

Enqsino	Materialcode	Description	Lot no	Qty	Unit	Dely dt	Destination	Bidder Response
1	RFW905290001	SUPPLY OF PROCESS WATER PUMP WITH MOTOR & ACC. AS PER ATTACHED TECHNICAL SPECIFICATION NTPC:FGD:WATER PUMPS & AS PER ANNEXURE A	1	6	ST	30-Mar-20	STORES/BHEL SITE OFFICE/BARH-I	
7	RFW905470001	MANDATORY SPARE : COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR THE PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
8	RFW905470002	MANDATORY SPARES: COMPLETE SUPPLY OF CASING LINERS (FOR EACH TYPE) FOR PROCESS WATER PUMP & AS PER ATTACHED ANNEXURE A	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
9	RFW905470003	MANDATORY SPARES: BEARINGS OF EACH TYPE & SIZE FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
10	RFW905470004	MANDATORY SPARE: COMPLETE SUPPLY OF MOTOR FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
16	RFW906660001	SUPPLY OF MIST ELIMINATOR WASHING PUMP WITH MOTOR & ACC. AS PER ATTACHED TECHNICAL SPECIFICATION NTPC:FGD:WATER PUMPS & AS PER ANNEXURE C	1	6	ST	30-Mar-20	STORES/BHEL SITE OFFICE/BARH-I	
17	RFW906670001	MANDATORY SPARE: COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C .	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
18	RFW906670002	MANDATORY SPARE: COMPLETE SUPPLY OF CASING LINERS OR WEIR RINGS(FOR EACH TYPE AS APPLICABLE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
19	RFW906670003	MANDATORY SPARE: BEARING OF EACH TYPE & SIZE FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
20	RFW906670004	MANDATORY SPARE: COMPLETE SUPPLY OF THE MOTOR FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	

Enqsino	Materialcode	Description	Lot no	Qty	Unit	Delv dt	Destination	Bidder Response
2	RFW905300001	SUPPLY OF PROCESS WATER PUMP WITH MOTOR & ACC. AS PER ATTACHED TECHNICAL SPECIFICATION NTPC:FGD:WATER PUMPS & AS PER ANNEXURE A	1	4	ST	30-Mar-20	STORES/BHEL SITE OFFICE/BARH-II	
3	RFW905460001	MANDATORY SPARE : COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR THE PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
4	RFW905460002	MANDATORY SPARES: COMPLETE SUPPLY OF CASING LINERS (FOR EACH TYPE) FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
5	RFW905460003	MANDATORY SPARES: BEARINGS OF EACH TYPE & SIZE FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
6	RFW905460004	MANDATORY SPARE: COMPLETE SUPPLY OF MOTOR FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
11	RFW906640001	SUPPLY OF MIST ELIMINATOR WASHING PUMP WITH MOTOR & ACCESSORIES AS PER TECHNICAL SPECIFICATION NTPC:FGD:WATER PUMPS & AS PER ANNEXURE D.	1	4	ST	30-Mar-20	STORES/BHEL SITE OFFICE/BARH-II	
12	RFW906650001	MANDATORY SPARE: COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE D.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
13	RFW906650002	MANDATORY SPARE: COMPLETE SUPPLY OF CASING LINERS OR WEIR RINGS (FOR EACH TYPE AS APPLICABLE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ANNEXURE D.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
14	RFW906650003	MANDATORY SPARE: BEARING OF EACH TYPE & SIZE FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE D.	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	
15	RFW906650004	MANDATORY SPARE: COMPLETE SUPPLY OF THE MOTOR FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE D	1	1	ST	30-Mar-20	STORES/BHEL RANIPET	

Enq sno	Material code	Item Description	Qty	Unit	Quoted Currency	Exchange Rate	Unit Rate in Quoted Currency	Unit rate in INR	Total rate in INR
1	RFW905290001	SUPPLY OF PROCESS WATER PUMP WITH MOTOR & ACC. AS PER ATTACHED TECHNICAL SPECIFICATION NTPC.FGD:WATER PUMPS & AS PER ANNEXURE A	6	ST					
7	RFW905470001	MANDATORY SPARE : COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR THE PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A.	1	ST					
8	RFW905470002	MANDATORY SPARES: COMPLETE SUPPLY OF CASING LINERS (FOR EACH TYPE) FOR PROCESS WATER PUMP & AS PER ATTACHED ANNEXURE A	1	ST					
9	RFW905470003	MANDATORY SPARES: BEARINGS OF EACH TYPE & SIZE FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	ST					
10	RFW905470004	MANDATORY SPARE: COMPLETE SUPPLY OF MOTOR FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	ST					
16	RFW906660001	SUPPLY OF MIST ELIMINATOR WASHING PUMP WITH MOTOR &ACC. AS PER ATTACHED TECHNICAL SPECIFICATION NTPC.FGD:WATER PUMPS & AS PER ANNEXURE C	6	ST					
17	RFW906670001	MANDATORY SPARE: COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C.	1	ST					
18	RFW906670002	MANDATORY SPARE: COMPLETE SUPPLY OF CASING LINERS OR WEIR RINGS(FOR EACH TYPE AS APPLICABLE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C.	1	ST					
19	RFW906670003	MANDATORY SPARE: BEARING OF EACH TYPE & SIZE FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C.	1	ST					
20	RFW906670004	MANDATORY SPARE: COMPLETE SUPPLY OF THE MOTOR FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE C	1	ST					

Enq sno	Material code	Item Description	Qty	Unit	Quoted Currency	Exchange Rate	Unit Rate in Quoted Currency	Unit rate in INR	Total rate in INR
2	RFW905300001	SUPPLY OF PROCESS WATER PUMP WITH MOTOR & ACC. AS PER ATTACHED TECHNICAL SPECIFICATION NTPC.FGD:WATER PUMPS & AS PER ANNEXURE A	4	ST					
3	RFW905460001	MANDATORY SPARE : COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR THE PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A.	1	ST					
4	RFW905460002	MANDATORY SPARES: COMPLETE SUPPLY OF CASING LINERS (FOR EACH TYPE) FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A.	1	ST					
5	RFW905460003	MANDATORY SPARES: BEARINGS OF EACH TYPE & SIZE FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	ST					
6	RFW905460004	MANDATORY SPARE: COMPLETE SUPPLY OF MOTOR FOR PROCESS WATER PUMP AS PER ATTACHED ANNEXURE A	1	ST					
11	RFW906640001	SUPPLY OF MIST ELIMINATOR WASHING PUMP WITH MOTOR & ACCESSORIES AS PER TECHNICAL SPECIFICATION NTPC.FGD:WATER PUMPS & AS PER ANNEXURE D.	4	ST					
12	RFW906650001	MANDATORY SPARE: COMPLETE SUPPLY OF IMPELLER ASSEMBLY (EACH TYPE & SIZE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE D.	1	ST					
13	RFW906650002	MANDATORY SPARE: COMPLETE SUPPLY OF CASING LINERS OR WEIR RINGS (FOR EACH TYPE AS APPLICABLE) FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ANNEXURE D.	1	ST					
14	RFW906650003	MANDATORY SPARE: BEARING OF EACH TYPE & SIZE FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE D.	1	ST					
15	RFW906650004	MANDATORY SPARE: COMPLETE SUPPLY OF THE MOTOR FOR MIST ELIMINATOR WASH & EMERGENCY QUENCH PUMP AS PER ATTACHED ANNEXURE D	1	ST					

ANNEXURE A

FOR

WATER PUMPS

OF NTPC PROJECT

CONFIDENTIAL

CUSTOMER	: NTPC
APPLICATION	: FLUE GAS DESULPHURIZATION SYSTEM
PROJECT	: BARH - I



Flue Gas Desulphurization
Air Quality Control Systems
Bharat Heavy Electrical Limited
Ranipet – 632 406.

	TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project
NTPC:FGD:WP: BARH-I : ANNEXURE A	

CONTENTS

1.0	PROJECT INFORMATION
2.0	PROVENNESS CRITERIA:
3.0	WATER ANALYSIS
4.0	PUMP DETAILS
5.0	PAINTING PROCEDURE
5.4	POWER SUPPLY
6.0	MANDATORY SPARES
7.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE A

1.0 PROJECT INFORMATION:

a.	Owner	NTPC (BARH –I- 3 X 660MW)
b.	Buyer	BHEL, Ranipet
c.	Process/Application	Flue Gas Desulphurization
d.	Site Location	Bihar, Patna

A) SITE CONDITIONS

1.	Ambient Temperature and Relative Humidity		
a.	Average Site Condition ASC		
	Ambient Temperature	:	27 deg C
	Ambient Temperature (Design)	:	45 deg C
	Relative Humidity	:	60 %

A) PROJECT LOCATION AND APPROACH

a	Site Address	BHEL SITE OFFICE BARH-I- 3x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA”
---	--------------	--



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE A

2.0 PROVENNESS CRITERIA:

Bidder should have previous experience of design, manufacture, supply, erection and commissioning / supervised erection & commissioning of the Water Pumps as per criteria given in table below and the water pump(s) should have been in successful operation for a period not less than One (1) year prior to Part-I (Techno-commercial) bid opening date”

Sl. No.	Name of Equipment	Type of Equipment	Equipment Rating
1	Water Pumps	Centrifugal pump	80% of the flow & 100% of the head of the offered water Pump(s)

The Bidder shall offer only proven design which meets the Provenness criteria indicated above. Necessary documentary evidences as per Annexure-I for qualification shall be submitted along with the bid. If bidder does not meet the specified Provenness criteria, they are denied to participate in this tender.

ANNEXURE – I

a) REFERENCE LIST as per format shown below

S. No.	Project Name , Customer & Plant capacity	Flow	Head	Motor KW	Qty	Year of Commg	Performance Certificate/ Documentary Evidence
1.							to be enclosed
2.							to be enclosed

SIGNATURE OF BIDDER

NAME

DESIGNATION



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE A

3.0 WATER ANALYSIS:

The following water analysis to be considered:

S.No	Constituents	Unit	Water quality
1.	Total Cations as CaCO_3	ppm	2136.75
2.	Total Anions as CaCO_3	ppm	2136.75
3.	Calcium as CaCO_3	ppm	1102.75
4.	Magnesium as CaCO_3	ppm	506
5.	Sodium as CaCO_3	ppm	528
6.	Potassium as CaCO_3	ppm	
7.	Iron as Fe	ppm	1.65
8.	Total Alkalinity as CaCO_3	ppm	1232
9.	Chlorides as CaCO_3	ppm	583
10.	Sulphate as CaCO_3	ppm	321.75
11.	Silica	ppm	55
12.	pH		7-8.5
13.	p-alkalinity as CaCO_3	ppm	Nil
14.	Turbidity	NTU	55

4.0 PUMP DETAILS:

Sl.No	Description	Unit	Process water Pumps
1.	Number of pumps	Nos	6
2.	Drive Motor		Included in the bidder's scope of supply. The approved vendor list is attached separately (Annexure B)
3.	Head of the pump	m	50



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE A

4.	Capacity of the Pump	m3/ hr.	180
5.	Coupling		Direct drive
6.	Type of Pumps		Horizontal centrifugal
7.	Specific Gravity	--	1
8.	Viscosity	Pa-s	0.003
9.	Fluid medium	---	Process water
10.	Water Characteristics		As per Clause No: 3.0
11.	Mode of operation	--	Continuous
12.	Maximum operating temperature	°C	45
13.	Maximum operating speed	rpm	1500
14.	Service	---	Outdoor. Pump along with motor to be supplied with Canopy.
15.	Casing, Gland and stuffing Box		2.5 Ni Cast Iron to IS 210 Grade
			FG 260 or equivalent.
16.	Impeller (Wear Rings, as applicable)		Stainless Steel-316 grade
17.	Shaft & Sleeves		Stainless Steel-410
18.	Sound (maximum)	dB	85
19.	Pump Efficiency (min	%	60%(min)



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE A

5.0 PAINTING PROCEDURE

SURFACE PREPARATION: Power Tool Cleaning to St3 (SSPC-SP3)

Primer coat		Intermediate Coat		Finish Coat			Total DFT µm (min)
Paint	No. of Coats/ DFT	Paint	No. of Coats/ DFT	Paint	No. of Coats	Shade	
Red Oxide Zinc Phosphate Primer to IS: 12744	2 coat DFT = 30 µm per coat	Synthetic Enamel intermediate coat to IS 2932	1 coat DFT = 50 µm	Synthetic Enamel coat to IS 2932	2 coat DFT = 50 µm per coat	To be informed later	210 Microns

6.0	MANDATORY SPARES
	Bidder to quote for below mentioned mandatory spares with break up price : 1. Complete Impeller Assembly - 1 nos for each type & size. 2. Casing Liners or Weir Rings- 1 set for each type.(Whichever is applicable) 3. Bearings -1 Set 4. Motor- 1 No. of each type Note : Any change in size material design etc. which obviates one to one replacement of the part shall be considered a different type. Unless otherwise stated a set shall mean complete replacement for one equipment.
7.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
1.	POWER GUARANTEE: Bidder to specify the guaranteed power consumption at motor input terminal per Pump operating at the duty point in their offer.

	TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project
NTPC:FGD:WP: BARH-I : ANNEXURE A	

2.	BID EVALUATION CRITERIA FOR POWER CONSUMPTION: Power loading is applicable for the following Pumps 1) Process water Pump The best of the parameter for auxiliary power consumption quoted by any qualified bidder shall be taken as the base or ceiling value. Adjustment factor for excess power consumption in USD = (GPC-CV) X PL X No's of Working pumps. Exchange rate as applicable on price bid opening date will be considered. GPC- Guaranteed Power Consumption quoted by bidder in KW CV- Ceiling Value for Guaranteed Power Consumption in KW PL- Power Loading per KW shall be 135000 INR
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION
	If actual shaft Power Consumption during prove out (or) PG Test operating at the duty point exceeds the value guaranteed by the bidder, liquidated damages for shortfall in performance shall be deducted from contract price as per the formula given below Liquidated damage deductible in USD = (GPC-APC) X P X Total No's of Working pumps for Where • GPC- Guaranteed Power Consumption quoted by bidder in KW • APC- Actual Power Consumption in KW • P- Penalty per KW : 135000 INR/KW

9.0	PACKING AND FORWARDING
1.	Each package or shipping units shall be clearly marked or stenciled on at least two sides as PRE Annexure A BHEL SITE OFFICE BARH-I- 3x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA” In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.

ANNEXURE A

FOR

WATER PUMPS

OF NTPC PROJECT

CONFIDENTIAL

CUSTOMER : NTPC

APPLICATION : FLUE GAS DESULPHURIZATION SYSTEM

PROJECT : BARH – II 2 x 660 MW



Flue Gas Desulphurization

Air Quality Control Systems

Bharat Heavy Electrical Limited

Ranipet – 632 406.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE A

CONTENTS

1.0	PROJECT INFORMATION
2.0	PROVENNESS CRITERIA:
3.0	WATER ANALYSIS
4.0	PUMP DETAILS
5.0	PAINTING PROCEDURE
5.4	POWER SUPPLY
6.0	MANDATORY SPARES
7.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE A

1.0 PROJECT INFORMATION:

a.	Owner	NTPC (BARH –II- 2 X 660MW)
b.	Buyer	BHEL, Ranipet
c.	Process/Application	Flue Gas Desulphurization
d.	Site Location	Bihar, Patna

A) SITE CONDITIONS

1.	Ambient Temperature and Relative Humidity		
a.	Average Site Condition ASC		
	Ambient Temperature	:	27 deg C
	Ambient Temperature (Design)	:	45 deg C
	Relative Humidity	:	60 %

A) PROJECT LOCATION AND APPROACH

a	Site Address	BHEL SITE OFFICE BARH-II- 2x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA”
---	--------------	---

	TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project
NTPC:FGD:WP: BARH-II : ANNEXURE A	

2.0 PROVENNESS CRITERIA:

Bidder should have previous experience of design, manufacture, supply, erection and commissioning / supervised erection & commissioning of the Water Pumps as per criteria given in table below and the water pump(s) should have been in successful operation for a period not less than One (1) year prior to Part-I (Techno-commercial) bid opening date”

Sl. No.	Name of Equipment	Type of Equipment	Equipment Rating
1	Water Pumps	Centrifugal pump	80% of the flow & 100% of the head of the offered water Pump(s)

The Bidder shall offer only proven design which meets the Provenness criteria indicated above. Necessary documentary evidences as per Annexure-I for qualification shall be submitted along with the bid. If bidder does not meet the specified Provenness criteria, they are denied to participate in this tender.

ANNEXURE – I

a) REFERENCE LIST as per format shown below

S. No.	Project Name , Customer & Plant capacity	Flow	Head	Motor KW	Qty	Year of Commg	Performance Certificate/ Documentary Evidence
1.							to be enclosed
2.							to be enclosed

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE A

3.0 WATER ANALYSIS:

The following water analysis to be considered:

S.No	Constituents	Unit	Water quality
1.	Total Cations as CaCO_3	ppm	2136.75
2.	Total Anions as CaCO_3	ppm	2136.75
3.	Calcium as CaCO_3	ppm	1102.75
4.	Magnesium as CaCO_3	ppm	506
5.	Sodium as CaCO_3	ppm	528
6.	Potassium as CaCO_3	ppm	
7.	Iron as Fe	ppm	1.65
8.	Total Alkalinity as CaCO_3	ppm	1232
9.	Chlorides as CaCO_3	ppm	583
10.	Sulphate as CaCO_3	ppm	321.75
11.	Silica	ppm	55
12.	pH		7-8.5
13.	p-alkalinity as CaCO_3	ppm	Nil
14.	Turbidity	NTU	55

4.0 PUMP DETAILS:

Sl.No	Description	Unit	Process water Pumps
1.	Number of pumps	Nos	4
2.	Drive Motor		Included in the bidder's scope of supply. The approved vendor list is attached separately (Annexure B)
3.	Head of the pump	m	45

**TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project****NTPC:FGD:WP: BARH-II : ANNEXURE A**

4.	Capacity of the Pump	m3/ hr.	190
5.	Coupling		Direct drive
6.	Type of Pumps		Horizontal centrifugal
7.	Specific Gravity	--	1
8.	Viscosity	Pa-s	0.003
9.	Fluid medium	---	Process water
10.	Water Characteristics		As per Clause No: 3.0
11.	Mode of operation	--	Continuous
12.	Maximum operating temperature	°C	45
13.	Maximum operating speed	rpm	1500
14	Service	---	Outdoor. Pump along with motor to be supplied along with canopy.
15	Casing, Gland and stuffing Box		2.5 Ni Cast Iron to IS 210 Grade
			FG 260 or equivalent.
16	Impeller (Wear Rings, as applicable)		Stainless Steel-316 grade
17	Shaft & Sleeves		Stainless Steel-410
18	Sound (maximum)	dB	85
19	Pump Efficiency (min	%	60%(min)



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE A

5.0 PAINTING PROCEDURE

SURFACE PREPARATION: Power Tool Cleaning to St3 (SSPC-SP3)

Primer coat		Intermediate Coat		Finish Coat		Shade	Total DFT µm (min)
Paint	No. of Coats/ DFT	Paint	No. of Coats/ DFT	Paint	No. of Coats		
Red Oxide Zinc Phosphate Primer to IS: 12744	2 coat DFT = 30 µm per coat	Synthetic Enamel intermedia te coat to IS 2932	1 coat DFT = 50 µm	Synthetic Enamel coat to IS 2932	2 coat DFT = 50 µm per coat	To be informed latter	210 Microns

6.0	MANDATORY SPARES
	Bidder to quote for below mentioned mandatory spares with break up price : 1. Complete Impeller Assembly - 1 nos for each type & size. 2. Casing Liners or Weir Rings - 1 set for each type.(Whichever is applicable) 3. Bearings -1 Set 4. Motor- 1 No. of each type Note : Any change in size material design etc. which obviates one to one replacement of the part shall be considered a different type. Unless other wise stated a set shall mean complete replacement for one equipment.
7.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
1.	POWER GUARANTEE: Bidder to specify the guaranteed power consumption at motor input Terminal per Pump operating at the duty point in their offer.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE A

2.	BID EVALUATION CRITERIA FOR POWER CONSUMPTION: Power loading is applicable for the following Pumps 1) Process water Pump The best of the parameter for auxiliary power consumption quoted by any qualified bidder shall be taken as the base or ceiling value. Adjustment factor for excess power consumption in USD = (GPC-CV) X PL X No's of Working pumps. Exchange rate as applicable on price bid opening date will be considered. GPC- Guaranteed Power Consumption quoted by bidder in KW CV- Ceiling Value for Guaranteed Power Consumption in KW PL- Power Loading per KW shall be US Dollars 1899
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION If actual shaft Power Consumption during prove out (or) PG Test operating at the duty point exceeds the value guaranteed by the bidder, liquidated damages for shortfall in performance shall be deducted from contract price as per the formula given below Liquidated damage deductible in USD = (GPC-APC) X P X Total No's of Working pumps for Where • GPC- Guaranteed Power Consumption quoted by bidder in KW • APC- Actual Power Consumption in KW • P- Penalty per KW : 1899 USD/KW
9.0	PACKING AND FORWARDING 1. Each package or shipping units shall be clearly marked or stenciled on at least two sides as PRE Annexure A BHEL SITE OFFICE BARH-II- 2x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA" In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.

ANNEXURE C

FOR

WATER PUMPS

OF NTPC PROJECT

CONFIDENTIAL

CUSTOMER	: NTPC
APPLICATION	: FLUE GAS DESULPHURIZATION SYSTEM
PROJECT	: BARH - I



Flue Gas Desulphurization
Air Quality Control Systems
Bharat Heavy Electrical Limited
Ranipet – 632 406.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

CONTENTS

1.0	PROJECT INFORMATION
2.0	PROVENNESS CRITERIA:
3.0	WATER ANALYSIS
4.0	PUMP DETAILS
5.0	PAINTING PROCEDURE
5.4	POWER SUPPLY
6.0	MANDATORY SPARES
7.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

1.0 PROJECT INFORMATION:

a.	Owner	NTPC (BARH –I- 3 X 660MW)
b.	Buyer	BHEL, Ranipet
c.	Process/Application	Flue Gas Desulphurization
d.	Site Location	Bihar, Patna

A) SITE CONDITIONS

1.	Ambient Temperature and Relative Humidity		
a.	Average Site Condition ASC		
	Ambient Temperature	:	27 deg C
	Ambient Temperature (Design)	:	45 deg C
	Relative Humidity	:	60 %

A) PROJECT LOCATION AND APPROACH

a	Site Address	BHEL SITE OFFICE BARH-I- 3x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA”
---	--------------	--



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

2.0 PROVENNESS CRITERIA:

Bidder should have previous experience of design, manufacture, supply, erection and commissioning / supervised erection & commissioning of the Water Pumps as per criteria given in table below and the water pump(s) should have been in successful operation for a period not less than One (1) year prior to Part-I (Techno-commercial) bid opening date”

Sl. No.	Name of Equipment	Type of Equipment	Equipment Rating
1	Water Pumps	Centrifugal pump	80% of the flow & 100% of the head of the offered water Pump(s)

The Bidder shall offer only proven design which meets the Proveness criteria indicated above. Necessary documentary evidences as per Annexure-I for qualification shall be submitted along with the bid. If bidder does not meet the specified Provenness criteria, they are denied to participate in this tender.

ANNEXURE – I

a) REFERENCE LIST as per format shown below

S. No.	Project Name , Customer & Plant capacity	Flow	Head	Motor KW	Qty	Year of Commg	Performance Certificate/ Documentary Evidence
1.							to be enclosed
2.							to be enclosed

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

3.0 WATER ANALYSIS:

The following water analysis to be considered:

S.No	Constituents	Unit	Water quality
1.	Total Cations as CaCO_3	ppm	2136.75
2.	Total Anions as CaCO_3	ppm	2136.75
3.	Calcium as CaCO_3	ppm	1102.75
4.	Magnesium as CaCO_3	ppm	506
5.	Sodium as CaCO_3	ppm	528
6.	Potassium as CaCO_3	ppm	
7.	Iron as Fe	ppm	1.65
8.	Total Alkalinity as CaCO_3	ppm	1232
9.	Chlorides as CaCO_3	ppm	583
10.	Sulphate as CaCO_3	ppm	321.75
11.	Silica	ppm	55
12.	pH		7-8.5
13.	p-alkalinity as CaCO_3	ppm	Nil
14.	Turbidity	NTU	55

4.0 PUMP DETAILS:

Sl.No	Description	Unit	Mist eliminator wash & Emergency Quench pumps
1.	Number of pumps	Nos	6
2.	Drive Motor		Included in the bidder's scope of supply. The approved vendor list is attached separately (Annexure B)
3.	Head of the pump	m	75



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

4.	Capacity of the Pump	m ³ / hr.	180
5.	Coupling		Direct drive
6.	Type of Pumps		Horizontal centrifugal
7.	Specific Gravity	--	1
8.	Viscosity	Pa-s	0.003
9.	Fluid medium	---	Process water
10.	Water Characteristics		As per Clause No: 3.0
11.	Mode of operation	--	Continuous
12.	Maximum operating temperature	°C	45
13.	Maximum operating speed	rpm	1500
14	Service	---	Outdoor. Pump along with motor to be supplied with Canopy.
15	Casing, Gland and stuffing Box		2.5 Ni Cast Iron to IS 210 Grade
			FG 260 or equivalent.
16	Impeller (Wear Rings, as applicable)		Stainless Steel-316 grade
17	Shaft & Sleeves		Stainless Steel-410
18	Sound (maximum)	dB	85
19	Pump Efficiency (min	%	60%(min)

5.0 PAINTING PROCEDURE

SURFACE PREPARATION: Power Tool Cleaning to St3 (SSPC-SP3)

Primer coat	Intermediate Coat	Finish Coat	Total
-------------	-------------------	-------------	-------



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

Paint	No. of Coats/ DFT	Paint	No. of Coats/ DFT	Paint	No. of Coats	Shade	DFT µm (min)
Red Oxide Zinc Phosphate Primer to IS: 12744	2 coat DFT = 30 µm per coat	Synthetic Enamel intermedia te coat to IS 2932	1 coat DFT = 50 µm	Synthetic Enamel coat to IS 2932	2 coat DFT = 50 µm per coat	To be informed later	210 Microns

6.0

MANDATORY SPARES

Bidder to quote for below mentioned mandatory spares with break up price :

1. Complete Impeller Assembly - 1 nos for each type & size.
2. Casing Liners or Weir Rings- 1 set for each type(whichever is applicable)
3. Bearings -1 Set
4. Motor- 1 No. of each type

Note :

1) Any change in size material design etc. which obviates one to one replacement of the part shall be considered a different type. Unless otherwise stated a set shall mean complete replacement for one equipment.

7.0

BID EVALUATION CRITERIA FOR POWER CONSUMPTION:

1.

POWER GUARANTEE: Bidder to specify the guaranteed power consumption at motor input terminal per Pump operating at the duty point in their offer.

2.

BID EVALUATION CRITERIA FOR POWER CONSUMPTION: Power loading is applicable for the following Pumps

- 1) Mist Eliminator wash.

The best of the parameter for auxiliary power consumption quoted by any qualified bidder shall be taken as the base or ceiling value.

Adjustment factor for excess power consumption in USD = (GPC-CV) X PL X No's of Working pumps. Exchange rate as applicable on price bid opening date will be considered.

GPC- Guaranteed Power Consumption quoted by bidder in KW

CV- Ceiling Value for Guaranteed Power Consumption in KW

PL- Power Loading per KW shall be 135000 INR



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-I : ANNEXURE C

8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION
	If actual shaft Power Consumption during prove out (or) PG Test operating at the duty point exceeds the value guaranteed by the bidder, liquidated damages for shortfall in performance shall be deducted from contract price as per the formula given below Liquidated damage deductible in USD = (GPC-APC) X P X Total No's of Working pumps for Where • GPC- Guaranteed Power Consumption quoted by bidder in KW • APC- Actual Power Consumption in KW • P- Penalty per KW : 135000 INR/KW

9.0	PACKING AND FORWARDING
1.	Each package or shipping units shall be clearly marked or stenciled on at least two sides as PRE Annexure A BHEL SITE OFFICE BARH-I- 3x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA" In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.

ANNEXURE D

FOR

WATER PUMPS

OF NTPC PROJECT

CONFIDENTIAL

CUSTOMER	: NTPC
APPLICATION	: FLUE GAS DESULPHURIZATION SYSTEM
PROJECT	: BARH – II 2 x 660 MW



Flue Gas Desulphurization
Air Quality Control Systems
Bharat Heavy Electrical Limited
Ranipet – 632 406.

	TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project NTPC:FGD:WP: BARH-II : ANNEXURE D
---	---

CONTENTS

1.0	PROJECT INFORMATION
2.0	PROVENNESS CRITERIA:
3.0	WATER ANALYSIS
4.0	PUMP DETAILS
5.0	PAINTING PROCEDURE
5.4	POWER SUPPLY
6.0	MANDATORY SPARES
7.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE D

1.0 PROJECT INFORMATION:

a.	Owner	NTPC (BARH –II- 2 X 660MW)
b.	Buyer	BHEL, Ranipet
c.	Process/Application	Flue Gas Desulphurization
d.	Site Location	Bihar, Patna

A) SITE CONDITIONS

1.	Ambient Temperature and Relative Humidity		
a.	Average Site Condition ASC		
	Ambient Temperature	:	27 deg C
	Ambient Temperature (Design)	:	45 deg C
	Relative Humidity	:	60 %

A) PROJECT LOCATION AND APPROACH

a	Site Address	BHEL SITE OFFICE BARH-II- 2x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA”
---	--------------	---



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE D

2.0 PROVENNESS CRITERIA:

Bidder should have previous experience of design, manufacture, supply, erection and commissioning / supervised erection & commissioning of the Water Pumps as per criteria given in table below and the water pump(s) should have been in successful operation for a period not less than One (1) year prior to Part-I (Techno-commercial) bid opening date”

Sl. No.	Name of Equipment	Type of Equipment	Equipment Rating
1	Water Pumps	Centrifugal pump	80% of the flow & 100% of the head of the offered water Pump(s)

The Bidder shall offer only proven design which meets the Proveness criteria indicated above. Necessary documentary evidences as per Annexure-I for qualification shall be submitted along with the bid. If bidder does not meet the specified Provenness criteria, they are denied to participate in this tender.

ANNEXURE – I

a) REFERENCE LIST as per format shown below

S. No.	Project Name , Customer & Plant capacity	Flow	Head	Motor KW	Qty	Year of Commg	Performance Certificate/ Documentary Evidence
1.							to be enclosed
2.							to be enclosed

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE D

3.0 WATER ANALYSIS:

.The following water analysis to be considered:

S.No	Constituents	Unit	Water quality
1.	Total Cations as CaCO_3	ppm	2136.75
2.	Total Anions as CaCO_3	ppm	2136.75
3.	Calcium as CaCO_3	ppm	1102.75
4.	Magnesium as CaCO_3	ppm	506
5.	Sodium as CaCO_3	ppm	528
6.	Potassium as CaCO_3	ppm	
7.	Iron as Fe	ppm	1.65
8.	Total Alkalinity as CaCO_3	ppm	1232
9.	Chlorides as CaCO_3	ppm	583
10.	Sulphate as CaCO_3	ppm	321.75
11.	Silica	ppm	55
12.	pH		7-8.5
13.	p-alkalinity as CaCO_3	ppm	Nil
14.	Turbidity	NTU	55

4.0 PUMP DETAILS:

Sl.No	Description	Unit	Mist eliminator wash & Emergency Quench pumps
1.	Number of pumps	Nos	4
2.	Drive Motor		Included in the bidder's scope of supply. The approved vendor list is attached separately (Annexure B)
3.	Head of the pump	m	70

**TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project****NTPC:FGD:WP: BARH-II : ANNEXURE D**

4.	Capacity of the Pump	m3/ hr.	180
5.	Coupling		Direct drive
6.	Type of Pumps		Horizontal centrifugal
7.	Specific Gravity	--	1
8.	Viscosity	Pa-s	0.003
9.	Fluid medium	---	Process water
10.	Water Characteristics		As per Clause No: 3.0
11.	Mode of operation	--	Continuous
12.	Maximum operating temperature	°C	45
13.	Maximum operating speed	rpm	1500
14.	Service	---	Outdoor. Pump along with motor to be supplied along with canopy.
15.	Casing, Gland and stuffing Box		2.5 Ni Cast Iron to IS 210 Grade
			FG 260 or equivalent.
16.	Impeller (Wear Rings, as applicable)		Stainless Steel-316 grade
17.	Shaft & Sleeves		Stainless Steel-410
18.	Sound (maximum)	dB	85
19.	Pump Efficiency (min)	%	60%(min)



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD:WP: BARH-II : ANNEXURE D

5.0 PAINTING PROCEDURE

SURFACE PREPARATION: Power Tool Cleaning to St3 (SSPC-SP3)

Primer coat		Intermediate Coat		Finish Coat			Total DFT μm (min)
Paint	No. of Coats/ DFT	Paint	No. of Coats/ DFT	Paint	No. of Coats	Shade	
Red Oxide Zinc Phosphate Primer to IS: 12744	2 coat DFT = 30 μm per coat	Synthetic Enamel intermediate coat to IS 2932	1 coat DFT = 50 μm	Synthetic Enamel coat to IS 2932	2 coat DFT = 50 μm per coat	To be informed latter	210 Microns

6.0 MANDATORY SPARES

Bidder to quote for below mentioned mandatory spares with break up price :

1. Complete Impeller Assembly - 1 nos for each type & size.
2. Casing Liners or Weir Rings- 1 set for each type (whichever is applicable)
3. Bearings -1 Set
4. Motor- 1 No. of each type

Note : Any change in size material design etc. which obviates one to one replacement of the part shall be considered a different type.

Unless other wise stated a set shall mean complete replacement for one equipment.

7.0 BID EVALUATION CRITERIA FOR POWER CONSUMPTION:

1. **POWER GUARANTEE:** Bidder to specify the guaranteed power consumption at motor input Terminal per Pump operating at the duty point in their offer.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

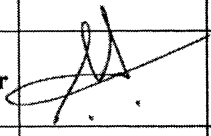
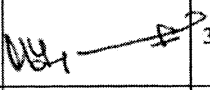
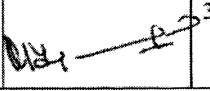
NTPC:FGD:WP: BARH-II : ANNEXURE D

2.	BID EVALUATION CRITERIA FOR POWER CONSUMPTION: Power loading is applicable for the following Pumps 1) Mist Eliminator wash. The best of the parameter for auxiliary power consumption quoted by any qualified bidder shall be taken as the base or ceiling value. Adjustment factor for excess power consumption in USD = (GPC-CV) X PL X No's of Working pumps. Exchange rate as applicable on price bid opening date will be considered. GPC- Guaranteed Power Consumption quoted by bidder in KW CV- Ceiling Value for Guaranteed Power Consumption in KW PL- Power Loading per KW shall be US Dollars 1899
8.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION If actual shaft Power Consumption during prove out (or) PG Test operating at the duty point exceeds the value guaranteed by the bidder, liquidated damages for shortfall in performance shall be deducted from contract price as per the formula given below Liquidated damage deductible in USD = (GPC-APC) X P X Total No's of Working pumps for Where • GPC- Guaranteed Power Consumption quoted by bidder in KW • APC- Actual Power Consumption in KW • P- Penalty per KW : 1899 USD/KW
9.0	PACKING AND FORWARDING 1. Each package or shipping units shall be clearly marked or stenciled on at least two sides as PRE Annexure A BHEL SITE OFFICE BARH-II- 2x660 MW, NATIONAL THERMAL POWER CORPORATION BIHAR,PATNA, INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA" In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.

Product Standard
EDC / ELECTRICAL , C & I
RANIPET 632406

TECI : LT MOTOR: REV 02
PAGE 1 OF 8
Effective date: 30.01.2017

TITLE : TECHNICAL SPECIFICATION FOR BOUGHT OUT ITEMS
ITEM : LT MOTOR
Project : BHEL standard

NAME		DESIGNATION	SIGNATURE	DATE
PREPARED	K S S MANIAN	Ex Addl Engr		31.01.17
CHECKED	M JEYAMURUGANAND	S D G M		31.01.17
APPROVED	M JEYAMURUGANAND	S D G M		31.01.17

ISSUED BY EDC ECI

Record of revision

REVISION NO : 02	CI 39.0 PACKING DRAWING INCLUDED
REVISION NO : 01	CI2.1 Reviewed & Revised
REVISION NO : 00	INITIAL RELEASE : 19.3.2013 Based on TDC TCI 140 Rev 08 & TFN LTM rev 05

CI No.	CHARACTERISTICS	REQUIREMENT	VENDOR COMPLIANCE (Refer Note: 2)
1.0	<u>SITE CONDITIONS</u>		
1.1	Altitude above mean sea level	> 1000 m.	
1.2	Ambient temperature condition	6 to 50°C.	
1.3	Relative humidity	100 %	
1.4	Atmosphere	Tropical ,Dusty, salty, corrosive & highly polluted	
2.0	<u>GENERAL</u>	in a coal based Thermal power plant.	
2.1	Reference standards	IS 325, IS 1231, IS 4722, IS 6362, IS 2253, IS 12065, IS 12075 , IS 4691 & <u>IS 12615- Energy efficient</u>	
2.2	Design ambient	50 Deg C	
2.3	Application/ Type(Normal/ Energy efficient)	As per Enquiry & PO.	
2.4	Duty cycle	Continuous S1	
2.5	Rated voltage, frequency & Phases	415 V AC $\pm 10\%$; 50 Hz $\pm 5\%$;(PI check enquiry for voltage) 10% absolute sum - 3 phase	
2.6	Minimum starting voltage	80% of the rated voltage	
2.7	Minimum voltage under which motor will run satisfactorily Capacity to restart (at voltage specified in point No. 2.4)	75% of the rated voltage for 5 minutes i. TWO successive starts from cold condition ii. Two HOT restarts starts from Hot condition iii. Three equally spread start per hour	
2.8	High speed bus transfer withstand capability	Suitable to withstand 150 % of rated voltage	
2.9	Type of balancing for rotor	Dynamic balancing	
2.10	Direction of rotation	Suitable for both direction	
2.11	Direction of cooling air	Non-drive end to driving end	
2.12	Class of insulation	Class F with temperature rise limited to Class B.	
2.13	Winding treatment	The insulation shall be given tropical and fungicidal treatment for successful operation of the motor in hot , humid & tropical climate.	
2.14	Allowed winding temperature rise at continuous full load	60°C by thermometer method & 70°C by resistance method	

CI No.	CHARACTERISTICS	REQUIREMENT	VENDOR COMPLIANCE (Refer Note: 2)
2.15	Starting current	Less than or equal to 600% full load current subject to tolerance as per IS.(Normal motor) Less than or equal to 700% full load current subject to tolerance as per IS.(Energy efficient)	
2.16	Starting time & locked rotor withstand time	The locked rotor withstand time (LRWT) at 110% rated voltage (RV) under HOT condition shall be at least 3 sec more than the starting time at 80% of rated voltage for motors with acceleration time upto 20 sec at RV and 5 sec where the accelerating time is more than 20 sec at RV.	
2.17	Vibration	The peak amplitude of vibration shall be as per IS 12075	
2.18	Noise level	Within the limits specified by IS 12065. (<80 db at full load condition) @ 1 metre distance.	
2.19	Type of enclosure	TEFC, IP 55 as per IS 4691.	
2.20	Type of mounting	Horizontal foot mounted.	
2.21	Bearings	Ball or roller type / bearings effectively sealed against ingress of dust. The bearing shall be so constructed that the loss of lubricating grease is kept to minimum. Sealed bearings are also acceptable.	
2.22	Lubricant Type	Grease	
2.23	Bearing life	Bearings shall have a minimum life of 40000 Working hours.	
2.24	Shaft extension	Motors shall be provided with key slotted bare shaft extension with key at the driving end.	
2.25	Terminal box Type	Weather proof IP 55 as per IS 4691, Capable of being turned through 360° in steps of 90°.	
2.26	Cable gland and lugs	Double compression type nickel plated brass cable glands and insulated tinned copper crimping lugs to suit the cable size shall be supplied along with the motor. i) Size of power cables will be intimated after PO. ii) For space heater cable glands and lugs suitable for 2CX2.5 to be provided	
2.27	Type of terminals	Stud / screw type with plain washers, spring washers / checknuts & lugs	

CI No.	CHARACTERISTICS	REQUIREMENT	VENDOR COMPLIANCE (Refer Note: 2)
2.28	Fault level	40 KA for 0.25 Sec (Suitable HRC fuse backup will be provided by BHEL in MCC/switchgear)	
2.29	Painting	Epoxy based paint (Colour shade 631/ Shade 632/ Shade 275/ RAL 5012 as per IS:5. This will be confirmed after PO.	
30.0	Space heaters		
30.0.A	Motors above 30 kW	Separate space heater suitable for 240V, 1 Phase, AC, 50 Hz shall be provided	
30.0.B	Motors below 30 kW	Winding shall be suitable for heating continuously at 24 V, Single phase, AC, 50 Hz	
30.0.C	Terminals for space heater	Separately terminated with clear identification in main terminal box.	
31.0	RTD for winding	Two numbers of Thermistors / RTD for each phase as below are to be provided A. Motors above 37 Kw shall have thermistors Or RTD if specifically called for in enquiry. B. Motor rated 160kW and above shall have RTDs	
32.0	Bearing RTD	For motors 132 Kw and above bearing temperature detectors(RTD) shall also be offered.	
33.0	Terminals for RTD/ Thermistor	Thermistors/ RTDs shall be terminated in a auxiliary terminal box. Details shall be furnished in TB diagram.	
34.0	Earthing	Two no of earthing provisions on terminal box and on motor body	
35.0	Name plate	As per IS 325 and Addl data on name plate:: a. Bearing DE/ NDE details. b. Year of manufacture	
36.0	Lifting Device	Eye bolt or lugs to facilitate safe lifting	
37.0	<u>INSPECTION & TESTING</u>	As per applicable quality plan	

CI No.	CHARACTERISTICS	REQUIREMENT	VENDOR COMPLIANCE (Refer Note: 2)
38.0	<u>DOCUMENTS</u> a) Along with offer: b) After placement of Purchase order (within 15 days)	One set of technical data sheet as per the enclosed format and Motor general arrangement drawing giving foundation details, shaft details. Three sets of the following for approval: 1. Technical Data sheet as per the enclosed format of TECI LTMOTOR REV 00- sh 6 to 8 2. Motor general arrangement drawing giving foundation details, shaft details and weight 3. Motor Terminal box arrangement drawing 4. Motor characteristic curves . 5. Steel crate packing drawing. The following shall be submitted 1. Guarantee certificate. 2. O & M manuals. <u>3. Acceleration time and LRWT calculation shall be submitted for review.</u> a) As per Drawing No:- 3-00-114-39893 b) The packing shall meet the Transport, Environment & Storage hazards. c) As per Packing Procedure QA:CI: STD:PR:03 or as per Manufacturer's Standard Practice subject to approval. <u>Vendor shall check the applicable rated voltage in enquiry.</u>	
39.0	<u>PACKING</u>	 	

NOTE:

1. Refer current valid list for revision status of Quality Plan & Packing Procedure.
2. In 'Vendor compliance' column Vendor to indicate 'YES', 'NO' or 'NOT APPLICABLE'. Clarification , if any, in this column will not be considered.

