ODISHA POWER GENERATION CORPORATION LIMITED

2 X 660 MW IB VALLEY TPS, BANHARPALLI

TECHNICAL SPECIFICATION FOR CHAIN PULLEY BLOCKS

SPECIFICATION NO.: PE-TS-391-563-A001

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR PROJECT ENGINEERIING MANAGEMENT
NOIDA (U.P.)
INDIA

INDEX

1.0 SCOPE OF ENQUIRY/INTENT OF SPECIFICATION

1.1 The specification is intended to cover design, engineering, manufacture, inspection and testing at vendor's/ sub-vendor's works, painting, forwarding, proper packing and shipment and delivery at site as required on FOR site basis, performance and guarantee testing at vendor's works (as mentioned elsewhere in the specification) of **CHAIN PULLEY BLOCK** as per details in different sections / volumes of this specification for **2X660 MW OPGCL IB VALLEY TPS BANHARPALLI.**

1.2 The contractor shall be responsible for providing all material, equipment & services, which are required to fulfil the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under this specification, irrespective of whether it has been specifically listed herein or not. **Omission of specific reference to any component / accessory necessary for proper performance of the equipment shall not relieve the contractor of the responsibility of providing such facilities to complete the supply of CHAIN PULLEY BLOCK.**

1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which in his judgement is not in full accordance herewith.

1.4 The extent of supply under the contract includes all items shown in the drawings, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly, the extent of supply also includes all items mentioned in the specification and /or schedules, notwithstanding the fact that such items may have been omitted in the drawing.

1.5 The general term and conditions, instructions to tenderer and other attachment referred to elsewhere are made part of the tender specification. The equipment materials and works covered by this specification is subject to compliance to all attachments referred to in the specification. The bidder shall be responsible for and governed by all requirements stipulated herein.

1.6 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information , ensure completeness of specification, to bring out any contradictory / conflicting requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol-III of the specification **within 10 days of receipt of tender documents.** In absence of any such clarifications, in case of any contradictory requirement, the more stringent requirement as per interpretation of Purchaser/Customer shall prevail and shall be complied by the bidder without any commercial implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by Purchaser/ Customer as and when brought to their notice either by the bidder or by purchaser/ customer themselves. However, such requirements shall be binding on the successful bidder without any commercial & delivery implication.

1.7 The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions.

1.8 Deviations, if any, should be very clearly brought out clause by clause in the enclosed schedule; otherwise, it will be presumed that the vendor's offer is strictly in line with NIT specification.

1.9 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.

1.10 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder /vendor and Customer/ Purchaser/Employer will mean BHEL and /or customer including their consultant as interpreted by BHEL in the relevant context.

Miscellaneous Requirements

a) Successful bidder shall furnish detailed erection manual for each of the equipment supplied under this contract at least 3 months before the scheduled erection of the concerned equipment / component or along with supply of concerned equipment / component whichever is earlier.

b) Document approval by customer under Approval category or information category shall not absolve the vendor of their contractual obligations of completing the work as per specification requirement. Any deviation from specified requirement shall be reported by the vendor in writing and require written approval. Unless any change in specified requirement has been brought out by the vendor during detail engineering in writing while submitting the document to customer for approval, approved document (with implicit deviation) will not be cited as a reason for not following the specification requirement.

c) Bidder to note that the successful bidder, during detail engineering, will submit the drg/doc through web based Document Management System in addition to hard copies to be submitted as per dwg/ document distribution schedule. Bidder would be provided access to the DMS for drg/doc approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end

- *Internet explorer version – Minimum Internet Explorer 7*
- *Internet speed – 2 mbps (Minimum preferred)*
- *Pop ups from our external DMS IP (124.124.36.198) should not be blocked*
- *Vendor's Internal proxy setting should not block DMS application's link (http://124.124.36.198/wrenchwebaccess/login.aspx)"*

DMS user manuals to be used by BHEL PEM vendors for uploading, viewing, revising, commenting and tracking documents on PEM's DMS have been uploaded on PEM internet website (www.bhelpem.com) under the Vendor session.

