.0	01	6.5
		28.1	24.7					1979	1966	75	28.4	2.5	1.2			1959			1959	
11		23.4	19.5	29.1	16.4	32.3	12.6	35.4 06	10.8 30	69	19.7	1.2	0.7	4.0	0.5	22.7	0.0	20.4	01	6.0
		25.3	20.5					1965	1978	63	20.3	1.0	0.6			1977			1971	
12		18.9	15.2	25.4	11.8	28.9	8.2	31.1 04	4.4 21	65	14.3	1.0	0.6	2.1	0.1	33.8	0.0	22.0	29	7.0
		22.0	16.7					1962	1966	56	14.7	1.0	0.5			1977			1977	
YR		26.1	22.1	32.1	20.2	44.5	7.0	46.4	4.4	69	24.2	2.8	1.5	1286.3	66.0	1951.7	848.5	387.7		9.6
LY		28.5	22.8							61	23.8	2.8	1.3			1978	1966			
YRS		24	24	23	21	23	21	23	21	24	24	23	17	25	25	25	25	25		22
		24	24							24	24	23	17							

* Occurred More Than Once

STATION : Durgapur 32734 .. contd

	Weather						Wind speed				% Wind Direction								Total Cloud					Low cloud					Visibility		
MN	PPT	HAIL	THUN	FOG	D.STM	SQUA	62	61	19	0	N	NE	E	SE	S	SW	W	NW	0	0	T-2	3-5	6-7	8	0	T-2	3-5	6-7	8	F8	<1	1-4	4-10	10-20	>20
1	1.4	0.0	0.0	0.7	0.0	0.0	0	1	29	1	29	11	4	3	2	1	4	42	4	22	6	1	1	1	25	5	1	0	0	0	1.6	2.8	16.6	8.2	1.8
							0	0	29	2	27	15	4	3	3	2	2	37	7	23	5	1	1	1	25	5	1	0	0	0	0.3	5.5	16.4	8.2	0.6
2	1.7	0.0	0.0	0.3	0.0	0.0	0	1	26	1	28	11	3	3	6	7	6	32	4	22	4	1	0	1	23	4	0	1	0	0	1.0	2.0	10.6	10.9	3.5
							0	0	26	2	25	8	4	5	5	8	6	31	8	21	5	1	0	1	22	5	0	1	0	0	0.0	2.5	12.2	10.6	2.7
3	2.0	0.0	0.1	0.2	0.1	0.0	0	1	29	1	16	7	4	12	17	12	6	23	3	21	5	2	1	2	24	5	1	1	0	0	0.6	2.4	7.6	14.9	5.5
							0	1	29	1	15	5	4	12	14	14	7	24	5	20	6	2	1	2	23	6	1	1	0	0	0.0	2.3	10.6	14.5	3.6
4	2.8	0.1	0.0	0.0	0.2	0.0	0	3	27	0	7	5	3	15	27	20	10	13	0	16	6	3	1	4	23	5	1	1	0	0	0.1	1.5	7.1	16.6	4.7
							0	2	27	1	7	4	3	16	23	21	8	16	2	20	5	2	1	2	24	5	0	1	0	0	0.0	2.8	7.3	14.9	5.0
5	4.5	0.1	0.6	0.0	0.4	0.0	0	3	27	1	3	5	4	20	34	23	5	5	1	20	5	2	1	3	23	5	1	1	1	0	0.0	0.8	6.3	15.4	8.5
							0	4	26	1	2	6	5	26	29	18	5	8	1	19	5	2	1	4	23	5	1	2	0	0	0.0	2.4	7.7	13.6	7.3
6	13.0	0.0	0.3	0.0	0.1	0.0	0	4	26	0	3	4	5	27	35	21	2	2	1	14	4	1	2	9	19	4	2	4	1	0	0.1	0.4	7.1	13.8	8.6
							0	4	25	1	3	4	6	30	29	20	3	4	1	11	3	2	2	12	18	4	2	5	1	0	0.0	1.2	8.8	12.5	7.5
7	18.2	0.0	0.4	0.0	0.0	0.0	0	3	28	0	2	4	8	23	32	24	4	3	0	3	5	2	5	16	13	6	4	5	3	0	0.0	0.7	9.2	12.6	8.5
							0	2	29	0	3	2	6	24	33	23	4	3	2	3	5	3	4	16	14	6	3	6	2	0	0.0	1.6	9.2	12.4	7.8
8	18.0	0.0	0.7	0.0	0.0	0.0	0	2	28	1	3	2	9	24	34	21	3	3	1	4	5	3	3	16	10	6	6	6	3	0	0.0	0.7	9.1	12.4	8.8
							0	1	29	1	4	2	7	22	33	21	3	4	4	1	6	3	5	16	13	6	4	6	2	0	0.0	0.8	10.3	12.2	7.7