PO no ::

DATA SHEET - Cust No :: Project ::

CL. NO	CHARACTERISTICS	Vendor data (To be filled by vendor)
1.0	Application	
1.1	Fan / Load Curve referred	
2.0	Manufacturer	
3.0	Type & frame size	Normal / Energy efficient Frame size:
3.1	Degree of Protection	IP55
4.0	Rated output in kW	
4.1	Rated speed	
5.0	Rated voltage , frequency & phases	415 V AC $\pm 10\%$; 50 Hz $\pm 5\%$; (<u>Check voltage as per enqy</u>), 10% absolute sum - 3 phase
6.0	Full load current	Amps
7.0	Energy efficient	As per IS 12615
8.0	Efficiency & power factor at Full load	Eff-- PF--
9.0	Efficiency & power factor at 75 % load	Eff-- PF--
10.0	Efficiency & power factor at 50 % load	Eff-- PF--
11.0	Duty Cycle	S1 - Continuous
12.0	Rated torque	
13.0	Starting current	600% of full load current
14.0	No load current (with mechanism coupled)	@ RV and Frequency
15.0	Starting torque in % of full load torque	
16.0	Pull up torque in % of full load torque	
17.0	Pull out torque in % of full load torque	
18.0	No load starting time (without mechanism coupled)	
19.0	Locked rotor withstand time at rated voltage	a. Hot b. Cold
20.0	Locked rotor withstand time at minimum starting voltage	a. Hot b. Cold
21.0	Locked rotor withstand time at 110% rated voltage	a. Hot b. Cold
22.0	Starting time at minimum starting voltage with mechanism coupled	
23.0	Starting time at rated voltage with mechanism coupled	
24.0	Maximum permissible starting time	
25.0	Stator thermal time constant	Minutes
26.0	Type & No of terminals brought out	

CI no	CHARACTERISTICS	Vendor Data (To be filled by vendor)
27.0	Stator winding connection	Delta / star
28.0	Class of insulation & temperature rise	Class F; 60°C by thermometer method / 70°C by resistance method.
29.0	Minimum permissible starting voltage	Volts
30.0	Resistance per phase @20 Deg C (Indicative)	Ohms
31.0	No of successive starts in Hot condition	ONE / TWO
32.0	Quantity and power consumption of space heater	Qty== Watts==
33.0	Direction of rotation	Bi-Directional.
34.0	Bearing make & type	Make:: Drive End; Non Drive End;
35.0	Lubricant quantity , grade & recommended interval of lubrication	
36.0	Type of mounting & shaft orientation <u>Terminal Box</u>	Foot mounting; Horizontal.
37.0	Location & angle of rotation	
38.0	Gland size for stator winding	
39.0	Gland size for space heater	Suitable for 2CX2.5 sq.mm(armoured), if applicable.
40.0	Cable entry	
41.0	GD ² of motor (kg-m ²)	
42.0	Total weight of motor (kg).	
43.0	Weight of stator (kg)	
44.0	Weight of rotor (kg)	
45.0	Anticipated bearing life in Hours	
46.0	Method of connection to driven equipment Limiting rotor temperature for determining safe stall time	☐
47.0	RTD for winding/ Bearing	Applicable YES NO
48.0	Grade of balance of motor	
49.0	Standard continuous rating at 40 Deg C ambient.	
50.0	Derated rating of motor at 50 Deg C.	
51.0	a. Locked Rotor KVA b. Ratio of Locked rotor KVA / Rated KW	
52.0	a. Motor Dynamic Load b. Motor Static load	Upward/ Downward— Upward / Downward—
53.0	PAINT SHADE	
54.0		

Vendor's signature and seal

Rev No ::

Date ::

The following curves are to be enclosed during datasheet approval.

1. GA drawing , Terminal box arrangement
2. Torque Vs Speed with load curve superimposed.
3. Speed Vs Current
4. Time Vs Current
5. Thermal with stand curve
6. Load Vs Efficiency
7. Load Vs Slip
8. Load Vs Power factor
9. Speed Vs Time
10. Load Vs Current.

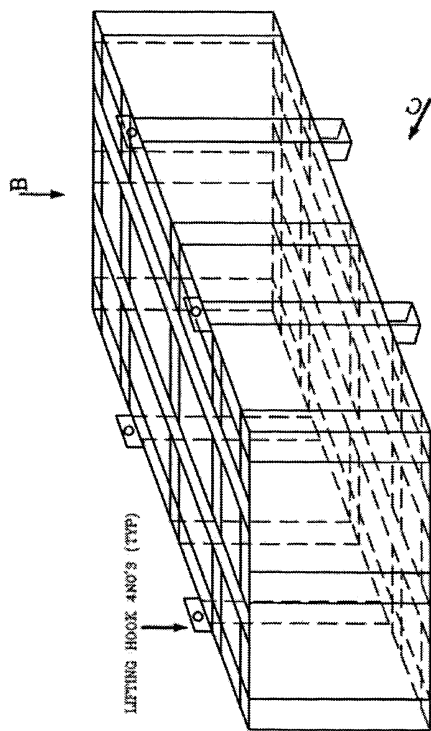
The following information shall be specifically provided for motors suitable for VFD drive (if called for in eqny during datasheet approval in addition to datasheet.

1. Stator RESISTANCE
2. Stator leakage reactance
3. Magnetising reactance
4. Rotor resistance referred to stator
5. Rotor reactance referred to stator

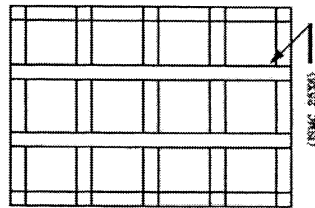
Vendor's signature and seal.

Date ::

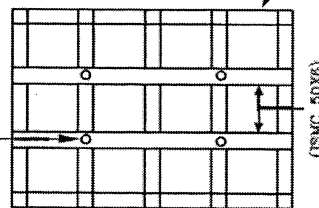
NOTES:
 01. LT MOTOR SHALL BE WRAPPED WITH BUBBLED PLASTIC SHEET
 OVER IRMS STEEL CRATE PACKING.
 02. STEEL CRATE SIZE :: OVERALL SIZE OF MOTOR +200 MM (L, B & H)
 03. MATERIAL - STEEL CRATE.
 04. LT MOTOR ONE IN EACH CRATE.
 05. STEEL CRATE SHALL WITH STAND MECHANICALLY AFTER MULTIPLE
 LANDING PUNTS. VENDOR WORKS BHEL STORES LORRY SITE STORES).
 06. MATERIAL CODE PROJECT NAME MOTOR WEIGHT SHALL
 BE PAINTED BOLDLY ON ANY TWO SIDES OF FRAME FOR IDENTIFICATION.
 07. PACKING SLIP INDICATING MOTOR P.O DETAILS MATERIAL CODE WEIGHT
 SHALL BE AFFIXED TO MOTOR FRAME FOR IDENTIFICATION.
 08. THIS PACKING DRAWING IS TYPICAL AND SHALL SUIT THE MOTOR
 WEIGHT SUPPLIED.
 09. THE PACKING DRAWING INDICATING SIZE AND MATERIAL USED SHALL BE
 SUBMITTED ALONG WITH DATASHEET FOR BHEL APPROVAL.



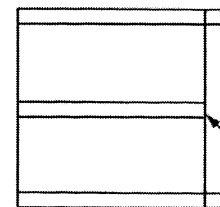
MOTOR SHALL BE FIRMLY BOLTED ON BOTTOM FRAME (TYP)



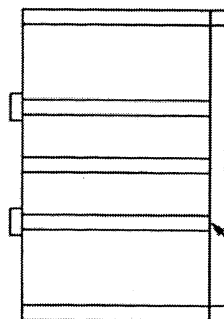
TOP VIEW



BOTTOM VIEW



ELEVATION
VIEW A
ISM 25X6



SIDE VIEW
VIEW C
ISM 25X6

STANDARD DRAWING

PROJECT

CAREFULLY THE INFORMATION ON THIS DOCUMENT IS THE
 PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT
 MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY
 WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

300-000

BHARAT HEAVY ELECTRICALS LIMITED,
 BOILER AUXILIARIES PLANT,
 RAIPUR - 832 406.

DATE	SIGN	TITLE
30.01.17	E.S.	PACKING ARRANGEMENT FOR
30.01.17	A.	LT-MOTOR (STEEL CRATE)
30.01.17	M.J.M.	DRG. NO.
30.01.17		REV.

3-00-114-39893

00

NTS

6

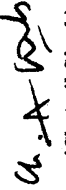
7

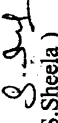
8

Size A2

ANNEXURE B

 Ranipet					DOC. NO: CQR: ELE: G501&G502 REV. NO.: 00 DATE : 17 05 2018 Page 5 of 11	
SL. NO.	ITEM	NTPC APPROVED VENDORS	PLACE	QP CATEGORY	NTPC Type Test Requirements & Quality Plan/Check Lists Requirement	Remarks
04	LT MOTORS	a) KEC	Bangalore/Hubli (Up to 90KW)	Please refer remark column for Categorization	BAP/QR/ G501 & G502 /LTM:012 Rev NO: 00 dt 17 05 2018	Cat I Above 50 KW and up to 200KW NTPC insp as per appd RQP/MQP
		c) CGL	Ahmednagar			
	b) SIEMENS	Mumbai				
	c)ABB	Faridabad up to 55KW/ Bangalore above 55KW				Cat-II **From 30KW to 50KW BHEL inspection
	a) BBL	Mumbai			** Acceptance of Motor rating between 30KW to 50 KW is based on NTPC Review of Routine Test Inspection report as per IS 325 Witnessed by BHEL/BHEL AIA ie Main contractor along with COC of the manufacturer and the contractor confirming as follows: "It is hereby confirmed that the above mentioned motor was /motors were manufactured taking care of NTPC specific requirements regarding ambient temperature, voltage and frequency variation, hot starts , pull out torque, starting KVA/KW, temperature rise, distance between centre of stud and gland plate, space heater and in accordance with approved drawing /data sheets" ##Acceptance of Motor less than 30KW is based on COC of the manufacturer and the contractor conforming as follows: "It is here by confirmed that the above mentioned motor/motor was / were manufactured taking care of NTPC specific requirements regarding ambient temperature, voltage and frequency variation, hot starts , pull out torque, starting KVA/KW, temperature rise ,distance between centre of stud and gland plate and tested in accordance with approved drawing /data sheet".	# Cat-III Up to 30KW
	b) NGEF	Hubli (up to 15KW)				
	c) Marathon	Kolkata				
	d) Jyoti	Vadodara				
	e) LHP	Solapur				
		(For other PMD vendors except above NTPC approved vendors, pl refer Slno. 4 under important notes in page no:11)				

Prepared by: 
 (Ch. Anil Singh)
 Dy. Engineer/QA (Electrics)

Reviewed by: 
 (S. Sheela)
 Dy. Manager/QA (Electrics) & System

Approved by: 
 (K. Gandhi Parimalam)
 DGM / QA (Electrics)

GENERAL SPECIFICATION

FOR

WATER PUMPS

OF NTPC PROJECT

CONFIDENTIAL

CUSTOMER	: NTPC
APPLICATION	: FLUE GAS DESULPHURIZATION SYSTEM



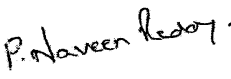
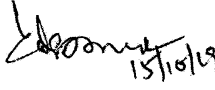
**Flue Gas Desulphurization
Air Quality Control Systems
Bharat Heavy Electrical Limited
Ranipet – 632 406.**



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

TECHNICAL SPECIFICATION FOR WATER PUMPS

Department	Prepared	Checked	Approved
FGD	 Abhinav Kumar Sr. Engineer-WS	 Naveen Reddy Mgr-FGD	 K.Meenakshisundarm DGM-WS
Revision – 00 Dated 15/10/2019		COMMENTS : ----	

This document is meant for the exclusive purpose of bidding against this specification and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

CONTENTS

1.0	PROJECT INFORMATION
2.0	APPLICABLE CODES & REGULATIONS
3.0	WATER ANALYSIS
4.0	INTENT OF SPECIFICATION
4.1	ANNEXURE I :PROVENNESS CRITERIA:
5.0	TECHNICAL INFORMATION
5.1	SCOPE OF SUPPLY
5.2	ANNEXURE II :DATA SHEET TO BE FILLED BY VENDOR: (FOR ALL PUMPS)
5.3	PAINTING PROCEDURE
5.4	POWER SUPPLY
6.0	GENERAL REQUIREMENTS
6.1	CONSTRUCTIONAL FEATURES
6.2	PACKING & FORWARDING
7.0	SUPERVISION OF ERECTION, TESTING & COMMISSIONING
8.0	EXCLUSION
9.0	INSPECTION AND TESTING
10.0	OTHER SALIENT POINTS
11.0	SPARES, TOOLS & TACKLES
11.1	START UP & COMMISSIONING SPARES
12.0	MANDATORY SPARES
13.0	DEFECT LIABILITY & WARRANTY
14.0	FIRST FILL OF CONSUMABLES
15.0	PERFORMANCE GUARANTEE
16.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION
17.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION
18.0	DOCUMENTATION
19.1	ANNEXURE III- SCHEDULE OF GUARANTEES
19.2	ANNEXURE – IV- LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT
19.3	ANNEXURE –V- A)DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER
	ANNEXURE –V- B)DOCUMENTS TO BE SUBMITTED AFTER CONTRACT
19.4	ANNEXURE-VI : TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING
19.5	ANNEXURE-VII: INSPECTION & TESTING
19.6	ANNEXURE-VIII- LT MOTOR DATA SHEET



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

1.0 PROJECT INFORMATION:

As per Annexure A , Clause 1.0

2.0 APPLICABLE CODES & REGULATIONS

The design and materials shall conform to the requirements of applicable codes and regulations of the latest edition. The design, manufacture, installation and testing of the pump shall follow the latest applicable Indian/International (ASME/EN/Japanese) Standards.

3.0 WATER ANALYSIS:

As per Annexure A , Clause 3.0

4.0 INTENT OF SPECIFICATION

This specification covers the minimum requirements for the complete design, material, manufacturing, shop inspection, testing at the manufacturer's works, supervision of erection & performance testing at bidder's works of water pumps along with accessories which is furnished in the Flue Gas Desulphurization system. The following points may be noted.

- a. Each unit is envisaged with one FGD system. The details for the pumps is envisaged in the Annexure A.
- b. Bidder shall assume full unit responsibility for the entire equipment assembly and make all possible efforts to comply strictly with the requirements of this specification and other specifications/attachments to inquiry/order.
- c. In case, deviations are considered essential by the Bidder (after exhausting all possible efforts), the same shall be separately listed in the Bidder's proposal under separate section, titled as "List of Deviations/Exceptions to the Enquiry Document (**Annexure-IV**)".
- d. Any deviation, not listed under the above section, even if reflected in any other portion of the proposal, shall not be considered applicable.
- e. No deviation or exception shall be permitted without the written approval of the purchaser.
- f. Compliance to this specification shall not relieve the Bidder of the responsibility of furnishing equipment and accessories/auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions.
- g. In case, the Bidder considers requirement of additional instrumentation, controls, safety devices and any other accessories/auxiliaries essential for safe and satisfactory operation of the equipment, the same shall be recommended along with reasons in a separate section and include the same in scope of supply.
- h. All accessories, items of work, though not indicated but required to make the system complete for its safe, efficient, reliable and trouble free operation and maintenance shall also be in supplier's scope unless specifically excluded.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

5.1 Scope of Supply & Services

1. All the pumps shall be supplied along with individual drive motor (IE3), Base Plate along with required isolations, Coupling, Foundation Bolt and valves, Expansion Bellows(Neoprene) at inlet & outlet & other accessories as required.
2. Bidder's Service Engineer shall visit the site for supervision of Erection and commissioning of the pumps.
3. Supervision of Erection and Commissioning of the all pumps at project site
4. First Fill of Consumables, Oil & Lubricants shall be supplied.

5.2 Annexure II: Data Sheet to be filled by vendor: (to be filled by bidder for each pump)

Sl. No	Description	Value
TECHNICAL DETAILS		
1	Make	
2	Model	
3	Application	
4	Design Flow at Rated Speed (m3/hr)	
5	Minimum & Maximum Continuous Flow (m3/hr)	
6	Total Discharge Head @ design flow MWC	
7	Shut off Head @ MWC	
8	NPSH required (minimum) @ MWC	
9	Hydraulic test pr.@ Kg/Sq. Cm	
10	Pump efficiency -	
10.1	At design point %	
10.2	At maximum flow %	
11	Pump shaft power reqd. at design point @ KW	
12	Maximum shaft power required @ KW	
13	Selected motor @ KW	
14	Rated speed & critical speed @ rpm	
15	GD2 of the pump @ kgm2	
16	Operating flow range from design point % : + -	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

17	Noise level at duty range dBA at 1.0 m distance			
18	Vibration level -			
18.1	Displacement microns			
18.2	Velocity (Peak) mm/sec			
19	Balancing quality as per ISO 1940 std.			
20	Rotation of shaft viewing from drive end			
21	Tolerance on head and efficiency at rated speed and flow.			
CONSTRUCTIONAL DETAILS				
1.0	Suction / Discharge nozzle			
1.1	Size mm			
1.2	Rating psi			
1.3	Flange drilling standard			
1.4	Nozzle Orientation looking from DE			
2.0	Material of construction / make			
2.1	Pump casing			
2.2	Impeller			
2.3	Shaft			
2.4	Shaft sleeve			
2.5	Wear rings			
2.6	Diffuser			
2.7	Mechanical seal			
2.8	Bearing housing			
2.9	Fasteners			
2.10	Others if any			
3.0	No. of stage			
3.1	Impeller type			
3.2	Impeller diameter Trimmed / Untrimmed			
4.0	Bearings			
4.1	Type			
4.2	Make			
4.3	Lubrication Oil - Specification			
4.4	Lub. Oil Quantity / pump Litre			



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

5.0	Mechanical seal			
5.1	Type			
5.2	Make			
5.3	Model			
5.4	Drawing No			
6.0	Performance curve references No.			
7.0	Foundation Draws No.			
7.1	Pump Dimension L x W x H in mm			
7.2	Pump Weight in Kg			
COUPLING				
1.0	Type			
2.0	Make , Model No			
3.0	Coupling guard Material			
4.0	Dimension detail with BOM enclosed			
5.0	Weight in Kg			
BASE FRAME AND ACCESSORIES				
1.0	Material			
2.0	Dimension detail in mm			
3.0	Weight kg :			
GENERAL				
1.0	Shipping package dim. in mm			
2.0	Total assembly weight in Kg			
3.0	Total shipment weight in Kg			

6.0	TECHNICAL REQUIREMENTS
	The pumps shall be designed for continuous operation. The pump shall be single stage centrifugal type capable of delivering the rated flow at rated head as specified in the respective clauses.
1.	The design of the shaft shall ensure that the operating speed is at least 20% above the critical speed of the shaft.
2.	The pump shall be provided with seals of proven type and shall be designed for minimization of seal water consumption. The shaft shall be supported on heavy duty ball/roller bearings.
3.	All pumps shall be designed to withstand a test pressure of 1.5 times the maximum possible pump shut off pressure under maximum suction pressure conditions
4.	The Pump flow/head characteristics shall be such that within the operation range the head will continuously increase with decreasing flow, maximum head (shut off head) being at least 10% higher than the duty point head.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

5.	All pumps shall be fitted with suction and discharge pressure gauges											
6.	Each pump will have a coupling of adequate size, designed for full load and capable of supporting start –Up an overload moment.											
7.	The Antifriction bearing of the pumps shall be designed for minimum useful life (L-10) of 25,000 hours of continuous operation (Under the design condition). The thrust bearing will have dimensions for a minimum of 175 % of the required load.											
8.	Pump induced vibration due to flow pulsations shall be avoided through suitable design.											
9.	Each rotating equipment shall be first statically balanced and then dynamically balanced according to ISO 1940 (in the case of impellers this shall be done before and after mounting of the service rotor shaft).											
10.	Pumps shall run smoothly without undue noise and vibration. Peak to peak vibration limits shall be restricted to the following values during operation: <table><tr><td>Speed</td><td>Antifriction Bearing</td><td>Sleeve Bearing</td></tr><tr><td>1500 rpm and below</td><td>75.0 micron</td><td>75.0 micron</td></tr><tr><td>3000 rpm</td><td>50.0 micron</td><td>65.0 micron</td></tr></table>			Speed	Antifriction Bearing	Sleeve Bearing	1500 rpm and below	75.0 micron	75.0 micron	3000 rpm	50.0 micron	65.0 micron
Speed	Antifriction Bearing	Sleeve Bearing										
1500 rpm and below	75.0 micron	75.0 micron										
3000 rpm	50.0 micron	65.0 micron										
11.	The pumps shall be capable of starting with discharge valve fully open and close condition. Motors shall be selected to suit to the above requirements. Minimum motor margin (as per table below) shall be provided above maximum load demand of the pump in the entire operating range to take care of the system frequency variation and no case less than the maximum power requirement at any condition of the entire characteristic curve of the pump. Continuous Motor rating shall be at 50 deg.C ambient. Motor margin shall be as below <table><tr><td>Pump rated BKW</td><td>Motor rating</td></tr><tr><td><22 kW</td><td>125% of pump rated BKW</td></tr><tr><td>22 kW – 55 kW</td><td>115% of pump rated BKW</td></tr><tr><td>>55 kW</td><td>110% of pump rated BKW</td></tr></table>			Pump rated BKW	Motor rating	<22 kW	125% of pump rated BKW	22 kW – 55 kW	115% of pump rated BKW	>55 kW	110% of pump rated BKW	
Pump rated BKW	Motor rating											
<22 kW	125% of pump rated BKW											
22 kW – 55 kW	115% of pump rated BKW											
>55 kW	110% of pump rated BKW											
12.	Make of the Bearings : SKF/FAG only.											
6.1	CONSTRUCTIONAL FEATURES											
	General:											
	The pumps shall be complete with drive motors, baseplate and other accessories. The constructional features of the pump shall be as follows: a). Pump casing may be axially or radially split. The casing shall be of robust construction. Casing drain and vent connections shall be provided. b). Impeller shall be made in one piece and securely keyed to the shaft. Locking device shall be											



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

	provided to prevent its loosening during all conditions of operation. c). Wearing rings shall be of renewable type. Opposed wearing surface shall be of hardened material and shall have a hardness difference of at least 50 BHN. d). Replaceable shaft sleeves shall be provided to protect the shaft where it passes through bearings and stuffing boxes. The end of the shaft sleeve assembly shall extend through the packing gland. Shaft sleeve shall be securely locked or keyed to the shaft to prevent loosening or rotation. Shaft and shaft sleeves shall be machined and assembled for concentric rotation. e). The design of the shaft shall take into consideration the critical speed, which shall be at least 20% away from operating speed. f). Pump bearings shall be of antifriction type. Bearings shall be readily accessible without disturbing the alignment of pump. g). Packed stuffing boxes shall be of sufficient length to prevent leakage along the shaft and shall be complete with all packing and lantern rings required. h). Pumps shall be furnished complete with an approved type of flexible - coupling. i). Couplings guards made of expanded metal and bolted to the base plate shall be furnished. j). The common base plate for pumps and motor shall be in one piece and shall be made of fabricated steel. k). Pump speed shall be less than 1500 rpm for pumps of capacity more than 10 m³/hr. l). The Pump shall be capable of developing the required total head at rated capacity for continuous operation. Also the pumps shall be capable of being operated to give satisfactory performance at any point on the HQ characteristics curve. The operating range of the pump shall be 20% to 120% of the duty point unless otherwise mentioned elsewhere. The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the rated design flow as indicated in data sheets. m). The total head capacity curve shall be continuously rising from the operating point towards shut-off without any zone of instability and with a minimum shut-off head of about 15% more than the design head. The power, head and flow characteristics of each pump shall be suitable for parallel operation. The Power characteristics of the pumps shall be of non-overloading type. All rotating parts of the pumps shall be statically and dynamically balanced. The motor shall be rated for continuous operation and confirm to companion electrical specification. However, motor rating shall not be less than the max. power demand throughout the entire range of operation of pump. Design duty point of pump shall match with the average value of maximum and minimum flow rates of the pump in the stable operation zone.
A)	Casing, Gland & Stuffing Box
a.	The material of the Casing, Gland & Stuffing Box shall be of <u>2.5 Ni Cast iron to IS 210 Grade FG or equivalent.</u>
b.	The casing and flanges shall be designed to withstand the maximum shut-off pressure developed by the pump at the pumping temperature.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

c.	Pressure casing shall be designed with a corrosion allowance to meet the requirement “Technical requirements” and taking into account the “Operating Parameters”.
d.	Connection for suction and discharge pressure gauge shall be provided as standard feature.
e.	Lifting provision of pump should be provided.
B)	IMPELLER & Wearing Rings (As applicable)
a.	The Impeller & wearing Rings (as applicable) material shall be of <u>Stainless Steel 316</u> grade.
b.	Miller number for the material should be justified for that pumping medium as per ASTM G75-95 as well as the corrosion effect of pumping medium.
c.	Impeller as rotating assembly along with all elements should be dynamically balanced according to ISO 1940
d.	Impeller tip speed shall be within vendor’s experience. And Impeller shall have air bleed holes to eliminate any air accumulation around the shaft seal
e.	Maximum size impellers for the pump body shall not be quoted for. By installation of a new impeller, a head increase of 5% minimum shall be possible.
C)	SHAFT AND SHAFT SLEEVES
a.	All Shafts & Shaft Sleeves shall be of SS 410 grade. All Pump shafts shall be of ample size to transmit the maximum possible output from the prime mover.
b.	The pump shaft and coupling are to be so dimensioned that the maximum permissible torque of the shaft is higher than the maximum transmissible torque of the coupling.
c.	Pumps shall operate smoothly throughout the speed range up to their operating speeds. The first coupled critical speed must be at least 20% higher than the maximum operating speed. The determination of the shaft diameter and the distance between two consecutive bearings must include a sufficiently large safety margin to satisfy this condition.
d.	Shafts shall be conservatively designed to transmit maximum power required and to assure rigidity. Shafts shall be machined and ground to close tolerances and shall be tapered to permit easy removal of the seals and bearings.
D)	BASE PLATE
a.	A common base plate shall be provided for pump assembly & Motor and the same shall be rigidly constructed, adequately braced and provided with finish pads for mounting pump.
b.	Suitable holes shall be provided for grouting and these shall be so located that the base plate can be grouted in place without disturbing the pump and motor.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

c.	Common base plate for Pump and Motor shall be in the scope of the bidder.
d.	Base plate must be stress-relieved for any residual welding stress and certificate to that effect is to be submitted as per inspection requirement.
E)	BEARINGS
a.	The bearings may be ball, roller or sleeve bearing. If sleeve bearings are used these shall be machined for close running fit. The bearings shall be designed to take the necessary radial load as well as the net axial thrust.
F)	ACCESSORIES:
1.	Expansion Joints:
i.	Expansion Joints with limiting bolt & nuts shall be provided at suction and discharge of each pump
2.	Pump shall be provided with accessories such as Coupling guard, drain plugs, Vent Valves etc
3.	FASTENERS
I	All fasteners to be SS316 only.

6.1 POWER SUPPLY

1.	POWER SUPPLY	
	The following voltage levels shall apply:	
	3 phase, 3.3 kV AC ,50 Hz	: Voltage for motors equal to / bigger than 200KW and for power distribution within the plant.
	3 phase, 415 V, AC , 50 Hz	Standard voltage for power supplies to electric power consumers and motors Above 0.2 KW and upto 200 kW.
	240V AC / 3 phase 415 V AC, 50 Hz	Standard voltage for power supplies to electric power consumers and motors Upto 0.2 kW.
1.	All equipment's shall be suitable for rated frequency of 50 Hz with a variation of + 3% & - 5%, and 10 % combined variation of voltage and frequency unless specifically brought out in the specification.	
2.	Bidder shall design and supply the equipment suitable for satisfactory operation under	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

above mentioned power supply condition.

6.2	PACKING AND FORWARDING
1.	Proper packing to be ensured. Indigenous Supply: Pump & sub system assembly shall be wrapped in polythene bags & packed in a strong rigid wooden crate. Rain water should not enter into the pump internals during storage in the outer yard of power plant. <u>Imported Supply:</u> All imported supply should be packed as per Sea worthy packing standards Annexure - VI. All imported items should have Sea worthy packing. Liberal packing materials and struts shall be provided to arrest rolling and to protect from transit damages.
2.	Equipment and process materials shall be packed and semi-knocked down, to the extent possible, to facilitate handling and storage and to protect bearings and other machine surfaces from oxidation. Each container, box, crate or bundle shall be reinforced with steel strapping in such a manner that breaking of one strap will not cause complete failure of packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while awaiting erection at the site.
3.	Equipment and materials in wooden cases or crates shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable to tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventive compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper.
4.	Crates and packing material used for shipping will become the property of owner.(NTPC)
5.	Packing (tare) shall be part of the equipment cost and shall not be subject to return. The packing should ensure integrity and cohesiveness of each delivery batch of equipment during transportation. In case of equipment assemblies and unit's delivery in the packing of glass, plastics or paper the specification of packing with the material and weight characteristics are to be indicated.
6.	Each package should have the following inscriptions and signs stenciled with an indelible ink legibly and clearly: - Destination - Package Number - Gross and Net Weight - Dimensions - Lifting places



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

	f. Handling marks and the following delivery marking
7.	Each part of the equipment which is to be shipped as a separate piece or smaller parts packed within the same case shall be legibly marked to show the unit of which it is part, and match marked to show its relative position in the unit, to facilitate assembly in the field. Unit marks and match marks shall be made with steel stamps and with paint.
8.	Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied together with the shipment of materials no single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained.
9.	The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed.
10.	Wherever necessary besides usual inscriptions the cases shall bear special indication such as "Top", "Do not turn over", "Care", "Keep Dry" etc. as well as indication of the center of gravity (with red vertical lines) and places for attaching slings (with chain marks)
11.	Marking for Safe handling: To ensure safe handling, packing case shall be marked to show the following: a. Upright position b. Sling position and center of Gravity position c. Storage category d. Fragile components (to be marked properly with a clear warning for safe handling)
12.	Each crate or package is to contain a packing list in a waterproof envelope. All items are to be clearly marked for easy identification against the packing List. All cases, packages etc. are to be clearly marked on the outside to indicate the total weight where the weight is bearing and the correct position of the slings are to bear an identification mark relating them to the appropriate shipping documents. All stencil marks on the outside of cases are either to be made in waterproof material or protected by shellac or varnish to prevent obliteration in transit.
13.	The packing slip shall contain the following information: - Customer name, Name of the equipment, Purchase Order number with Date, Address of the delivery site, Name and Address of the Sender, Serial Number of pump & accessories, BHEL item Code, Gross Weight and Net weight of Supplied items.
14.	Prior to transport from manufacturer's work to destination, components of the unit shall be completely cleaned to remove any foreign particles. Flange faces and other machined surfaces shall be protected by an easily removable rust preventive coating followed by suitable wrapping.
6.3	Motor



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

6.3.1 General

This specification generally covers the requirement for motors involved in Slurry Pumps system package. Technical Specification TECI:LT MOTOR:REV 02 Dated: 30.01.2017 to be also gone through.

6.3.2 Voltage level:

The voltage level for motors shall be as follows:

S.No	Rating	Voltage	Freq and voltage variation
1	Upto 0.2 kw	Single phase 240V AC / Three phase 415V AC	1. 50 Hz- +3% & -5 % 2. 10% combined variation of voltage & frequency.
2	Above 0.2 and up to 200 kw	Three phase 415V AC	

6.3.3 Starting voltage requirement

Up to 85% of rated voltage for ratings below 110 KW

Up to 80% of rated voltage for ratings from 110 KW to 200 KW

- Voltage rating for special purpose motors viz, VFD shall be as per manufacturer's standard.

6.3.4 Degree of protection:

S.NO	Item	Indoor	Outdoor
1	Motors	IP 54	IP 55
2	Cable box	IP 54	IP 55

6.3.5 Efficiency class:

Premium efficiency IE3 (For Continuous duty motors up to 200 kw) as per IS 12615, IEC:60034-30

6.3.6 General requirements:

S.No	Parameters	To be confirmed by vendor	Vendors confirmation
1	Direction of rotation	Suitable for both directions	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

2	Class of Insulation	Thermal class 155 (F) insulation	
3	Winding Insulation	The winding insulation process shall be Global Vacuum Pressure Impregnated i.e. resin poor method	
4	Starting Current	1. Less than or equal to 600 % full load current subject to tolerance as per IS (Normal motor) 2. Less than or equal to 700 % full load current subject to tolerance as per IS (Normal motor)	
5	Starting Voltage	1. Up to 85% of rated voltage for ratings below 110 KW 2. Up to 80% of rated voltage for ratings from 110 KW to 200 KW	
6	Torque requirement	1. Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque. 2. Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.	
7	Type of enclosure	1. Motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type. 2. VFD driven motors to be offered with forced cooling type with machine mounted fan or pump driven by separate electric motor.	
8	Dimensions of Terminal box for LV motors	Motor MCR	Distance between center of stud & gland plate (in mm)
		a. Upto 3 Kw b. Above 3 kw to 7 kw c. Above 7 kw to 13 kw d. Above 13 kw to 24kw e. Above 24 kw to 37kw f. Above 37 kw to 55kw g. Above 55 kw to 90kw	As per manufacturer's practice 85 115 167 196 249 277
9	Cable glands & Lugs	Double compression type Nickel plated brass cable gland & insulated tinned copper crimping lugs to suit the cable sizes	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

10	Paint shade	RAL 5012 (Blue)	
11	Space heaters	Suitable single phase space heaters shall be provided on motors rated 30KW and above. Separate terminal box for space heaters shall be provided	

6.3.7 Locked rotor withstand time

S.No	Starting time at min permissible voltage	Locked rotor withstand time
1	Upto 20 secs	Under hot condition at highest voltage limit shall be at least 2.5 secs. more than starting time
2	More than 20 sec & less than 45 sec	Under hot condition at highest voltage limit shall be at least 5 secs. more than starting time
3	More than 45 sec's	under hot condition at highest voltage limit shall be more than starting time by at least 10% of the starting time

6.3.8 Special Requirement:

Motor operating through variable frequency drives shall be suitable for inverter duty. Also these motors shall comply the requirements stipulated in IEC: 60034-18-41 and IEC: 60034-18-42 as applicable.

6.3.9 Torque Requirements

- Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.
- Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.

7.0	SUPERVISION OF ERECTION, TESTING AND COMMISSIONING
1.	Erection of Water Pumps will be done by owner as per Erection Manual and check List. Supervision of Erection and Commissioning of the all pumps at project site is in bidder's scope. Bidder shall include 5 working days per visit in the offer with minimum three visit for the supervision of erection, pre-commissioning & post-commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

2.	TA/DA, boarding and lodging shall be borne by the bidder and shall be inclusive in supply portion.
8.0	EXCLUSION
	The following work associated with the water pumps will be by others: a. Civil foundations b. Walkways, platforms and ladders c. Element handling hoists
9.0	INSPECTION AND TESTING
A)	Minimum Testing requirements to be considered are as below:
1.	Hydrostatic test is to be conducted at 150 % of design pressure for duration of 30 minutes, taking into consideration of the fact that actual operating temperature is in the range of 35-45 deg Celsius.
2.	Impeller and rotor shall be first statically balanced and then dynamically balanced according to ISO 1940 (in the case of impellers this shall be done before and after mounting of the service rotor shaft).
3.	Vibration levels measured on the non-rotating parts shall not exceed the zone limit "B" as defined in ISO 10816 at steady conditions and shall not exceed the zone limit "C" as defined in ISO 10816 at transient conditions.
4.	Test certificates shall be issued for each lot of raw material used in the coating, corresponding to specific weight and traction resistance.
B)	General Inspection requirements to be considered are as below:
1.	Bidder shall furnish written copies of shop production, fabrication and quality test procedures and drawings to be used for review by BHEL / NTPC prior to manufacture. Inspection of above mentioned tests by BHEL/ NTPC representative at bidder's works is envisaged.
2.	The Bidder shall furnish performance test procedure along with standard. The test procedure will be reviewed and approved by the BHEL/NTPC.
3.	Pumps shall be inspected at the Bidder's works before dispatch or where the test facilities are available.
4.	The Bidder shall conduct performance test for the all the pumps and submit the reports.
5.	A dynamic balancing certificates stating that the rotating assembly has been balanced dynamically shall be sent to NTPC/ BHEL within one (1) week of the successful completion of balancing.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

6.	Acceptance tolerance of actual versus guaranteed performance for capacity, head, efficiency and power absorbed shall be as per applicable standard.
7.	Vibration levels shall be measured during shop running/performance tests.
8.	Mechanical running and the performance test shall be carried out. Bidder to arrange Motor of same / higher rating for the shop test and inspection.