For quick access bidder may refer the link
http://bhelpem.com/DMSManuals/DMSManuals.html

SECTION – B

PROJECT INFORMATION

VOLUME : IIA

SECTION-III

PROJECT SYNOPSIS AND GENERAL INFORMATION

1.00.00 INTRODUCTION

The proposed Thermal Power Station comprising of 2 x 660 MW base unit size, Super-Critical Units would be set up by Odisha Power Generation Corporation Limited (OPGCL) in the Jharsuguda district of Odisha, India. OPGCL had already installed two units of 210 MW each adjacent to the proposed units under Phase-I of the project at IB Thermal Power Station and the units have been working for the last fifteen years.

Seller has acquainted himself by visiting to the site, with the conditions prevailing at site. The information given here in under is for general guidance and shall not be contractually binding on the Buyer. All relevant site data /information as may be necessary shall have to be obtained/ collected by the Seller.

2.00.00 APPROACH TO SITE

The project site is located at Banaharpalli in the Jharsuguda district of Odisha on the bank of Hirakud Reservoir and about 20 km south of Belpahar railway station and 40 km south west of Jharsuguda. The main Howrah-Mumbai railway line passes 20 km north of the plant (at Belpahar). NH-200 (Chandikhole to Raipur) and SH-10 (Sambalpur to Sundergarh) pass through Jharsuguda town.

OPGCL has a private railway siding connecting the plant to the Indian Railways network at Lajkura Railway station.

Nearest Airport – Bhubaneswar.

Nearest Seaport – Paradeep/ Haldia.

3.00.00 LAND

The total land proposed to be required (around 40 Ha) taking into account the locations of various facilities and plant auxiliaries for units 3 & 4 under IB Thermal Power Station 2 x 660 MW units 3 & 4 and also future 2 x 660 MW will be as per the Plot Plan enclosed in Volume II-L. Land for the proposed units have already been acquired and Power block area is fairly flat land sloping towards South to South -West with contour variation from RL 204.00 M to RL 199.00 M. The Seller shall accommodate equipment offered under this specification generally within the spaces allocated for such equipment in the Plot Plan. Specific approval from Consultant shall be taken by the Seller prior to any revision or relocation.

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4.00.0 SOURCE OF COAL

Coal will be the primary fuel for the proposed project. OPGC has been allotted with two coal blocks (Manoharpur and Dip-side of Manoharpur) in IB valley area with an estimated total reserve of 531.68 Million Metric Tons for captive use of the projects. Manoharpur coal block has been explored fully and has net geological reserves of 181.68 Million Metric Tons and Dip side of Manoharpur (Regionally explored) has geological reserves of 350 Million Metric Tons approximately.

Manoharpur Coal Block is about 45 Km away from Sundargarh Town along Sundargarh – Hemgiri road which passes near the block. It is also connected by black top road with two important towns of Odisha viz. Rourkela (145 Km) and Jharshuguda (75 Km). The nearest Railway station is Hemgiri, lying on the Mumbai – Howrah main line and is about 20 Km away from Manoharpur Block. Coal from the mine to the power plant will be transported by dedicated merry-go-round rail system.

5.00.00 SOURCE OF WATER

Water is drawn from the Hirakud reservoir through a 5.45 Km intake channel. The reservoir has a catchment area of 83.395 sq.km. with a current gross storage capacity of 7189 lakhs m^3. The project too will meet its water requirements from the Hirakud reservoir through the existing intake structure, which is sufficient to cater to the proposed project. The project had taken approval from the Water Resources Department of Odisha to draw 5400 m^3/hr of water from the reservoir, which will cater the requirement of Phase-I (existing 2 x 210 MW) and the proposed units of 2x660 MW.

The Power station will operate on semi open recirculating condenser cooling system using cooling towers. In addition all water conservation and recycling measures will be adopted to minimize requirement of make up water. The proposed project will adopt zero effluent discharge philosophy.

6.00.00 ASH DISPOSAL AREA

Not Used.