```
  9  14.6   0.0   0.3   0.0   0.0   0.0  0   2  27   1   7  5  8 18 25 19  8  9  1    6   5   3   3  13   13   6   5   4   2   0    0.0   0.9   8.4
14.7   6.0
                                          0   2  27   1   9  5  8 20 25 19  7  6  1    3   6   3   4  14   12   7   4   4   3   0    0.1   1.3  10.8
12.3   5.5

 10   6.3   0.0   0.0   0.0   0.0   0.0  0   1  29   1  21  7  6 15 18 11  6 14  2   17   7   1   1   5   19   7   2   2   1   0    0.0   0.4   7.6
15.6   7.4
                                          0   0  29   2  18 11  7 15 19  9  4 11  6   15   7   2   2   5   19   8   2   2   0   0    0.0   2.8  11.6
11.6   5.0

 11   1.0   0.0   0.0   0.3   0.0   0.0  0   1  28   1  31 11  4  3  5  2  6 35  3   20   7   1   0   2   21   7   1   1   0   0    0.0   2.6   9.6
14.4   3.4
                                          0   0  27   3  37 12  5  4  7  1  2 24  8   21   7   1   0   1   23   7   0   0   0   0    0.0   4.4  15.4
8.7    1.5

 12   0.3   0.0   0.0   0.5   0.0   0.0  0   1  28   2  29 12  2  1  2  1  3 48  2   21   7   1   1   1   24   7   0   0   0   0    0.0   2.6  16.1
8.9    3.4
                                          0   0  29   2  32 10  3  1  1  1  4 41  7   21   7   1   1   1   25   6   0   0   0   0    0.0   4.7  17.1
8.5    0.7

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 YR  83.8   0.2   2.4   2.0   0.8   0.0  0  23 332  10  15  7  5 14 20 14  5 19  1  186  66  21  19  73  237  67  24  26  11   0    3.4  17.8 115.3
158.4  70.1
 LY                                       0  16 332  17  15  7  5 15 18 13  5 17  5  178  67  23  22  75  241  70  18  28   8   0    0.4  32.3 137.4
140.0  54.9

 YRS                  23                    24                  24                    18                  18                    18
                                            24                  24                    18                  18                    18
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SECTION – C6

CONTENTS

Bidder to furnish Datasheet as per format attached.

SECTION – C6

TECHNICAL SPECIFICATION - INSTRUMENTS AND SYSTEMS

1.00.00 FIELD INSTRUMENTS

This section provides general hardware guidelines for field instruments and equipment to be supplied under this specification.

1.01.00 PRESSURE TRANSMITTER