10.0	Other Salient Points
1.	Base plate, Foundation Bolts, Pressure Gauges, Companion Flanges, Coupling, Coupling Guards shall be in scope of bidder's supply
2.	The design of shaft shall ensure that the operating speed is at least 20% above the critical speed of the shaft.
3.	Recommended motor power consumption to be provided by bidder.
4.	The pump shall be provided with seals of proven type and shall be designed for minimization of seal water consumption.
5.	Make of Mechanical Seals: Eagle Burgmann/ Flowserve/ John crane only. No other make is acceptable

11.0	SPARES, TOOLS & TACKLES
11.1	START UP & COMMISSIONING SPARES
	Start-up & Commissioning Spares shall be part of the main supply of the Water pumps. Start-up & commissioning spares are those spares which may be required during the start-up and commissioning of the equipment/system. All spares required for successful operation till commissioning of pump shall come under this category. Bidder shall provide an adequate stock of such start up and commissioning spares to be brought by him to the site for the equipment erection and commissioning. The spares must be available at site before the equipments are energized. The List of such spares to be provided by bidders with their offer.
12.0	MANDATORY SPARES
	Bidder to quote for below mentioned mandatory spares with break up price as per Annexure A (Clause 6.0): Note : 1. Unless stated otherwise a 'set' means items or sub-items required for each type/size range of the assembly/ sub-assembly, required for replacement in one main equipment. It is further



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

	intended that the assembly/ sub-assembly which have different orientation (like left hand or right hand, top or bottom), different direction of rotation or mirror image positioning or any other reasons which result in maintaining two different sets of the spares to be used for the subject assembly/ sub-assembly, these shall be considered as different types of assembly/ sub-assembly. 2. Wherever quantity has been specified as percentage (%), the quantity of mandatory spares to be provided by contractor shall be the specified percentage (%) of the total population of the plant. In case the quantity so calculated happens to be a fraction, the same shall be rounded off to next higher whole number. 3. Whenever the quantities have been indicated for each type, size, thickness, material, radius, range etc., these shall cover all the items supplied and installed and the breakup for these shall be furnished in the bid. 4. In case spares indicated in the list are not applicable to the particular design offered by the bidder, the bidder should offer spares applicable to offered design with quantities generally in line with the approach followed in the above list. 5. Price of each and every item is to be given separately. Any change in size, material, design etc, which obviates one to one replacement of the part shall be considered a different type. Unless otherwise stated, a set shall mean complete replacement for one equipment. Bidder shall quote for the "Initial Spares Part List", and it will be considered for L1 evaluation. Initial spare parts items shall be handed over separately and shall not be mixed with the supply of the main equipment parts. Spares shall be sent in pre-decided lots in containers/secure boxes. All boxes/containers are to be distinctly marked in red color with boldly written "S" mark on each face of the containers. Spares shall not be dispatched before dispatch of corresponding main equipment's. Each item shall be labelled in English and be packed against damage and sealed to prevent deterioration from corrosion. The protection shall be sufficient for a minimum of 10 years' storage in a dry weatherproof building. All spares supplied under this contract shall be strictly inter-changeable with the parts for which they are intended for replacements. All the Initial spares shall be manufactured along with the main equipment components as a continuous operation as per same specification and quality plan. Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply of the machine.
13.0	DEFECT LIABILITY & WARRANTY
1.	The Bidder warrants that the equipments/items shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed. The Defect Liability Period shall be Twenty four (24) months from the date of delivery or eighteen (18) months from the date of commissioning, whichever first occurs. If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Bidder, the Bidder shall promptly, in consultation and agreement with BHEL regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as

	TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project
NTPC:FGD: WATER PUMPS	

	the Bidder shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect.
2.	In case of failure of the equipment to meet the guarantee, NTPC/BHEL reserves the right to reject the equipment. However, NTPC/BHEL reserves the right to use the equipment until new equipment supplied by bidder meets the guaranteed requirement .
14.0	FIRST FILL OF CONSUMABLES:
1.	Bidder's scope shall also include supply and filling of all , lubricants, grease items for operation up to commissioning including top up requirements. All lubricants proposed for the plant operation shall be suitable for all operating and environmental conditions that will be met on site consistent with good maintenance procedures as instructed in the maintenance manuals.

15.0	PERFORMANCE GUARANTEE
	All performance tests for Water pumps shall be carried out in accordance with any latest international codes/standards. 1) Bidder shall furnish Performance guarantee for the design, manufacture, material, safe and trouble-free operation of the water pumps and its accessories 2) Bidder shall guarantee and demonstrate the rated capacity of the pump at the rated head. 3) The Bidder shall ensure a design of the equipment to achieve an average target availability of 98% of pump for a continuous period of 120 days. 4) All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 20000 hrs. 5) Noise level-≤85 dB (A) at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed. 6) Vibration levels measured on the non-rotating parts shall not exceed the zone limit “B” as defined in ISO 10816 at steady conditions and shall not exceed the zone limit “C” as defined in ISO 10816 at transient conditions. 7) Acceptance tests to be carried out as per the procedure defined by the bidder which shall be submitted for customer approval. 8) In the event that the performance test is unsuccessful, bidder shall take necessary remedial action at his cost and the performance test shall be repeated.
16.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

	As per Annexure A Clause 7.0
17.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION
	As per Annexure A Clause 8.0
18.0	DOCUMENTATION
A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER
	The Bidder shall submit all documents, drawings, diagrams and all such information, which are necessary to fully understand the offer for techno – commercial evaluation as per Annexure V. Annexure V documents are required for proper evaluation purpose and vendors are requested to comply with above in all respect.
B	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT
	The Successful bidder shall submit necessary data, documents and drawings for review, approval as specified under Annexure V. All necessary GA drawings, sections, sub-assembly drawings, specifications of main and sub components and necessary set of operation & maintenance manual as asked by NTPC must be furnished by bidder in soft and hard copy forms. Unless agreed otherwise, Ten (10) hard copies and five (05) sets of electronic copies of all documents are to be submitted in the English language. Electronic Copies shall be submitted in primary original data format (e.g. DOC, XLS, DWG) as well as in a printable non-proprietary document format (e.g. PDF). However all the engineering related information shall be furnished in soft form to BHEL.



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

19.1 ANNEXURE III- SCHEDULE OF GUARANTEES

Sl. No	Description	Data
1.	Rated capacity of pump m ³ /hr	:
2.	Total head at design capacity M	:
3.	Guaranteed shaft power consumption at rated capacity & head kW	:
4.	Noise level at a distance of 1.0 meter from the equipment at site and 1.5 m above operating floor dB(A)	:
5.	Maximum vibration (peak to peak amplitude at site) microns	:
6.	Equipment Availability (%)	:
7.	Pump Efficiency (%)	:

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

19.2

ANNEXURE – IV- LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT

SI No	Clause No	Page No	Description of Deviation

Note: Enlarge the table to incorporate items

SIGNATURE OF BIDDER

NAME

DESIGNATION



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

19.3

ANNEXURE –V

A) DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER:

Sl. No.	Description	No of copies With proposal
1.	Specification duly signed and seal on each page	1
2.	Anchor Plan & Civil foundation Loading details	1
3.	GA drawings of pump assembly	1
4.	Data Sheet	1
5.	Performance curve	1
6.	Test Arrangement & Test procedure	1
7.	Proforma Packing List	1
8.	Shortest Manufacturing Time	1
9.	Approximate weight of each skid	1
10.	Reference plant details	1
11.	Required Electric power & other Utility List	1
12.	Deviation List	1
13.	Scope of Supply	1
14.	Start-up & Commissioning Spares	1
15.	List of Special Tools	1
16.	Delivery Schedule	1
17.	T-S curve	1
18.	Catalogue	1



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

B) DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:

Sl. No.	Description	No of copies After award of contract	Delivery Time
1.	Utility Consumption	1	2 weeks after contract
2.	Foundation Data including Anchor plan	1	2 weeks after contract
3.	Performance curve	2	2 weeks after contract
4.	Assembly drawings of each equipment	1	1 month after contract
5.	Cross section detail drawing	1	1 month after contract
6.	Data Sheet	1	2 weeks after contract
7.	Lubricating oil list	1	2 months after contract
8.	Special tools list	1	2 months after contract
9.	Installation and assembly procedure	1	4 months after contract
10.	Inspection and Test Procedure	1	1 month after contract
11.	Inspection & Test record	1	In 2 weeks after test
12.	Inspection Certificate	1	In 2 weeks after test
13.	Sub vendors List	1	2 weeks after contract
14.	Manufacturing Schedule	1	2 weeks after contract
15.	Progress report	1	Every month
16.	Proforma Packing List	1	2 months prior to shipping
17.	Approximate weight of each skid	1	2 months after contract
18.	Required Electric power	2	2 weeks after contract
19.	Pump and Motor Sizing Calculation	1	2 weeks after contract
20.	Material Test Certificates	2	In 2 weeks after test
21.	Pre Commissioning Check List	2	4 months after contract
22.	Scope of Supply	2	2 weeks after contract
23.	Quality Plan	4	1 month after contract
24.	Operation and Maintenance Manual	• 10 hardcopies and 5 electronic copies in English	4 months after contract
25.	Start-up & Commissioning Spares	2	1 month after contract



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

Sl. No.	Description	No of copies After award of contract	Delivery Time
26.	List of Special Tools	1	1 month after contract
27.	Delivery Schedule	1	2 weeks after contract
28.	Test Arrangement & Test procedure	2	1 month after contract
29.	T-S curve	2	2 weeks after contract
30.	P & I Diagram	2	2 weeks after contract
31.	Catalogue	2	2 weeks after contract

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

19.4 ANNEXURE-VI : TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING

Applicable for Import Supply

Refer to Specification No: PE-TS-888-100-A001 for detailed specification on Seaworthy packing

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

19.5

ANNEXURE-VII: INSPECTION & TESTING

Vendor to confirm acceptance to all clauses for Inspection & testing requirements as per spec.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

19.6 ANNEXURE-VIII:

REFER TO MOTOR SPECIFICATION. DATASHEET HAS TO BE SUBMITTED IN THE FORMAT BELOW. LT MOTOR SHALL BE FROM VENDORS APPROVED BY NTPC

DE-1	LT MOTORS	
A.	GENERAL	
1.	Manufacturer & Country of origin.	
2.	Equipment driven by motor	
3.	Motor type	
4.	Quantity	
B.	DESIGN AND PERFORMANCE DATA	
1.	Frame size	
2.	Type of duty	
3.	Type of enclosure /Method of cooling/ Degree of protection	
4.	Applicable standard to which motor generally conforms	
5.	Efficiency class as per IS 12615(IE3)	
6.	(a)Whether motor is flame proof	
	(b)If yes, the gas group to which it conforms as per IS:2148	
7.	Type of mounting	
8.	Direction of rotation as viewed from DE END	
9.	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10.	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11.	Maximum continuous load demand of driven equipment in KW	
12.	Rated Voltage (volts)	
13.	Permissible variation of :	
	a. Voltage (Volts)	
	b. Frequency (Hz)	
	c. Combined voltage and frequency	
14.	Rated speed at rated voltage and frequency(RPM)	
15.	At rated Voltage and frequency:	
	a. Full load current	
	b. No load current	
16.	Power Factor at	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

	a. 100%/75%/50% load	
	b. NO load	
	c. Starting.	
17.	Efficiency at rated voltage and frequency,	
	a. 100% load	
	b. 75% load	
	c. 50% load	
18.	Starting current (amps) at	
	a. 100 % voltage	
	b. 85% voltage	
	c. 80% voltage	
19.	Minimum permissible starting Voltage (Volts)	
20.	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
	a. Without driven equipment coupled	
	b. With driven equipment coupled	
21.	Safe stall time with 100% ,110% & 80% of rated voltage	
	a. From hot condition	
	b. From cold condition	
22.	Torques :	
	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
	b. Pull up torque at rated voltage.	
	c. Pull out torque	
	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
	e. Rated torque (kg.m)	
23.	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24.	GD ² value of motors	
25.	No of permissible successive starts when motor is in hot condition	
26.	Locked Rotor KVA Input	
27.	Locked Rotor KVA/KW	
28.	Vibration limit :Velocity (mm/s)	
29.	Noise level limit (dBA)	
C.	CONSTRUCTIONAL FEATURES	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

1.	Stator winding insulation	
	a. Class & Type	
	b. Winding Insulation Process	
	c. Tropicalised (Yes/No)	
	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
	e. Method of temperature measurement	
	f. Stator winding connection	
2.	Main Terminal Box	
	a. Type	
	b. Location(viewed from NDE side)	
	c. Entry of cables(bottom/side)	
	d. Recommended cable size(To be matched with cable size envisaged by owner)	
	e. Fault level (MVA),Fault level duration(sec)	
	f. Cable glands & lugs details (shall be suitable for power cable)	
3.	Type of DE/NDE Bearing	
4.	Motor Paint shade	
5.	Weight of	
	a. Motor stator (KG)	
	b. Motor Rotor (KG)	
	c. Total weight (KG)	
D.	List of accessories.	
1.	Space Heaters (Nos./Power in watts/supply voltage)	
2.	Terminal Box for Space Heater (Yes/No)	
3.	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4.	Insulation of bearing (Yes/No)	
5.	Noise reducer(Yes/No)	
6.	Grounding pads	
	i) No and size on motor body	
	ii) Nos on terminal Box	
7.	Any other fitments	
E	List of curves.	
1.	Torque speed characteristic of the motor	
2.	Thermal withstand characteristic	



TECHNICAL SPECIFICATION FOR WATER PUMPS –NTPC Project

NTPC:FGD: WATER PUMPS

3.	Starting. current Vs. Time	
4.	Starting. current Vs speed	
5.	P.F. and Effi. Vs Load	

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

Bharat Heavy Electricals Limited
Ranipet-632406, India.
Quality Assurance(Mech)

To,

Shri. V Raghupathy, SM/FGD-Purchase NTPC: Barh-I&II/ FGD-WP&SPARE /QA-MECH: 37

Kind Attn: Shri M Venkateswarlu, Mgr/Purchase

Dt. 14-02-2020

Ref: ENGG SPEC: NTPC: FGD: WATER PUMPS.

Engg Transmittal No.: Barh II-G607/G608-WP-001,Dt:06.02.2020.

Barh I-G604/G605/G606-WP-001,Dt:06.02.2020.

G604: Barh-I: Pump:002,Dt:29.01.2020.

G604: Barh-I: Pump:001,Dt:29.01.2020.

G607: Barh-II: Pump:002,Dt:29.01.2020..

G607: Barh-II: Pump:001,Dt:29.01.2020.

SL. No	INDENT NO.	PGMA	Date	PROJECT	INDENT rev. Date
1.	RFW90664-65	FW705,FW997	06.02.2020	Barh-II	NA
2	RFW90666-67	FW705, FW997	06.02.2020	Barh-I	NA
3	RFW90547,RFW90529	FW997 , FW705	15.10.2019	Barh-I	29.01.2020
4	RFW90546,RFW90530	FW997 , FW705	15.10.2019	Barh-II	28.01.2020

Quality comments as follows:

1. BHEL Approved PMD Vendors are acceptable.
2. Inspection and testing shall be done as per approved Quality plan. Detailed Quality plan Including Raw material check, in process Inspection and final inspection report to be submitted for BHEL Approval. Inspection reports of raw material TC (chem & mech), Hydrostatic test, and Dynamic Balancing Certificates shall be submitted to BHEL.
3. QP shall be arranged in Customer format (attached herewith). *Q/No. Pump: 600/00, L*
Painting shall be as per BHEL Technical Specification Annexure C&D.
4. Supplier should be manufacturer not a trader/Agent.
5. Reference norms and acceptance norms in QP shall be "BHEL Specification/Approved Data sheet/Relevant standard.
6. BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO. The supplier shall inform BHEL in advance about the readiness of the goods for inspection and testing. Inspection / Inspection wavier / approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO. Material Test Certificates shall be submitted to BHEL.
7. All the Items shall be inspected at supplier works as per approved QP/Approved Drawing/Approved datasheet and BHEL Specification.
8. Annexure 'Q' shall be part of enquiry File.

Prepared by
Sanjib
14.02.2020
Sanjib Pandit (AE/QA)

Reviewed & approved by
R K Madhu
R K Madhu (Dy Mgr/QA)

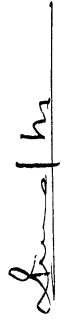
 Ranipet		MANUFACTURER'S NAME & ADDRESS BHEL- RANIPET /BHEL APPD SUPPLIERS		STANDARD QUALITY PLAN Item/Subsystem: WATER PUMP		PROJECT: STANDARD QP NO: PUMP:610 Rev:00 Date:29.12.2019 Page 1 of 3					
SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6	REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10	REMARKS KS	
					M	B/C			M	B	C

RAW MATERIAL INSPECTION											
1	CASTING	CHEMICAL COMPOSITION MECHANICAL PROPERTIES SURFACE EXAMINATION	MAJOR	CHEMICAL ANALYSIS TENSILE TEST VISUAL INSPECTION	1 SAMPLE / HEAT 1 SAMPLE / HEAT 100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS CASTING WILL BE FREE FROM CRACKS, SHRINKAGE, COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	MTC MTC IR	✓ ✓ ✓	P P P	V V V	NO REPAIR WELDING IS PERMITTED ON CI AS CAST / PUNCHED HEAT NO SHALL BE PROVIDED FOR CORRELATION
2	IMPELLER	CHEMICAL COMPOSITION MECHANICAL PROPERTIES HEAT TREATMENT (As applicable) SURFACE EXAMINATION	MAJOR	CHEMICAL ANALYSIS TENSILE TEST & HARDNESS REVIEW OF TIME- TEMP CHART VISUAL INSPECTION	1 SAMPLE / HEAT 1 SAMPLE / HEAT 100% 100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS CASTING WILL BE FREE FROM CRACKS, SHRINKAGE, COLD SHUT, INJURIES, POROSITY SAND FUSION ETC	MTC MTC HT CAHRT IR	✓ ✓ ✓ ✓	P P P P	V V V V	
3	BRASS (ROLLED / FORGED) FOR SHAFT SHAFT SLEEVES	CHEMICAL COMPOSITION MECHANICAL PROPERTIES SOUNDNESS	MAJOR	CHEMICAL ANALYSIS TENSILE TEST VISUAL INSPECTION	1 SAMPLE / HEAT 1 SAMPLE / HEAT 100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS RELEVANT PROCEDURE	MTC MTC UT Report	✓ ✓ ✓	P P P	V V V	FOR BAR DIA. ≥50 MM ONLY
4	WEARING RINGS	CHEMICAL PROPERTIES MECHANICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS TENSILE TEST & HARDNESS	1 SAMPLE / HEAT 1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC MTR	✓ ✓	P P	V V	

M – Manufacturer / Subcontractor, B – BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports W - Witness, TC - Test certificate DR – Dimensional report. * Record, identified with "tick" (✓) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by  Sanjib Pandit (AE/QA)	Reviewed by  Rakesh Kr Madhu (Dy. Mgr/QA)	Approved by  K C Gandhiparimalam (DGM/QA)
---	---	--	--

		MANUFACTURER'S NAME & ADDRESS BHEL - RANIPET /BHEL APPD SUPPLIERS		STANDARD QUALITY PLAN Item/subsystem: WATER PUMP		PROJECT: STANDARD QP NO: PUMP:610 Rev:00 Date:29.12.2019 Page 2 of 3					
SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6	REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10	REMARKS KS	
					M	B/C			M	B	C

IN PROCESS INSPECTION											
5	CASING & WEAR AREA	DIMENSIONAL HYDROSTATIC TEST OF CASTING	MAJOR CRITICAL	MEASURE PRESSURE TEST	100% 100%	20%	MANUFACTURING DRAWING SEE NOTE 2	IR	✓	P	V
6	IMPELLER	DIMENSIONAL DYNAMIC BALANCING	MAJOR CRITICAL	MEASURE MEASURE	100% 100%	20%	MANUFACTURING DRAWING ISO 1940, GR. 6.3	IR	✓	P	V
7	DPT OF MACHINED AREA OF CASINGS & IMPELLER	SOUNDNESS OF CASTING	MAJOR	NDT-DPT	100%		FLOWMORE PROCEDURE FMP/NDT/PRO/PT/01	DPT Report	✓	P	V
8	SHAFT & SLEEVES	DIMENSIONAL SOUNDNESS	MAJOR CRITICAL	VISUAL ULTRASONIC TEST	100% 100%		MANUFACTURING DRAWING RELEVANT PROCEDURE	IR UT Report	✓	P P	V W
		DP TEST ON MACHINED AREA	MAJOR	DP TEST	100%		RELEVANT PROCEDURE	DPT Report	✓	P	V
FOR SHAFT DIA ≥ 50 MM ONLY (EXCEPT THREADED PORTION) SEE NOTE-1											
FINAL INSPECTION											

M - Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports W - Witness, TC - Test certificate DR - Dimensional report. * Record, identified with "tick" (✓) under column 'D' shall be submitted to customer as a QA documentation package	Prepared by  Sanjib Pandit (AE/QA)	Reviewed by  Rakesh Kr Madhu (Dy. Mgr/QA)	Approved by  K C Gandhiparimalam (DGM/QA)
--	---	--	--

		MANUFACTURER'S NAME & ADDRESS BHEL - RANIPET /BHEL APPD SUPPLIERS		STANDARD QUALITY PLAN Item/Subsystem: WATER PUMP		PROJECT: STANDARD													
COMPONENT & OPERATION 2		CHARACTERISTICS 3		CLASS 4		TYPE OF CHECK 5		QUANTUM OF CHECK 6 M B/C		REFERENCE DOCUMENTS 7		ACCEPTANCE NORMS 8		FORMAT OF RECORD 9 D		AGENCY 10 M B C		REMARKS 11	
SL NO 1		Ranipet																	

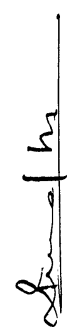
IN PROCESS INSPECTION																	
5	CASING & WEAR AREA	DIMENSIONAL HYDROSTATIC TEST OF CASTING	MAJOR CRITICAL	MEASURE PRESSURE TEST	100%	20%	MANUFACTURING DRAWING	IR	✓	P	V	V					
6	IMPELLER	DIMENSIONAL DYNAMIC BALANCING	MAJOR CRITICAL	MEASURE	100%	20%	MANUFACTURING DRAWING	IR	✓	P	V	V					
7	DPT OF MACHINED AREA OF CASINGS & IMPELLER	SOUNDNESS OF CASTING	MAJOR	NDT-DPT	100%		FLOWMORE PROCEDURE EMP/NDT/PRO/PT/01	DPT Report	✓	P	V	V					
8	SHAFT & SLEEVES	DIMENSIONAL SOUNDNESS	MAJOR CRITICAL	VISUAL ULTRASONIC TEST	100%	1005	MANUFACTURING DRAWING RELAVANT PROCEDURE	IR UT Report	✓	P	V	V					
		DP TEST ON MACHINED AREA	MAJOR	DP TEST	100%		RELAVANT PROCEDURE	DPT Report	✓	P	V	V					
FOR SHAFT DIA ≥ 50 MM ONLY (EXCEPT THREADED PORTION) SEE NOTE-1																	

FINAL INSPECTION

M - Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer, P - perform, V - Verification of reports W - Witness, TC - Test certificate DR - Dimensional report. * Record, identified with "tick" (✓) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by  Sanjib Pandit (AE/QA)	Reviewed by  Rakesh Kr Madhu (Dy. Mgr/QA)	Approved by  K C Gandhiparimalam (DGM/QA)
--	---	--	--

		MANUFACTURER'S NAME & ADDRESS BHEL- RANIPET /BHEL APPD SUPPLIERS		STANDARD QUALITY PLAN Item/subsystem: WATER PUMP QP NO: PUMP:610 Rev:00 Date:29.12.2019 Page 1 of 3		PROJECT: STANDARD					
SL NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
1	Ranipet	3	4	5	6	7	8	9 D	10	11	
					M	B/C			M	B	C

RAW MATERIAL INSPECTION											
1	CASTING	CHEMICAL COMPOSITION MECHANICAL PROPERTIES SURFACE EXAMINATION	MAJOR	CHEMICAL ANALYSIS TENSILE TEST VISUAL INSPECTION	1 SAMPLE / HEAT 100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	✓	P	V	NO REPAIR WELDING IS PERMITTED ON CI AS CAST / PUNCHED HEAT NO SHALL BE PROVIDED FOR CORRELATION
			MAJOR				MTC	✓	P	V	
			MAJOR				MTC	✓	P	V	
			MAJOR				IR	✓	P	V	
2	IMPELLER	CHEMICAL COMPOSITION MECHANICAL PROPERTIES HEAT TREATMENT (As applicable)	MAJOR	CHEMICAL ANALYSIS TENSILE TEST & HARDNESS REVIEW OF TIME- TEMP CHART VISUAL INSPECTION	1 SAMPLE / HEAT 100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	✓	P	V	
			MAJOR				MTC	✓	P	V	
			CRITICAL				HT CAHRT	✓	P	V	
			MAJOR				IR		P	V	
3	BRASS (ROLLED / FORGED) FOR SHAFT SHAFT SLEEVES	CHEMICAL COMPOSITION MECHANICAL PROPERTIES SOUNDNESS	MAJOR	CHEMICAL ANALYSIS TENSILE TEST VISUAL INSPECTION	1 SAMPLE / HEAT 100%	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	✓	P	V	
			MAJOR				MTC	✓	P	V	
			CRITICAL				UT Report	✓	P	V	FOR BAR DIA ≥50 MM ONLY
4	WEARING RINGS	CHEMICAL PROPERTIES MECHANICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECS AS PER APPD. DRG. / DATA SHEETS	MTC	✓	P	V	
			MAJOR				MTR	✓	P	V	

M - Manufacturer / Subcontractor, B - BHEL /BHEL Authorized Inspection Agency, C- End Customer , P - perform, V - Verification of reports W - Witness, TC - Test certificate DR - Dimensional report. * Record, identified with "tick" (✓) under column 'D' shall be submitted to customer as a QA documentation package	Prepared by  Sanjib Pandit (AE/QA)	Reviewed by  Rakesh Kr Madhu (Dy. Mgr/QA)	Approved by  K C Gandhiparimalam (DGM/QA)
--	---	--	--



ANNEXURE –B
GENERAL TERMS & CONDITIONS
(FOR GUIDANCE TO THE SUPPLIERS)

A] Submission of Offer

a) Invitation for bid

Tenders are invited through electronic mode from eligible suppliers in case of open tenders and from suppliers to whom the enquiry is addressed in case of Limited / Single Tender.

The offers shall be posted into the system before the date and time specified in the tender.

The offer shall be sent on single part / two part / three part basis as specified in the main tender document.

Bids shall be submitted through e-Procurement portal, <https://bhel.abcprocure.com> of M/s e-Procurement Technologies, Ahmedabad who is our solution provider.

b) Hardware and Software requirements for participating in e-tender

Requirement for participating in e-Procurement is as under:

- i) A Computer with internet connectivity (Internet Explorer 9.0 (32-bit Browser only) & above)
- ii) Digital Signature Certificate (Class 3- SHA2-2048 BIT- with both Signing and Encryption component separately).
- iii) JAVA (Version 1.8 Update 45).
- iv) Steps for Hardware and software configuration is detailed at <https://bhel.abcprocure.com/EPROC/> under title “Minimum system requirements and Settings Document for BHEL User and Bidders”.

c) Instructions for Registered Suppliers

For all types of tenders (Single / Limited / Open) an automated email alert regarding issue of the Tender will be sent by the e-procurement portal to all Suppliers registered with BHEL, Ranipet for the item/s for which the tender is issued.

In case of open tenders, Registered suppliers with registered DSC will have to login with their user id/password & DSC and search for the Open Tender. To participate in event and to submit bid, a bidder needs to agree the terms and conditions.

Registered suppliers without DSC will have get their profiles approved by mapping DSC after login.

To know the procedure for obtaining Digital Signature Certificate (DSC), suppliers who are not having the DSC are advised to visit our website www.bhel.com → Tender Notifications → Sample Checklist.

d) Instructions for new suppliers wishing to bid against open tenders

New, unregistered suppliers wanting to bid against open tender/s will have to first register themselves in <https://bhel.abcprocure.com> as new supplier by clicking the “Register” button.

After entering the Income Tax Permanent Account Number (PAN) details and pressing “Enter”, they have to select the respective BHEL Unit for which they want to participate in the Open Tender and also fill up other relevant Company information as a one-time activity. On successful registration, your profile will be approved by the authorized officer and you can login to portal and can participate in the procurement event.



To participate in a tender, you need to login to the portal. You must be an approved registered user. If you are not a registered user, you can register yourself by clicking upon the “Register” link. You need to have a valid vendor code and password to login to the portal. Enter your Vendor code, password and click on Login button after Login, you need to select your digital signing and encryption certificates certificate. The DSC will be approved by M/s e-Procurement Technologies/ Authorised officer of BHEL.

As required by the tender, the necessary documents have to be filled-in online, in the provided template. Additional documents required are to be scanned and uploaded as .pdf file. Suppliers are advised to take note that the maximum space that is provided for uploading the documents that are to be attached is 300 MB. However the size of an individual document cannot exceed 10 MB. For any clarification on submission of offer on line, attention of the Supplier/s is invited to our document “Bidder Manual for BHEL Bidders” hosted in the home-page of the e-procurement portal. During normal business hours, helpline maintained by the service provider M/s e-Procurement Technologies is available for clarifying any doubts of supplier/s. The helpline numbers are +91-79-40270599/508/560/590/513 and email id is: Bhel.Support@abcProcure.com . Bidder can also refer to “Bidder Manual for BHEL Bidders” hosted in the home-page of the e-procurement portal <https://bhel.abcprocure.com>.

Typical documents that would be required as part of tender submission would be

- a) **Complete technical Offer** with details, catalogues, as applicable.
- b) **Un-priced bid** (i.e. Bid without the Price) as per given format, if any.
- c) **Filled-in BHEL’s Standard Terms & Conditions** as per Annexure enclosed with the Tender Document,
- d) **Deviation summary** submitted in two parts – giving the summary of technical deviations separately and the commercial deviations separately, if any and
- e) **Supporting documents** to substantiate equivalent material specifications / sections, where quoted for.
- f) Where asked for, **Client list** with their full address including detail of contact person with phone no., fax no. & e-mail ID (if any) to whom the same / similar items are supplied in the past two years. The date of supply may also be indicated, against each client.
- g) Suppliers can also upload their credentials by way of submission of Performance certificate/s issued by their customer/s detailing the quantity supplied and specification along with the un-priced PO copies and proof of supply along with the offer.

Technical acceptance of offer by BHEL shall be based on the evaluation of offer and the submitted documents.

- h) **Bidders who are not already registered with BHEL Ranipet** are requested to submit the Supplier Registration Form (SRF) online (<http://supplier.bhel.in/>) for evaluating and registering as an approved vendor. The Supplier Development Cell (SDC) of BHEL, Ranipet would process the SRF for evaluation / registering the Supplier. Don’t send hardcopies of SRF to BHEL-Ranipet, **only** online submission is accepted. This registration process is a separate / parallel activity and do not mix-up with submission offers.

Note

- (i) The materials offered, shall conform to the specification and scope attached in the tender.
- (ii) In case the offered materials are not conforming to the Enquiry material Specification, such offers would not be considered for evaluation and would be rejected.



Where equivalent specifications are offered, considering such offers will be at the sole discretion of BHEL. Wherever alternative standards / specifications are offered by Bidder, the Bidder shall provide sufficient documentary evidence to ensure equivalence to the designated standards / specifications, failing which the offer would be considered as not technically acceptable and hence shall stand rejected.

(iii) All taxes and duties payable as extra to the quoted price should be specifically stated in offers (as appearing in the online template).

Offer/s from within India shall be submitted along with the applicable HS Number and the applicable Goods & services Tax (GST) for each quoted item, failing which the purchaser will not be liable for payment of such taxes and duties. Our GST No: **33AAACB4146P2ZL**.

(iv) The un-priced bid shall be used to indicate relevant commercial terms such as scope of freight and insurance, applicability of duties and taxes etc. All Commercial terms are to be indicated clearly in the offer.

(vi) No changes shall be entertained once the bid is opened unless otherwise specifically agreed to in writing by BHEL.

(vii) Money values other than for those items appearing in the un-priced bid template shall not be indicated anywhere in the un-priced bid.

(viii) Time required for inspection (at Supplier's works), should be clearly given in terms of numbers of working days.

(x) **Offers sent by FAX / E-mail:** would not be entertained.

(xi) Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.

(xii) Registration process for items required by BHEL is always open at <https://supplier.bhel.in>. Prospective suppliers (including MSEs & owned by SCs/STs) may visit this site and apply for registration in the respective Unit.

Price Bid in conformance with the specification and terms as given in the Un-Priced bid document.

Caution on submission of price bids thru EPS:

The suppliers are severely cautioned to note that the price bid document accepts the price in figures only. It does not allow the supplier to write the value by words. Therefore all care shall be exercised by the supplier while filling in the figures. Once the price bid is opened no option is available for the supplier to retract the offer under any grounds. If a supplier, for any reason whatsoever approaches BHEL with a request for change in the price, it would be treated as going back on the offer submitted. In such cases, action would be initiated by BHEL for suspending further business dealings with such suppliers as per policy of BHEL which prevails at that point of time.

Foreign / Overseas suppliers are hereby informed that offers with differential currencies are not permitted for a given tender document.

Note

(i) The price break-up should be in line with technical specification / scope of the tender. (Cost of material, packing charges, forwarding charges, freight and insurance charges shall be shown appropriately, as applicable).



- (ii) Unless otherwise specified as a part of the tender condition, No Price Variation Clause will be entertained and No advance payment will be made by BHEL.
- (iii) In case, there is a discrepancy in the term quoted in techno-commercial bid and price bid, the term as per the techno-commercial bid (Part I) shall hold good and the commercial term quoted in the Price Bid (Part II) shall not be considered.
- (iv) In their own interest, all Tenderers are advised to double check their prices, applicable duties and taxes.
- (v) The quotation should be valid at least for a period of 90 days from the tender opening date.
- (vi) Indian bidders should submit the prices in Indian Rupees only.
- (vii) Foreign bidders may submit their bid in foreign currency. The currency for quoting shall be selected from the drop-down menu provided.
- (x) Indian Suppliers shall quote on FOR Destination basis only. Destination is BHEL, Ranipet Stores or BHEL Project Site as specified in the tender requirement. Foreign Suppliers shall quote on CFR Chennai Seaport Delivery and Insurance will be in BHEL's scope. No other delivery terms shall be acceptable. Shipment shall be arranged by the Seller on *Liner in / Liner out basis*. As per Government of India guidelines, BHEL Ranipet being a Government of India Undertaking the Bill of Lading shall be made with the Shipper as "Government of India". This shall be specifically confirmed by the Bidder.
- (xi) Where the cargo is containerized, Container washing charges, stuffing charges and / or any other such charges would be to the account of the supplier, where the containers are to be stuffed at the works of the supplier.

B] Opening of Offers

a) **Tenders can be submitted up to 1400 Hours on tender opening due date. Part I will be opened on the same day at 1430 Hours. Results of the tender opening will be available for viewing for upto 7 days from the date of opening.**

b) Requests by Bidders for extension of due date will not be entertained by BHEL.

c) Price Bid opening will be done through e-mode / Reverse Auction method (English method) which will be decided after techno-commercial bid evaluation is completed. All tenderers would have to specifically give their acceptance for this in their bid/s.

Note

- (i) Bids including all enclosures and supporting documents like catalogues, pamphlets, etc., shall be provided in ENGLISH language only.
- (ii) In exceptional circumstances, at its option, BHEL may consider extending the due date/s for the tender openings for reasons such as (but not limited to) paucity of offers etc. However, sufficient notice would be given by BHEL for such extension.
- (iii) Deviations shall be summarized and provided in a "Deviation Statement", listing the points and the deviation against each point.
- (iv) BHEL reserves the right to increase or decrease the tendered quantity and to order on more than one vendor at the lowest acceptable price to BHEL. In ordering on more than one source, the ratio of quantity split will be as specified in the tender terms.



If not explicitly specified, BHEL reserves the right to split the quantity of the enquiry as follows: 70% quantity being ordered on the original lowest bidder (L1) and balance 30% on the next higher bidder/s excluding H1, who accepts the L1 price. However, the final decision to split the order rests with BHEL only.

In the event that the other than L1 suppliers do not accept the L1 price, then the balance will be reverted to the original L1 and the original L1 shall be bound to accept the balance of the enquiry quantity kept reserved for order splitting. This decision would be given by BHEL within 60 days of the price bid opening.

Notwithstanding the quantum of split that may be indicated in the main body of the enquiry, bidders are advised to note that the splitting of the orders will be decided by BHEL after the evaluation of the techno-commercial and price bids.

(v) Offers for part quantities on item level basis are not acceptable to BHEL. While tenderers can quote for some or all the tendered items, no supplier shall quote for partial quantity of any given enquiry item. Such partial offer would not be considered in the enquiry for that item. Suppliers are to note that the evaluation unless otherwise specified will be on item level and not for the tendered items as a whole.

C] Evaluation of Offers

a) The price bids including the impact price (if any) of the technically acceptable offers alone shall be opened.

b) Offers with pre-conditions (like conditional discounts) for price are liable to be not considered / rejected. For evaluation such conditions would be removed and only the base offer would be considered for evaluation and comparison.

d) In the event of any change in scope / quantity arising out of the discussions, offerers would be given a chance to submit their revised offer / Impact bids. The option for the revised offer / impact offer will be triggered by BHEL. The Supplier then will have the facility to feed-in the revised price / impact price as per the provision given by BHEL. The impact price can be positive or negative (or nil). The impact price option shall contain only the price addition / deletion for such change in the scope / quantities, over and above the original scope and price quoted. The original price quoted would remain unchanged. The total price would then be computed by the arithmetic addition of the original price and the impact price. Where BHEL gives the option of submitting the revised offer, the impact would be computed as the arithmetic difference of the revised price and the original price.

e) For evaluating the overseas offers, CFR Chennai Sea Port price quoted will be taken into account. The cost to BHEL will be arrived at by loading the applicable customs duty project wise, insurance charges, inland transportation charges to BHEL stores and LC charges etc.,

f) Deleted.

g) BHEL reserves the right to reject without assigning any reasons / load any offer with factors other than already specified for such offers having deviations to BHEL Specifications, Standard Terms & Conditions at its discretion. The decision of BHEL in this regard shall be final.

h) BHEL reserves the right to reject an offer due to unsatisfactory performance during tender finalisation / execution of a contract at any of BHEL projects / units in the past or if unsatisfactory performance report is received from the party/s referenced by the supplier at any time during tender finalisation.



i) BHEL reserves the right to operate Purchase / Price preference to Government of India Undertakings, which shall be given as per the guidelines of Government of India given from time to time and / or relax the Terms and Conditions of the tender.

j) For the purpose of comparing prices, tender prices shall be converted to Indian rupees and the conversion shall be made by using the TT Selling rate of State Bank of India (SBI) prevailing on the date of opening of Techno-Commercial / Unpriced bids. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken. This exchange rate will be followed till placement of order. Tenderers may please note that even if an impact price is taken as in (d) for purpose of price evaluation and arriving at the rank; the exchange rate will be taken as explained above.

k) Unless otherwise specified, evaluation will be on individual line item basis only and ordering will be on respective L1 vendors.

l) BHEL reserves the right to conduct negotiations on the “Price” and “Other Commercial Terms and Conditions” with the lowest ranked offerer at any time after the bid opening but before the release of the Purchase Order and If so required by BHEL, Supplier may have to share their costing sheet with BHEL.

m) Bidders are required to confirm in writing in their techno-commercial document that other than themselves (the bidder) none of its group companies, concerns or affiliates etc., are participating in the tender either directly or indirectly or through any other agency under the same proprietor / common partner(s)/ common Directors. If during the evaluation of the bids it is found that the bidder has submitted the offer in violation of this condition then all the offers received from the group companies would stand rejected. If such relationship is found at a later date where the Purchase Order has been issued, then BHEL would cancel the Purchase Order and initiate suitable action/s under the contract/s including but not limited to invoking the Risk Purchase clause of the order and other applicable legal provisions / guidelines of BHEL including guidelines on suspension of business dealings. (Please see clause L sub-clause c).

n) For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019 and subsequent orders issued by the respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

Preference to Make in India including counter offering will be as per the Public Procurement (Preference to Make in India), Order 2017 available in the following links

<https://dipp.gov.in/public-procurements>

http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf

http://dipp.nic.in/sites/default/files/Revised-PPP-MII-Order-2017_28052018.pdf

https://dipp.gov.in/sites/default/files/PPP-MII%20Order%20dt%2029th%20May%2019_0.pdf

D] Execution of the Order

a) BHEL will have the option to pre-inspect the materials at Supplier's works by BHEL's own inspector or by third party agency appointed by BHEL or BHEL's end customer/s. The mere act of the pre-dispatch inspection (PDI) does not absolve the Supplier from giving the specifications as agreed upon in the Purchase Order. In the case of inspection being carried out by a third party inspector (TPI) as per the extant practice, the TPI would forward the Inspection Report (IR) along with Test Certificates and other related documents



to the Quality Assurance (QA) Department of BHEL. The QA department after scrutinising the report/s submitted by the TPI would issue the Material Dispatch Clearance Certificate (MDCC). Suppliers are hereby informed that materials should be dispatched only after getting the MDCC, failing which the materials may be rejected on receipt at BHEL Stores.

b) In the case of overseas suppliers Inspection call for carrying out the inspection shall be given 30 days before the scheduled contract delivery date. The Inspection date/s given by the Supplier shall be on firm basis. For local Suppliers the Notice period of Inspection shall be 10 working days.

c) Deviations, if any pointed out by the visiting Inspection team of BHEL shall be corrected and the items as per specification shall be dispatched on or before the contract delivery date after getting the MDCC.

d) The final inspection for acceptance will, however be carried out at BHEL's works at Ranipet.

e) The contract delivery date is the date of receipt at BHEL Stores for suppliers in India, applicable in the case of FOR Destination Contracts.