7.00.00 METEOROLOGICAL DATA

7.01.00 For the purpose of equipment design, the following Ambient Conditions / Meteorological data of site (Jharsuguda) shall be taken into consideration:-

Site elevation above MSL	:	199.5 M
Highest temp recorded	:	48.0 °C.
Lowest temp recorded	:	4.0 °C.
Monthly max. dry bulb temp	:	38.9 °C/28.0 °C/33.4 °C (Summer/winter/monsoon)

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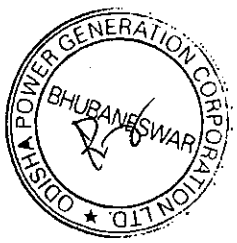
Monthly min. dry bulb temp	:	25.4 °C/16.7 °C/26.8 °C (Summer/winter/monsoon)
Monthly max. wet bulb temp	:	23.9 °C/17.8 °C/25.5 °C (Summer/winter/monsoon)
Monthly min. wet bulb temp	:	17.6 °C/13.4 °C/25.0 °C (Summer/winter/monsoon)
Maximum Relative Humidity	:	46% / 67% / 87% (Summer/winter/monsoon)
Minimum Relative Humidity	:	21% / 33% / 87% (Summer/winter/monsoon)
Average relative Humidity	:	65%
Average Annual Rainfall	:	1460 mm.
Normal period of rain fall	:	June – September.
Heaviest rainfall in 24 hours	:	257.8 mm
Wind direction	:	South West – North East.
Basic Wind Speed at 10 m Height	:	44 m/sec as per IS:875 Part-3 (1987).
Seismic Zone	:	Zone III as per IS:1893 Part-1 (2002).
		Geographical location : At Latitude 21° 48' North and Longitude 83° 52' East.



SECTION- C

Specific Technical Requirement

SECTION -C

1.0 SCOPE OF WORK

1.1 The equipment to be furnished by the bidder for the chain pulley blocks of different capacity and lift as specified in Annexure-I along with all accessories.

1.2 The chain pulley blocks offered shall have technical parameters as per the Data Sheet A enclosed herewith.

1.3 Any equipment/accessories not specified herein but required to make the equipment complete and efficient shall also be under bidder's scope of work.

The following shall be in the bidder's scope of work.

a. Chain pulley blocks with/without traveling trolleys as per the Annexure-I.

b. Maintenance Tools and Tackles as given at 4.0

c. Painting of all the equipment. (as per manufacturer's standard)

d. Packaging in wooden boxes.

e. O&M manuals, drawings and documents etc.

f. Inspection & testing of Chain Pulley Block as per BHEL standard Quality Plan/Customer approved QAP. Prime inspection agency shall be BHEL / End Customer. Equipment being supplied shall be strictly in accordance with nomenclature & technical specification. Any additional testing requirement at any stage of inspection deemed necessary by Customer/BHEL shall be carried out without any commercial or technical implication.

2.0 TESTING AND INSPECTION

2.1 As per standard quality plan enclosed. Any additional hoisting arrangement / CHP (customer's hold point) deemed necessary by customer/BHEL during detailed engineering shall also be complied with.

2.2 Chain pulley block shall be completely assembled at manufacturers work and minimum following tests shall be conducted at works

i. Over load test

ii. Rated load test

iii. Other tests as per IS-3832.

2.3 The scope of inspection shall include but not limited to the following:

i. Material identification / co-relation for important items like hook, load chain, hand chain, wheels, ratchet and pawl etc.

ii. Hardness for pawl and ratchet

iii. Dye penetration test/ UT test for hooks

iv. Operational test including operational effort, velocity ratio etc.

v. Proof load test upto 1.5 times of working load limit.

vi. Dimensional check of hook

vii. Marking

3.0 WORKS EXCLUDED

3.1 Supply of monorail for traveling trolley of chain pulley blocks.

4.0 MAINTENANCE TOOLS AND TACKLES

A complete unused one set_of special purpose maintenance tools & tackles and accessories along with detailed instructions for maintenance and manual operation shall be supplied. **Tools shall be of suitable sizes for maintenance of Chain Pulley Block of each type and capacity.** Each tool and wrench shall be stamped so as to be identified easy for its use and size. The tools shall be supplied in steel toolbox and with a copy of instruction manual. The items supplied shall be of the best quality, specially protected against rusting. The following shall be provided as minimum requirement.

i.	Adjustable spanner	One (1)
ii.	Wrench spanner	One (1)
iii.	Oil gun	One (1)
iv.	Set of Screw driver	Min 6 nos. (of different sizes suiting various types and capacities of Chain Pulley Blocks)
v.	2 lb hammer with wooden handle	One (1)
vi.	Grease Gun	One (1)

vii. Any other item required for maintenance shall also be provided.