01.	Working Principle	:	Smart
02.	Type	:	2 - Wire
03.	Output Signal	:	Simultaneous transmission of digital and 4-20 mA DC signal. Standard protocol.
04.	Signal Processing	:	Silicon solid state electronic circuitry
05.	Measuring Element	:	Capsule / Diaphragm
06.	Measuring element material	:	AISI-316 (Stainless Steel) Diaphragm
07.	Static Pressure	:	150 % of maximum span continuously, without affecting the calibration.
08.	Turn-down ratio	:	40 : 1 minimum.
09.	Span and Zero	:	Locally adjustable non-interacting. Facility for elevation and suppression by 100% of span
10.	Enclosure Class	:	IP-65 (Explosion proof for NEC Class-1, Division 1 area)
11.	Output Indicator	:	LCD type
12.	Nameplate	:	Tag number, service engraved in stainless steel tag plate
13.	Body	:	Forged Carbon Steel (SS for DM Water).
14.	Operating Voltage	:	16 - 48 Volts D.C.
15.	Load	:	600 Ohms (min.) at 24 Volts D.C.
16.	Ambient Temperature	:	0 - 50 ^{o}C
17.	Performance :		
	i) Accuracy	:	±0.2% of Span or better
	ii) Repeatability	:	±0.05% of Span or better

18. Sealing/Isolation : Extended diaphragm with 5 meters SS armored capillary for corrosive, viscous and dirty fluid applications. Material for separator diaphragm as per application.

19. Accessories :
a) Universal mounting bracket suitable for pipe and wall mounting.
b) High tensile carbon steel U- bolts.
c) Installation accessories as per relevant installation drawing.
d) Syphons for steam and hot water services.
e) ½" NPT 2-valve stainless steel manifold, constructed from SS316 bar stock.
f) Companion flange with nuts, bolts and gaskets.
g) Hand held configurator kit for calibration of Smart Transmitter.
h) ½" NPT cable gland

1.02.00 DIFFERENTIAL PRESSURE TRANSMITTER

01. Working Principle : Smart
02. Type : 2-Wire
03. Output signal : Simultaneous transmission of digital and 4-20 mA DC signal. Standard protocol.
04. Signal Processing Unit : Silicon solid-state electronic circuitry
05. Measuring element : Capsule/Diaphragm
06. Measuring element material : AISI-316 (Stainless Steel)
07. Static Pressure/ Overload Pressure : Maximum line (or static) pressure on either side without permanent deformation or loss of accuracy
08. Turn-down ratio : 40 : 1 minimum
09. Span and Zero : Locally adjustable, non-interacting
10. Enclosure class : IP-65 (Explosion proof for NEC Class-1, Division 1 area)

11. Zero suppression / elevation : At least 100% of Span
12. Output Indicator : LCD type
13. Nameplate : Tag number and Service engraved in stainless steel tag plate
14. Body : Forged Carbon Steel (SS for DM Water)
15. Ambient temperature : 0 - 50 ^{o} C
16. Operating Voltage : 16 - 48 Volts DC
17. Load : 600 Ohms (min.) at 24 Volts DC
18. Performance :-
i) Accuracy : ±0.2 % of span or better
ii) Repeatability : ± 0.05 % of span or better
19. Sealing/Isolation : Extended diaphragm with 5 meters SS armored capillary for corrosive, viscous and dirty fluid applications. Material for separator diaphragm, depending on application.
20. Accessories :
a) Universal mounting bracket suitable for pipe and wall mounting.
b) High tensile carbon steel U-bolts.
c) Installation accessories as per relevant installation drawing.
d) Syphons for steam and hot water services.
e) ½" NPT 5-valve stainless steel manifold, constructed from SS316 bar stock.
f) Companion flange with nuts, bolts and gaskets.
f) Hand held configurator kit for calibration of Smart Transmitter.
g) ½" NPT cable gland

1.03.00 DISPLACER TYPE LEVEL TRANSMITTERS

01. Type : SMART.
02. Stages of operation : Continuous

1988

07.	Totalized Value	:	Required
08.	Housing	:	IP-65 (Explosion proof for NEC Class-I, Division 1 area)
09.	Nameplate	:	Tag number, service engraved in stainless steel tag plate
10.	Accessories	:	a) Clamping strip, bracket, prefab cable etc. b) Special tool kit for calibration/ configuration. c) ½" NPT cable gland

1.07.00 ROTAMETER

01.	Type	:	On-line and by-pass
02.	Metering tube	:	Borosilicate glass
03.	Float	:	AISI 316-SS unless the process fluid demands some other material.
04.	Packing material	:	Teflon
05.	Body MOC	:	CS or SS as per fluid condition.
06.	Scale	:	Graduated- Engraved black on white background.
07.	Process connection	:	Flanged (RF) to line size as per ANSI. standards.
08.	Accuracy	:	± 2% of full scale detection or better for on-line type and ±4% of full-scale detection or better for by-pass type.