For ex-works contracts or FOR dispatching station indigenous contracts, the date of the Lorry way bill issued by the authorised transport carriers of BHEL / Railway Receipt / Courier Way bill / Airway bill or any such dispatch documents of carriage approved by BHEL would be considered as the Contract Delivery Date. In the case of CFR contracts with overseas suppliers, the B/L date shall be taken as the Contract Delivery Date

f) Travel & other local stay cost for the Inspectors sent by BHEL will be to BHEL account, but other Inspection Charges, if any shall be to the account of the Seller only.

g) The supplier shall arrange for packing suitably in all respects for normal transport by sea / rail / road and Materials shall be suitably protected against effect of tropical salt laden atmosphere in the event of shipment being delayed at ports / store yards and as per BHEL TDC.

h) Foreign suppliers shall dispatch on CFR agreed Sea-Port basis, according to the contract conditions. Indian suppliers shall dispatch on free delivery (door-delivery) at BHEL stores basis only. Unloading the materials at BHEL Stores would be to the account of BHEL only.

i) In the event of any short supply, it shall be the responsibility of the supplier to deliver such short supplied/ missing items on Free-of-Cost basis at BHEL stores, including customs clearances at Indian Ports in the case of foreign suppliers.

k) Terms of payment:

k.1) For Indigenous Suppliers: Unless otherwise agreed to by BHEL, the standard payment terms of BHEL shall be: For non-MSE suppliers 100% payment made directly through EFT within 90 days from the date of receipt and acceptance of materials at BHEL Stores, Ranipet or 90 days from the date of acknowledgement of receipt of materials at destination specified. If any supplier asks for payment terms other than the above specified, then suitable loading on cost will be considered. **Loading of any deviation in the payment terms w.r.t tender terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation sought by bidders.**

k.2) For MSE vendors (under Micro & Small category alone) 100% payment will be made within 45 days from the date of receipt and acceptance of materials at BHEL Stores, Ranipet or 45 days from the date of acknowledgement of receipt of materials at destination specified.



I) NOTE:

Where the destination specified is other than BHEL Stores Ranipet, for claiming payment, Supplier has to submit proof of receipt of the materials at the destination by furnishing a copy of the acknowledged despatch document (LR/RR/Courier receipt etc.) .

If the Bidder is bidding for the first time and wants to be considered as an MSE then, the Bidder shall submit document evidencing that they are an MSE along with a certificate from a Chartered Accountant certifying the status of their Unit / Works clearly specifying the address of the works which is to be considered as MSE and send the same to BHEL, Ranipet either before the tender opening date or upload it as a part of the tender document in the e-procurement portal. Where the document is submitted electronically a hard copy shall invariably be sent within a reasonable period (not exceeding 30 days) from the bid opening date for the purpose of BHEL's records. If the hard copy is not received within this specified time, then the supplier would be treated as a non-MSE. BHEL will not be responsible for any postal / courier / delivery delays.

For approved vendors the status as on the date of the bid opening as available with BHEL Ranipet's records shall be used for reckoning the status of the Bidder as an MSE or otherwise.

Offer/s received without these documents will be treated as non-MSE and order finalization will be done based on this premise. Documents submitted after Bid-opening will not be considered in this tender. This provision for MSE will apply subject to the condition that the participating MSE meets the tender requirements.

For approved suppliers, in case of any change in the MSE status, it shall be the responsibility of the Bidder to notify the change as a part of the Bid document. If at a later date it comes to the knowledge of BHEL, Ranipet that the change in the status has not been intimated by the Bidder and the order is obtained under the premise of an MSE then BHEL would cancel the pending order against this tender and take necessary steps for suspension of the business dealing with the Bidder as per the procurement policy of BHEL. Similarly if a supplier claims MSE status after the Part I bid opening, then the same would not be considered in the tender.

In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items / quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc. then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1.

Other concessions for MSEs / Reserved sectors (Also for women owned MSEs and MSEs owned by SC/STs)

In addition to the concessions specified above, MSE suppliers will be eligible for such other concessions as per the MSME Act 2006 and any other benefits / concessions that may be announced by the Government of India from time to time.. However, such concessions as applicable at the time of tender opening alone will be applicable. Any concessions advised after tender opening will not be considered for the current tender.

Items that are reserved for MSE and for any other items for which reservations for Indian manufacturers are notified by the Govt. Of India, such concessions as prevailing on the date of tender opening shall apply as a part of this tender conditions.

ii) Foreign Suppliers "100% thru' irrevocable & unconfirmed LC at sight within 3 weeks from the PO date through any one of our Bankers listed elsewhere in the tender conditions for 100% value (less Agency Commission, if any) valid up to the PO delivery period and 15 days thereafter for negotiation. All bank



charges in India to BHEL's account and all other charges outside India to Supplier's account. **BHEL would load the price of foreign suppliers in order to bring them on common platform as per Indigenous Suppliers on the account of differential payment terms to Indigenous Suppliers. Loading of payment terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation compared to indigenous suppliers i.e. 90 days.**

m) Any incidence of tax like Income tax, Goods & Services Tax (GST) and Withholding any other similar tax / duties /levies imposed by the Government of India, or the State Government, where the BHEL Unit is located, deductible at Source, during the tenure of the Order shall be deducted by BHEL and necessary certification of the deduction (Tax deduction at Source) would be given. This is subject to the supplier fulfilling the necessary documentation as specified by the Government of India. (e.g. Tax Residency Certificate, PAN Number etc.)

n) The Guarantee period shall start from the "Date of receipt and acceptance of the materials at BHEL Stores."

E] Liquidated Damages Clause:

BHEL will levy penalty as Liquidated Damages (LD), for delay in delivery. The damages shall be at the rate of ½% per week or part thereof subject to a maximum of 10% PLUS applicable Goods & Services Tax (GST). The contract delivery date for purpose of L.D is the date of receipt at BHEL Stores for suppliers in India for F.O.R. Destination Contract and the date of dispatch clearance given by BHEL for overseas suppliers. For ex-works or F.O.R dispatching station contracts, the date of the dispatch document will be reckoned as the date of delivery for computing the LD. Supplier shall deduct the applicable LD from the first payment when raising the claim for the same. The applicable LD if any would be communicated by BHEL along with the dispatch clearance. It is taken by BHEL that Foreign Suppliers have confirmed their acceptance to BHEL for opening the LC for value which is the value of the order reduced by the applicable LD. The LD would apply on the undelivered portion only. In case of reasons attributable to BHEL for the delay in delivery (for e.g. delay in arranging the pre-inspection) then the delivery time would be reset to the extent of the time delay attributable to BHEL, with waiver of the LD. Delivery being the essence of BHEL's contract requirements, unless otherwise specified the LD would apply on the undelivered portion of the contracted items. **In the event that a Supplier does not accept the LD condition above, the offer would be loaded to the extent of the shortfall with respect to upper limit specified above.**

F) Miscellaneous

i) Role of Principals and Agents:

BHEL will deal directly with indigenous manufacturers only.

BHEL strongly discourages the engagement of Agents in India by foreign principals, to deal with BHEL, in BHEL's tenders.

BHEL will not enter into any correspondence with an Indian Agent.

The Indian Agent will not be extended the privilege given to the principals, such as that of attending the tender openings, attending technical discussions, commercial discussions or price negotiations and such like.

In case, in spite of the above, a foreign principal insists on engaging an Indian Agent, It is made clear by BHEL that:



It is the sole responsibility of the foreign principal to ensure the Agent does not represent any other foreign principal in a given tender.

An undertaking to this effect shall be given by the foreign principal that his / her Agent does not represent any other foreign principal in the tender. This document shall form a part of the techno-commercial offer.

A Principal shall authorise only one Agent to quote against each BHEL's tender. In the event a Principal authorises more than one agent to quote against a BHEL's tender, then all such offers will be rejected by BHEL in that tender. Principals are also advised to include BHEL's tender Number / Reference in their authorisation issued to the Agent.

If at any stage of the tender, BHEL finds that an Indian Agent has represented more than one foreign principal, all such offers of and all the foreign principals would be disqualified summarily in the tender inquiry.

BHEL will only give an intimation of notice of the disqualification. No correspondence would be entertained by BHEL, on their decision. Such decision of BHEL shall be irrevocable, firm and final and shall be binding on the tenderer.

BHEL, due to business reasons would ban, would have banned Indian agents from dealing with BHEL.

Any foreign principal who engages such a banned agent, or an employee of the banned agency, or any other person connected with the banned agency, at any time during the tender proceedings, would be disqualified from the tender proceedings. The decision of BHEL in this regard shall be final and be binding on the OEM.

Hence in their own interests, prospective tenderers may check with BHEL, the status of their proposed agent vis-à-vis BHEL.

In view of the requirement of BHEL, it is strongly suggested that in their own interest, foreign principals may desist from engaging any Indian agent and deal with BHEL directly and it is stressed that any Main producer proposing to deal with BHEL by engaging and through an Indian Agent does so at their own risk.

BHEL shall in no way be responsible for any consequences that may arise to the foreign principal on account of the antecedents / actions of their Indian Agent.

In the event of the foreign principal engaging an Indian Agent:

a) The Supplier shall furnish an authenticated copy of the Agency Agreement with his agent detailing the precise relationship between them and their mutual interest in the business along with techno-commercial bid.

b) The Supplier shall furnish original authorization letter for the Indian Agent. The letter shall contain name, contact person, complete postal address including phone, fax and e-mail ID. It shall also spell out the type of services to be rendered by Indian Agent.

c) Indian Agent & Agency commission: An Indian Agent can represent only one Foreign Manufacturer against a particular Tender. The CFR price quoted by the foreign bidder shall include the agency commission. However, the agency commission component payable to their Indian Agents shall be shown separately in the Offer, either as a lump-sum or as a percentage of the quoted price. This will be paid by BHEL in Indian Rupees, on satisfactory receipt & acceptance of the materials. For calculation of Rupee equivalent of Agency Commission, exchange rate as prevailing on the date of Purchase Order will be taken and



d) For all discussions, technical clarification and negotiations etc. only the principal would be authorized for interaction with BHEL. The Agent shall not be a party to the discussions / negotiations and would not be normally allowed to participate.

ii) Terms & Conditions of Letter of Credit (L/C) for overseas suppliers (indicated for acceptance).

a) Unconfirmed irrevocable Letter of Credit at Sight only will be opened by BHEL. Confirmation of L/C is not preferred by BHEL. Also L.C will be opened in Lots in line with the staggered delivery.

b) All Bank charges out side India are to the Supplier's account and within India to BHEL's account.

c) In case of L/C extension caused by delays attributable to the Supplier, the L/C extension / commitment charges are to be borne by the Supplier.

iii) Other terms & conditions for letter of credit: - Documents for negotiation

a) Signed Commercial invoice in quadruplicate, for a value not exceeding the draft amount, quoting the import Licence No and certifying goods evidencing shipment of the merchandise are as per Applicant's Purchase Order. The amount of invoice after deducting Indian Agent's commission, if any, should not exceed the Credit amount. (The Indian agent's commission, if any, is payable in India in Indian rupees only.)

b) Certificate of Country of Origin, from the country of manufacture, issued by the Chamber of Commerce.

c) One set of Original and two sets of Non-negotiable copies of 'signed', 'unmarked', 'clean on board' Ocean Bill of Lading, showing Shipper as "Government of India" Account M/s. Bharat Heavy Electrical Ltd, Unit: BHEL, Ranipet as consignee (The opening bank should not be notified as consignee), marked freight payable / prepaid at destination.

d) Packing list in 4 copies in English, indicating Size wise Number of bundles / pieces shipped and weight.

e) Certified copy of the fax / e-mail sent by the beneficiary to the applicant giving the following particulars of shipment, as the insurance is to be arranged by the Applicant in India: (a) Purchase Order Number & date; (b) Bill of Lading Number & date (c) Name of vessel; (d) Port of Loading; (e) Number of bundles / pieces and weight; (f) Invoice Number, date and value (g) Purchase Order item number's despatched. The cable / fax is to be sent within 2 working days of shipment.

f) Beneficiary's certificate showing the relevant airmail / courier reference no. and date that the following clauses have been complied with:

1] Beneficiary to forward by Registered Airmail / Courier one complete set of original documents and one set of non-negotiable documents within 3 working days of obtaining shipping documents to Regional Manager (ROD), Bharat Heavy Electricals Ltd, 6th Floor, EVR Periyar Bldg. No 690 (Old 474), Anna Salai, Nandanam, Chennai-600035. India. (Phone: +91-24330931, 24330253; e-mail: pbpwar@bhel.in)

2] Beneficiary to courier at his cost 3 copies of complete set of non-negotiable documents to the Officer who released the Purchase Order.

3] Declaration by the Supplier certifying that the contents in each case are not less than those entered in the invoices / packing list and that the invoicing for the supplies effected is strictly in accordance with agreed rates as stipulated in the Purchase Order.

4] Declaration to the effect that all other documents as per purchase order has been couriered to the Purchase order releasing authority

5) The carrying steamer should be seaworthy, less than 25 years of age and approved by Lloyds / Classification Societies / General Insurance Corporation of India from time to time and



6) Copy of Dispatch Clearance / Instruction issued by BHEL.

iv) Documents to be sent directly to the Purchaser prior to shipment

- a) Manufacturer's Original Internal Inspection / Test certificate in triplicate.
- b) Manufacturer's Original Guarantee certificate as per Purchase Order. The material shall be guaranteed for a period of 12 months from the date of acceptance of the materials at BHEL stores or 18 months from the date of dispatch whichever is earlier. The acceptance would be evidenced by the Stores Receipt Voucher (SRV) which will be raised by BHEL.
- c) Inspection / Test Certificate issued by BHEL / Inspection agency specified in the Purchase Order. In the event that Inspection prior to dispatch is not carried out by the Engineers of BHEL, the Inspection certificate of the third party so authorized by BHEL and
- d) Any other documentation as specified in the Purchase Order.

v) Conditions for transportation:

- a) All shipping documents shall show the Purchase Order Number & Date, Import Licence Number & Date, and Letter of Credit Number & Date.
- b) Transshipment is to be avoided.
- c) Loading on deck is not permitted. The transport document must not contain a provision that goods may be carried on deck.
- d) A transport document which is produced or appearing to have been produced by reprographic, automated or computerized systems or as carbon copy will be accepted as an original document provided that it is marked as original and is ink-signed.
- e) The transport document must contain all the conditions of carriage on the original document.
- f) The transport document must not indicate the place of destination as being different from the port of discharge.
- g) The transport document must not contain the indication 'intended' or similar qualification in relation to the vessel or other means of transport or port of loading or port of discharge.
- h) The transport document must be issued by the carrier or his agent and not by any freight forwarder.
- i) Transport documents bearing reference by stamp or otherwise, to costs additional to the freight charges are not acceptable.
- j) The Bills of Exchange must be dated and presentation of documents for negotiation must not be later than 15 days after the date of shipment and in any case not later than the expiry date of the Credit.
- l) Indian suppliers shall dispatch the materials on freight prepaid and on door-delivery basis (FOR Destination – Destination: BHEL Stores) and
- m) In the event there is a delay by the Supplier in negotiating / submitting the document, any demurrage / wharfage arising out of the same shall be to the account of the Supplier and shall be deducted from the final payment. Also, in such cases, the Supplier shall authorize the Steamer / Shipping agent / transporter to freely release the consignment to BHEL by providing a “Surrender Bill of Lading”. Over-seas Suppliers have to give a No-Objection Certificate to BHEL, authorizing BHEL to get the Delivery Order from the Steamer

Agent without producing the Original Bill of Lading. This is required to ensure avoidance of incidence of demurrage at Chennai Sea-port that may arise in case of delayed presentation of documents by the Seller.

G) Reverse auction (RA) / on-line bidding on internet:

1. *“BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders shall give their acceptance with their offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of the bids, in case BHEL decides to go for RA.”*

2. *Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit ‘Process compliance form’ (to the designated service provider) as well as ‘Online sealed bid’ in the Reverse Auction. Non-submission of ‘Process compliance form’ or ‘Online sealed bid’ by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for “Suspension of Business Dealings with Suppliers/ Contractors (as available on www.bhel.com).”*

3. The philosophy followed for reverse auction shall be English Reverse (No ties).

4. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

5. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

6. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.

7. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

8. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

9. Reverse auction will be conducted on scheduled date & time.

Note: Decision to go for RA or not will be on case to case basis.

10. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

11. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, to the Service provider within two working days of Auction without fail.

12. Bidders are be required to read the “Terms and Conditions” section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the „Business Rules of Reverse Auction“, which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with their offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, would also be opened after the RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. It is considered that the bidder having submitted their offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rate/s.
16. If it is found that L1 bidder has quoted higher in the online sealed bid in comparison to the envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)."
17. The calculation sheet e.g. excel sheet (which will help to arrive at 'Total Cost to BHEL') will be communicated to respective bidders of RA by BHEL. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Goods & Services Tax (GST) and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.]
18. This calculation sheet will be finalized based on the evaluation criteria specified in the NIT.
19. Suppliers are required to submit their best price bid in a separate sealed cover along with techno-commercial bid. After evaluation of Techno-Commercial Bids:
- a) In case BHEL decides not to conduct RA, the envelope sealed price bids of all techno-commercially qualified bidders, along with price impact, if any, would be opened and processed as per extant the internal Purchase/ Works Policy as applicable to BHEL.
 - b) In case BHEL decides to conduct RA, business rules of RA will be sent to service provider.(See Annexure for Model General Business Rules of RA.)
20. Generally the start price for the RA would be the lowest of
- a) Lowest online sealed bid and
 - b) Internal Estimate of BHEL
- Note: Wherever more than one lowest online sealed bids are identical and lower than the estimate, the start price, would be that price arrived by reducing the lowest online sealed bid by maximum of one decrement.*
21. Reverse auction process would deemed to have started upon receipt of 'Online Sealed Bids' from the bidders within the prescribed time frame as per Business Rules.
22. After receipt of 'online sealed bids', the start price & bid decrement will be decided by BHEL and the same would be communicated to the service provider, to start the bidding process.
23. Only those bidders who have submitted the 'online sealed bid' within the scheduled time would be eligible to participate further in RA process. However, the H1 bidder (whose quote is highest in online sealed bid) will not be allowed to participate in further RA process provided minimum three bidders are left after removal of H1 bidder. In case of tie for H1 bid (identical online sealed bids), 15 minutes additional time

would be provided and all the participating bidders would be informed by mail/ message on bidding screen to enable bidders submit revised online sealed bids so as to break the tie.

24. If the lowest online sealed bid is the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system. System would have the provision to indicate this bid as current L1 for further bidding.

25. If the start price is lower than the lowest online sealed bid, on acceptance of such start price by any bidder, this bid would be indicated as current L1 for further bidding.

26. In case of no further bidding, RA will be deemed to have been successful with current L1 bidder.

27. All bidders who had given online sealed bid would be able to see their rank and L1 price and their ranking L1, L2 etc. would be based on their last quoted price irrespective of quote received in RA or online sealed bid.

28. RA shall be treated as failed in the following scenarios:

a) In cases where the start price is (a) estimate or (b) one decrement (maximum) lower than the lowest of the online sealed bids and no bidder accepts the start price.

b) In cases where the number of online sealed bids are less than four before removal of highest bidder.

c) In cases of tie among H1 bidders, even after extension of submission of online sealed bids once by 15 minutes.

d) Wherever, the evaluation is done for individual line items, RA shall be treated as failed only for those line item(s) for which any of the above a), b) or c) satisfies.

29. In cases of failure of RA, sealed envelope price bids (of item(s) for which RA has failed) of all the techno-commercially qualified bidders would be opened and the tender would be processed accordingly. However, the envelope sealed bid(s) of techno-commercially acceptable bidder(s) who had agreed to participate in the RA and had failed to submit the online sealed bid would not be opened.

30. After declaring L1 upon completion of RA, the envelope sealed price bid of L1 bidder would also be opened for placement of order on lower of the two bids (RA closing price & envelope sealed price) and the offers would be processed as per extant their internal Purchase/ Works policy provisions of BHEL. Action as per NIT terms would be taken if online sealed bid is higher than the envelope sealed bid.

31. Relative position of bidders (for usage in cases of predefined splitting the quantities) would also include bidders who have given 'online sealed bids' but have not given further bids in auction. In case of splitting requirement, H1 bidder may be considered for counter offer if the pre-stated (NIT) numbers of suppliers do not accept the counter offer. However, principle of splitting to N-1 bidder would be maintained.

32. In case H1 bidder happen to be MSE and was removed from further bidding but is within L1 + 15% band, then this bid would be considered and to be processed in line with 'Public Procurement Policy for Micro & Small Enterprises (MSEs) order, 2012'.

33. For providing preference to domestically manufactured Electronic Products, in accordance with Department of Electronics and Information Technology (DeitY) Gazette Notification No. 33(3)/2013-IPHW dated 23.12.2013 and its related notifications issued from time to time, H1 bidder removed from further bidding would be considered for counter-offer to meet domestic bidder requirement for the item(s) under procurement.

34. In case BHEL decides not to go for Reverse Auction for the tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL would be opened as per BHEL's standard practice.

35. In case of enquiry through e-Procurement, the sealed electronic price bid (e-bid) would be treated as sealed envelope price bid.

Note: In order to bring more transparency and to address any queries of Bidders on Reverse Auction, an abridged version of BHEL's "Common Guidelines for conducting Reverse Auction (RA)" has been hosted in BHEL's web site www.bhel.com under the links "Supplier Registration Page" and "Tender Notification". All Bidders are requested to visit the link and familiarize themselves with BHEL's RA procedures and guidelines before submission of their bid/s. Submission of Bid shall mean that the Bidder has read and understood BHEL's RA procedures and the bid is in agreement with the same.

H] Force Majeure

If at any time during the currency of this contract, the performance in whole or in part, by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (hereinafter referred to as events), then provided notice of happening of any such events is given by either party to other within ten days from the date of occurrence thereof, neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by reason or any such event claims for extension of time shall be granted for period considered reasonable by the purchaser subject to prompt notification by the seller to the purchaser of the particulars of the events and supply to the purchaser if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

I] Cancellation of Order:

In the event of non-performance of the contract by the Supplier, BHEL reserves the right to cancel the order with issue of a written notice. BHEL would provide a curing period of 30 days, for the Supplier to rectify the situation. If the Supplier fails to rectify the reason/s that led to the issue of cancellation notice by BHEL, then the cancellation order would be issued automatically by BHEL, without further recourse to the Seller. BHEL will not pay any cancellation charges or any other charges / damages to the Supplier, arising out such cancellation. In the event of the non-performance of the supply contract, by the Supplier, the rights of BHEL include, in addition to cancelling the order, to take alternate purchase action at the cost and risk of the supplier. The additional expenditure to be incurred by BHEL in such alternate purchase would be to the account of the supplier. (Risk Purchase). This remedy would be in addition to the invoking of the CEBG on grounds of failure of the Supplier in executing the Contract and any other legal remedies." BHEL reserves the right to initiate the alternate purchase action at the cost and risk of the erring supplier by issue of a simple notice of intention for the alternate purchase action duly sent by any electronic means and / or by a letter. The cancellation of the order would not be a pre-condition for initiation of the alternate purchase action.



J] Contract Execution Bank Guarantee:

To demonstrate the fidelity of the successful bidder, in executing the Contract, on receipt of the Letter of Intent / Purchase Order, the Supplier shall arrange to provide a contract execution bank guarantee (CEBG). The format of the CEBG is a part of this enquiry. The format may be downloaded and necessary stamping may be obtained from the Banker towards submission of the CEBG. The indigenous suppliers have to provide the CEBG from any one of the Nationalized Banks, listed in the annexure to these terms. Overseas suppliers can submit the CEBG from any of the reputed International / National Bankers. However the CEBG is to be confirmed by any of the Bankers listed by us. In the event of failure by the Supplier to execute the contract either fully or partially, BHEL would encash the entire CEBG. The CEBG shall be valid for the period covering the agreed delivery date of the order with a further claim period of 3 months on the last specified delivery date. In the event of the failure of delivery BHEL would proceed with encashing the CEBG without reference to the Supplier. In the event of BHEL granting extension of the delivery dates, then the CEBG validity shall also be got extended by the Supplier to the extent of the extended delivery times together with the claim period as specified elsewhere. **The CEBG shall be for a value of 2% of the Purchase order.**

Suppliers who are all already registered with BHEL and having a vendor performance rating of A or A+ grade would be exempted from submission of CEBG.

Performance Bank Guarantee

Where ever so required, the Supplier shall arrange to provide a Performance bank guarantee (PBG). The indigenous suppliers have to provide the PBG from any one of the Nationalized Banks, listed in the tender terms. Overseas suppliers can submit the PBG from any of the reputed International / National Bankers. However the PBG shall be confirmed by any of the Bankers listed by us. The PBG shall guarantee the performance of the equipment / materials / items supplied and shall cover the guarantee period. The PBG shall have a claim period of 3 months in addition to the guarantee period. In the event of failure of the supplies made within the guarantee period, BHEL would encash the entire PBG. **The PBG shall be for a value of 10% of the Purchase order.**

The supplier/s have to get the PBG format (pre-printed) from BHEL and get the same stamped by the Banker. Change of PBG terms either by the supplier's Banker or by the supplier, after servicing of the order is not acceptable. Similarly PBG prepared by the supplier (typed by them) will also not be acceptable to BHEL. The pre-printed form issued by BHEL shall be used for making the PBG.

K] Post-order submission of documents for approval

In the event of the release of Letter of Intent (LoI) / Purchase order/s (PO) against this tender, Bidders have to submit the applicable documents as called for in the tender / LoI / PO/s, such as drawings, data sheets, design calculations etc. These documents for approval have to be submitted within the agreed timelines between BHEL and Bidder. Normally the time period for submission for approval is 15 days from the date of receipt of the LoI / PO by the supplier. The actual time period within which the documents have to be submitted for approval would be specified in the LoI / PO.

Such documents would be subjected to evaluation and approval by BHEL and / or by BHEL's customer / Consultant / Customer's Consultant. Bidders have to give their specific acceptance for this.

After approval of such documents and after getting clearance from BHEL, only the items ordered can be taken up for manufacture.

Any changes required by BHEL / Customer etc. in the documents submitted for approval shall be incorporated by the Bidder and no extra cost would be payable by BHEL for such changes.



In the event that the Bidder does not carry out the required corrections, then the LoI / PO would be liable for cancellation by BHEL and BHEL would resort to alternate purchase action at the risk and cost of the Bidder under the Risk Purchase Condition of the Purchase Order.

Note: After receiving the LoI / PO, supplier shall also forward the acknowledgement / acceptance of the LoI / PO by signing and returning the second copy of the LoI / PO as the token of acceptance.

L] Others

a) In case of any contradiction in the terms and conditions given here and elsewhere in the other documents of the tender, it shall be the responsibility of the tenderer to get it clarified from BHEL. The officer authorized to provide such clarifications is the tender issuing officer.

b) Alterations to the conditions of the Tender can be done only by the authorized officer, at any time before the date and time of tender opening and would be duly communicated through a corrigendum.

c) Suspension of Business dealings with Suppliers:

(i) Before submitting offer, prospective bidders are advised to visit our web-site www.bhel.com / supplier registration to familiarize themselves with BHEL's policy and procedures of Suspension of Business Dealings with Suppliers.

Submission of offer shall be deemed to be evidence of the Bidder to have read and understood the above said policy.

ii) Treatment of Banned / Under-performing Vendors:

Any supplier who has been put on "Hold" or "Banned" from having business dealings with BHEL, Ranipet or any other unit of BHEL shall not submit their offer against this tender. If any such offers are received they would be summarily rejected and sent back. During the processing of tender, if any unit of BHEL puts a supplier on "Ban" then further processing of the offer will not be taken up and in case an order is placed, BHEL, Ranipet may resort at their discretion to cancel the PO either fully or partially.

If any of the supplier who is supplying similar material to BHEL, Ranipet has a Vendor Performance Rating (VPR) score of 'C' or below, then offer given by such parties will not be considered for ordering in this tender.

If any of the Bidders have unexecuted order/s with BHEL and if in such orders, the deliveries have been delayed beyond a reasonable period (say 30 days of agreed delivery period), the offer of such Bidders will also be liable for rejection.

Offers of such of those bidders against whom action for suspension of business dealings has been initiated by BHEL, Ranipet or any other Units/Division of BHEL will also not be considered in this tender.

d) Fraud Prevention Policy:

The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

e) Applicability of Integrity Pact:-

IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. A panel of Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.



Sl	IEM	Address	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	Flat No. C-1204, C Tower, Amrapali, Platinum Complex, Sector 119, Noida (U.P)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	H.No.B-5/64, Vineet Khand, Gomti Nagar, Lucknow - 226010	vbsinghips@gmail.com

The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid(Part-I, in case of two/three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to the IEM(s).All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

For all clarifications/ issues related to the tender, please contact:

Name: (1) (2)

Dep't:

Address:

.....

Phone:(Landline/Mobile) (1) (2)

Email:

Fax:

Integrity Pact are applicable for all the BHEL enquiries whose estimated value is equal to or more than Rupees 05 Crores.

Copy of Integrity Pact with applicable nominated IEM is attached along with the tender documents for ready reference of Suppliers.

f) If any Supplier attempts to bribe, or pay commission, gift or any advantage or bring in undue influence either by himself or on his behalf any one including a stranger to the tender, in addition to instituting legal proceedings as per the extant laws prevailing, will disqualify the supplier from this tender and all future tenders of BHEL. Decision of the Purchaser would be final in this matter.

g) The laws governing this transaction shall be the laws in India.

h) Wherever not specified, Inco terms 2010 shall be used to interpret the Commercial terms and conditions and

i) In the event of an order, Supplier shall agree to settlement of disputes or differences, if any, by way of arbitration, in accordance with the "Rule of Arbitration" of the Indian Council of Arbitration.



The language in the tender documents downloaded by the Bidders shall at no point of time be changed, altered or modified in any manner by the Tenderer. If such changes are made by any tenderer, it shall be considered as tampering with BHEL's terms and the offer shall be summarily rejected, whenever it is noticed by BHEL. Such Bidders would be disqualified from the Bidding Process and their offers would be forfeited / Bank Guarantees invoked. They would also not be allowed to participate in future tenders of BHEL.

M. Conditions for rejection of offers:

Following is the list of situations which would lead to rejection of offer/s.

This list is not exhaustive but only indicative.

BHEL reserve the right to reject one or all offers without assigning any reason. The decision of BHEL will be final in this regard.

- 1. If the offer fails to meet the technical requirements/specifications of the tendered item/s.*
- 2. If the offer does not meet the commercial terms & conditions, such as but not limited to delivery period specified in the tender, Delivery terms, payment terms, Liquidated damages, Risk Purchase, cancellation clause etc., including the load factors specified in the tender.*
- 3. If the bidder fails to respond to clarification sought, within a reasonable period. In case of doubts / lack of clarity on the technical and commercial offer of the bidder, BHEL will seek clarifications. Bidders are required to respond completely to such BHEL's queries within 3 working days unless otherwise agreed to in writing by BHEL for period beyond 3 days. If supplier fails to respond within 3 working days or maximum 2 working days on a reminder thereon, the offer of such bidders will be automatically dis-qualified in the tender without further recourse to informing the bidder.*
- 4. If any of the conditions listed below are applicable to the bidder, the offer is liable to be rejected:*

If any

- Debt recovery / Winding up Proceedings are initiated against the Company in Courts / Debt Recovery Tribunals (DRTs),*
 - Proceedings are there against the Company in National Company Law Tribunal (NCLT) with respect to Insolvency and Bankruptcy Code (IBC) or otherwise,*
 - Any proceedings are there against the Company under the "Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act,*
 - Any restructuring proceedings are underway for the Company under Corporate Debt Restructuring (CDR), Strategic Debt Restructuring (SDR) or otherwise,*
 - Divestment / demerger proceedings are underway for the Company under the Companies Act.*
 - If action under guidelines of suspension of business dealings (Ref AA/MM/SB/01 Rev 02 dt 22.07.2016) and its latest revisions has been initiated against the company/bidder.*
- 5. Failure to sign & accept the Integrity Pact (where applicable). Bidders are hereby informed that the contents of the Integrity Pact are firm and fixed and cannot be changed.*

The above list is not exhaustive but is indicative only.

N. Special Note:

BHEL is a Government of India Undertaking. Its procurement practices are governed by the (Internal) Purchase Policy issued by the management of the company and as per Annexure B applicable at the time of finalising the order against this tender.

-O-



Record of Revisions:

Revision No.	Revision Date	Modification
01	17.08.2016	Payment terms for Foreign suppliers modified wrt loading- Clause k.ii
02	29.08.2016	Treatment of banned vendors – Para 3 added - Clause L.ii
03	14.09.2016	Opening of offers – clause B – sub clause ‘b’ included and existing clause ‘b’ renamed as ‘c’.
04	14.09.2016	Opening of offers – Note – sub clause (ii) modified
05	12.10.2016	Clause N. Special Note added
06	22.10.2016	Clause G Reverse Auction modified. Annexure on General Business Rules for Reverse Auction appended Role of Principals added under ‘Miscellaneous’
07	20.01.2017	Clause L (e) is modified. Clause L (f ,g ,h) renumbered.
08	24.02.2017	Clause F(c) modified.
09	08.07.2017	Clause M, Point 4 is added – regarding the financial health of the Bidder - as a criterion for disqualification.
10	20.07.2017	Duties and Taxes replaced with GST; Applicability of GST for LD inserted in Clause E; Treatment of poor performing current vendors inserted in clause L.c.(ii)
11	25.07.2017	Clause A.Note (iii) CST etc., replaced with GST; Clause C.f Deleted;
12	15.09.2017	Clause M, Point 5 inserted regarding Integrity Pact
13	21.03.2018	Clause A, Point xi inserted regarding Overwriting in Price Bids
14	28.05.2018	Clause A, a),b),c),d) amended for M/s E-Procurement technologies, https://bhel.abcpurchase.com . Clause A, (f, g, h) – modified. Clause M, Point 4, - regarding suspension of business dealings inserted.
15	23.07.2018	Clause L,(e)- Applicability of Integrity Pact – modified.
16	31.08.2018	Clause C,(n)- Preference to Make in India – added.
17	04.12.2018	Clause C,(n)- Preference to Make in India & Clause K.2 Note - MSE concessions– modified.
18	13.02.2019	Clause C,(n)- Preference to Make in India – modified. Page no 9 Clause o – Extended credit period - removed.
19	24.09.2019	Clause C,(n) - Preference to Make in India – modified. Clause L,(e) - New IEMs Updated

ANNEXURE

Model General Business Rules for Reverse Auction

This has reference to tender no {tender number....date...}. BHEL shall finalise the Rates for the supply of {item name} through Reverse Auction mode. BHEL has made arrangement with M/s. {Service provider}, who shall be BHEL's authorized service provider for the same. Bidders should go through the instructions given below and submit acceptance of the same. The technical & commercial terms are as per (a) BHEL Tender Enq. No. {...} dated {...}, (b) Bidders' technical & commercial bid (in case of two part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

1. Procedure of Reverse Auctioning

- i. Online Sealed Bid: This duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.
- ii. Online Reverse Auction: The 'opening price' i.e. start price for RA and 'bid decrement' will be decided by BHEL.
- iii. If BHEL decides the lowest online sealed bid as the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system and no acceptance of that price is required. System shall have the provision to indicate this bid as current L1.
- iv. Bidders by offering a minimum bid decrement or the multiples thereof can displace a standing lowest bid and become "L1" and this continues as an iterative process.
- v. After the completion of the online reverse auction, the Closing Price (CP) shall be available for further processing.

2. Schedule for Reverse Auction: The Reverse Auction is tentatively scheduled on {date}: and the duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.

- Online Sealed Bid:-

- {Start Time:
- Close Time: }

- Online Reverse Auction:-

- {Start Time:
- Close Time: }

3. Auction extension time:

If a bidder places a bid in the last {...} minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another {...} minutes, for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last {...} minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last {...} minutes. In case, there is no bid in the last {...} minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {Service provider} with a copy to BHEL within 15 minutes prior to initial closing time of Online Reverse Auction.

4. Bid price: The Bidder has to quote the {...} Price inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, GST, Freight (bidder to provide original Freight paid



receipt), insurance charges, etc. including loading (if indicated by BHEL due to deviations in technical/commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of total cost to BHEL (To be specified by Unit as per NIT conditions).

5. Bidding currency and unit of measurement:

Bidding will be conducted in *Indian Rupees per Unit* of the material as per the specifications {...}

In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid) shall be considered for conversion in Indian Rupees. If the relevant day happens to be a Bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.

6. Validity of bids: Price shall be valid for {... days} from the date of reverse auction. These shall not be subjected to any change whatsoever.

7. Lowest bid of a bidder: In case the bidder submits more than one bid, the lowest bid at the end of Online Reverse Auction will be considered as the bidder's final offer to execute the work.

8. Bidders shall be assigned a **Unique User Name & Password** by M/s. {Service provider}. Bidders are advised to change the Password and edit the information in the Registration Page after the receipt of initial Password from M/s. {Service provider} to ensure confidentiality. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.

9. Post auction procedure: BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.

10. Any commercial/ technical loading shall be intimated to bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during online sealed bid & Online Reverse Auction. Modalities of loading & de-loading shall be separately intimated to the bidders. The responsibility for correctness of total cost to BHEL shall lie with the bidders.

11. Computerized reverse auction shall be conducted by BHEL (through M/s. {Service Provider}), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

During the RA process if a bidder is not able to bid and requests for extension of time by FAX/ email/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained. Despite this extension if bidder fails to upload his prices due to extreme case of failure of Internet connectivity, (due to any reason whatsoever may be) it is the bidders'

responsibility/ decision to send fax communication immediately to M/s. {Service provider}, furnishing the price the bidder wants to bid online with a request to the service provider to upload the faxed price online so that the service provider will upload that price online on behalf of the Bidder. It shall be noted clearly that the concerned bidder communicating this price to service provider has to solely ensure that the fax message is received by the service provider in a readable/ legible form and also the Bidder should simultaneously check up with service provider about the clear receipt of the price faxed. It shall also be clearly understood that the bidder shall be at liberty to send such fax communications of prices to be uploaded by the service provider only within the closure of Bid time and under no circumstance it shall be allowed beyond the closure of Bid time /reverse auction. It shall also be noted that the service provider should be given a reasonable required time by the bidders, to upload such prices online and if such required time is not available at the disposal of the Service provider at the time of receipt of the fax message from the bidders, the service provider will not be uploading the prices and either BHEL or the service provider are not responsible for this unforeseen circumstances. In order to ward-off such contingent situation bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {Service provider} is responsible for such eventualities.