5.0 **DRAWINGS/DESIGN DOCUMENTS FOR SUBMISSION (during detailed engineering)**

A. For Approval

a. G.A. drawing showing clearances, assembly, cross section details, materials of construction, lifts & approaches etc.

b. Quality plan

c. Test certificates & reports on various shop tests.

6.0 **NO.OF DRAWINGS/DOCUMENTS FOR SUBMISSION** (as per attachment in Volume III)

7.0 **DEVIATIONS**

7.1 If the offer submitted has got any deviations from technical specification in the tender document. Bidder shall tabulate the same in the 'Schedule of Deviations" furnishing full particulars of such deviations. Deviations are to be furnished with mention to specific clause numbers notes/ comments e.g. "Refer to forwarding letter" etc. is not acceptable.

7.2 If there are no deviations from the tender document, bidder shall indicate so.

7.3 Reasons/explanations for such deviations shall be furnished.

8.0 **FUNCTIONAL TESTS**

8.1 The chain pulley blocks along with other accessories shall be guaranteed for the rated capacity. The minimum following tests shall be conducted at works – Overload test, rated load test and other tests as per IS-3832. Pull on the hoist and trolley shall not increase during full load operation.

8.2 The bidder shall have full responsibility for the safe and efficient operation of the chain pulley blocks and traveling trolley with associated accessories as a single unit.

8.3 If the shop performance tests indicate the failure of any of the components to achieve the functional performance, the deficiency shall be made good at bidder's cost.

8.4 Performance tests shall be carried out each time after the rectification modification is carried out.

9.0 **MAKE OF SUB-VENDOR ITEMS (*)**

Following makes of bought out items shall be considered:

Steel	SAIL/IISCO/TISCO
Steel Forgings	Chowdhary/Western India Forgings/Hindustan Steel Forgings/Ruby Forgings or as approved by BHEL.
Hooks	Herman Mohata/Moozumdar & Moozumdar/Steel Forgings/ Karachiwala/Smriti/Nasik Forge.
Brakes	BHEL approved make

(*) The sub-vendor list is indicative and will be subject to customer approval during detail engineering of the package without any commercial implication on account of the same.

10.0 **PAINTING SPECIFICATION**

As per manufacturer's standard.

SCOPE OF CHAIN PULLEY BLOCKS

ANNEXURE- I BHEL DOC NO PE-TS-391-563-A001

2X660 MW OPGCL IB VALLEY TPS, BANHARPALLI						
S.No.	**AREA / EQUIPMENT DESCRIPTION**	**Type**	**QTY (nos)**	**CAPACITY (T)**	**LIFT RANGE (M)**	**PATH**
B	**Scope of Chain pulley blocks (CPB)**					
1	Oil Barrel Handling in Central Lube oil System At EL +0.0 M	CPB with TT	1	1	8	Straight
2	Overload Valves Below TG Deck	CPB with TT	2	1	4	Straight
3	AC Plant for ESP-1 & ESP-2	CPB with TT	2	2	6	Straight
4	GENERAL PURPOSE MAINTENANCE For TG Building	CPB without TT	2	2	13	NA
	Fixed Chain Pulley Blocks					
5	GENERAL PURPOSE MAINTENANCE		10	1	10	NA
6	GENERAL PURPOSE MAINTENANCE		10	3	10	NA
7	GENERAL PURPOSE MAINTENANCE		8	5	10	NA
8	GENERAL PURPOSE MAINTENANCE		3	10	10	NA
9	One (1) set of Maintenance Tools and Tackles		1 set			
	Note					
1	***CPB: Chain Pulley Block TT: Travelling Trolley***					