09.	Nameplate	:	Tag number, service engraved in stainless steel tag plate
10.	Accessories	:	Slip-on orifice plate of 316-SS and taps of CS / SS as per application requirements. Applicable CS / SS Isolation valves and SS Range Orifice - for bypass type rotameters.

1.08.00 PRESSURE GAUGE AND DIFFERENTIAL PRESSURE GAUGE

01.	Type	:	Bourdon/Bellows/Diaphragm
02.	MOC Sensing & Socket	:	AISI-316 SS
03.	Movement Material	:	AISI-304 SS
04.	Case Material	:	Stainless steel casing bayonet type. Enclosure IP-65.

05.	Dial Size	:	Generally 150 mm (100 mm for SWAS gauges)
06.	Scale	:	Black lettering on white background in 270 Deg. arc.
07.	Window	:	shatterproof glass
08.	Range Selection	:	Normal process pressure – 50 ~ 70 % of range (approximately).
09.	Over-range Protection	:	125% of maximum range by internal stop. External stop at zero
10.	Adjustment	:	Micrometer screw for zero adjustment. Internal micrometer screw for range adjustment.
11.	Element Connection	:	Argon welding
12.	Process Connection	:	1/2" NPT(M) Bottom connection for local mounting, back connection for panel mounting.
13.	Performance	:	Accuracy of ± 1.0 % of span or better.
14.	Operating ambient temperature	:	0 - 50 ^{o}C
15.	Safety Feature	:	Blow out disc/diaphragm at the back
16.	Accessories	:	a) Snubbers and Glycerin filled for pulsating fluid applications and at pump discharge. b) Stainless steel Diaphragm seals for corrosive, viscous and solid-bearing or slurry type process fluids. c) 3-Way stainless steel Gauge cock for pressure gauges. Process connection ½" NPT. d) 5-valve SS316 manifold constructed from barstock for differential pressure gauge. Process connection ½" NPT. e) Union, nut & tail piece and other installation accessories as required.
17.	Applicable standard	:	IS-3624 / 1996
18.	Electrical Contact rating	:	240V, 5A AC/ 220V, 0.5A DC (for gauges with alarm contact). Number of Contacts: 1 SPDT
19.	Nameplate	:	Tag number, service engraved in stainless steel tag plate

06.	Adjustments	:	a) Internal Set Point b) Internal differential adjustment nut with dial for at least 10% of span (Min.)
07.	Process Connection	:	1/2" NPT (M) bottom connected
08.	Switch configuration	:	Two SPDT
09.	Switch Rating	:	240V, 5A AC/220V, 0.5A DC
10.	Switch Type	:	Snap acting, shock & vibration proof
11.	Adjustability	:	a) Set-point adjustable over span range. b) Differential adjustable by 10 percent of span (minimum).
12.	Sealing Ring	:	Viton, Buna-N
13.	Terminal Block	:	Suitable for full ring lugs for cable connection.
14.	Cable connection	:	1/2" NPT conduit connection or compression gland.
15.	Enclosure Class	:	IP-65 (Explosion proof for NEC Class-1, Division 1 area).
16.	Performance	:	a) Accuracy ±1.0% b) Accuracy of Setting Indication of ±1.5%
17.	Ambient temperature	:	0 – 50 Deg.C
18.	Nameplate	:	Tag number, service engraved in stainless steel tag plate
19.	Accessories	:	a) Remote diaphragm seal with SS-316 armored capillary for typical application. MOC of seal material shall be as per process fluid requirement. b) Snubbers for pulsating fluid application. c) Retention ring and screws for surface mounting. d) 1/2" NPT 2 Valve SS-316 manifold constructed from barstock e) 1/2" NPT cable gland

1.13.00 DIFFERENTIAL PRESSURE SWITCH

01.	Type	:	Bellows / Diaphragm / Piston actuated
02.	Sensing element material	:	AISI SS-316. For all other wetted part SS 316
03.	Case Material	:	Epoxy coated steel plate or die-cast aluminum alloy with neoprene gasket and clear glass where applicable cover conforming to IP-65. (Explosion proof for NEC Class-1, Division 1 area).