12. Proxy bids: Proxy bidding feature is a pro-bidder feature to safeguard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid. Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant. In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price. Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

13. Bidders are advised to get fully trained and clear all their doubts such as refreshing of screen, quantity being auctioned, tender value being auctioned etc. from M/s. {Service provider}.

14. M/s. {Service provider}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {Service provider}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.

15. Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure-VI) for price breakup including that of line items, if required, quoted during the Online Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {Service provider} besides BHEL within two working days of Auction without fail.

16. Any variation between the final bid value and that in the confirmatory signed price breakup Document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on www.bhel.com).

17. Bidders' bid will be taken as an offer to execute the work/ supplies of the item as per enquiry No. {...} dt. {...}. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on www.bhel.com).

18. Bidders shall be able to view the following on their screen along with the necessary fields during Online Reverse Auction:

- a. Leading (Running Lowest) Bid in the Auction (only total price of package).
- b. Bid Placed by the bidder.
- c. Start Price.
- d. Decrement value.
- e. Rank of their own bid during bidding as well as at the close of auction

19. BHEL's decision on award of contract shall be final and binding on all the Bidders.

20. BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with intimation to bidders.

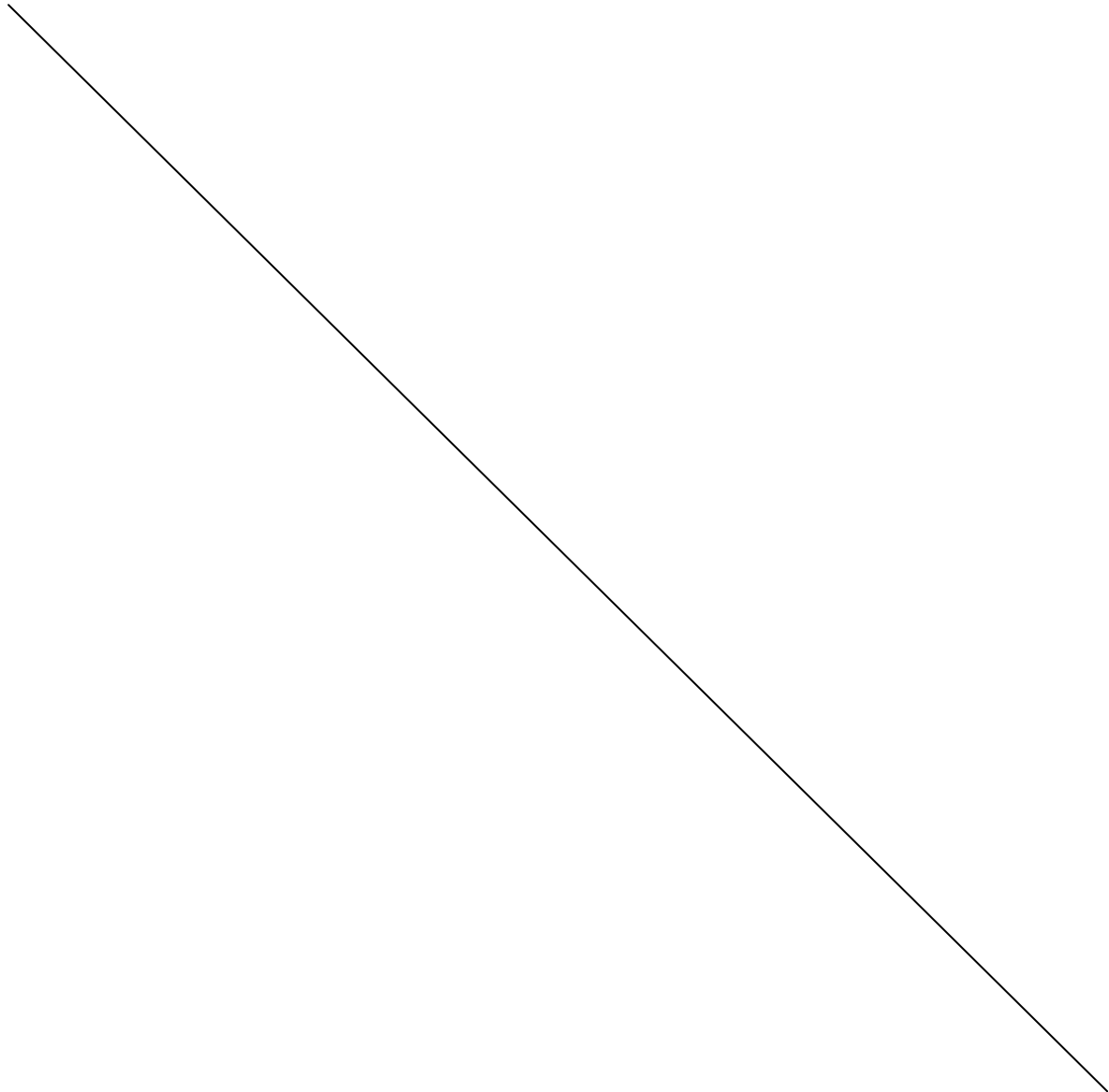


21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.

22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.

23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {Service provider}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time..

24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com), shall be initiated by BHEL.





RA price confirmation and breakup
(To be submitted by L1 bidder after completion of RA)

To
- M/s. Service provider
- Postal address

CC: M/s BHEL

BOILER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
RANIPET – 632406
TAMILNADU
INDIA.

Sub: Final price quoted during Reverse Auction and price breakup

Dear Sir,

We confirm that we have quoted.

Rs.{ _____ in value & in words _____ } for item(s) covered under tender enquiry
No. {...} dt.{...}

Total price of the items covered under above cited enquiries is inclusive of {Packing & forwarding, GST, freight and insurance charges up to {.....}
District, {.....} State and Type Test Charges etc., [exclusive of Goods & Services tax (GST)],
other as
per NIT}

as our final landed prices as quoted during the Reverse Auction conducted today {date} which will
be valid for a period of { ____ in nos. & in words ____ } days.

The price break-up including that of line items is as given below.

Total	=====
	- Rs.in value & in words
	=====

Thanking you and looking forward to the valuable order from BHEL.

Yours sincerely,
For _____
Name:
Company:
Date:
Seal:

Sl.No	Annexure-C for Commercial Terms and Conditions	SUPPLIER COMMENTS: REQUESTED TO OFFER EITHER CONFIRMED OR ACCEPTED OR REMARKS IF ANY DEVIATION IS TAKEN
1	Terms of Delivery- Indigenous Suppliers : FOR Destination: Destination for enquiry sl.no 1 & 16 is STORES/BHEL SITE OFFICE/BARH-I and for enquiry sl.no 2 & 11 is STORES/BHEL SITE OFFICE/BARH-II. For enquiry Sl.No 3-10,12-15 & 17-20 is to Stores/BHEL/Ranipet as indicated in the enquiry item annexure. (Cost, Packing, Forwarding ,Freight & Insurance etc., are in Supplier's scope i.e. included in the quoted prices.).	
2	Terms of Delivery -Foreign Supplies : CFR CHENNAI SEAPORT (Cost, Packing, Forwarding & Freight etc., are in Supplier's scope i.e. included in the quoted prices). Insurance in BHEL Scope.	
3	Delivery Period: To mention clearly the exact delivery period as it attracts contractual penalty on delays.Delivery is the essence of the contract.	
4	Terms of payment for Indigenous Suppliers: (1).80% payment will be made directly thru' EFT within 45 day for MSE Vendors and 120 days for Non-MSE Vendors from the date of receipt and acceptance of materials at site. (2).Balance 20% payment will be released within 45 days from the date of Erection & Commissioning (E&C) certificate issued by BHEL site officials and on submission of invoice. If E&C not happened within 24 month from the date of supply, then 20% payment will be released after 36 month from the date of supply. (3).100% within 45 days for MSE vendor and 120 days for Non MSE vendor for enquiry Sl.No 3-10,12-15 & 17-20 against receipt and acceptance of material at Stores/BHEL/Ranipet-6. If any supplier is asking for payment terms other than the above specified, then suitable loading on cost will be considered. Loading of any deviation in the payment terms w.r.t tender terms will be "MCLR rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation sought by bidders. (For details Pl ref Annexure-B-General Terms and conditions.). All bank charges are to seller's account. (5). No advance payment is applicable. (6). No LC payment term is applicable.	
5	Terms of Payment for Foreign Suppliers: (1)."80% thru' irrevocable & unconfirmed LC with 120 days usance period from the date of submission of negotiable documents. LC will be established within 3 months prior to PO delivery date through any one of our Bankers listed elsewhere in the tender conditions for 80% value (less Agency Commission, if any) valid upto the PO delivery period and 21 days thereafter for negotiation. (2).Balance 20% payment will be released on submission of invoice directly to BHEL/Ranipet within 45 days from the date of Erection & Commissioning (E&C) certificate issued by BHEL site officials. If E&C not happened within 24 months from the date of supply, then 20% payment will be released after 36 month from the date of supply. (3).100% Supervision charges for erection and commissioning (E&C) will be paid on successful completion of E&C against submission of invoice with E&C completion certificate issued by BHEL site officials. (4).100% payment will be made directly thru' irrevocable & unconfirmed LC within 3 weeks from the date of submission of negotiable documents. LC will be established within 3 months prior to PO delivery date through any one of our Bankers listed elsewhere in the tender conditions for alongwith 80% value of main supply (less Agency Commission, if any) valid upto the PO delivery period and 21 days thereafter for negotiation. (Enquiry Sl.No 3&4). All bank charges in India to BHEL's account and all bank charges outside India are to Supplier's account. (5). No advance payment is applicable. BHEL reserves the right to load the price of foreign suppliers in order to bring them on common platform as per Indigenous Suppliers on the account of differential payment terms to Indigenous Suppliers. Loading of payment terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation compared to indigenous suppliers i.e. 45days / 90days. Other than BHEL preferred payment term, any demurrage or any penalty arising out of delay in submission of documents or any other financial implications encountered by the act of bidder/s or supplier/s during the clearance of the goods at customs/ports, will be borne by the bidder/supplier and will be deducted from the supply invoice.	
6	Whenever there is an Indian Agent to represent a Supplier, it is mandatory to give the details of services to be rendered by Indian Agent and / or the details of agreement between Supplier and Agent. Supplier to indicate the Agency Commission payable. Indian Agency Commission will be paid only in Indian Rupees, calculated at the rate of exchange prevailing on the date of price bid opening. This is payable on satisfactory completion of the contract. Agency agreement copy shall be submitted along with Annexure-C without fail. Note: In order to maintain sanctity of the tender system, it is mandatory that one Agent cannot represent two Suppliers or quote on their behalf in a particular tender enquiry. If any Agent represents more than one Suppliers all such offers will be rejected.	
7	Contract Execution Bank Guarantee (CEBG): The Supplier shall submit a BG for 2% of the contract value valid for the agreed delivery period + 3 Months. Attached CEBG Format is to be signed and submitted along with Annexure-C as a token of acceptance. Please note no deviation is allowed.	
8	PERFORMANCE BANK GUARANTEE (10% OF ORDER VALUE): REQUIRED for a period of 27 months (24+3) from the date of supply of material (including 3 months retention period). If any supplier is asking for any deviation or non-acceptance, then suitable loading on cost will be considered (10% value PO value for 27 months). Loading of any deviation w.r.t tender terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the relaxation sought by bidders.	
9	OFFER Validity: Minimum 90 days shall be offered from the date of Techno Commercial Bid opening (Part-II) or 30 Days from the date of Reverse Auction and which ever occurs later will be considered. The specific acceptance for this offer validity is must.	
10	Clientele List: Supplier to submit detailed clientele list with their full address including detail of contact person with phone no., fax no. & e-mail ID as per respective clause of Annexure - B (General terms and Conditions).	

Sl.No	Annexure-C for Commercial Terms and Conditions	SUPPLIER COMMENTS: REQUESTED TO OFFER EITHER CONFIRMED OR ACCEPTED OR REMARKS IF ANY DEVIATION IS TAKEN
11	Price bid opening through Sealed bid / Reverse Auction: BHEL reserves the right to conduct RA/Sealed bid opening depending on the tender outcome. Supplier confirmation required. The sealed price bids alongwith the impact price bids arising out of techno commercial discussions already available with BHEL only will be opened. Please note that no impact price due to non-conductance of RA will be accepted.	
12	Test Certificate: To be submitted. With Chemical and Mechanical properties and dimensions as per Standards and our Technical Delivery Conditions and shall be as per Annexure Q	
13	QP: Specific conformation to Submission of manufacturer/vendor quality plan for our review and approval and shall be as per annexure Q	
14	Guarantee Certificate : Please conform furnishing guarantee certificate in BHEL format for 18 months from the date of commissioning or 24 months from the date of last despatch whichever is earlier.	
15	Warranty shall be as per technical specification	
16	Inspection before despatch: Inspection before despatch at supplier's works by BHEL / BHEL appointed Inspection agency / Customer / Customer appointed inspection agency. And other details shall be as per Annexure Q.	
17	Liquidated Damages (LD) : The applicable LD shall be at the rate of 0.5% per week to maximum of 10% for the undelivered portion and for the deliveries made beyond the agreed Delivery Period. Delivery being the essence of BHEL's contract requirements, in the event that a Supplier does not accept the above LD condition, the offer would be loaded to the extent of the shortfall with respect to upper limit specified above. Date of material receipt at our stores (Day Book date) will be considered as the 'Delivery date as mentioned in purchase order.	
18	Risk Purchase Clause (as per clause-I of Annexure-B) (Supplier Confirmation Required) and as per Terms and Conditions. Non acceptance to risk purchase clause may leads to rejection of offer. Hence bidders are requested to accept risk purchase clause and no clarification on this will be entertained.	
19	GST in % (FOR INDIGENOUS SUPPLIER): To be indicated by the supplier.GST invoice is required for availing Input Tax Credit and conformation to pass on ITC.	
20	GSTIN of the supplier/Works	
21	HSN Code(S) of the items offered	
22	Firm Price: Prices shall be kept firm till completion of supplies and acceptance of materials at BHEL stores.	
23	Supplier Registration Form- Online submission is to be done and soft copy of the same to be uploaded along with Technical Bid by new vendors.	
24	MSE / Non MSE Status with proof for indigenous suppliers.	
25	For Foreign Offers -Manufacturers' Name and address:	
26	For Foreign Offers - Country of Origin:	
27	For Foreign Offers - Mills Letter of Authority	
28	For Foreign Offers- Agency Agreement	
29	Approximate weight and cubage of the consignment.	
30	It is mandatory to incorporate the following details in the Bill of Lading for Foreign Suppliers Import & export Code (IEC) of importer : BHEL, Ranipet IEC No: 0588138690/38	
31	It is mandatory to incorporate the following details in the Bill of Lading for Foreign Suppliers GST Identification No (GSTIN) of importer;	
32	It is mandatory to incorporate the following details in the Bill of Lading for Foreign Suppliers Official email id of importer (to be used for correspondence by shipping lines and Customs).	
33	Contact details of bidders: Contact person/Designation/Mobile No/Email ID/Fax No/Phone No etc.,	
34	Pointwise conformation/acceptance or comments to our technical specification is must and Each page shall be signed BY THE BIDDER and affixed official seal.	
35	The contractual delivery period will be reckoned from the date of LOI, which shall be binding on the contract. Suppliers shall quote their best delivery period. Delivery is the essence of all contracts for BHEL. Before opening the Price Bid, based on the commercial bids received, if required, BHEL shall fix a reasonable delivery period, which would be generally the modal value of the deliveries quoted by the tenderers in the Bid. Bidders, who at the time of tender opening (Opening of Commercial Bids) have quoted for a delivery higher than the delivery required by BHEL, would have to accept the delivery period advised by BHEL. Such of those suppliers, who quote for higher than this delivery (i.e. do not meet BHEL delivery requirement) would not be considered for Price Bid Opening.	
36	Deduction of Income Tax: (i) TDS shall be deducted, as applicable, for the supervision of Erection & Commissioning Charges. (ii) TDS return shall be filed and TDS certificates shall be issued by BHEL	
37	For this procurement, public procurement (preference to make in India) , order 2017 dt 15.06.2017 & 28.05.2018 and subsequent order issued by the restrictive nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.In the event of any nodal ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable	
38	Minimum Local content shall be 50%. Please furnish details of location where this value addition has been done (.....)	
39	Margin of purchase preference to make in India shall be 20%	
40	False declaration will be in breach of the code of integrity under Rule 175 (i)(h) of the General Finance Rule for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Finance Rules along with such other actions as may be permissible under Law	

Sl.No	Annexure - F for Foreign Company / Principal / Mill / Manufacturers	Supplier Comments with necessary supporting documents
1	Name and Address of the Company	
2	Contact Details of Company : Contact person / Designation / Mobile No / Email ID / Fax No / Phone No etc.,	
3	Is the company already registered with any of the BHEL units?. If so details may please be given.	
4	Nature of Business and line of products with respective HSN	
5	Production Capacity per Annum with detailed Manufacturing / Testing Facilities. If required supporting documents shall be uploaded	
6	Report from third party business rating agencies like Dun & Brandstreet, Credit Reform etc.,. For any new supplier this document is mandatory and without which submitted offer is liable for rejection.	
7	Experience list / Performance Certificate for Offered / Similar products : Requested to attach list of present customers with name, address and contact details i.e. email/Phone No etc., for offered / similar type and size of item and equipment with whom you have continuous business since last three years.	
8	Framework Confidentiality Agreement cum Undertaking to be submitted along with offer.	
9	If Foreign Company/Principal/Mill/Manufacturers refuses to deal directly with BHEL (to be put on record) and insists on availing the services of an Indian Agent, deed of agency agreement between the Foreign Company / Principal / Mill / Manufacturers and Indian agent should necessarily be submitted. If not submitted offer is liable for rejection.	
10	In cases other than Indian Agents, valid authorisation certificates are to be submitted. However such authorisation certificates will be examined for technical suitability ,quality, guarantee, warranty, after sales support etc., If not submitted, offer is liable for rejection.	
11	For a document in language other than English, a self-attested English translated document to be attached	
12	Dealer / Trader / Distributor / Stockist / Channel Partners / Holding Company / Non-Manufacturer needs to submit an Authorization Certificate, clearly indicating the validity period as well as rights granted by respective Foreign Company / Principal / Mill / Manufacturers to them. i.e. to negotiate / quote / supply / after sales service etc	
13	Quality - Requested to enclose copy of certificate for Quality Management System (QMS) obtained and Table of Contents of quality manual.	
14	If not certified for ISO 9001, requested to enclose copy of Company owned Quality Management System or written down procedure	
15	Banker's Certificate- Requested to enclose banker's certificate certifying credit worthiness.	

Sl.No	Annexure-Q	##Specific confirmations by the manufacture
1	Quality Plan Requirement:	
1a.	(i) MQP (Manufacturing Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Typical MQP is attached for indicative purposes for guidance & use.	
1b.	(ii) MQP shall invariably cover w.r.t Inward inspection including on Raw material Procurement, In process and Final inspection in elaborated way/details.	
1c.	(iii) Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL/customer for finalization of Quality plan including test procedure/methodology during preaward / post award approval / detailed engineering in the event of an order.	
1d.	(iv) No deviation on BHEL/Customer approved MQP is acceptable.	
1e.	(v) Bidder shall agree to submit all cross referred documents other than codes/standards to BHEL/Customer/Consultant.	
2	Important Notes shall be included in MQP : (a) Latest revision of Standards & Specification shall apply. Only International Standards are applicable. Indian & Chinese Standards are not applicable (b) Materials shall be procured in compliance to Functional Technical Specification. (c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product. (d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V. (e) Gauges and measuring Instruments, with valid calibration only shall be used. (f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule. (g) Finished Products shall be packed to comply with Approved Packing Schedule. (h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.	
3	Domestic / Inland Inspection will be carried out by BHEL/BHEL appointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable).	
4	Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources: (1) Any one of the following Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself. (2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. However cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own, then these charges non claimable by the bidder. List of TPIA 1.M/s Bureau Veritas 2.M/s TUV-Nord 3.M/s TUV-SUD 4.M/s TUV Rheinland 5.M/s Lloyds Register 6.M/s SGS 7.M/s Germanischer Lloyd 8.M/s QUEST 9.M/s Certification Engineers International 10.M/s Intertek 11.M/s IR Class Systems and Solutions 12.M/s DNV 13. M/s Fichtner 14. M/s ABS Inspection Services	
5	Stage Inspection during manufacturing Process : Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review, verification and clearance for further processing. This inspection call shall be given well in advance (atleast 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.	
6	Inspection before despatch for domestic supplier : Inspection before despatch at supplier's works shall be carried out by BHEL/BHEL appointed Inspection agency. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .	

Sl.No	Annexure-Q	##Specific confirmations by the manufacture
7	Inspection at Foreign Source/Supplier: (a) As in sl no: 3. shall be ensured without fail (b) No materail / items shall be despatched without getting the written communication from BHEL / Customer inspection carried out by BHEL/BHEL apointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consulatnat. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentaion Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable). Inspection before despatch for Foreign supplier : Inspection before despatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in Sl no: 03 at supplier's cost.	
8	Painting shall be done strictly as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc shall be brought to the notice to BHEL well in advavnce before proceding including the BOI being procured for assy / skid like motors etc	
9	Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages (i) Index Sheet (ii) MQP/RQP/Endorsement Sheet (As applicable) (iii) TCs identified by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP. (iv) Final inspection report + TC including Chemical + Mechnaical + HT + NDT etc (v) Third party Inspection report + TC (vi) Customer CHP/ MDCC (vii) Type test / Performance Test reports conducted (viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer (ix) BOM with As Build Drgs with actual make / rating used with BHEL/customer approved drawings.	
10	Packing / Seaworthy Packing shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care tarnsit / handling / transhipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.	
11	Outsourcing of test facilities: Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accreadted third party lab / Govt / Govt Lab for major testing such as NDT, Electrical & Mechanical testing.	
12	Important Note: No deviation on the above requirement 01 to 10 is acceptable w.r.t Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidances in the offer itself.	
13	## Necessorily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.	

VOLUME IIB

**TECHNICAL SPECIFICATION
FOR
SEAWORTHY PACKING FOR EXPORT JOBS**

SPECIFICATION NO. PE-TS-888-100-A001



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

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 1	OF 52

1.0 Purpose

The purpose of this specification is to describe minimum packing requirements for the different items/equipment for all export Project and also to define marking and shipping requirements during transportation by ship, road and air for all export jobs.

2.0 SCOPE

For export jobs, sea worthy packing capable of performing all necessary functions like prevention of damage to the contents, sufficient to support frequent handling and lengthy period of outdoor storage in adverse weather conditions are required. Workmanship and materials used shall be of high standard meeting the technical requirements and in accordance with best commercial export packing practices. Vendor shall be responsible for sea worthy export packing, however it shall meet the minimum requirements specified herein. Equivalent or better packing methods may be deployed subject to approval of the BHEL/Purchaser. Vendor shall submit the packing procedure for its equivalent for purchaser's approval during detailed engineering.

The scope this specification is to define VENDOR's responsibilities in terms of:

- Preservation of the GOODS/items/equipments before packing.
- Packing of the GOODS for road, rail, sea and/or air transportation to desired destination i.e. project site
- Making cases/crates
- Chemical Treatment/Fumigation before packing to prevent fungus, damage due to termite, borer, rats, etc.
- Marking of cases/crates.
- Other Services required.

3.0 Application

This specification is applicable to all the goods to be transported to project site and requires to be in transit for longer duration. *However, for "Misc cable erection items", "Fire sealing system" & "Exothermic welding material", the packing requirements shall be as per the procurement specification.*

4.0 Definitions

- "BHEL" : Main EPC vendor
- "OWNER" : Customer for a particular export project.
- "VENDOR" : Company(ies)/VENDOR(s) to whom the BHEL has placed Purchase Order for GOODS/ items/system/package.
- "GOODS": means all or part of the articles, material, equipment supplies including technical documentation, as described in the Purchase Order, to be supplied by VENDOR.
- "PACKER": Packaging Company to whom VENDOR intends to sub-contract the packing in case they do not have own packing capability/facilities .
- "FREIGHT FORWARDER" : Means the Company responsible for performing freight forwarding activities.

5. General Information

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 2	OF 52

The following requirements are intended as minimum requirements, and compliance to these requirements in no way absolves or relieves VENDOR of any responsibility or obligation outlined in the Purchase Order. In all circumstances, the packing will be designed and constructed in order to support GOODS during transportation as well as to prevent the Goods from damage due to impact, extreme climatic conditions, sun and rain. It must be ensured that the delivery of the GOODS to the jobsite by sea, road or air, in good condition.

GOODS shall be export packed in compliance with the best-established practices for international projects, in accordance with the following instructions. In the event of any conflict between these specified requirement and the established practices, specification requirement shall govern.

Due to climatic conditions and the complex transport operation(s), it is essential that protection and packing is of the highest standard. Packing means to efficiently protect the GOODS during the total transport operation; from the moment they leave the factory until they are delivered to the jobsite, including handling operations (loading/unloading) and storage.

When VENDOR do not have packing capabilities/facilities of their own and therefore intends to sub-contract, VENDOR have to inform BHEL/Purchaser of the name and address of proposed PACKER(s) for approval.

6.0 Criteria for Selection of Packaging

Packages are to be made according to categories, described in articles 8.1 to 8.5, depending on the type of materials, their fragility and size.

These categories have been established for the protection of equipment and material during multi-mode transports, i.e.: combination of overland and sea transport; containerization, air transportation.

In a general manner, the GOODS have to be packed in such a way that crates, bundles, pallets can be stored into General Purpose containers, wherever possible.

If VENDOR has any doubt about the correct method of protection or packing, he should contact BHEL/Purchaser in order to mutually agree on the adequate type of packing to be used.

Materials can be classified in following categories

- Hazardous Material
- Non-Hazardous Material
-

Further to above categorisation, non-hazardous materials can be sub- categorised for selection of packing.

6.1 Hazardous Materials

Though handling of hazardous material may is not applicable in the scope of this specification. All hazardous material must be packed in adherence to the detailed requirement relating to packing, marking and labelling set out in the most recent report of the Board's Standard Advisory Committee on the Carriage of Dangerous Goods in Ships for sea freight, and the Restricted Articles Regulations, laid down by the International Air Transport Association for airfreight.

6.2 Non-Hazardous GOODS

The scope of this specification is to provide necessary guidelines for packing for power plant equipment, components, Pipings & Valves, Fittings, other structural items, electrical items, spare parts and erection materials. The procedure is defined in subsequent paragraphs in details in clause no. 8.0.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 3	OF 52

7.0 Marking Instructions & Despatch details, Storage Code

7.1 Marking Instructions & despatch details

Packages and crates will be marked with indelible black paint, resistant to seawater. Marking must be perfectly legible.

The shipping marks, which will be as per fig-13, shall be stencilled on two sides and one end in clear characters at least 5 centimetres high (where crate size permits, otherwise use optimum size for each package dimension).

When the GOODS are to be shipped in containers then marking may be stencilled on one end only. However, packages must be stowed in a manner that shows these marks.

Crates containing fragile articles must be packed with special precaution against risk of breakage and must be stencilled on all sides "FRAGILE - HANDLE WITH CARE". Where crates are not to be overturned, VENDOR must show on the crates, clear and readily visible identification as per fig-12, to ensure they are kept in the correct position.

Packages/equipment of 2,000 kg or more must be marked with slinging points on all sides, in addition to the centre of gravity marks.

Number packages consecutively i.e. 1 of 10, 2 of 10, etc. Do not duplicate package numbers. VENDOR is responsible for any loss or damage caused by incorrect marking.

All cases/crates shall also be marked with the appropriate international standard graphic symbols for handling as shown in Fig 12.

As a minimum, all cases/crates are to be marked clearly on all four sides with:

- "HANDLE WITH CARE"
- "RIGHT SIDE UP"
- "KEEP DRY"

In the case of packages with a single gross weight totalling 2,000 kg and/or a height of more than 1m, the centre of gravity shall be clearly marked with the symbol on two adjoining sides. For all items of equipment with an eccentric centre of gravity this symbol shall be marked at the bottom, side and top of the package.

The slinging and lashing points shall be marked with a chain symbol.

When packing in cases/crates, these packages shall also have metal corners at the slinging points. (Fig-11)

External front and rear sides of the boxes to be planed for writing instructions.

Dispatch details such as consigner/consignee address, contract and case details, country of origin, port of delivery, stacking instructions shall be written on one side of the boxes. An anodized aluminum plate as per details and specifications given in fig-13 shall be provided on one side of the boxes.

One copy of packing slip wrapped in polyethylene bag covered with aluminum packing slip holder to be nailed on the external surface of the box. One more copy of the packing slip wrapped in polyethylene bag is to be kept inside the box at the pertinent place.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 4	OF 52

7.2 Storage Code

The type of storage required is required to be specified, it will be shown on each packaging in **RED colour**.

- X Crates or packages to be stored outdoor without covers
- XX Crates or packages to be stored under tarpaulin
- XXX Crates or packages to be stored in covered or enclosed premises
- XXXX Crates or packages which must be stored in air-conditioned premises

8.0 GUIDELINES FOR PACKING GOODS

8.1 In the subsequent paragraphs details of different types of packings for different types of GOODS are defined. Vendor shall make packing details/procedure based on the guidelines and submit for approval.

8.1.1 Packing for Pipe, Fittings, Flanges and Valves, Structural Steel

Particular attention should be brought to pipe, fittings, flanges, valves and structural steel. Packing categories for piping and fittings will differ according to the diameter and wall thickness of these products. VENDOR shall comply with the following established practice.

IMPORTANT NOTE:

Depending on the project schedule and availability of ocean vessels, the piping and structural steel may be shipped in containers. In this event, VENDOR has to arrange the packages in such a way it allows the stuffing into Open Top in gauge containers.

8.1.2 Pipe

Where practicable, pipe lengths shall be limited to 11.8 meters.

All pipes 2" included and below shall be packed in crates. All pipes to be capped and ends sealed with waterproof tape.

Pipes over 2" up to 6", shall be bundled and banded in bundles of uniform length. Bundling is carried out with U-IRON or traversal planks, joined with threaded connecting rods with locknuts. Quantities and strapping positions depend on the lengths, with a 120 cm spacing to prevent distortion. Bundle weight shall not exceed 2,000 kg. All pipes are to be capped and ends sealed with waterproof tape (tape is not necessary if end caps are of the pre-shrunk or self-sealing type).

Pipes larger than 6" shall be shipped as single lengths with the ends capped. End caps are to be of the recessed type to enable the use of soft faced hooks, but still completely sealing the end and also protecting the weld.

All stainless steel piping must be packed separately in wooden crates. Any banding of bundles is to be with the same material.

8.1.3 Pipe Fittings, Flanges and Valves

All pipe fittings, flanges and valves up to 6", are to be packed in cases/crates. For items over 6", these may be fixed securely to a pallet base and enclosed in a crate, for protection. Where valves have actuators attached, rigidity must be ensured for the valve and actuator. The vulnerable parts of the actuator are to be completely protected within a wooden crate.

All stainless steel fittings, flanges and valves of all sizes, must be packed separately in wooden crates. Any strapping is to be with the same material.

8.1.4 Structural Steel

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 5	OF 52

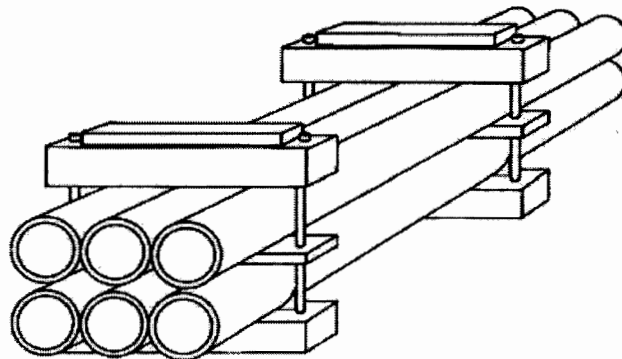
Structural Steel, reinforcing rods, bars, etc., should be packed in bundles of uniform length. Refer to articles 8.1.2, for strapping requirements. Bundle weight not normally to exceed 2,000 kg. Fabricated structures and structural steelwork, etc, should be bundled and packed using wooden beams and long bolting to secure the load.

8.2 Bundling – Packing Category I

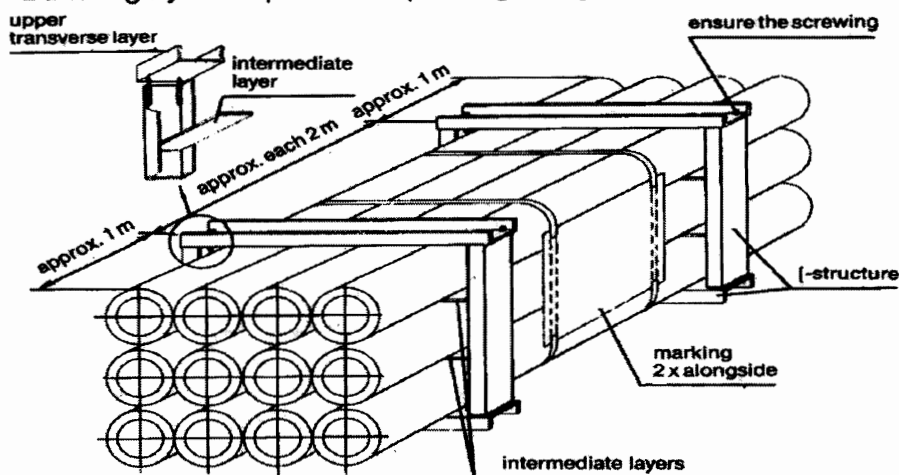
8.2.1 Type of Equipment

Equipment which is not subject to damage by corrosion or mechanical effect, i.e. pipes, piping, structural steel.

Packing category I



Bundling by U-shaped iron – packing category I A



8.2.2 Type of Construction

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 6	OF 52

- Bundling has to be effected
- By squared timber and threaded rods.
- With an intermediate layer (threaded on tightening bolts) according to the weight of the package.
- Wedge-shaped timbers must be added at the outer points of lower layer.
- Between the bolts a spacer must be nailed.
- The bolts must be secured (e.g. by locking nut).
- If single parts could protrude, an appropriate protection must be installed (flat iron or plates).
- Bundling with steel straps or PVC straps is not accepted.

8.3 Skids, Square Timber Constructions, Casings – Packing (Category II)

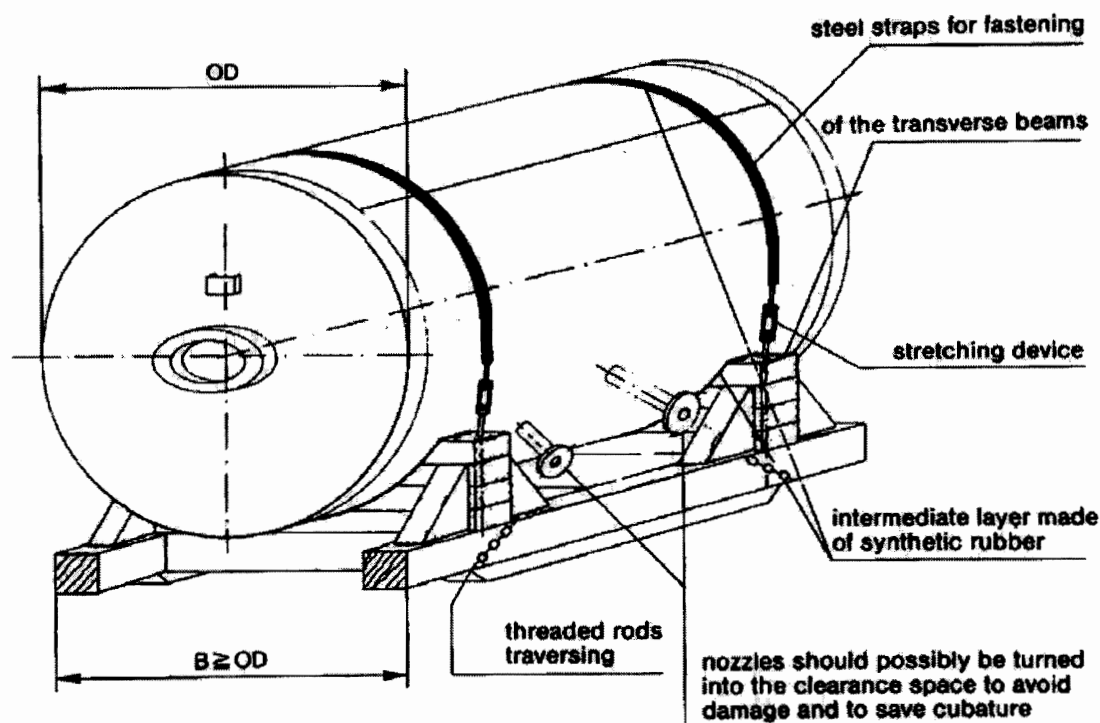
8.3.1 Type of Equipment

Voluminous apparatus, tanks and/or heavy pieces those are not vulnerable to mechanical or corrosive effects.

8.3.2 Type of Construction

- The construction skid can be made of wood or of metal.
- The fastening of the packages on the skid will be made by steel straps (flat iron) which have to be elastically lined, non-slip and securely bolted onto the skids.
- Flange openings have to be closed with gaskets and blind flanges or, if necessary, provided with cover.
- Skid constructions may not be less than the dimensions of the package in length or in width.
- Tanks and apparatus with their own support cradles must be supplied with an anti-slip lining.

PACKING CATEGORY-II



	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 7	OF 52

8.4 Packing of GOODS in Wooden Crates/Cases/Boxes

The construction of wooden crate/cases/boxes shall be as per the details indicated in clause 9.0 & Fig 1 to 11. Details indicated in the sketches for different categories Packing crates/boxes are only for a typical equipment considered for illustration.

8.4.1 Packing Category III

8.4.1.1 Type of Equipment

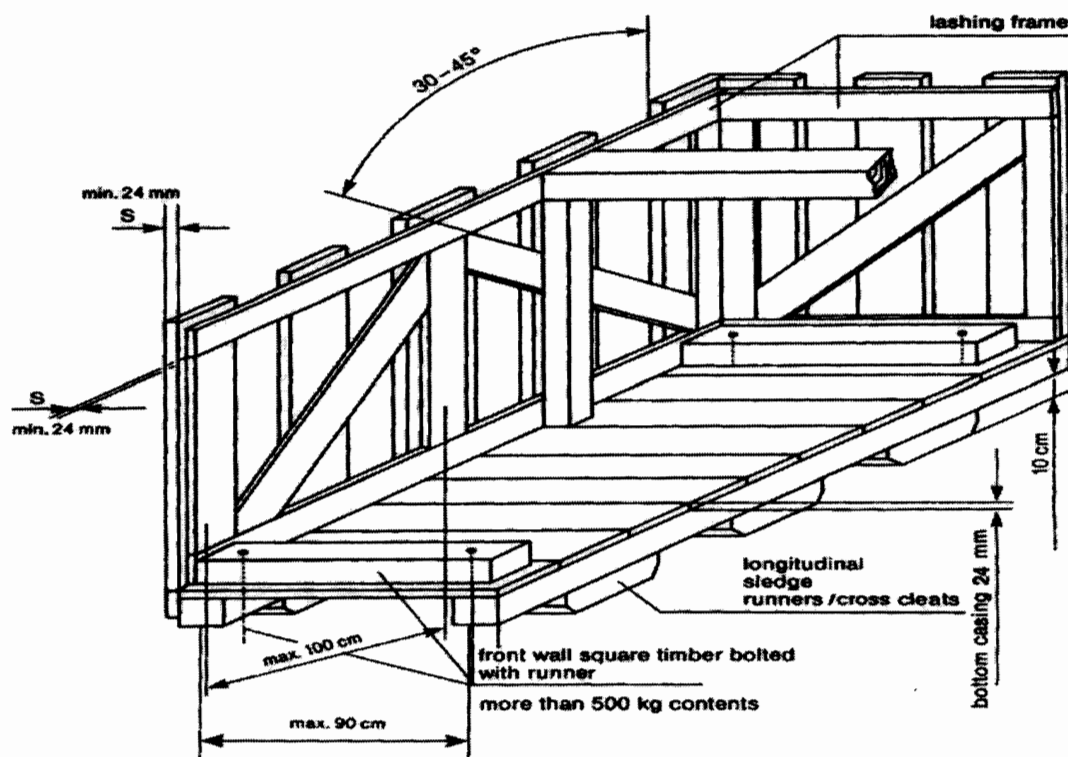
Fabricated equipment, which cannot be transported on cradles; frame-works, prefabricated piping and fittings, mechanical and electrical assemblies. *This type of packing is recommended where many parts of the equipment/component/assembly are not protruding out.*

8.4.1.2 Type of Construction

The equipment must be safely fastened to the bottom with bolts, possibly by the runners or to be spread in such a manner that no protruding parts are possible. For parts, sensitive to rainwater and/or debris, a protection has to be made by a foil cap.