1.00.00	Type	:	Hand operated chain pulley blocks
2.00.00	Capacity & Lift	:	As per Annexure I in Volume II B, Section C
3.00.00	Design	:	IS: 3832
4.00.00	Duty Class as per IS:3832	:	Class -II
5.00.00	Hoisting Mechanism		
a)	Type	:	Hand operated gear transmission
b)	Type of gear	:	Spur / Helical
c)	Load Chain	:	
	i) Type	:	Link type
ii)	Material	:	Alloy steel grade 80 as per IS: 6216 / IS3109
iii)	Conforms to (Std./Code)	:	IS: 6216/3109
d)	Hand Chain	:	
	i) Type	:	Link type
	ii) Material	:	Mild steel (grade 30) as per IS 2429 Part I
e)	Load Hook & Hook Block	:	
	i) Type of load hook	:	Plain shank- Trapezoidal section / ‘C’ Type
ii)	Load hooks conforms to (Std./Code)/ Material	:	IS: 15560/ Forged alloy steel/ carbon steel
iii)	Type of hook suspension	:	Swivelling type with lock
iv)	Type of make of bearing of hook suspension	:	Thrust ball bearing
f)	Gears	:	
i)	Type	:	Spur
ii)	Material	:	Alloy steel / carbon steel
iii)	Type of bearing used	:	Antifriction ball bearing / Roller
g)	Pinions		
i)	Type of bearing used	:	Antifriction ball bearing / Roller

h)	Sprockets		
i)	Type of bearings used	:	Antifriction ball bearing / Roller
i)	Method of lubrications Used		
i)	Bearings	:	Grease
ii)	Gearing & Pinions	:	Grease
iii)	Sprockets	:	Grease
j)	Brakes	:	
i)	Type	:	Screw and friction disc type self-actuating load pressure brake
6.00.0	Trolley & Bridge Drive		
a)	Trolley		
i)	Type	:	Geared (Manually operated)
ii)	Material of frame	:	Mild steel (IS:2062 Grade A or B)
b)	Drive Chain		
i)	Type	:	Link type
ii)	Material	:	Steel Gr.30
c]	Trolley Wheel		
i)	Number of pairs of wheel in each trolley/bridge	:	Two/four
ii)	Flange	:	Single flanged
iii)	Wheel material	:	Heat Treated Carbon steel/low alloy steel/graded cast iron
iv)	Type of bearings need	:	Antifriction
d)	Gears		
	i) Type	:	Spur / helical
	ii) Material	:	Alloy/ Carbon steel

iii) Type of bearings used : Antifriction

e) Method of lubrication for

i) Bearings : Grease

ii) Sprockets : Grease

f) Load chain wheel

i) Material : Malleable / S G Iron casting

g) Hand chain wheel

i) Material : SG Iron (IS:1865)

	MANUFACTURER'S NAME & ADDRESS :	**MANUFACTURING QUALITY PLAN** **ITEM :** Chain Pulley Block **QP No.:** PE-TS-391-563-A001 **REV**.:0, **Date.: 01.09.14, PAGE**: 1 OF 4	**PROJECT :** **2X660 MW OPGCL IB VALLEY TPS BANHARPALLI** **PACKAGE : chain pulley blocks** **VOL IIB, SEC C**

Sr. No.	COMPONENT / OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									M	C	N	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.			11.
1	**RAW MATERIAL & B/OUT ITEMS:**											
1.1	HOOKS	DIMENSIONS, CHEMICAL COMPOSITION. IDENTIFICATION & COMPLIANCE WITH TC. MECHANICAL, PHYSICAL PROPERTIES	MA MA MA	LAB ANALYSIS HARDNESS MECHANICAL PROPERTIES	One sample PER LOT	IS: 15560 Gr. M OR APPD. DRAWING	IS: 15560 Gr. M or APPD. DRG.	MFR's T.C. ✓	P	V	V	
1.2	LOAD CHAIN	- DIMENSIONS - BREAKING STRENGTH - PROOF LOAD	MA MA MA	MEASUREMENT -TENSILE TEST -TENSILE TEST	100 % 100% 100%	IS: 6216 OR APPD. DRAWINGS	IS: 6216 & APPD. DRGS.	MFR'S TC ✓	P	V	V	
1.3	RAW MATL. FOR GEAR/ RATCHET PAWL / RATCHET WHEEL	CHEMICAL COMPOSITION MECHANICAL	MA MA	LAB ANALYSIS HARDNESS	ONE SAMPLE PER LOT	BS 970/ DIN 17210/SAE/ IS	En 9 / En 3A 16MnCr5 /16Mn5Cr4	TC ✓ TC ✓	P P	V V	V V	TC or inspection report for components shall be given.