04.	Setter Scale	:	Black graduation on white scale with 0-100% graduation and provided with red pointer for set point adjustment
05.	Over range	:	Static pressure on any one side, the other side being open to atmosphere.
06.	Adjustments	:	a) Internal set point adjustment b) Internal differential adjustment nut with dial.
07.	Process Connection	:	1/2" NPT (M) bottom connected / back connected.
08.	Switch configuration	:	Two SPDT
09.	Switch rating	:	240V, 5A AC/220V, 0.5A DC.
10.	Switch type	:	Snap acting type contacts, shock and vibration proof.
11.	Adjustability	:	a) Set point adjustable over span range. b) Differential adjustable by 10 % of span (minimum).
12.	Terminal Blocks	:	Suitable for full ring lugs for cable connection.
13.	Cable Connection	:	1/2" NPT conduit connection or compression gland.
14.	Performance	:	a) Accuracy of repeatability : ±1.0% of span. b) Accuracy of set point indication: ±1.5%
15.	Operating Ambient Temperature	:	0 - 50 ^{o} C (Maximum Continuous)
16.	Enclosure	:	IP – 65 (Explosion proof for NEC Class-1, Division 1 area).

17.	Accessories	:	a) Snubbers for pulsating fluid application. b) Retention ring and screws for surface mounting. c) 1/2" NPT 5 Valve SS-316 manifold constructed from barstock d) 1/2" NPT Cable gland
18.	Nameplate	:	Tag number, service engraved in stainless steel tag plate
19.	Preferred Features	:	Free floating bellows attached to high-pressure bellows for temperature compensation.
20.	Remote Seal type for special application	:	a) Silicone oil / fluorolube filled remote diaphragm seal for dirty / viscous / corrosive fluid. b) SS armored capillary at least 3 meters each. c) Adapter flanges with nuts, bolts and gaskets for instrument and process side.

1.14.00 TEMPERATURE SWITCH

01.	Type	:	Mercury / gas filled-in
02.	Sensing Element Material	:	Bellow / Bourdon AISI SS-316
03.	Bulb Material	:	AISI SS-316
04.	Capillary	:	Stainless steel armored
05.	Movement Material	:	AISI SS-304
06.	Case material	:	Epoxy coated steel plate or die-cast aluminum alloy with neoprene gasket and clear glass where applicable cover conforming to IP-65. (Explosion proof for NEC Class-1, Division 1 area).
07.	Scale	:	Black lettering on white background
08.	Over range Protection	:	120 %
09.	Instrument connection	:	Bottom
10.	Switch configuration	:	Two SPDT

11.	Switch rating	:	240V, 5A AC/220V, 0.5A DC
12.	Switch type	:	Snap acting, shock and vibration-proof.
13.	Adjustability	:	Internal Set point adjustable over span range
14.	Cable connection	:	1/2" NPT conduit connection or compression gland.
15.	Compensation	:	a) Capillary compensation with invar wire throughout the capillary length. b) Case compensation
16.	Performance	:	
	i) Scale Accuracy	:	±1.0 % of full scale
	i) Repeatability	:	< 0.5 % of full range
	ii) Response time	:	Less than 40 seconds with thermowell
17.	Capillary length	:	5 meters (minimum) for local mounting/15 meters for local panel mounting.
18.	Nameplate	:	Tag number, service engraved in stainless steel tag plate
19.	Accessories	:	Mounting accessories, 3/4"ETcable gland.

1.15.00 LEVEL SWITCH

01.	Type	:	External cage float operated. Magnetically coupled.
02.	Float Material	:	AISI-316 stainless steel
03.	Other wetted parts	:	AISI-316 stainless steel
04.	External Cage	:	Carbon steel / Stainless steel as per process requirements., welded type / flanged construction. Cage pressure rating shall equal or exceed the rating of the main vessel.