If it is possible that single part could protrude through the front/back side wall, they shall be closed completely. The marking of the package shall be done on plywood plates at the prescribed sides.

Packing Category III



	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 8	OF 52

8.4.2 Cases with Lining – Packing Category IV

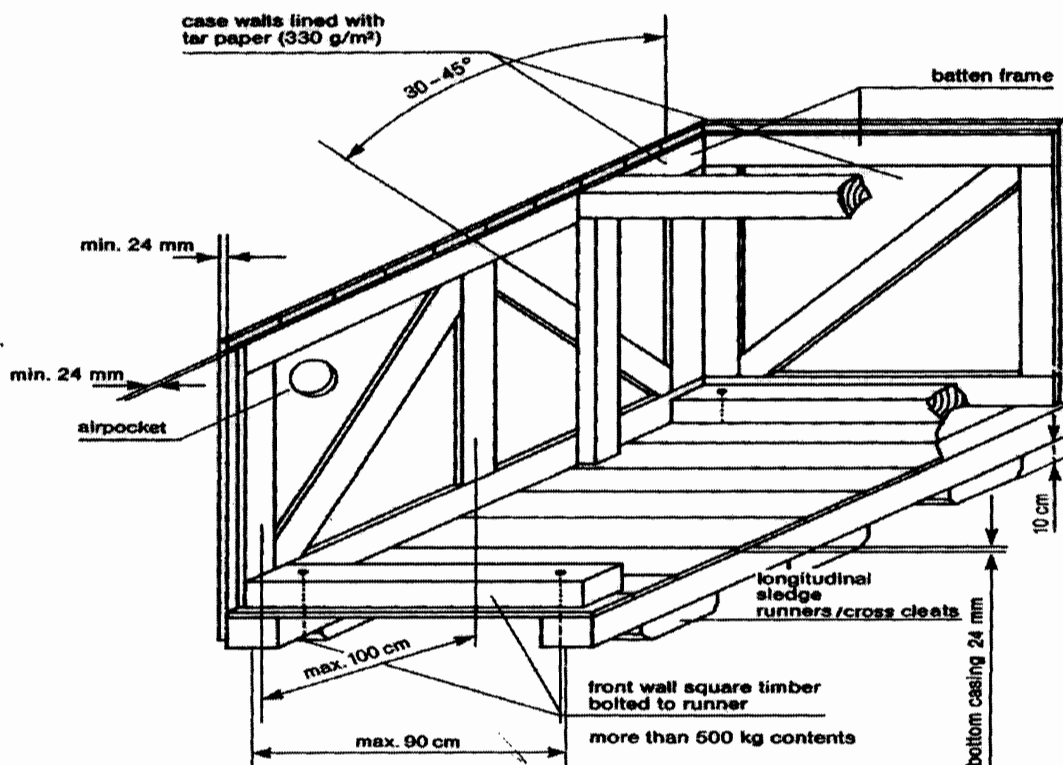
8.4.2.1 Type of Equipment

Recommended for equipment and mechanical parts Equipment sensitive to mechanical damage or parts and components that are particularly at risk of theft or loss; pumps, elbows, flanges, fittings, tools, erection materials, etc.

8.4.2.2 Type of Construction

The same type of construction as article 8.4.1.2, but with all sides completely boarded without space between the boards. Sides to be provided with waterproof lining; fabric-reinforced waterproof tar paper or polyethylene-foils resistant to ultraviolet rays can be used. Polyethylene-foil shall be fixed under the lid cover to avoid penetration of water. At weights of more than 500 kg the longitudinal runner must be bolted to the front all square timber. For ventilation inside the case, an opening in the waterproof lining must be placed between the diagonal battens and diagonal joists.

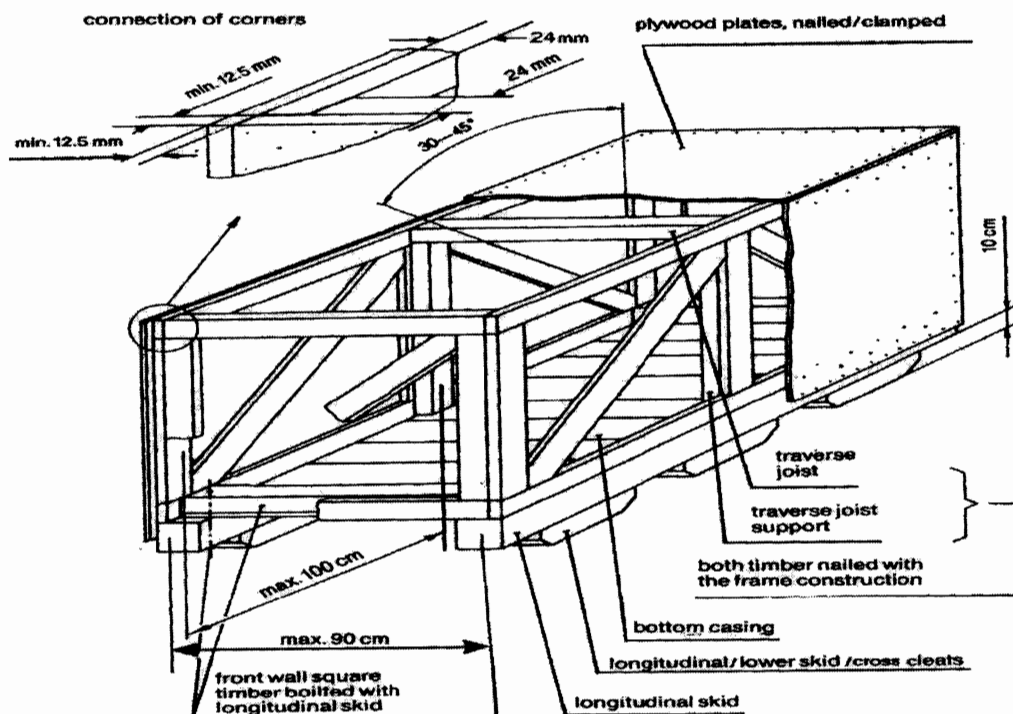
Packing Category IV



8.4.3 Cases with Alternative Surface Materials

8.4.3.1 Plywood Box – Packing Category IV A

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 9	OF 52



Case constructed of 5 layers of watertight, glued plywood with a total thickness of 12.5 mm. The frame must be constructed from minimum 24 mm timber or as per guide lines given above against clause 8.0, Fig 1 to 11 and must be suitable for the weight and nature of the parts to be packed. Planed square timber must be bolted with longitudinal skid and covered with diagonal joists. If applicable, construction of the cover and sides is to include diagonal bracing. Covers consisting of several layers of plywood are to be sealed with durable elastic putty or additional water-resistant sheets to be fixed.

8.4.4 Case with Barrier Material – Polyethylene Foil – Packing Category V

8.4.4.1 Type of Equipment

Sensitive equipment, simple electrical equipment, insulation materials, fire-resistant materials, with non-corrosion- guarantee for a period up to twelve (12) months.

8.4.4.2 Type of Construction

Preservation by welding in polyethylene-foil with addition of desiccants and if necessary, application of non-corrosive contact agents, otherwise, type of construction as indicated in article 8.4.2.2.

Additional marking:

- Case with desiccants.

8.4.5 Case with Barrier Material – Aluminium Compound Foil – Packing Category VI

8.4.5.1 Type of Equipment

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 10	OF 52

Electrical equipment such as, switchboards, electric motors, sensitive equipment, with non-corrosion guarantee, for a period up to twelve (12) months.

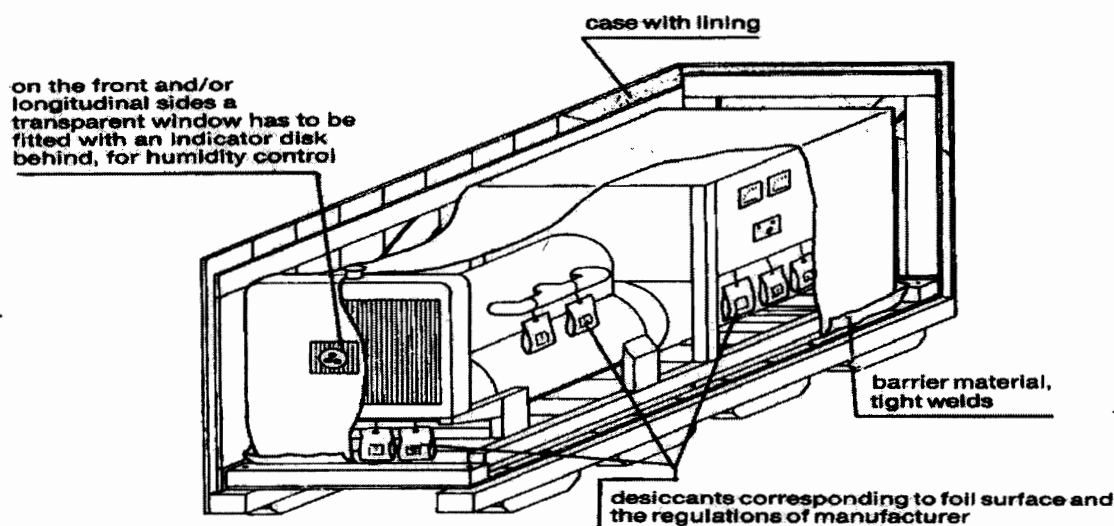
8.4.5.2 Type of Construction

Type of construction as indicated in article 8.4.2.2. Preservation by sealing an aluminium compound foil, with the addition of desiccants. Humidity indicators, if required and installed in the barrier wrapping, shall allow easy control from the outside.

Additional marking:

- Case with desiccants.

Packing Category V/VI



8.4.6 Double Case – Packing Category VII

8.4.6.1 Type of Equipment

GOODS which are of high sensitivity to shock, impact and vibration, for instance, special electrical equipment like computers, switchboards, laboratory instruments

8.4.6.2 Type of Construction

Case construction as indicated in article 8.4.2.2, with additional floating inner packing (case-in-case principle), padding corresponding to weight and sensitiveness. Preservation by sealing in aluminium compound foil with the addition of desiccants. The inner case has to be made of plywood or equivalent material with a thickness of 8-12 mm, depending on the weight of the GOODS to be packed. The inner buckles and/or frame borders have to be dimensioned so that the full stability of the inside case will be reached and no twisting is possible. The inner sides of the inside case will be lined with bituminous kraft paper on all sides (except bottom).

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 11	OF 52

8.4.7 Cable Drum – Packing Category VIII

8.4.7.1 Type of Equipment

All type of cables, wires, ropes, hoses.

8.4.7.2 Type of Construction

For all type of cables refer clause no. 11.1. For other items (wires, ropes, hoses) new or practically new drums are to be used. Planking of the e drums by use of boards, thickness minimum 20 mm, with additional double steel strapping, nailed, and carefully preserved/protected cable ends prior to packing.

8.4.8 Hazardous Materials – Packing Category IX

8.4.8.1 Type of Equipment

Hazardous materials according to the law are explosives, compressed gases, liquefied gases dissolved under pressure or deeply refrigerated, flammable liquids, flammable solids: substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases, oxidizing substances, organic peroxides, poisonous (toxic) and infectious substances; radioactive materials, corrosives, miscellaneous dangerous goods.

8.4.8.2 Type of Construction

Hazardous materials shall always be packed and documented separately from any other material. Selection of packaging materials, execution of packing and marking as well as documentation shall always be in compliance with the applicable laws and regulations. Any certificates required for transportation or for authorities to be supplied before shipment of the GOODS.

8.4.9 Wooden Floor as a Transport Support – Packing Category X

8.4.9.1 Type of Equipment

Any materials to be stuffed in containers or on flat racks and that are not stowed on standard pallets or otherwise suitably packed

8.4.9.2 Type of Construction

- Longitudinal internal square timbers bolted to the front wall runners, longitudinal skid.
- Maximum distance between longitudinal runners 90 cm (middle to middle of the runner).
- Full boarding of the floor.
- Attaching of lifting lugs and/or iron ropes for lifting/pulling the units off the transport equipment.
- If applicable, preservation of the equipment by sealing in polyethylene-foil or aluminium compound foil and the addition of desiccants.

8.5 Air Transport Packing

8.5.1 General

Certain types of material may have to be shipped by air from their country of origin. This means of transport will be exceptional, and will be used only:

- For GOODS, which are highly sensitive to shock or vibrations, such as computers, electronic instruments, or those of small dimensions and weight.
- For GOODS urgently required at the module yard(s) and/or jobsite.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001		
		VOLUME II B		
		SECTION D		
		REV. NO. 0	DATE 10/08/2010	
		SHEET 12	OF	52

8.5.2 Type of Packing

Depending on the goods to be packed, VENDOR may use one of the following types:

- A triple-corrugated cardboard container made with waterproofed glue and a barrier layer of polyethylene on the outsides to keep out humidity.
- Wooden/cardboard packing cases: the wood being used for the framework and base of the cases, waterproofed triple-corrugated cardboard being used for the sides and top. These cases are of the "Bell" type, and used for material of small or medium dimensions.
- For larger dimensions, plywood cases are acceptable. The timber characteristics, cross-sections and thickness will be systematically determined by the nature of the loads to be packed.

8.5.3 Dimensions

In order to optimize the existing transport facilities (passenger or cargo aircraft), the dimensions of:

- Triple-corrugated containers.
 - Wooden/cardboard packing cases.
 - Plywood cases.
- Are to be adapted to pallets used for air transportation.

9.0 Detailed specification for Wooden Crates/Boxes/Cases and other packing materials

9.1 Technical specification for wood

The wood shall be Fir, Chir, Silver Oak (Gravillea Robusta), chemically treated mango and Pinewood with moisture content not exceeding 50%. The wood shall have flexural and compressive strength, stiffness, shock absorption and nail retention properties. The wood shall be free from common defects such as warp, bone, twist, knot, cracks, splits, end splits, bend, visible sign of infection and any kind of decay caused by insects or fungus, etc. Surface cracks with maximum depth of 3mm are permissible. A continuous crack of any depth all along the length is not allowed.

9.2 Chemical Treatment of Wood:

The wood shall be chemically treated to provide protection against deterioration due to fungi and attack by termites, borers, marine organism and any other kind of infection. It shall be treated only after final processing like cutting, planning, joint grooving, etc.

9.3 TYPE, DESIGN & DIMENSION OF WOODEN PACKING CASES:

9.3.1 PACKING OF EQUIPMENTS

Various mechanical, electrical and C&I equipment e.g. Pumps, motors, equipment skids, heat exchangers, control panels, switch gears, transformers, etc. shall be wrapped in weather proof packing and then secured in wooden packing cases. The construction of wooden packing cases/crates shall be as per details given below and also given in figure 1 to 11.

9.3.1.1 Bottom Frame

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 13	OF 52

The construction of bottom frame shall be as per Fig-2. The No. of slides/runners for bottom frames shall be selected depending upon the weight and overall dimensions of the load to be carried. The equipment shall be secured by fixing their base frame/plate with the help of bolt and nuts etc. to bottom frame of the wooden packing cases/crates. The equipment not provided with base frame/plate like cylindrical vessels, etc to be secured to the bottom frame of the wooden cases with "C" clamps fabricated from steel channels/ angle iron.

9.3.1.2 TOP FRAME

The construction of top frame shall be as per fig-3.

9.3.1.3 END PANELS

The dimension of the end and lateral panels shall be calculated according to overall dimensions of the items to be packed. Diagonal braces shall be used for packing cases having height exceeding 500mm. Details of bracings shall be as per fig 5 to 9.

9.3.1.4 Sling Plate

To facilitate lifting of cases, longitudinal under slide boards shall be fixed. To avoid damage to the box while lifting sling plates shall be provided. Refer fig-11.

9.3.1.5 Angle Iron Cleats

Angle iron cleats shall be used for strengthening the joints as indicated in fig-10

9.3.1.6 Other Requirements

- The thickness of planks for top, bottom, side and end panels shall be at least 25mm. Planks used for this purpose shall be joined with each other by tongue and groove joint. The groove dimension shall be such that tongue fits tightly into groove to make the joint.
- Runners/slides, traverse bars, etc shall be of single length i.e. without any joint. Planks for sheathing, diagonal bracing etc shall also be of single length up to 2400mm, proper jointing is permitted for planks for sheathing and diagonal bracings.
- Each equipment to be individually covered with double polyethylene petticoat. Sheet thickness of polythene sheet shall not be less than 0.175 mm (175 microns). The sealing shall be such so as not to allow moisture inside.
- The inner surface of 4 sides of shooks shall be nailed with bituminized water proof craft paper. Wherever 2 pieces of kraft paper are used, joint shall have an overlap of minimum 20 mm.
- All the inner sides of the box shall be nailed with bitumen coated HESSIAN POLYTHYLENE KRAFT PAPER. For top frame it shall project on all sides by 100mm and shall be nailed on sides. Wherever 2 pieces of kraft paper are used, joint shall have an overlap of minimum 20 mm.
- For delicate equipment like control panels and switchgears, lighting panels and lighting transformers, suitable cushioning material like rubberised coir (min. 50 mm thick and 100 mm wide) shall be provided on their bottom support and the gap between the panel and casing

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 14	OF 52

shall be filled with rubberized coir with distance between consecutive supports less than 500 mm (ref fig15). For other equipment suitable support from sides of the casing shall be provided.

- Switchgear cubicles, control panels and control desks shall be packed and shipped in separate convenient sections. The components e.g. circuit breakers relays and instruments etc. which are removed from panels for shipping purpose and shall be separately packed and shipped as per packing instructions in clause 10.4.
- Packing case for control panels and switchgear panels shall be finally covered with GI sheet of minimum thickness of 0.4mm.
- Packing cases shall be bound at edges by nailing MS clamps/brackets at sufficient intervals. Further heavier boxes shall be strapped with C clamps (ref fig-4) fabricated from steel channels/angles and lighter boxes shall be strapped with hoop iron strips.
- Silica gel is used for this purpose to protect contents over sufficiently long time from corrosion. Silica gel shall be indicating type confirming to IS-304 (1979) packed in cotton bags placed at different positions inside the packing for absorbing moisture and shall not come into directly contact with equipment/material inside the package. The quantity of silica gel shall be adequate for storage period of one year, however it shall not be less than 4 gm. per ltr. Volume of case subject to minimum 400 gm. Per case.



TITLE

TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS

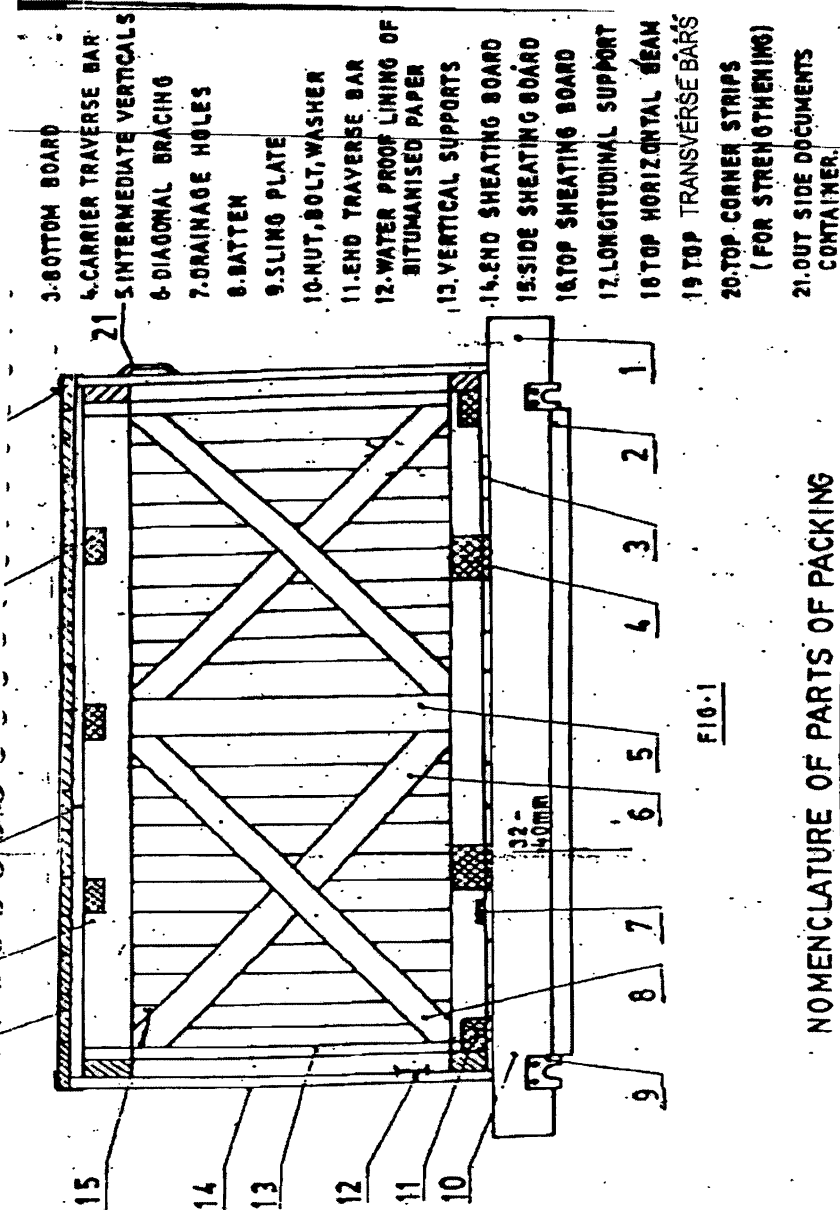
SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 15 OF 52





TITLE

TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 16 OF 52

BOTTOM FRAME ARRANGEMENTS

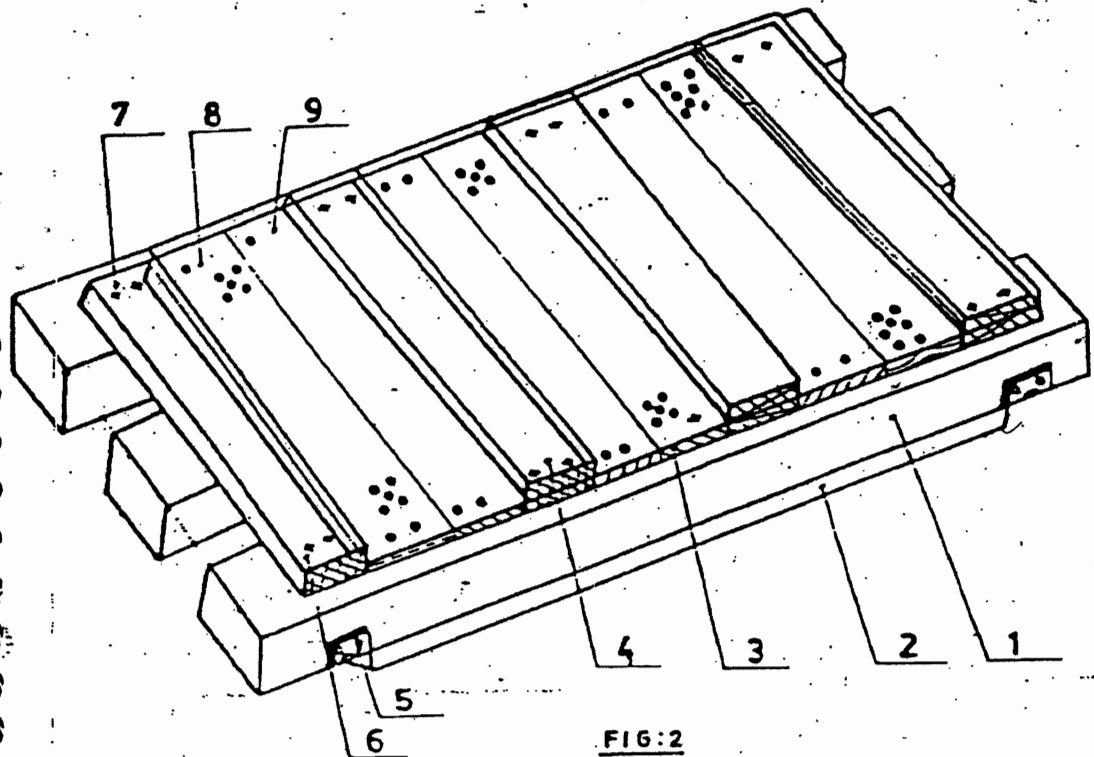


FIG:2

Nos. of slides: Minimum 2 Nos.
For length more than 1800 mm or
load more than 1000kg, Nos. of
slides shall be minimum 3 Nos.
For dimensions of slides, refer Table 1
Cross section of end traverse bar; 100 x 100 mm.
(minimum)

1. SLIDE
2. UNDER SLIDE BOARD
3. BOTTOM BOARD
4. CARRIER TRAVERSE BAR
5. SLING PLATE
6. TRAVERSE BAR
7. BOLT, NUT & WASHER
8. DRAINAGE HOLES
9. NAILS

027



TITLE

TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 17 OF 52

TOP FRAME ARRANGEMENT

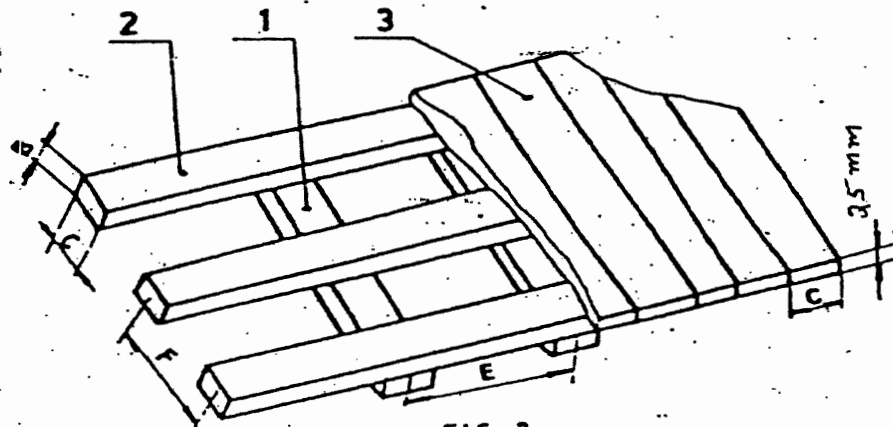
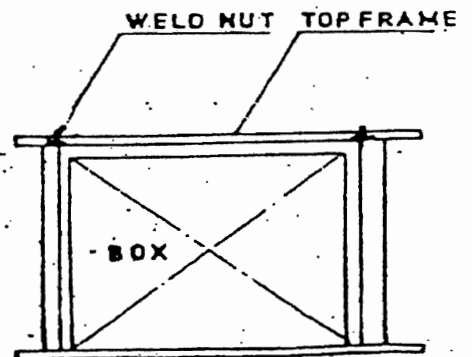
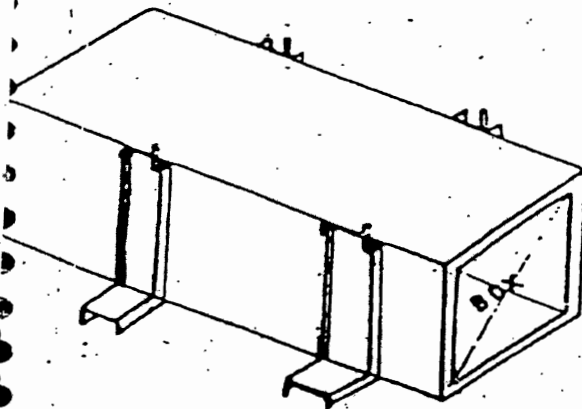


FIG-3

F : 700 to 1000 mm
E : 500 to 900 mm
30 x 100 mm.

- 1 - Traverse Bars
- 2 - Horizontal Soans
- 3 - Top Board

ARRANGEMENT OF C-CLAMPS AROUND CASES



**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 18 OF 52

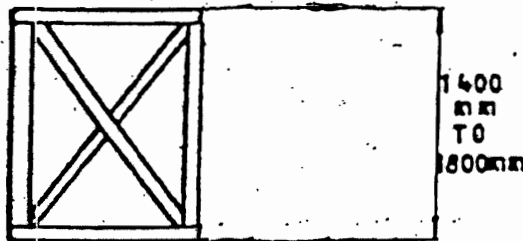
**ARRANGEMENT OF DIAGONAL BRACING AND
HORIZONTAL SUPPORT**

FIG:6

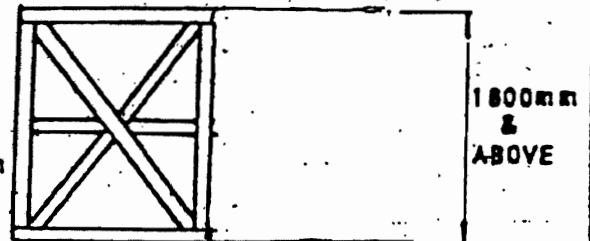


FIG:8

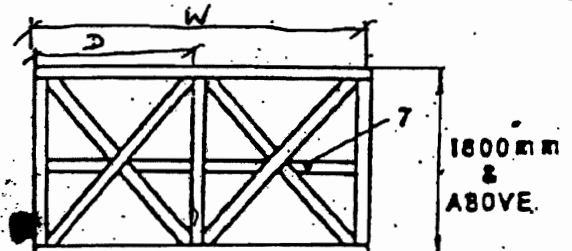


FIG:7

7- Middle Horizontal Support

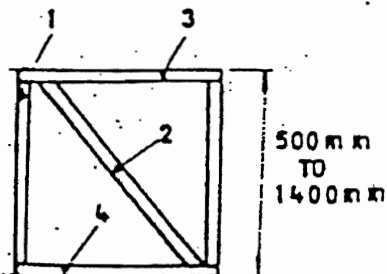


FIG:5

1- Vertical Support

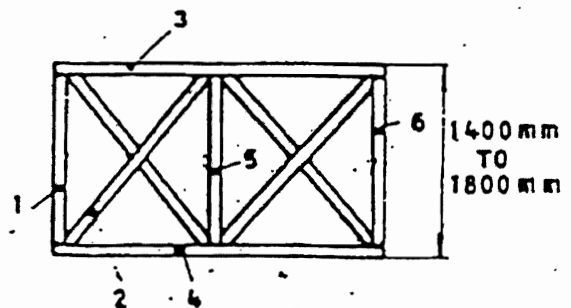


FIG:7

1, 5, 6 - Vertical Support

**TITLE**

**TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

SPECIFICATION NO. PE-TS-888-100-A001

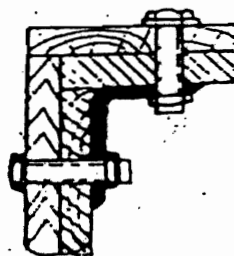
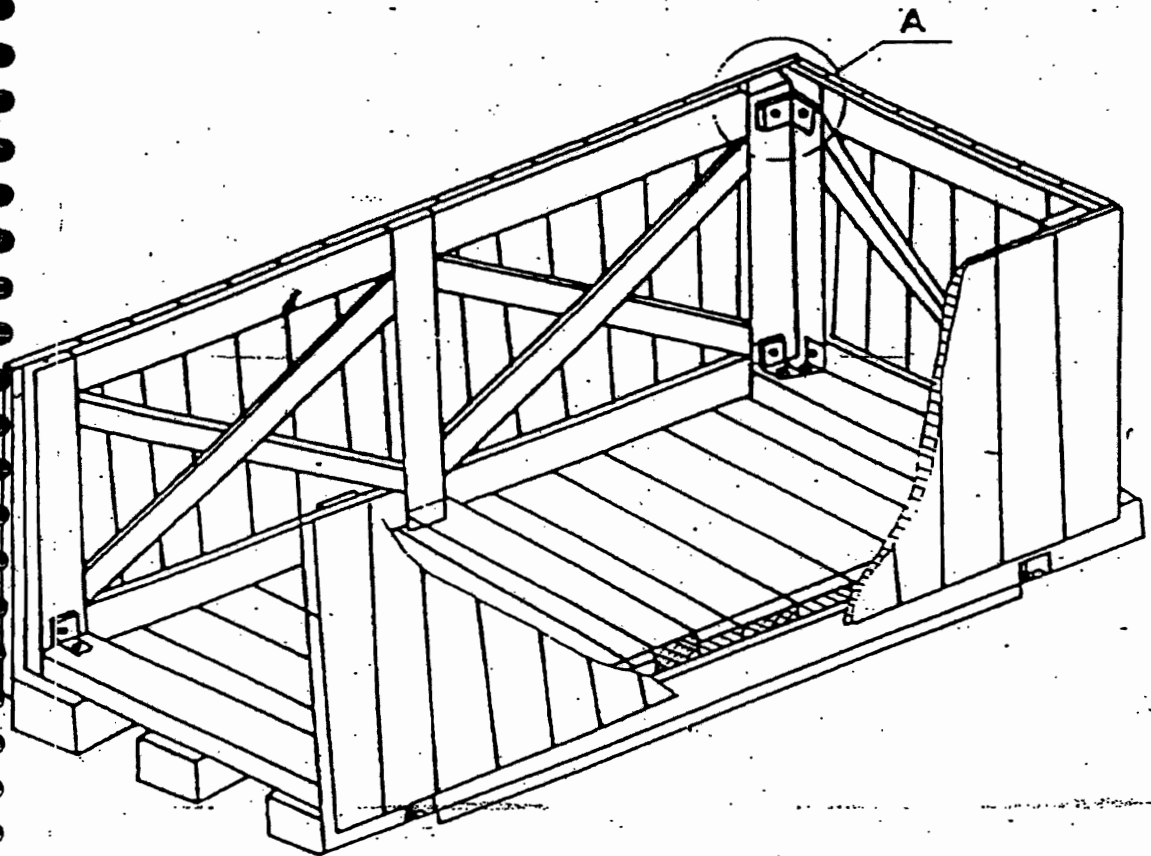
VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 19 OF 52

ARRANGEMENT OF PACKING CASE



DETAIL-A

HOLE DIAMETER
MUST CONFORM
TO BOLT DIA

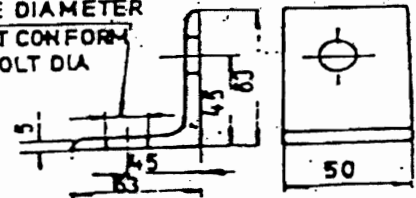


FIG:10

030

**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

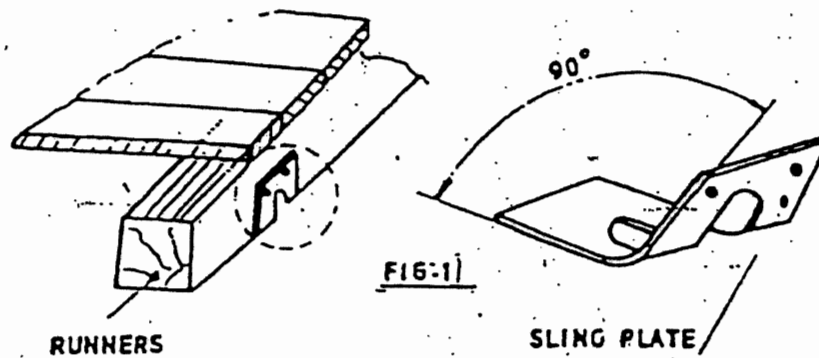
SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 20 OF 52

**ARRANGEMENT OF SLING & PLATE ON
CASES**

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 21	OF 52

TABLE-1

LOADS	LENGTHS OF SLIDES						
	600	800	1000	1200	1300	1500	2000
	Cross section b x c				c b		
500	50 X 100	50 X 100	50 X 100	50 X 100	75 X 100	75 X 100	100 X 100
800	50 X 100	50 X 100	75 X 100	75 X 100	75 X 100	75 X 100	100 X 100
1000	75 X 100	75 X 100	75 X 100	100 X 100	100 X 100	100 X 110	100 X 150
1500	75 X 100	75 X 100	100 X 100	100 X 100	100 X 100	100 X 150	100 X 150
2000	75 X 100	100 X 100	100 X 100	100 X 150	100 X 150	100 X 150	150 X 150
2500	75 X 100	100 X 100	100 X 150	100 X 150	100 X 150	150 X 150	150 X 150
3000	100 X 100	100 X 150	150 X 150	150 X 150	150 X 150	150 X 150	150 X 150

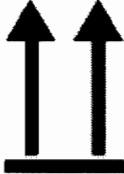
	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 22	OF 52

Table-2

End and side panels	Width of the panel "W"	Distance between longitudinal support (Dimension "D")						
		600	800	1000	1200	1400	1600	1800
		Cross section b x c				Item 1 to 7		
Fig- 5 to Fig-9	600 to 1200	30	30	30	30	30	30	30
		X	X	X	X	X	X	X
	1201 to 1600	100	100	100	130	130	130	130
		30	30	30	30	30	30	30
	1601 to 2000	X	X	X	X	X	X	X
		130	130	130	130	130	130	130
	2001 to 3000	30	30	30	30	30	30	40
		X	X	X	X	X	X	X
	3001 to 4000	130	130	130	130	130	130	150
		40	40	40	40	40	40	40
		X	X	X	X	X	X	X
		150	150	150	150	150	150	150

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 23	OF 52

INDICATION MARKS ON CASES/BOXES/CRATES

Designation	Symbol	Explanation
Fragile, Handle with care		The symbol should be applied to easily broken cargoes. Cargoes marked with this symbol should be handled carefully and should never be tipped over or slung.
Use no hooks		Any other kind of point load should also be avoided with cargoes marked with this symbol. The symbol does not automatically prohibit the use of the plate hooks used for handling bagged cargo.
Top		The package must always be transported, handled and stored in such a way that the arrows always point upwards. Rolling, swinging, severe tipping or tumbling or other such handling must be avoided.
Keep away from heat (solar radiation)		Compliance with the symbol is best achieved if the cargo is kept under the coolest possible conditions. In any event, it must be kept away from additional sources of heat. It may be appropriate to enquire whether prevailing or anticipated temperatures may be harmful.
Protect from heat and radioactive sources		Stowage as for the preceding symbol. The cargo must additionally be protected from radioactivity.
Sling here		The symbol indicates merely where the cargo should be slung, but not the method of lifting. If the symbols are applied equidistant from the middle or center of gravity, the package will hang level if the slings are of identical length. If this is not the case, the slinging equipment must be shortened on one side.
Keep dry		Cargo bearing this symbol must be protected from excessive humidity and must accordingly be stored under cover. If particularly large or bulky packages cannot be stored in warehouses or sheds, they must be carefully covered with tarpaulins.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 24	OF 52

Center of gravity		This symbol is intended to provide a clear indication of the position of the center of gravity. To be meaningful, this symbol should only be used where the center of gravity is not central. The meaning is unambiguous if the symbol is applied onto two upright surfaces at right angles to each other.
No hand truck here		The absence of this symbol on packages amounts to permission to use a hand truck on them.
Stacking limitation		The maximum stacking load must be stated as "... kg max.". Since such marking is sensible only on packages with little loading capacity, cargo bearing this symbol should be stowed in the uppermost layer.
Clamp here		Stating that the package may be clamped at the indicated point is logically equivalent to a prohibition of clamping anywhere else.
Temperature limitations		According to regulations, the symbol should either be provided with the suffix "...°C" for a specific temperature or, in the case of a temperature range, with an upper ("...°C max.") and lower ("...°C min.") temperature limit. The corresponding temperatures or temperature limits should also be noted on the consignment note.
Do not use forklift truck here		This symbol should only be applied to the sides where the forklift truck cannot be used. Absence of the symbol on other sides of the package amounts to permission to use forklift trucks on these sides.
Electrostatic sensitive device		Contact with packages bearing this symbol should be avoided at low levels of relative humidity, especially if insulating footwear is being worn or the ground/floor is nonconductive. Low levels of relative humidity must in particular be expected on hot, dry summer days and very cold winter days.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 25	OF 52

Do not destroy barrier		A barrier layer which is (virtually) impermeable to water vapor and contains desiccants for corrosion protection is located beneath the outer packaging. This protection will be ineffective if the barrier layer is damaged. Since the symbol has not yet been approved by the ISO, puncturing of the outer shell must in particular be avoided for any packages bearing the words "Packed with desiccants".
Tear off here		This symbol is intended only for the receiver.