	LEGEND:	FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR SUB-CONTRACTOR	** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION		
SIGNATURE		REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY & SEAL

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										M	C	N	
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.			11.
1.4.	LOAD CHAIN WHEELS	- CHEMICAL COMPOSITION PHYSICAL PROPERTIES	MA MA	CHEMICAL MECHANICAL PROPERTIES	ONE SAMPLE PER LOT	IS 1865 OR APPD. DRG.	Gr 500/7 OR APPD. DRG.	MFR'S TC	✓	P	V	V	
1.5	BEARINGS	MAKE, TYPE, CATALOUGE NO.	MA	VISUAL	RANDOM	APP DRG / MFR"S CATALOGUE	APP DRG / MFR"S CATALOGUE	IR	✓	P	V	V	
1.6	HAND CHAIN WHEEL	CHEMICAL PHYSICAL PROPERTIES	MA	CHEMICAL MECHANICAL PROPERTIES	ONE SAMPLE PER LOT	AS PER DRAWING	AS PER DRAWING	IR/TC	✓	P	V	V	
1.7	HAND CHAIN	GRADE/ DIMENSION	MA	GRADE DIMENSION	ONE SAMPLE PER LOT	AS PER DRAWING	AS PER DRAWING	IR/TC	✓	P	V	V	
1.8	TROLLEY GEARS, PINION,WHEELS, AXLE	CHEMICAL & MECHANICAL	MA	LAB ANALYSIS,	100%	APPVD DRGS	APPVD DRGS	IR/TC	✓	P	V	V	
2	**IN PROCESS**												
2.1	HOOKS	-PROOF LOAD, -DPT /MPI AFTER P / LOAD	MA MA MA	LOAD TEST DPT/MPI UT	100 % 100 % 100%	IS:15560 ASTM E165 ASTM A388	IS:15560 NO DEFECT 20% DF Max., 80% BWE Min.	IR IR IR	✓ ✓ ✓	P P P	V V V	V V V	-UT FOR SHANK IF DIA. > 50 MM)

	LEGEND:	FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR SUB-CONTRACTOR	** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION		
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										M	C	N	
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.			11.
2.2	RATCHET PAWL / RATCHET WHEEL	-HARDNESS -SURFACE CRACK	MA MA	HARDNESS DPT	100% 100 %	IS:3832/ APPD DRG. ASTM E165	IS:3832/ APPD. DRG. NO DEFECT	IR IR	✓ ✓	P P	V V	V V	
2.3	GEARS AND PINIONS	SURFACE HARDNESS HEAT TREATMENT, SURFACE CRACK, CASE DEPTH	MA	HARDNESS HT CHART, DPT FOR SURFACE CRACK	RANDOM ASTM E 165 FOR DPT	MFG STANDARD NO DEFECT	MFG STANDARD	IR IR	✓ ✓	P P	V V	V V	HT Chart to be provided
3.0	**FINAL INSPECTION**												
3.1	COMPLETE ASSEMBLY	OVERALL DIMENSION PROOF LOAD TEST LIGHT LOAD TEST HEIGHT OF LIFT SWIVELING OF HOOK EFFORT	MA CR MA MA MA MA	MEASUREMENT LOAD TEST LOAD TEST MEASUREMENT VISUAL PULL ON CHAIN	100 % 100% 100% 100% 100 % 100%	IS:3832 /APPD DRG -DO- IS 3832 Cl NO 9.3.1 -DO- -DO- -DO-	IS:3832 /APPD DRG No cracks, flaws & other defects IS 3832 -DO – -DO- -DO-	IR IR IR IR IR IR	✓ ✓ ✓ ✓ ✓ ✓	P P P P P P	W W W W W W	W W W W W W	
3.2	PAINTING	-CLEANING - SHADE & DFT OF PAINT (Blue / Black)	MA MI	VISUAL VISUAL	AT RANDOM AT RANDOM	APPROVED DRAWING/ **SPECIFICATION**	APPROVED DRAWING/ **SPECIFICATION**	IR IR		P p	--- W	--- ---	

	LEGEND:	FOR CUSTOMER USE	
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									M	C	N	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.			11.
3.3	NAME PLATE	VERIFICATION	MA	VISUAL	100%			IR		P	V	---	
3.4	PACKING	-VERIFICATION	MI	VISUAL	100%	SPECS.	SPECS.	IR		P	---	---	
3.5	REVIEW OF QA DOCUMENTATION	VERIFICATION	MA	VISUAL	100%	APPD. QP	APPD. QP		✓	V	V	V	