05.	External cage mounting	:	Side – Side with drain valve.
06.	External cage connection	:	25 NB socket weld to vessel or RF flanges.
07.	Switch housing	:	Epoxy coated die-cast aluminum alloy with neoprene gasket conforming to IP-65. (Explosion proof for NEC Class-1, Division 1 area).

Guided Wave Radar Level Transmitter

1. Guided wave radar type level transmitter shall be provided for level measurements of the vessel under vacuum or low pressure applications or wherever required.
2. Guided wave radar type level transmitters shall have following features as a minimum:
    - Type : Guided wave radar
    - Principle : TDR (Time domain reflectometry)
    - Probe type & : Coaxial, SS 316 / 316 L. Material (If required, probe shall be suitable for over-fill prevention.
    - Signal O / P : 4 – 20 mA DC with HART signal suitable for over-fill prevention.
      Display : Integral
    - Power Supply : 24 V DC
    - Accuracy : 5 mm
    - Electromagnetic : Shall meet EN 61326-1 (1997)
    - Compatibility : EN 50081-2 & EN 50082-2.
    - Mounting : External cage mounting
3. The transmitters shall be provided with IP-55 protection class with durable corrosion resistant coating.
4. The transmitters shall be able to provide digital signals super imposed on 4 – 20 mA DC signal as per HART protocol.

PACKAGE WISE REGISTERED VENDOR LIST (REG/TRIAL)

Sl No	Package Code	Package Name	Vendor Code	Vendor Name	Reg Status	Vendor Address	Tech Limit
1	145-24000-A	LOCAL CONTROL PANELS	C001	C and S ELECTRIC LTD.	REGULAR	222, OKHLA INDUSTRIAL ESTATE,PHASE-II,NEW	
2	145-24000-A	LOCAL CONTROL PANELS	I031	INDUSTRIAL CONTROLS & APPLIANCES PVT LTD	REGULAR	47, CHAKALA ROAD,ANDHERI(EAST),MUMBAI2834	
3	145-24000-A	LOCAL CONTROL PANELS	P035	PYROTECH ELECTRONICS PVT. LTD.	REGULAR	E-329, ROAD NO.12, MIA,UDAIPUR2492122,31,34www.py	
4	145-24000-A	LOCAL CONTROL PANELS	P036	PROCON INSTRUMENTATION PVT. LTD.	REGULAR	1H, SHAKTI TOWERS,766, ANNA SALAI,CHENNAI28266041,2824142	

PACKAGE WISE REGISTERED VENDOR LIST (REG/TRIAL)

Sl No	Package Code	Package Name	Vendor Code	Vendor Name	Reg Status	Vendor Address	Tech Limit
1	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	A049	ABB LTD	TRIAL	2'ND FLOOR, EAST WING,KHANIJA BHAVAN,49, RACE COURSE	
2	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	F034	FORBES MARSHALL PVT. LTD.	TRIAL		
3	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	G035	GE Intelligent Platforms Private Limited	REGULAR	90/B, ELECTRONICS CITY,HOSUR ROAD,BANGLORE28528328r.ramana	
4	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	L001	LARSEN and TOUBRO LTD.	TRIAL	L & T HOUSE, BALLARD ESTATE,P.O.BOX-	
5	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	R021	ROCKWELL AUTOMATION INDIA LTD	REGULAR	(ALLENBRADLEY),C-11, SITE-4,INDUSTRIAL AREA	
6	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	S001	SIEMENS LIMITED	REGULAR	4A , RING ROAD , I.P.ESTATE,NEW DELHI-110002NEW	
7	145-03000-A	PROGRAMMABLE LOGIC CONTROLLER	S083	SCHNEIDER ELECTRIC INDIA PVT.LTD.	REGULAR	A-4 , MOHAN CO-OP INDL AREAMATHURA ROAD , NEW	

PACKAGE WISE REGISTERED VENDOR LIST (REG/TRIAL)