FIG-12

**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 26 OF 52

BHEL-PEM-DELHI-INDIA	
CONSIGNEE	
MATERIAL	
CUSTOMER REF.	MO. NO.
DESPATCH ADVICE NOTE NO.	CASE NO.
DIMENSIONS(MM) LXBXH	NET WT -KGS
	GROSS WT -KGS
SPECIAL INSTRUCTIONS	HANDLE WITH CARE -- KEEP DRY DO NOT DROP -- DO NOT TILT

FIG-13: MARKING PLATE



TITLE

TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 27 OF 52

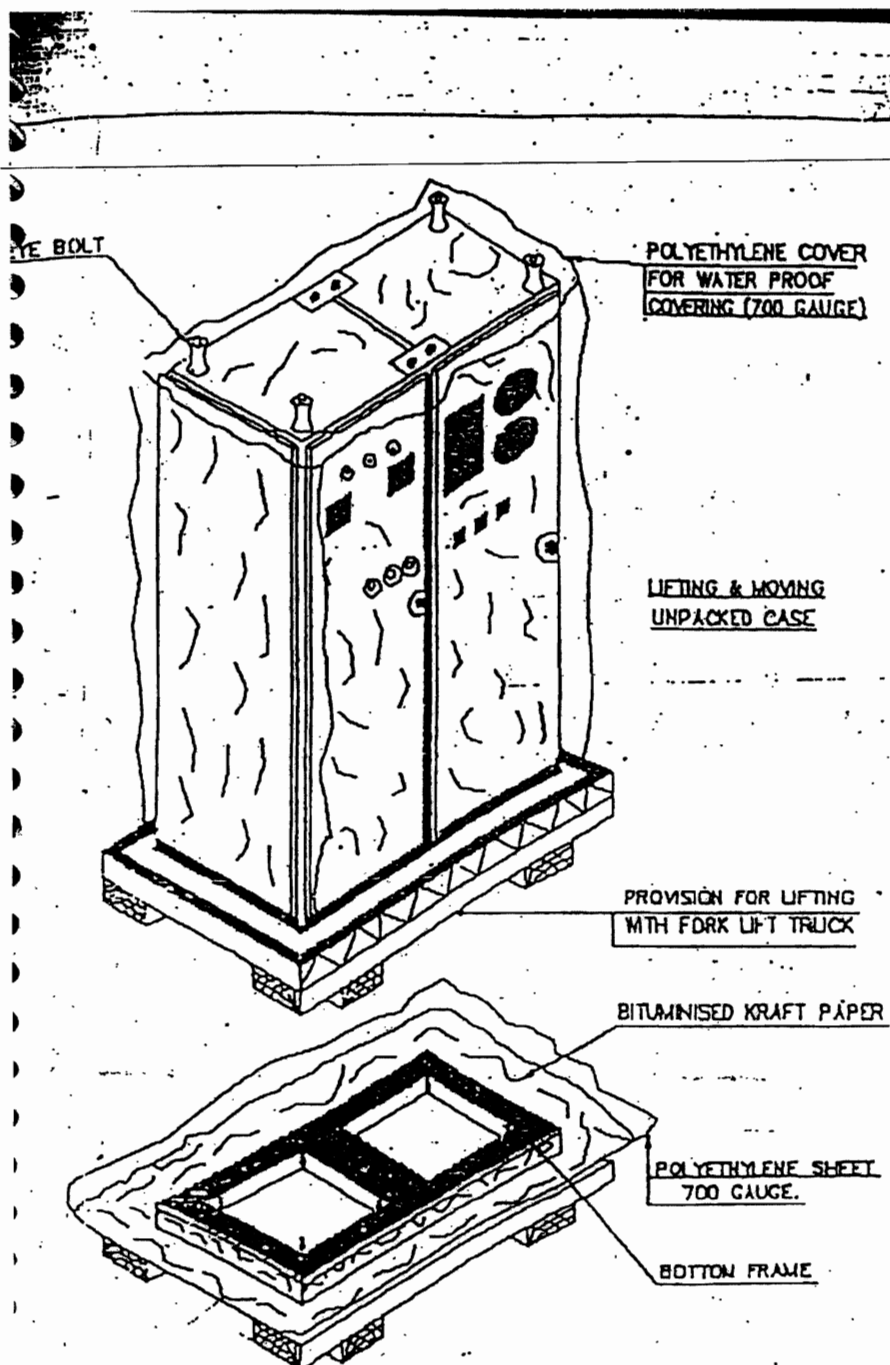


FIGURE-14



TITLE

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 28 OF 52

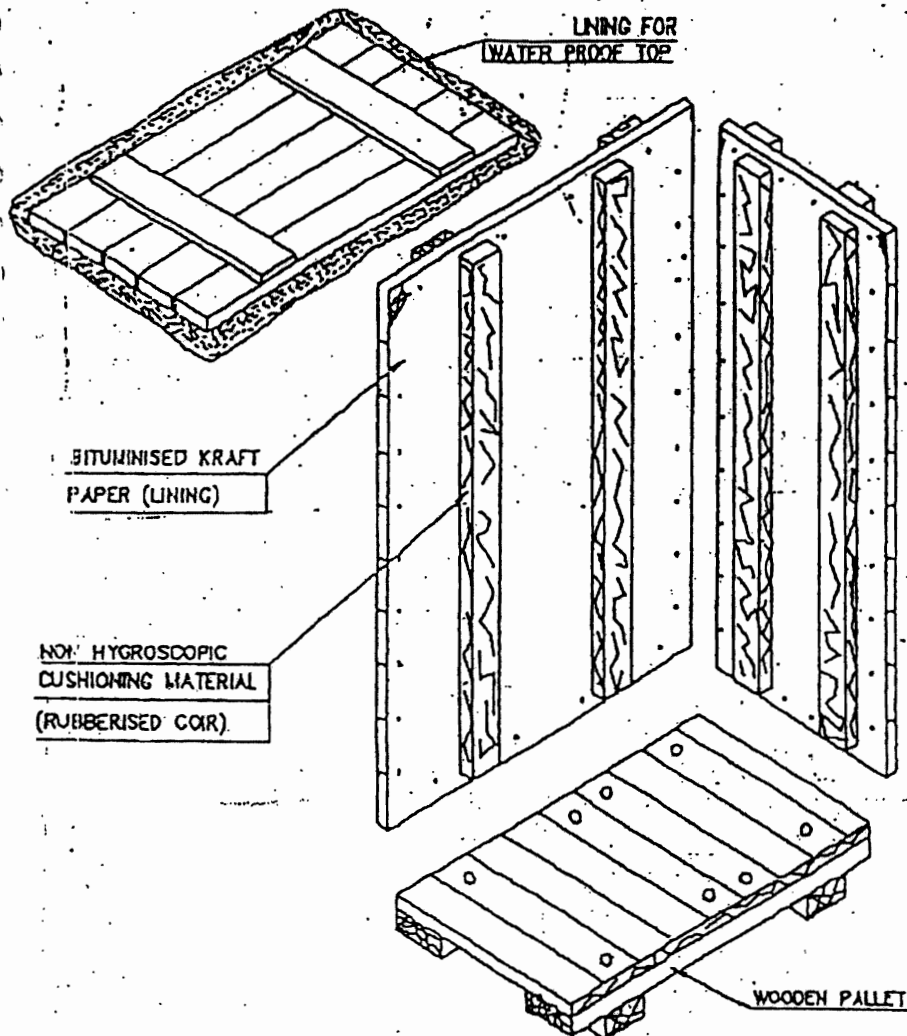
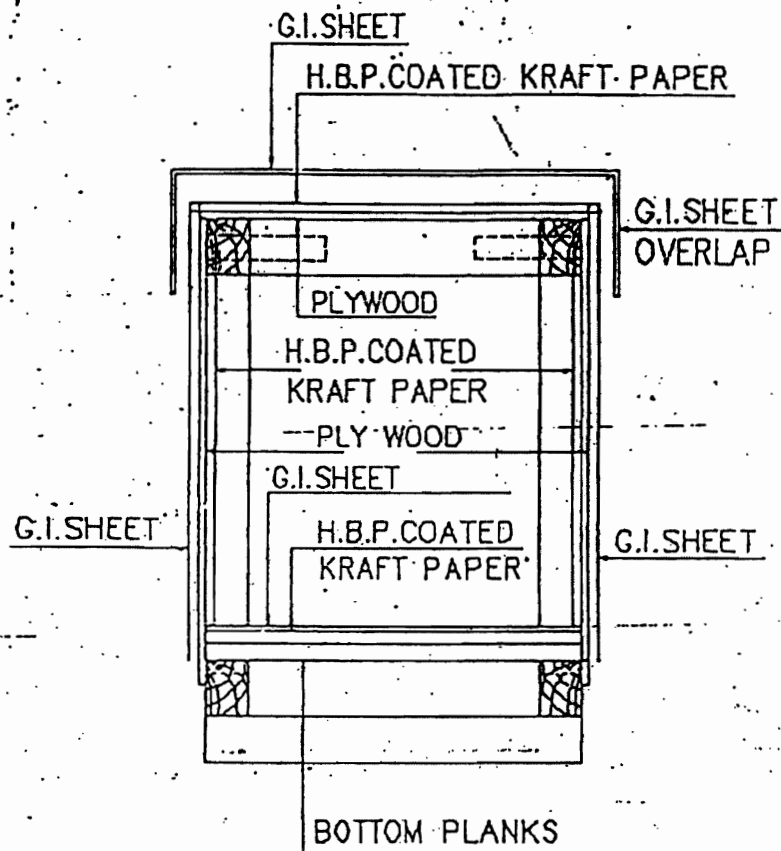


FIGURE-15

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 29	OF 52



**FIG-16 : CLOSED PACKING CASE WITH G.I.SHEET
SHOWING LAYERS OF PACKING MATERIALS.**

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 30	OF 52

10.0 TYPICAL PACKING DETAILS/PROCEDURE FOR MECHANICAL ITEMS

10.1 INSULATION MATERIAL (MINERAL WOOL MATTRESSES)

This specification covers the requirements of seaworthy packing and marking for bonded mineral (rock) wool mattresses having metallic hexagonal wire netting as facing on one or both sides.

10.1.1 TYPE OF CONSTRUCTION

Mattress shall be packed in Polythene (of 0.2 mm thickness) all around and sealed to prevent moisture absorption during transit and storage. Further it shall be wrapped with Bitumen coated Polythene bonded/lined Hessian and stitched and then packed in 5 ply DFC carton box.

Silica gel is used for this purpose to protect contents over sufficiently long time from corrosion. Silica gel shall be of indicating type conforming to IS:304-1979 packed in cotton bags placed at different positions inside the packing for absorbing moisture and shall not come into direct contact with the material inside the package. The quantity of silica gel shall be enough for storage period of one year. However, it shall not be less than 4 gms per litre volume of case subject to minimum of 400 gms per case.

Each mattress as well as the packages shall be serial numbered. Also, printed sheets indicating the nominal thickness, density and wire netting details (i.e. material and size) shall be placed below the wire netting.

Following details shall be legibly written on the packages. The details shall also be typed on a sheet of paper & kept in a sealed Polythene cover, inside the packages

- a) Project Name
- b) Purchase Order No.
- c) Sl. No. of package
- d) Size of mattress (Thickness x Length x Width)
- e) Density
- f) Wire netting material and size
- g) Weight of the package

10.2 INSULATION MATERIAL (ALUMINIUM COIL)

Heavy Gauge Aluminium Coil Packaging are done by Eye-to-Sky packaging or by Eye to eye packaging as per the proven practice being followed by manufacturer of Aluminium sheets.

10.2.1 Type of construction for Eye to Sky packaging

- a. Strapping of coil with polyester strap around circumference at one place.
- b. Putting paper I. D. Edge protector.
- c. Wrapping the coil with VCI stretch film after putting silica gel bags (4 nos.) Inside the coil.
- d. Wrapping the coil with HDPE film.
- e. Covering the coil including its build up & bore with masonite / particle board.
- f. Putting metallic I. D on coil.
- g. Putting O.D edge protector (paper) on coil.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 31	OF 52

- h. Putting circumferential polyester strap (3 nos.) & eye polyester strap (4 nos.).
- i. After placing the coil on coil tilter ply wood (10mm thick) of suitable size along with wooden pallet is to be put at the bottom side of the coil.
- j. Coil is to be tilted to eye-to-sky position.
- k. Final strapping with metallic strap to unit coil and skid at 2 places with top cover of plywood.
- l. Fixing the coil with wooden blocks at 4 corners.
- m. Labeling 2 nos.(one metallic & one adhesivetype) For specification, net wt. & gross wt.

10.2.2 Type of construction for Eye to Eye packaging

- a. Strapping of coil with polyester strap around circumference at one place.
 - b. Putting paper I. D. Edge protector.
 - c. Wrapping the coil with VCI stretch film after putting silica gel bags (4 nos.) Inside the coil.
 - d. Wrapping the coil with HDPE film.
 - e. Covering the coil including its build up & bore with masonite / particle board.
 - f. Putting metallic I. D on coil.
 - g. Putting O.D edge protector (paper) on coil.
 - h. Putting circumferential polyester strap (3 nos.) & eye polyester strap (4 nos.).
 - i. Placing of coil on wooden skid Coil is to be tilted to eye-to-sky position.
 - j. Final strapping of coil and skid at 2 places with steel strap. Fixing the coil with wooden blocks at 4 corners.
- Labeling 2 nos.(one metallic & one adhesive type) For specification net wt. & gross wt.

10.3 Packing Procedure for Online Tube Cleaning System and accessories

This procedure is applicable for the shipment of Onload Tube Cleaning System and accessories by sea.

10.3.1 Packing details:

- The Packing case shall be made of treated rubber wood. The design of the case shall be as per Annexure IIIA & IIIB.
- The Equipments shall be placed on the wooden base of the Packing case and fastened if required to arrest the movement of the same.
- Equipment shall be covered by Polythene sheet and inside wall surfaces of the wooden cases also shall be covered by polythene sheet.
- All Nozzles shall be closed with plywood dummies.
- All electrical components assembled or loose shall be covered with polythene sheets along with silica gel pack.
- Silica gel desiccants shall be kept inside each case in sufficient quantities in order to absorb the moisture.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 32	OF 52

- Thermocol packing shall be made for glass items like Ball vessel sight glass, Vpiece
- sight glass & pressure gauge.
- Silica gel desiccants shall be kept inside of each case to absorb the moisture.
- A Packing list covered in a polythene envelope shall be fixed inside and outside of each packing case.
- Shipping marks and consignee address shall be painted on the outer surface of the case.
- All handling instruction required for the case like top, sling, rain, handle with care etc, shall be marked on the case as per the symbol attached.
- Machined surface will be applied with Anti rust oil and covered by polyurethane sheet to protect from external oxidation.
- All valves will be closed with dummies to protect the internals and placed in the wooden case which will covered by polyurethane sheet.



TITLE

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

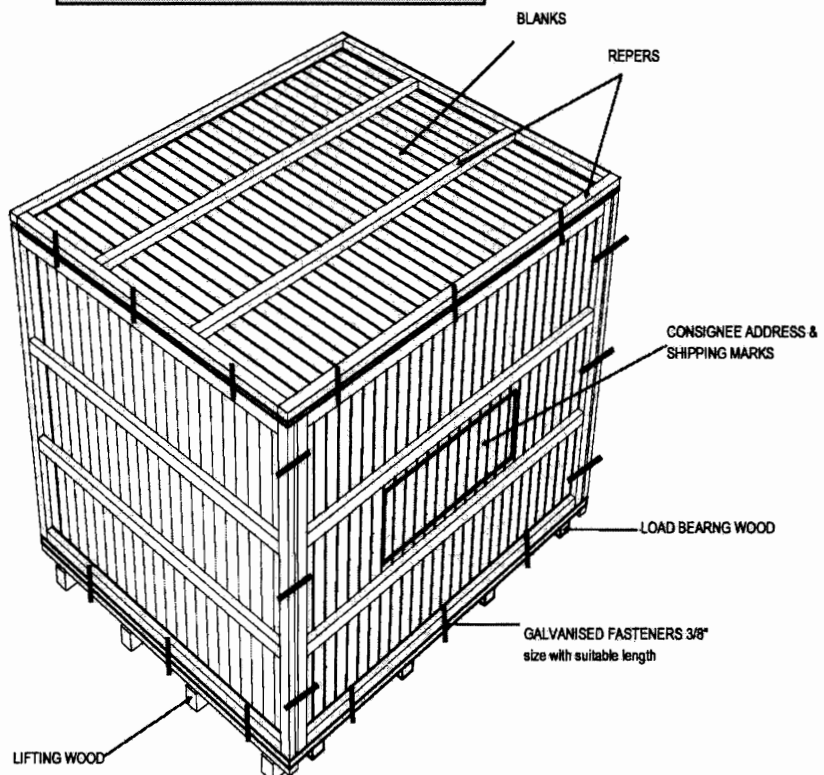
REV. NO. 0 DATE 10/08/2010

SHEET 33 OF 52

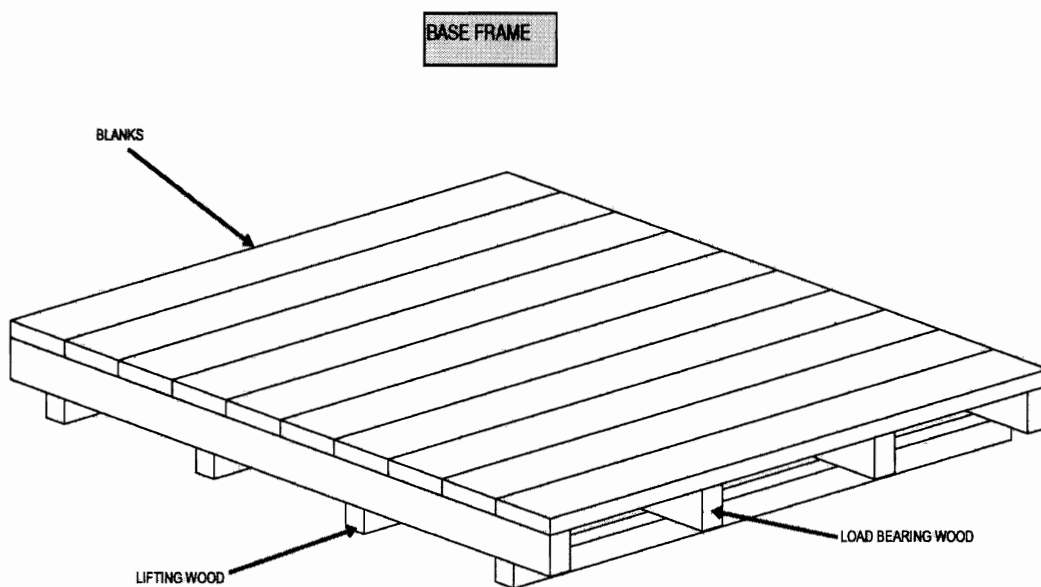
MODEL: FASTNERS TYPE (BASE, SIDE & TOP
ATTACHED WITH BOLT, NUT & WASHER)

This Type of case to be used for
following items:

1. BALL SEPERATOR
2. BALL COLECTOR SKID



	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 34	OF 52



**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

SPECIFICATION NO. PE-TS-888-100-A001

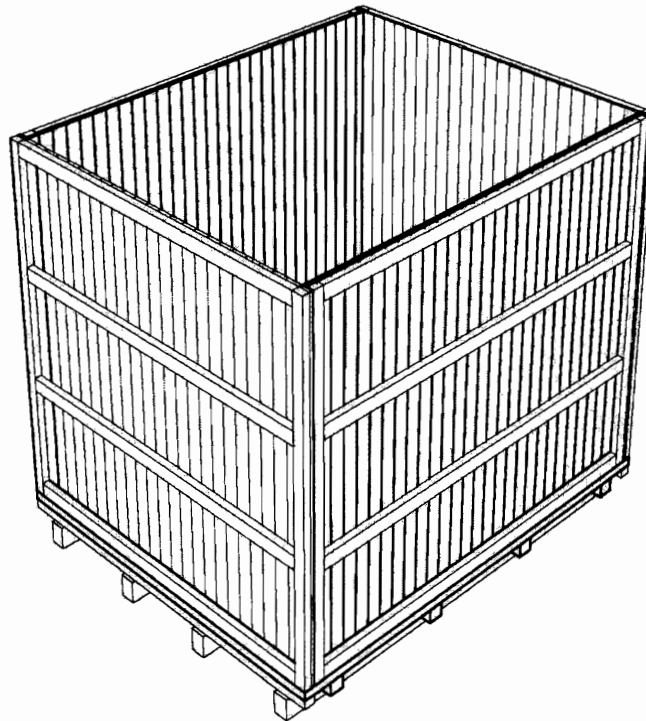
VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 35 OF 52

MODEL: FASTNERS TYPE - WITHOUT TOP





TITLE

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 36 OF 52

MODEL: NAILING TYPE
(FRAME & INSIDE REEFER NAILED)

THIS TYPE OF CASE TO BE USED FOR THE
FOLLOWING ITEMS:

1. PUMP SKID
2. CONTROL PANEL
3. LOOSE ITEMS, TOOLS & TACKLES
4. DPMS, BRM
5. SPARES
6. CLEANING BALLS
7. CABLES & ACCESSORIES

Shipping marks & Consignee
Address

BLANKS

LIFTING WOOD

BLANKS

REEPERS

BLANKS

REEPERS

LOAD BEARING WOOD

SHEET 08 of 10



TITLE

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

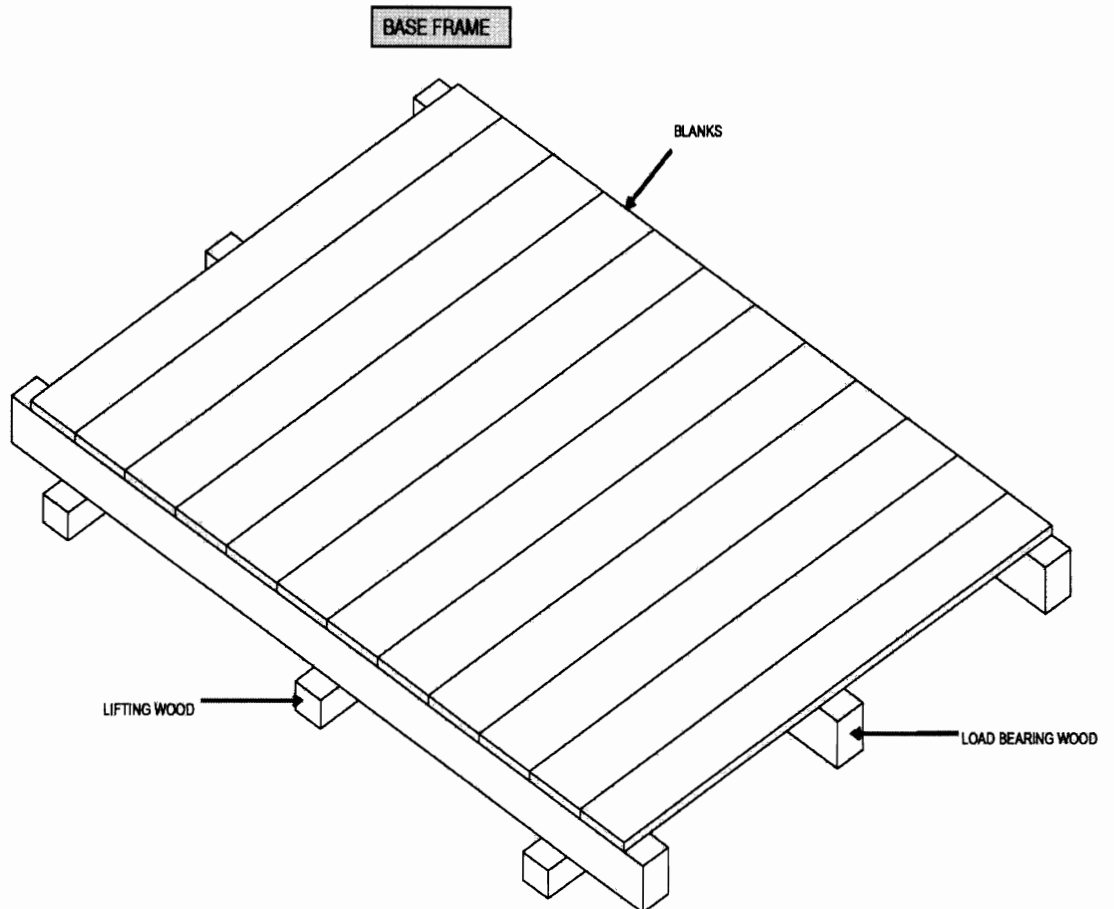
SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 37 OF 52



SHEET 09 of 10

**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**SPECIFICATION NO. **PE-TS-888-100-A001**

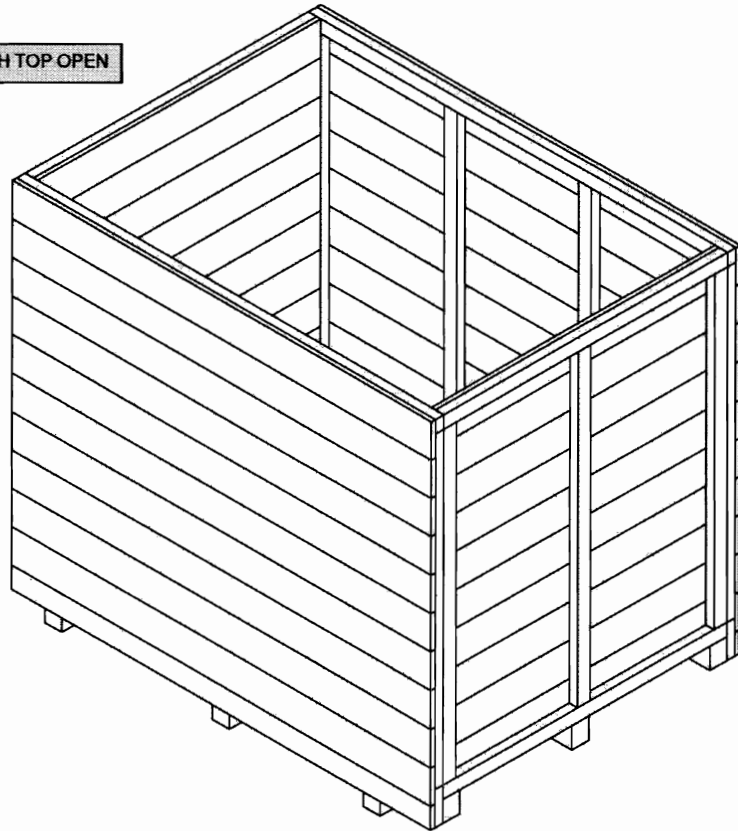
VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 38 OF 52

NAILING TYPE MODEL WITH TOP OPEN



SHEET 10 of 10

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 39	OF 52

10.4 PACKING OF LOOSE ITEMS

Loose mechanical, electrical and C&I items e.g. valves, fittings, pressure/temperature gauges/switches, circuit breakers, relays etc shall be individually wrapped using polyethylene sheets/U foam/ thermocol sheets/air bubble sheets depending upon the items and then packed in wooden boxes. The left out spaces and top of the boxes shall be filled with rubberized coir to get proper cushioning effect, Special attention shall be paid to relays, instruments etc for arresting the movements of their operating mechanism during transportation.

The construction of wooden packing cases shall be as per clause 9.3.1 retaining its all features concerning strength of the box. The construction of wooden packing case for electrical and C&I items shall be as per fig-16.

Inner surface of 6 sides of the box shall be lined with bitumen coated hessian polyethylene kraft paper. Rubberized coir of min. 25mm thickness and 100 mm width shall be nailed to inner surfaces of bottom and 4 sides of the boxes.

11.0 PACKING OF ELECTRICAL ITEMS

11.1 CABLES

11.1.1 Type of Equipment
All type of cables..

11.1.2 Type of Construction

New or practically new cable drums made of steel and painted with epoxy resin paint are to be used. Cable ends are carefully protected before packing. Over the cables polyethylene sheet shall be wrapped and then sealed properly. Cable drum can be put in wooden crates for ease in transportation and handling. (Wooden cable drum is also acceptable, however vendor to furnish constructional details for approval).



TITLE

TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS

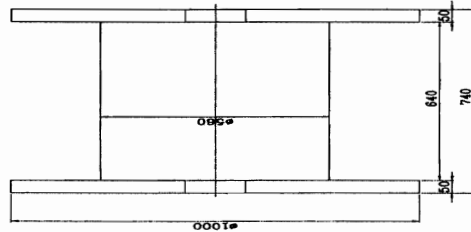
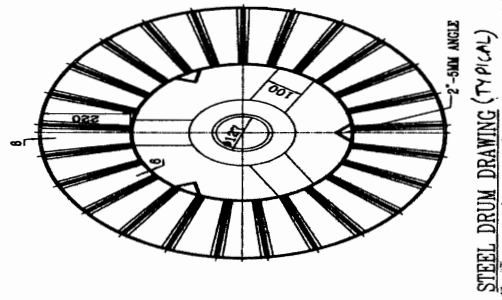
SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

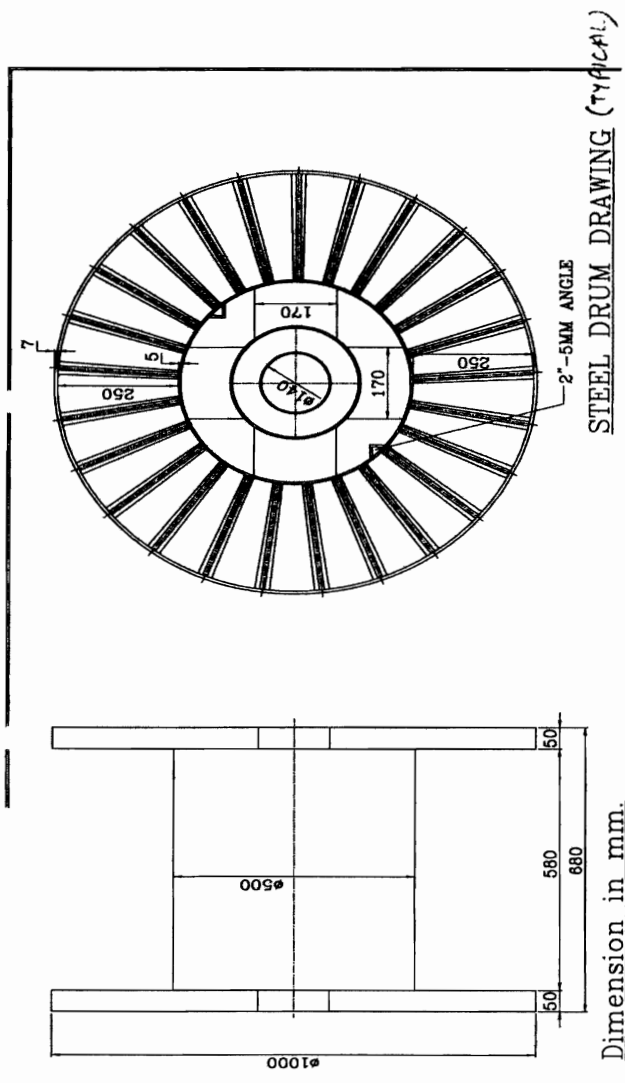
REV. NO. 0 DATE 10/08/2010

SHEET 40 OF 52



Dimension in mm.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 41	OF 52



11.2 PACKING OF CABLE TRAYS & ACCESSORIES AND CABLE TRAY SUPPORT MATERIAL

11.2.1 Cable trays can be packed in wooden boxes as per fig 1 to 11 or in steel boxes. Details of steel box construction is as indicated below.

- 1) All Dimensions are in "mm" unless otherwise stated.
- 2) Packing Box shall be fabricated using 50x50x6mm MS Angle, 50x3mm Flat, 2.5 mm thick C Channel, 1mm & 1.6mm Thick sheet.
- 3) Finish of Packing Box Shall be Galvanized.
- 4) Angle & Channel Section forming part of the Main frame shall be welded thoroughly with each other to give a rigid structure.
- 5) Sheet Section and Flat section shall be bolted/ Riveted/ Welded suitably to the Main frame stated in '4' above.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 42	OF 52

- 6) Welding Portion on galvanized surfaces shall be painted with Zinc Rich Paint.
- 7) Dispatch details such as consignor/consignee address, contract and case details, 'country of origin, port of delivery, stacking instructions shall be written on one of the side of boxes. An anodized aluminium plate as per details and specifications given in page 3 of 5 shall be provided on the boxes
- 8) One copy of packing slip wrapped in polythylene bag covered with suitable aluminium .packing slip holder to be nailed on the external surface of the box. One more copy 9f the packing Slip wrapped in polythylene bag to be kept inside the box at the prominent place.
- 9) **INDICATION MARKS ON THE BOXES:** Markings shall be provided on the boxes indicating position of Boxes for handling, storage and nature of consignment. For guidelines referred page 4 of 5. The ink issued for this purpose as well as for marking dispatch instruction shall be indelible/non-washable marking ink.
- 10) Each item as mentioned in BOQ shall be packed & supplied as a set comprising of required numbers of associated fasteners & hardware etc

**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

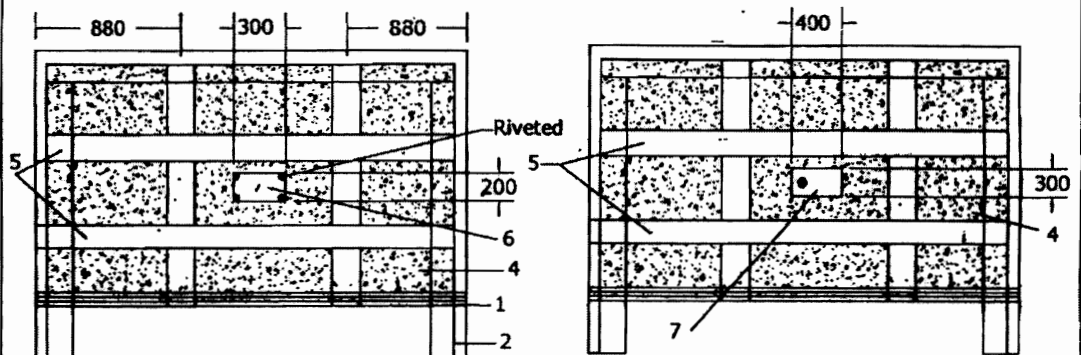
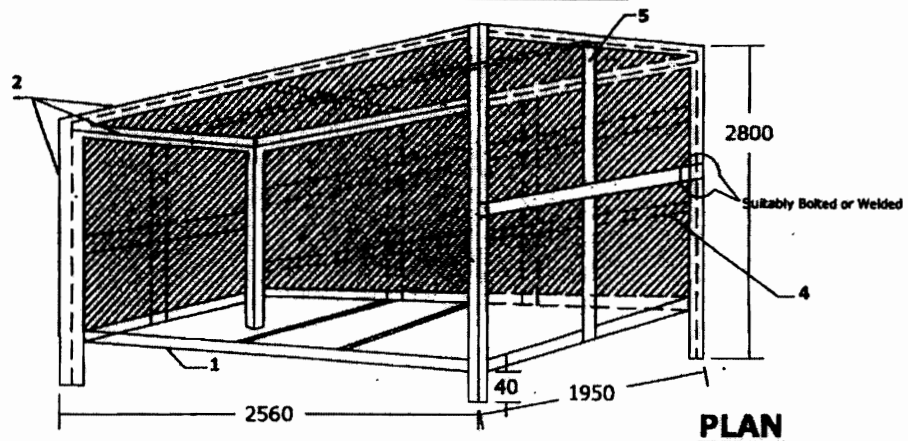
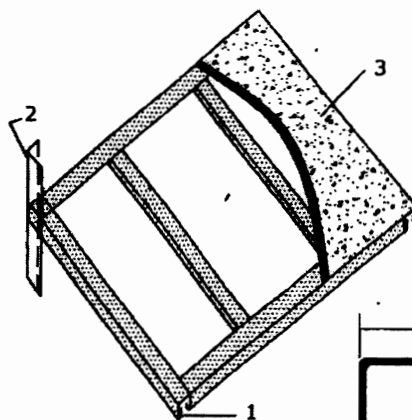
SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

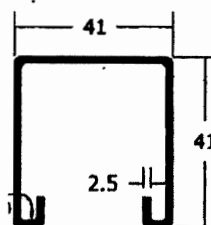
SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 43 OF 52

STEEL PACKING (TYPICAL DETAILS)**FRONT SIDE OF BOX****BACK SIDE OF BOX****Note:**

1. "C" Channel to be used on Bottom Frame.
2. 50x50x6 Angle to be used Vertically on four sides of the Box and Horizontally on four sides on the top Frame.
3. 1.6mm thick sheet (plain) on Bottom Plate.
4. 1.0mm thick sheet to cover top & four sides of BOX.
5. 50x3 Flat as additional cross members to be used Horizontally & Vertically on top & Four Sides of Box.
6. Anodised Aluminium Plate for Marking.
7. Hinged Inspection Window.



	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 44	OF 52

11.3 PACKING FOR STATION LIGHTING SYSTEM

Aspects of packing specific to equipments / items of station lighting system are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

11.3.1 For LIGHTING TRANSFORMER, DISTRIBUTION BOARDS, LIGHTING PANELS,

- Construction of packing case for LIGHTING DISTRIBUTION BOARDS, LIGHTING PANELS, TRANSFORMER . shall be EITHER as per FIGURE 1,2,3,5,6,7,8,9,10,11 OR FIGURE 14,15,16.
- Each Panel/Transformer shall be individually covered with double polythene sheet of thickness 175 microns minimum.
- All the 6 inner surfaces of packing shall be nailed with bitumen coated hessian polythene craft paper. Wherever 2 pieces of craft paper are used, the joint shall have minimum overlap of 20mm.

For the top frame it shall be project on all sides by 100mm and shall be nailed on sides .

- The gap between the panels and packing case shall be filled with rubberized coir of thickness 50mm minimum and width 100mm. The distance between two consecutive supports of rubberized coir shall be less than 500mm.
- Silica get packed in cotton bags shall be placed at different positions inside the packing.
- Packing case shall be finally covered with GI sheet of thickness 0.4mm minimum.

11.3.2 For LUMINARIES, RECEPTACLES. EMERGENCY LIGHT, 240/24V TRANSFORMER, CEILING FAN, SWITCH BOARDS, FLEXIBLE CONDUIT, WIRES, EARTH WIRE. JUNCTION BOXES, ERECTION COMMISSIONING SPARES, RECOMMENDED SPARES , ERECTION MATERIAL AND CONSUMABLES

- Construction of packing case for THE ABOVE MATERIAL shall be as per FIGURE 1to11.
- Items placed inside the case shall be covered with double polythene sheet of thickness 175 microns minimum.
- All the 6 inner surfaces of packing shall be nailed with bitumen coated hessian craft paper. wherever 2 pieces of craft paper are used, the joint shall have minimum overlap of 20mm. For the top frame it shall be project on all sides by 100mm and shall be nailed on sides.
- Silica get packed in cotton bags shall be placed at different positions inside the packing.