Sl No	Package Code	Package Name	Vendor Code	Vendor Name	Reg Status	Vendor Address	Tech Limit
1	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	B085	Barksdale GmbH, Germany	REGULAR	Dorn Assenheimer, Strasse 27, D-61203,Reichelsheim, Germany	
2	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	D003	INDFOS (INDIA) LIMITED	REGULAR	B-20-21, INDUSTRIAL AREA,MEERUT ROAD,GHAZIABAD0120-2712016	
3	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	D021	DRESSER INDUSTRIES INC.	REGULAR	INSTRUMENT DIVISION250, EAST MAIN ROADSTARTFORD,CONNECTICUT00-	
4	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	G060	GENERAL INSTRUMENTS CONSORTIUM	REGULAR	194/195, GOPI TANK ROADOPP: PANDURANG NAIKMARG, MAHIM, MUMBAI-400 016	
5	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	I041	INDFOS INDUSTRIES LIMITED	REGULAR	B-20-21, INDUSTRIAL AREA,MEERUT ROAD,GHAZIABAD0120-2712016	
6	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	K032	KAUSTUBHA UDYOG	TRIAL	7, PARICHAYA SOCIETY,1000/6D, NAVI PETH,PUNE24332124,24321053press	
7	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	S009	SWITZER INSTRUMENT LTD.	REGULAR	9, SOUTH BOAG ROAD, II FLOOR,PB NO-1423, T.NAGAR,CHENNAI24340999/3956sal	
8	145-06000-A	PRESSURE SWITCH/DIFF. PRESSURE SWITCH	S010	SOR INC.	REGULAR	14685, WEST, 105th STREETPO BOX-15964LENEXA,KENSAS00-913-8882630	

PACKAGE WISE REGISTERED VENDOR LIST (REG/TRIAL)

Sl No	Package Code	Package Name	Vendor Code	Vendor Name	Reg Status	Vendor Address	Tech Limit
1	145-13000-A	TEMP. ELEMENT	G007	GENERAL INSTRUMENT CONSORTIUM	REGULAR	511, EROS APARTMENTS,56, NEHRU PLACE,NEW	
2	145-13000-A	TEMP. ELEMENT	I022	DETRIVE INSTRUMENTATION & ELECTRONICS LTD.	REGULAR	320, TV INDUSTIAL ESTATE,OFF.DR.A.BESANT	
3	145-13000-A	TEMP. ELEMENT	P061	PYRO ELECTRIC INSTRUMENTS GOA PVT.LTD.	REGULAR	G.B, HILL CROWN APARTMENTS,COLLEGE	
4	145-13000-A	TEMP. ELEMENT	T001	TOSHNIWAL BROTHERS PVT.LTD.	REGULAR	WORKS:TOSHNIWAL IND.PVT.LTD,INDUSTRIAL ESTATE	
5	145-13000-A	TEMP. ELEMENT	T106	TECHNO INSTRUMENTS	REGULAR	Works & HO: Plot No 1145/1, Opp	
6	145-13000-A	TEMP. ELEMENT	T107	Tempsens Instrument (I) Pvt Ltd	REGULAR	B-188 A, MIA, Madri Udaipur - 313 003Hemant Rathi-	
7	145-13000-A	TEMP. ELEMENT	W017	WAAREE INSTRUMENTS LIMITED	REGULAR	23 , COMMUNITY CENTRE , 2ND FL.EAST OF KAILASHNEW	

ANNEXURE-2

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

Sub	No Deviation Certificate.	
Job	Design, engineering, manufacturing, supply/delivery, erection, commissioning, trial run, handing over to customer etc of Fuel oil unloading & storage system and Miscellaneous tank system (1 no. condensate storage tank) Package for 1x250 MW Unit at DPL, Durgapur, WB.	
Ref	1.0	Tender no PSER:SCT:DPL-M1283:11
	2.0	BHEL's NIT, vide reference no PSER:SCT:DPL-M1283:2628, dated 08-12-2011
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:DPL-M1283:TCN-01, dated 27-12-2011
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:DPL-M1283:TCN-02, dated 07-01-2012
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:DPL-M1283:TCN-03, dated 16-01-2012.
	6.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)