11.3.3 For CONDUIT PIPE

As per international practice pipes are shipped in open bundles with metal strapping. Packing as per attached figure A shall be provided which is described as following:

- Each bundle shall be wrapped with 2 layers of 175 microns thick polythene sheet.
- Then bundle will be wrapped with bitumen coated hessian craft paper.
- Bundle shall be strapped with steel straps.
- An anodized aluminium packing description plate as per Figure No. 13 shall be provided.

11.3.4 For POLES

Poles will be wrapped with 2 layers of minimum 175 microns thick polythene sheet and then with bitumen coated hessian craft paper, packed as per Figure – C i.e. bundling.

11.3.5 For STRUCTURAL STEEL

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 45	OF 52

Structural steel will be different sizes and shapes. Hence it will be packed as per Figure No. B and described as following :

- a) Each bundle shall be wrapped with 2 layers of 175 microns thick polythene sheet.
- b) Then bundle will be wrapped with bitumen coated hessian craft paper.
- c) Bundle shall be strapped with steel straps.
- d) An anodized aluminium packing description plate as per Figure No. 13 shall be provided.

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 46	OF 52

PACKING PROCEDURE FOR CONDUIT PIPE

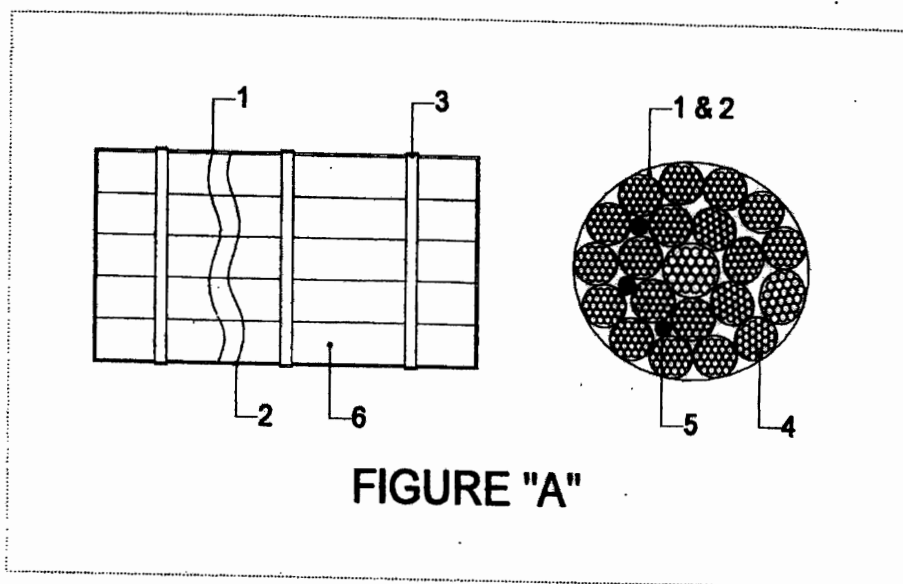


FIGURE "A"

- 1) LAYER OF BITUMEN COATED HESSIAN KRAFT PAPER.
- 2) LAYER OF POLYTHENE SHEET.
- 3) METAL STRAPPING.
- 4) CONDUIT PIPES.
- 5) SILICA GEL POUCHES.
- 6) BUNDLES OF CONDUIT PIPES.

**TITLE****TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS**

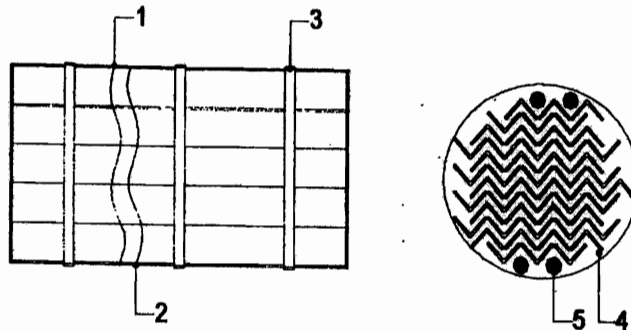
SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

SHEET 47 OF 52

PACKING PROCEDURE FOR STRUCTURAL STEEL**FIGURE "B"**

- 1) LAYER OF BITUMEN COATED HESSIAN KRAFT PAPER.
- 2) LAYER OF POLYTHENE SHEET.
- 3) METAL STRAPPING.
- 4) STRUCTURAL STEEL.
- 5) SILICA GEL POUCHES.



TITLE

TECHNICAL SPECIFICATION
FOR SEAWORTHY PACKING
FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

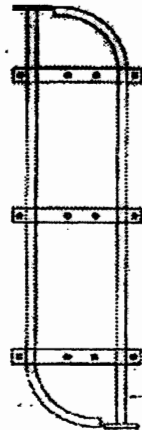
VOLUME II B

SECTION D

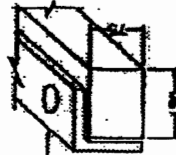
REV. NO. 0 DATE 10/08/2010

SHEET 48 OF 52

packing procedure for poles



POLES WRAPPED WITH POLYTHENE SHEET &
EXTENDING COATED HESSIAN CLOTH



TOP WOODEN BATTEN TO BE
FIXED WITH L90x80x6 MM ON TOP
OF IT FOR TIEING THE ROD
25 MM DIA



BOTTOM WOODEN BATTEN TO BE
FIXED ON L90x80x6 MM ANGLE

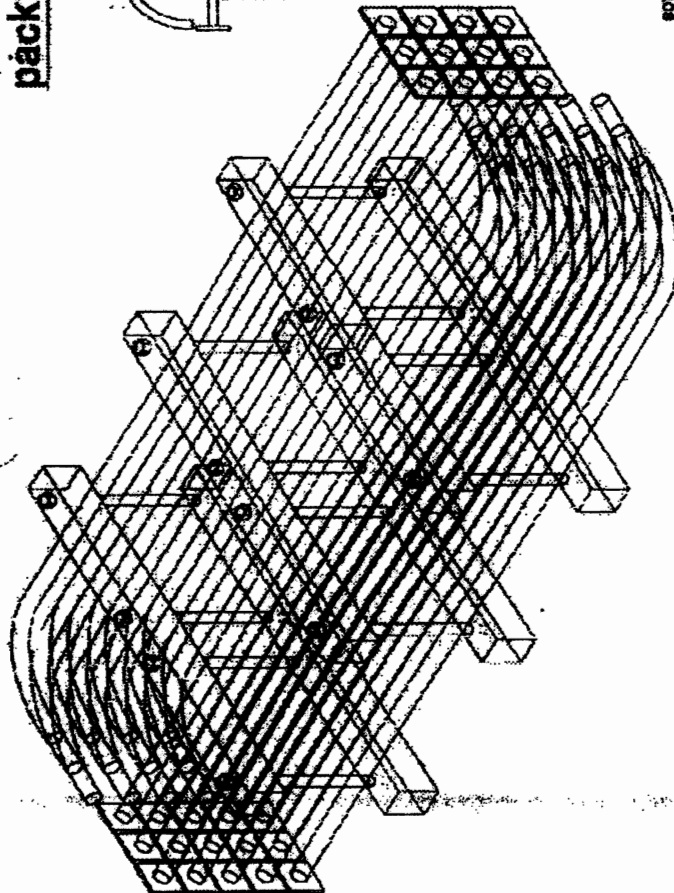


FIGURE "C"

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 49	OF 52

11.4 PACKING FOR DC BATTERY

The packing procedure for seaworthy packing of DC Battery is defined below, which is capable of withstanding impacts, compression, vibration, toppling, sea water spray, prevention against rust, temperature and extreme atmospheric conditions. Aspects of packing specific to equipments / items of DC Battery are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

The packing procedure consists of various stages namely primary packing, cushioning, securing, desiccant, outside packing box, Runners/ sliders/ transverse bars of plywood, etc., provided for each movement.

- a) The packing boxes shall be made up of plywood boxes (thickness 9mm min.) with blocks at the bottom of the box for provision for handling the boxes using the forklift. The packing boxes sizes are generally standardized to half-euro size (capable of handling equipment's weight).
- b) Rubberized coir of 25mm thickness shall be provided as cushioning material at the bottom and thermocole of 20mm shall be provided inside on all four sides. Other than this polyethylene film wrap or cover also will be provided. Left out spaces to be filled with rubberized coir/ thermocol to get cushioning effect.
- c) Silica gel in dust free air permeable cotton/paper bag shall be placed in the packing boxes for storage period of 1 year as per IS 304 (1979)
- d) While packing the cells, transit caps (polypropylene) of red and blue shall be used for big size cells for ensuring that cells does not get damaged during the transport due to vibrations etc.
- e) The battery accessories shall be packed with suitable precautions as follows:
 - i) Copper connectors shall be packed after making bunches with lead wire seals to avoid misplacement.
 - ii) Hardware items shall be packed in polyethylene bags (Thickness $\geq 0.175\text{mm}$) with item slip
 - iii) Battery rack shall be packed in dismantled condition, wrapped with polyethylene sheet
 - iv) For Ni-Cd type battery, electrolyte in solid form for dry cells shall be packed in cans with KOH, LiOH being packed separately.
 - f) Galvanized Steel straps are provided for binding the packing box sides.
 - g) The handling instructions shall be marked in indelible/ non-washable ink, indicating the upright position.

11.5 PACKING OF SERVICE TRANSFORMERS(OIL FILLED) & ACCESSORIES

This instruction is applicable for packing of transformers (oil filled), its accessories and components so as to ensure safe delivery to end user. Aspects of packing specific to equipments / items of transformers(oil filled) are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

11.5.01 PACKING DETAILS :

- a) Items shall be packed in case / crates as per the shipping list.
- b) All fragile items and small items shall be packed in cases and to be marked as "Fragile, handle with care Fragile items".
- c) Fragile accessories are to be first packed in their original boxes (VENDOR's packing). Very

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 50	OF 52

- d small / delicate items such as glass thermometer, door keys shall be packed in separate box.
- d In case original box is found damaged, suitable alternate box or packing method using felt or foam sheet and polythene wrap to be used.
- e These boxes are then placed in identified wooden boxes. Inside of such boxes are lined with a layer of polythene sheet, packing wool / grass and another layer of polythene sheet before placing the boxes. All boxes are then wrapped with this polythene sheet before closing the box. Fragile items shall not be placed loose, one above the other inside the case.
- f All wiring cables, connection flats of non-ferrous materials, CTs, valves bellows shall also be packed.
- g Items like CTs, Oil communicating bushings, insulators, wired equipments and housings such as RTCC Panel, M. Box, Drive Mechanism, thermometers, gauges shall be wrapped in polythene from all around.
- h Buchholz relay and OSR relay openings will be blanked using covers, before putting them in the box
- i Items shall be carefully lowered and arranged inside the crate / case and each item shall be locked from all sides in such a way to avoid its movement in any way. Wooden stoppers and separators shall be provided for this and nailed to the crate / case wood.
- j Wooden planks and batons in contact with fragile items shall be provided with kit foam at the locations of contact.
- k Oil communication bushings shall be packed in separate case on V or U shape wooden felted supports, as in case of condenser bushings.
- l While placing and arranging the items inside the crates / cases, these shall be verified for correctness and then the packing note shall be signed. The cover top of the crate / case shall then be closed.
- m The main equipment like transformer tank shall be packed suitably to prevent any damage during transit / storage. Support structures like frame, header supports etc. shall be crated. Conservator headers shall also be crated. Radiators pipe work and other instruments & components shall be packed in cases. All the cases shall be lined with polythene from inside.

11.6 ALTERNATIVE PACKING CASES FOR CONTROL PANELS AND SWITCH GEARS

For Control and switch gear panels, construction of wooden packing cases may be provided as per fig 14 & 15 and as detailed below.

Thickness of planks for all sides, binding and jointing battens shall be at least 25 mm. Width of the plank shall be at least 125mm and that of binding and jointing planks shall be at least 100mm.

Top frame shall be suitable so that it does not collapse due to sandwiching between slings while lifting. Longitudinal and traverse bars for the bottom wooden pallet to be suitably selected.

Diagonal bracings shall be as per cl 9.3.1.3 and all other requirements shall be as per clauses 9.3.1.4 to 9.3.1.6.

12.0 Containerization

As required by BHEL, the VENDOR shall stuff the GOODS into 20 or 40 foot containers (dry, open top, flat racks, etc.).

The maximum inside dimensions of containers are to be considered:

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001			
		VOLUME II B			
		SECTION D			
		REV. NO. 0	DATE 10/08/2010		
		SHEET	51	OF	52

- 40 foot containers: 11.80 m x 2.20 m x 2.05 m
- 20 foot containers: 5.80 m x 2.20 m x 2.05m
-

The present definition of containerization is valid for sea containers only. Vendor to check the size of containers before start of packing of equipment.

12.1 Protection of Cases/Crates

Since shipping containers are in general not water tight, packing in contact with the floor of the container shall be raised in order to prevent it from being damaged by the accumulation of water.

12.2 Mechanical Constraints

The mechanical constraints for "general use" closed containers are of a different nature (height of "stacking" being limited inside the containers), the packing for the GOODS may be of a lighter structure. However, it is necessary that the packing be appropriate so as to protect the GOODS on site during the storage period, as required after discharging of the GOOD'S from the containers.

Note:

It is the responsibility of the VENDOR to ensure that the cases/crates are stowed, secured and fastened inside the container. The VENDOR will take all necessary precautions to conform to the maximum weight allowed and the centre of gravity of the container. The securing and fastening of the cases/ crates can be carried out by nailing timbers on the bottom or on the vertical sides of the container.

13.0 Other Services to be provided by Vendor

In addition to the packing and shipping documents, VENDOR must also carry out the following services, which shall be included in his quotation:

Carriage of VENDOR's sub-contracted equipment and material, which must be re-grouped in VENDOR's or PACKER's workshops, whilst waiting for packaging.

BHEL reserves the right to postpone the shipping of the GOODS. In this event, any storage and insurance costs during the first ninety (90) days shall be borne by the VENDOR.

Loading, including lifting, securing, lashing, and stowing, of all cases, crates, or packages onto means of transportation such as, but not limited to, trailers, containers, etc.

14.0 Responsibilities and Guarantees

VENDOR is responsible for the choice of category for packing according to the transport facilities used, and on the basis of the present document. In case of doubt or disagreement regarding the choice, VENDOR must inform BHEL prior to packing and await BHEL's approval. All phases of packaging, marking, loading, etc. will be subject to BHEL inspection.

BHEL reserves the right to reject the packing when the packing does not conform to these instructions and/or when the packing does not ensure perfect protection of the GOODS. VENDOR is responsible for the weights and dimensions declared, and the marking of the packages.

The documents must be in strict conformity with the packing contents.

The packing specified in these "Packing, Marking and Shipping Instructions" is guaranteed for a twelve (12) months storage period after delivery on site.

VENDOR is responsible for providing storage recommendation adapted to the GOODS. According to this guarantee, VENDOR is held responsible in the event of goods becoming

	TITLE TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS	SPECIFICATION NO. PE-TS-888-100-A001	
		VOLUME II B	
		SECTION D	
		REV. NO. 0	DATE 10/08/2010
		SHEET 52	OF 52

useless, damaged or broken, as a result of poor packing and/or stowing, or due to corrosion, subsequent to insufficient or inadequate protection. All direct or indirect costs resulting thereof, will be back-charged to VENDOR.

TERMS AND CONDITIONS FOR INDIGENOUS OFFERS

- a) **Quotations :** Each Tender should be sent in duplicate in a sealed cover. Inner cover should be sealed with tenderer's distinctive seal and superscribed with correct Tender No., item of supply and due date of opening. Tender should not be addressed to any individual's names but only by designation and shall be addressed to
Manager/Purchase, BHARAT HEAVY ELECTRICALS LIMITED, BOLIER AUXILIARIES PLANT, INDIRA GANDHI INDUSTRIAL COMPLEX, RANIPET, VELLORE DISTRICT - 632406, INDIA.
- b) Tenders should be neatly typewritten and should be free from CORRECTION AND ERASURES. Corrections, if any, must be attested. All amount shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.
- c) Price should be net F.O.R. destination inclusive of risk in transit and remain valid for 90 days from the due date.
- d) If any Sales Tax is payable as extra to the quoted price it should be specifically stated in quotation failing which the purchaser will not be liable for payment of Sales Tax. Our TIN No. 33024364741 & CST Number 1141686.
- e) Products with I.S.I certification marks will be preferred.
- f) The applicable rate of excise duty shall be clearly indicated in the quote itself.
- g) The tenderer shall fill up the specification Deviation Disposition Report either NIL or the deviation taken by the tenderer against the Tender specification.
2. **Samples :** Wherever possible samples should be submitted separately whether specifically requested or not, so as to reach the purchase on or before the due date of the enquiry. They should be clearly marked with the Enquiry No. and the date on the outside cover to facilitate identification.
3. **Packing and Marking :** The supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.
4. **Terms of Payment :** Payment will be made within 45 days for MSME (Small / Micro) Vendors and 90 days for others after receipt and acceptance of materials at BHEL Stores or receipt of site acknowledgment in case of direct to site items of satisfactory receipt of materials at site. Where required by the purchase, the successful tenderer must send the operation and maintenance manuals, test certificates, drawings, etc., as called for, for the materials ordered. These should be sent immediately after despatch of the materials and a statement to that effect should be made in the invoice. Failure to comply with this provision will result in delay in payment of the bills. Goods despatched either by V.P.P. or by the documents presented through bank will not be accepted unless agreed to by the Purchaser.
The transporter's copy of Excise Invoice should accompany the material. The Original Invoice alongwith other documents shall be (a) routed through bank or (b) directly sent to us as called for in the contract. One set of the Advance copies of the above documents shall be sent to Manager / Finance (Stores Bill section), BHEL, BAP, RANIPET - 6 and one set to Manager / Purchase BHEL, BAP, RANIPET - 6.
5. **Liquidated Damages :** It is clearly understood among the parties to the contract that "Time is the essence of the contract". Therefore, the delivery of the goods specified in the purchase order should be made within the time limit prescribed. Where the seller supplies or despatches the goods, beyond the delivery period specified, the Purchaser will have no obligation to accept the goods, if accepted, liquidated damages at the rate of 1/2% of the value of goods delayed for each week of delay or part thereof will be levied without prejudice to any other relief or compensation due to the purchaser under any other condition of this contract.
6. **Risk Purchase :** Alternatively, the purchaser at his option will be entitled to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefor. The supplier shall be liable for any loss which the purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in Clause 5 above.
7. **Preferential Delivery :** It should be noted that if a contract is placed on higher tenderer as a result of this invitation to tender in preference to the lowest acceptable offer in consideration to the earlier delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F.O.R. destination including all elements of freights, sales tax, duties and other incidentals in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.
8. **MODVAT CREDIT :** If any Excise duty is payable, the chapter head/sub - head reference and the rate of duty should be quoted. If the tenderer is availing MODVAT credit for his input materials, the effect of proforma credit should be passed on the purchaser. Tender under "MODVAT" shall be preferred.
9. **General :** a) The Purchaser reserves the right to split up the tender and place for individual items with different tenderers and also increase the quantity.

TERMS AND CONDITIONS FOR FOREIGN OFFERS

Offer : Offer in ENGLISH LANGUAGE AND IN TRIPPLICATE IN A SEALED COVER superscribing the enquiry number and due date shall be submitted addressed to: THE MANAGER / PURCHASE, BHARAT HEAVY ELECTRICALS LIMITED, BOLIER AUXILIARIES PLANT, INDIRA GANDHI INDUSTRIAL COMPLEX, RANIPET - 632 406, TAMIL NADU, INDIA.

Offers should be firm for net FOB / FCA nearest Sea / air port price and C & F Chennai Port Price indicating the shipping specifications and the earliest delivery in the respect of others from overseas suppliers.

Documents :

- (i) Offers should be accompanied by detailed technical literature, catalogue and detailed dimensional drawing in ENGLISH and in DUPLICATE, or otherwise the offers will not be considered.
- (ii) In case overseas suppliers route their accredited selling agents, a letter of authority should be furnished mentioning the name and address of their selling agents, who are authorised to bid, negotiate and conclude a contract on their behalf.

Agency Commission : In respect of offers from overseas suppliers, agency commission, if any, payable to their agents in India shall invariably be shown separately in the proforma invoice and this will be paid by us in India, in Indian Rupees, on satisfactory completion of the contract.

Spare : The tenderer should quote separately for spares that are required for two years trouble free operation. The spares offer should accompany the offer of main equipment, otherwise the quotation will be overlooked.

Validity : The offers for main equipment and spares shall be kept open for acceptance for 90 days (Ninety days) for the date of opening of the tender.

Test Certificates, Operating and Maintenance Manuals : The tenderer shall clearly mention in their offer that Test Certificates and Operating and Manuals, etc., as called for in technical specification, in the required number of copies will be provided at no extra cost. If any amount is payable as extra, the same shall be indicated separately in the offer.

Terms and payment : In the event of an order the purchaser will arrange for an unconfirmed irrevocable letter of credit against presentation of documents. Under, no circumstances confirmed irrecoverable letter of credit will be established by the purchaser.

General :

- (i) Preference will be given to suitable indigenous or ex-stock imported offers, failing which imported offers from incoming consignment against the indigenous supplies "Stock and sale Licence" will be accepted, if Stock and sale licence is not available with the indigenous suppliers, the same shall be indicated in their offer.
- (ii) The offer should reach us on or before 14.00 Hours of date of tender opening. The offer will be opened at 14.30 hours on the due date in the presence of the tenderers who may like to be present.
- (iii) **BANK GUARANTEE (if applicable) :** The supplier in the event of an order, should furnish a Bank Guarantee from an approved Bank at no extra cost in a proforma which will be supplied to the supplier, along with the order, for an amount equivalent to 10% of the value of the contract. The Bank Guarantee should remain in full force and effect during the period that would be taken of successful completion of the contract and shall continue to be enforceable till 12 months from the date of receipt of consignment at purchaser's site or 18 months from the date of last shipment at the port of Delivery, whichever is earlier.
- (iv) **INCOTERMS :** The definition for terms shall be as per Incoterms 2010
- (v) **PLEASE QUOTE YOUR RATE FOR ALL THE FOLLOWING CONDITIONS.**
 - (a) FOB on at sight L.C.
 - (b) On C & F Chennai Port India with at sight L.C.
 - (c) Rate on credit basis with rate of interest and period of credit.
 - (d) Rates with suppliers credit.

(To be executed on Non-judicial Stamp Paper for an appropriate value.
To be stamped as an agreement)

(For Suppliers on Unit's/Division's PMD)

Framework Confidentiality Agreement cum Undertaking

This Agreement made on this the _____ day of (month) _____ 20__ (“Effective Date”) by and between

M/s BHARAT HEAVY ELECTRICALS LIMITED, having registered office at “BHEL House”, Siri Fort, New Delhi – 110049 (India), acting through its _____ Unit (hereinafter may be referred to as “BHEL” or “the Company”).

And

M/s _____ (address) _____
represented by authorized representative Sri _____ (herein after referred to as the “Supplier”).

The Supplier and the Company may, unless the context otherwise requires, hereinafter be collectively referred to as “Parties” or singly as the “Party”.

RECITALS

Whereas, BHEL is engaged in the design, engineering, manufacturing, construction, testing, commissioning and servicing of a wide range of products, systems and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable energy, Oil & Gas and Defence and providing associated services to varied customers in relation to which BHEL/its affiliates own valuable information of a secret and confidential nature.

Whereas the Company may, in connection with Contract(s) (as defined hereunder) placed or to be placed upon the Supplier, or otherwise, from time to time, make available, Technical Information as is defined hereunder.

And Whereas BHEL is willing to provide such Technical Information to the Supplier from time to time and the Supplier understands and acknowledges that such Technical Information is valuable for the Company and as such is willing to protect confidentiality of such information, subject to the terms and conditions set out hereunder.

Now therefore, in view of the foregoing premises and in consideration of the mutual covenants and agreements hereinafter set forth, the Parties agree as under:

1. Definitions:

Unless the context so requires, in this Agreement, the following terms will bear the meaning ascribed to the said term in this clause.

- A. **“Contract”** means the Contract entered into with a Supplier and includes a Purchase Order, or a Work Order for procurement of any goods or for provision of any services.
- B. **“Effective Date”** means the date of this Agreement as mentioned in the preamble of this Agreement.

- C. **“Supplier”** includes a Contractor or a Vendor of the Company whether for supplying of goods or for providing any services under a Contract or both.
 - D. **“Technical Information”** includes Drawings, and/or Product Standards and/or Specifications and/or Corporate / Plant Specifications and/or Technological Process Sheets and/or Technical Data Sheets and/or Jigs & Fixtures and/or Pattern & Dies and/or Special Gauges and/or Tools etc. belonging to or wherein the Company has acquired from a third party a right of user and includes any improvement thereto from time to time whether carried out by the Company or by the Supplier.
 - E. **“Intended Purpose”** means the purpose for which the Technical Information is provided to the Supplier under or in connection with a Contract.
 - F. **“Improvement”** includes any modification made to, or adaptation of, the Technical Information which enhances or is calculated to enhance the performance (whether in terms of effectiveness or in terms of efficiency or both) of the product and/or the service to be provided by the Supplier under a Contract.
2. This Agreement shall come into force/deemed to have come into force, as the case may be, on the Effective Date; or, on the first date when the Technical Information or any part thereof is provided by BHEL to the Supplier; whichever is earlier.
3. **Agreement deemed to be incorporated in each Contract:** Unless and to the extent otherwise stipulated in the Contract, the conditions of this Agreement are deemed to be incorporated in all Contracts which may be entered into between the Company and the Supplier. Further, unless otherwise stipulated, the obligations under this Agreement are and will be independent of the obligations under the Contracts and such obligations of the Supplier hereunder will remain of full effect and validity notwithstanding that the period of validity of the Contracts has expired by efflux of time stipulated therein; or, the contract has been discharged by performance or breach; or, the termination of the Contracts for any reason whatsoever.
4. **Ownership:**
- 4.1 The Company may, from time to time, make available to the Supplier, Technical Information on a non-exclusive basis by way of loan.
- 4.2 The Supplier acknowledges and agrees that all Technical Information and copies thereof that are or may be provided by the Company to the Supplier, are and shall remain the property of BHEL or that of the concerned entity from whom BHEL has obtained the Technical Information and such Technical Information are and shall constitute trade secrets of the BHEL. Nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any patent, copyright or design or any other intellectual property rights of whatsoever description that subsists or may hereinafter exist in the Technical Information. Furthermore, nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any license or rights of use of such patent,

Annexure-G

copyright or design or any other intellectual property rights of whatsoever description which may now or hereafter exist in the Technical Information except for use of the Technical Information strictly in accordance with this Agreement and the Contract and/or as directed in writing by the Company, solely for the Intended Purpose under the Contract.

- 4.3 Neither Party is obligated by or under this Agreement to purchase from or provide to the other Party any service or product and that any such purchase/sale of any product and/or service by one Party to the other Party will be governed by the Contract if any, that may be entered into by and between the Company and the Supplier.
- 4.4 The Supplier is/has been made well aware and acknowledges that the Technical Information being/which may be shared with it by the Company has been either generated by the Company by incurring huge investment and cost or obtained from foreign collaborators under Technical Collaboration Agreement (TCA) with stringent confidentiality conditions.
- 4.5 The Supplier agrees and undertakes to adhere to confidentiality requirements as applicable to BHEL under a TCA and also ensure that the confidentiality requirements are adhered to by all its concerned employees or sub-contractors/suppliers (where permitted to be engaged by BHEL). Any damages, losses, expenses of any description whatsoever, arising out of or in connection with a breach of the confidentiality requirements under a TCA owing to any act or omission on the part of the Supplier or its employees or sub-contractors/suppliers that is claimed by a foreign collaborator from the Company shall be wholly borne by the Supplier and it shall keep BHEL fully indemnified in this behalf. The demand by the Company shall be conclusive upon the Supplier who shall thereupon forthwith pay to the Company without demur, dispute or delay the amount as demanded without demanding any further proof thereof.
- 4.6 The Supplier agrees and undertakes that unless so decided and advised by the Company in writing all rights/title to any Improvement to the Technical Information shall vest in the Company. The Supplier undertakes and agrees to inform forthwith to the Company of any such Improvement made to the Technical Information and transfer all drawings/documents or other materials connected with such Improvement to the Company and also agrees to fully cooperate with the Company for protecting the Company's interests in such Improvement in the Technical Information including but not limited to obtaining necessary protection for the intellectual property rights in such improvement, if so desired by the Company. If a question arises whether a modification amounts to Improvement to the Technical Information, the same shall be decided by the Company and such decision shall be final and binding upon the Supplier.

5. Use and Non-Disclosure:

- 5.1 Unless otherwise stipulated by the Company, all Technical Information made available to the Supplier, by the Company shall be treated as Confidential irrespective of whether the same is marked or otherwise denoted to be Confidential or not.

Annexure-G

- 5.2 The Supplier undertakes and agrees that the Technical Information in its possession shall be held in strict confidence and will be used strictly in accordance with this Agreement and solely for the Intended Purpose under the Contract. Use of the Technical Information for any other purpose other than Intended Purpose is prohibited.
- 5.3 In particular, the Supplier shall not use Technical Information or any Improvement in its possession for the manufacture or procurement of the Product(s) or components or parts thereof or use the Technical Information or any portion thereof or any modification or adaptation thereof in any form to provide any product and/or service to any third party, without the prior written consent of the Company.
- 5.4 The Supplier shall not disclose any of such Technical Information to any third party without the prior written consent of the Company. The Supplier agrees that without prior written consent of the Company, the Supplier shall not disclose to a third party about the existence of this Agreement, or of the fact that it is/was in possession of or has experience in the use of any Technical Information nor shall the Supplier share in any manner whatsoever, with a third party, the name or details of any Contract(s) awarded by the Company to it or performed by the Supplier or the scope of work thereof or share any document or correspondence by and between the Company and the Supplier in or in connection with this Agreement or such Contract(s). Notwithstanding what is stated elsewhere, the overall responsibility of any breach of the confidentiality provisions under this Agreement shall rest with the Supplier.
- 5.5 The Supplier undertakes and agrees not to make copies or extracts of and not to disclose to others any or all of the Technical Information in its possession, except as follows:
- (a) The Supplier may disclose the Technical Information to such of its officers and employees strictly to the extent as is necessary for such officer or employee for the Intended Purpose, provided that the Confidential Information (or copies thereof) disclosed shall be marked clearly as the confidential and proprietary information of Company and that such officers and employees shall similarly be bound by undertakings of confidence, restricted use and non-disclosure in respect of the Technical Information. The Supplier shall be responsible for any breach of such confidentiality provisions by such officers and employees.
 - (b) With the prior written consent of Company, the Supplier may disclose for the Intended Purpose such Technical Information as is provided for in such consent to such of its professional advisers: consultants, insurers and subcontractors who shall be similarly bound by undertakings of confidence, restricted use and non-disclosure in respect of such Technical Information.
 - (c) The Supplier shall not be prevented to make any disclosure required by (i) order of a court of competent jurisdiction or (ii) any competent regulatory authority or agency where such disclosure is required by law, provided that where the Supplier intends to

make such disclosure, it shall first consult Company and take all reasonable steps requested by it to minimize the extent of the Technical Information disclosed and to make such disclosure in confidence and also shall cooperate with the Company in seeking any protective order or any other remedy from proper authority in this matter.

6. Exceptions:

The obligations of the Supplier pursuant to the provisions of this agreement shall not apply to any Confidential Information that:

- a) was/is known to, or in the possession of the Supplier prior to disclosure thereof by the Company;
- b) is or becomes publicly known, otherwise than as a result of a breach of this agreement by the Supplier.
- c) is developed independently of the Disclosing Party by the Supplier in circumstances that do not amount to a breach of the provisions of this Agreement or the Contract;
- d) is received from a third party in circumstances that do not result in a breach of the provisions of this Agreement.

7. The obligation of maintaining confidentiality of the Technical Information on each occasion, shall subsist for the entire duration during which the Technical Information / equipment is in possession of the Supplier and shall thereafter subsist for a further period of ----- years from the date when the complete Technical Information has been returned to the Company and if Technical Information has been returned in portions on different dates then, the period of ---- years will be reckoned from the date when the last portion of the Technical Information has been returned. Notwithstanding the expiry of the confidentiality obligation, the obligation of the Supplier under clause 5.4 shall continue to subsist for a further period of ----- years.

8. Warranties & Undertakings:

a) The Supplier undertakes to ensure the due observance of the undertakings of confidence, restricted use and non-disclosure by its persons to whom it discloses or releases copies or extracts of the Technical Information.

b) The Supplier shall keep the Technical Information or improvement made therein properly segregated and not mix up the same with any other material/documents belonging to him/it or to any other third party.

c) The Supplier further undertakes that he/it shall not hypothecate or give on lease or otherwise alienate or do away with any of the Technical Information and/or equipment of the Company, made available to him/it, and undertakes that he/it shall hold the same as a trustee, in capacity of custodian thereof and use/utilise the same solely for the purpose of executing the Contract awarded by the Company.

d) The Supplier further undertakes that he/it shall return all the equipment and/or Technical Information as far as practicable in the same condition in which the same was made available to him/it by the Company together with any Improvement thereon and the documents connected with such Improvement, to the Company forthwith upon completion of the scope of work or

Annexure-G

Contract for which such Technical Information was provided by the Company to it or as directed by the Company together with a confirmation by way of an affidavit or in such manner as directed by the Company that it has not retained any equipment and/or Technical Information/Improvement thereof. In case any such equipment and/or Technical Information or Improvement thereof shall remain in his possession or is not capable of being returned, the retention and use of such Technical Information or Improvement thereto shall continue to be governed by this Agreement.

e) The Supplier undertakes to indemnify the Company for all the direct, indirect and/or consequential losses, damages, expenses whatsoever including any consequential loss of business, profits suffered by the Company owing to breach by the Supplier of its obligations under this Agreement and/or the confidentiality requirements, if any, contained in the Contract and that the Supplier hereby agrees that the decision of the Company in all such or any such matter/s shall be final and binding on the Supplier. On mere written demand of the Company, the Supplier shall forthwith and without demur or delay pay to the Company any such sum as determined by the Company as the amount of loss or damage or expense which has been suffered by the Company. The Supplier agrees that the Company shall be entitled to withhold and appropriate any amount payable to the Supplier under any Contract then existing between the Company and the Supplier, in case the Supplier fails to make payment, in terms of the written demand, within 7 days thereof. Without prejudice to the foregoing actions, in respect to any breach of this Agreement, the Company shall be entitled to take any other action against the Supplier as per applicable laws, the Contract, Company's applicable policies, guidelines rules, procedures, etc.

9. Without prejudice to any other mode of recovery as may be available to the Company for recovery of the amount determined as due as per Clause 9(f) hereinabove, the Company shall have a right to withhold, recover and appropriate the amount due towards such losses, damages, expenses, from any amount due to the Supplier in respect of any other Contract (s) placed on him/it by any department/office/Unit/Division of the said Company.

10. Arbitration & Conciliation:

a) In case amicable settlement is not reached between the Parties, in respect of any dispute or difference or claim or controversy arising out of the formation, breach, termination, validity or execution of the Contract(or Agreement) or the respective rights and liabilities of the parties or in relation to interpretation of any provision of the Contract or in any manner touching upon the Contract, then, either Party may, by a notice in writing to the other Party refer such dispute or difference or controversy or claim, (except as to any matters, the decision of which is specifically provided for therein) to the sole arbitration by the arbitrator appointed by Head/In-Charge of the Unit/Division/Region.

b) The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties to the dispute.

c) Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India), or other statutory modifications or re enactments thereof and the rules made thereunder and for the time

being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be at ----- **(Insert the name of the city/town of the concerned Unit/Division).**

d) In case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred to by either party to the arbitration of one of the arbitrators in the department of public enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the parties hereto finally and conclusively.

f) Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Supplier shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and expedition in a professional manner.

11. Governing Law & Jurisdiction:

This Agreement shall be governed by and be construed as per applicable Indian Laws in force at the relevant time.

Subject to clauses 10(a) and 10(d) hereinabove, all matters in connection with the subject agreement shall be subject to exclusive jurisdiction of Courts situated at -----**(insert the name of the place where the Unit/Division is located)**

SIGNATURE

WITNESSES

1

Name
Address:

2.

Name:
Address:

List of Consortium Banks

Sl. No	Nationalised Banks	Sl. No	Public Sector Banks
1	State Bank of India	18	IDBI
2	Allahabad bank		
3	Andhra bank	Sl. No	Private banks
4	Bank of Baroda	19	Axis Bank
5	Canara Bank	20	HDFC
6	Corporation bank	21	ICICI
7	Central bank	22	The Federal Bank Limited
8	Indian Bank	23	Kotak Mahindra Bank
9	Indian Oversea Bank	24	Indusind Bank
10	Oriental bank of Commerce	25	Yes Bank
11	Punjab National Bank		
12	Punjab & Sindh Bank	Sl. No	Foreign banks
13	Syndicate Bank	26	CITI Bank N.A
14	UCO Bank	27	Deutsche Bank AG
15	Union Bank of India	28	HSBC
16	United Bank of India	29	Standard Chartered Bank
17	Vijaya Bank	30	J P Morgan

Payment Mechanism at BHEL, Ranipet

(Effective for all tenders issued by BHEL Ranipet from 01 July 2011 onwards unless otherwise notified of change/s in writing given by an authorized official of BHEL, Ranipet)

BHEL, Ranipet's payment mechanism will be as follows: (All Bidders are requested to read this carefully and take note of it before submitting their offer)

All bills of Suppliers processed for payment by BHEL, Ranipet shall pass through the following mile stones:

- (1) Receipt of materials at BHEL, Ranipet Stores (evidenced by the Day-Book Number and Date generated at BHEL Stores, Ranipet) or Receipt of materials at Project Site / Destination specified in the Purchase Order (as evidenced by the acknowledgement given by the Consignee).
- (2) Acceptance of the supplied materials at BHEL Stores, Ranipet. (Proof of evidence: Stores Receipt voucher - Short form "SRV", raised by BHEL Stores, Ranipet referenced by the SRV Number and Date)
- (3) Receipt and Registration of the Bills / Invoices of the Supplier at BHEL, Ranipet Accounts Department. (evidenced by the ABS Number and Date)
- (4) Receipt of clarifications, if any that may be required by BHEL, Ranipet Accounts or Purchase Department, from the Supplier. (As evidenced by the IOM Inward Date)
- (5) Bill processing and passing.
- (6) Payment release.

All these events are transparently available in the SCM web-site of BHEL, Ranipet, { <http://bapscm.bhelrpt.co.in/purc> } which can be viewed by all registered suppliers with a password.

Allowed Time frames:

- A] From DB to SRV: 10 Days
- B] From SRV to ABS: 15 Days
- C] From ABS to Bill Pass: 07 Days (if Stage 4 above is not applicable)

OR

From IOM to Bill Pass: 07 Days (if Stage 4 above is applicable)

- D] From Bill Pass to Payment Release: As per payment terms of the Purchase order.

All Suppliers payment/s would be released based on seniority of receipt of the processed bills at the payment section of BHEL, Ranipet Accounts Department.

The seniority would be based on the sequence of milestone events listed above.

In the sequence of the bill processing the preceding mile-stone seniority will be void, if the subsequent event occurs beyond the permitted time frame between two successive events.

Thus for example:

Start seniority would be with the DB date.

If the SRV date is greater than 10 days of the DB date, then the seniority of the DB date would be replaced by the SRV date.

If the ABS date is greater than 15 days of the SRV date, then the seniority would be reckoned by the ABS date.

If the Bill pass date is greater than 07 days of the ABS date then the seniority would be the date of inward receipt of the IOM.

The logics of these sequence is that SRV, ABS, IOM inward entry are dependent entirely on submission of correct documentation by Suppliers, as called for in the Purchase Order. If the documents are correctly submitted each of the milestone listed above will occur within BHEL, Ranipet within the timelines specified above.

Hence, in their own interest all Suppliers are requested to take note of this process and comply with the same.

Caution: Suppliers' payments would get delayed / affected if they fail to adhere to the submission of the documents specified in the Purchase Order / Contract, since the listed milestone events occurrence are contingent upon the availability of the requisite documents.