CR – CRITICAL, MA – MAJOR , MI – MINOR

NOTE: BACK WALL ECHO SHALL BE ADJUSTED TO 100% OF FULL SCREEN HEIGHT IN SOUND (DEFECT FREE) AREA. DEFECT ECHO HEIGHT MORE THAN 20% OF SCREEN HEIGHT SHALL BE TREATED AS UNACCEPTABLE. BACK WALL ECHO SHALL NOT BE LESS THAN 80% OF SCREEN HEIGHT IN ANY CASE.
NOTE 2: RECORDS IDENTIFIED WITH TICK SHALL BE ESSENTIALLY INLCUDED IN QA DOCUMENTATION.

	LEGEND:	FOR CUSTOMER USE	
MANUFACTURER / CONTRACTOR SUB-CONTRACTOR	** M : MANUFACTURER / SUB-CONTRACTOR C : BHEL / NOMINATED INSPECTION AGENCY. N : CUSTOMER INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION		
SIGNATURE		REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY & SEAL

VOLUME : IIK

SECTION-III

MISCELLANEOUS HOISTS

CONTENT

VOLUME : II K

SECTION-III

MISCELLANEOUS HOISTS

1.00.00 GENERAL INFORMATION

1.01.00 The hoists shall be used for erection and maintenance of various equipment in different buildings under the scope of Main Plant Package of 2 x 660 MW IB Thermal Power Station ~~Expansion Project~~, Units 3 & 4.

1.02.00 Hoists are divided into two separate groups - (a) Hand operated and (b) Electric operated.

2.00.00 CODES AND STANDARDS

The design, manufacture and testing of the equipment covered under this specification shall conform to the latest editions of the following Indian Standards:

2.01.00	IS : 3832	:	Specification for Hand Operated Chain Pulley-blocks.
2.02.00	IS : 807	:	Code of Practice for Design, Manufacture, Erection and Testing (Structural Portion) of Cranes and Hoists.
2.03.00	IS : 6216	:	Short link Chain, Grade T(8) for Pulley-blocks & other Lifting Appliances.
2.04.00	IS : 2429 (part -I)	:	Non-calibrated Load Chain for Lifting Purposes.
2.05.00	IS : 15560	:	Point Hook with Shank up to 160 tones - Specification
2.06.00	IS : 3938	:	Specification for Electric Wire Rope Hoists.

and other Indian Standards referred to in the above standards.

3.00.00 SCOPE OF WORK

3.01.00 Hoists shall be provided in all areas under the scope of this specification (except the areas covered by E.O.T. cranes) where any equipment/component weighing 100 kg and above is installed, mobile equipment is not accessible to those areas and needs to be handled for maintenance purposes. Number of monorail beams shall be such that the centre line of the hoist and the centre line of equipment to be handled shall be not more than 500 mm.

3.01.01 The location and no. of hoists is to be finalised during detailed engineering. Final arrangement is subject to approval of Consultant.

3.01.02 Monorail hoists shall at least be provided in the areas mentioned in Annexure-I. The list is indicative only and not an exhaustive one.

3.01.03 Fixed Chain Pulley blocks of following capacities and numbers :

Capacity (T)	Nos.
1	10
3	10
5	8
10	3

3.02.00 All drive motors and driving gears as necessary.

3.03.00 Limit switches for electrical hoist as necessary.

3.04.00 Trailing cable with all supporting fixtures as necessary for electric hoists.

3.05.00 Pendent control station with all accessories for electric hoists.

3.06.00 Lifting lug, eye bolts etc., for handling hoist parts.

3.07.00 Protection guard as specified.

3.08.00 Lifting hook block assembly for hoists.

4.00.00 SPECIFIC DESIGN REQUIREMENTS

4.01.00 Lifting capacity

4.01.01 Capacity of each hoist shall be 1.2 times the maximum working load.

4.01.02 Hoists of capacity below 5 tones shall be manual hoists.

Hoists of capacity equal and above 5 tones shall be electric hoists.

4.02.00 Effort for Mechanical Hoists

4.02.01 Hoisting

Hoisting effort for hoists up to 3 tones capacity shall not be more than 20 kg.

Hoisting effort for hoists above 3 tones capacity shall not be more than 25 kg.

4.02.02 Trolley Motion

Effort for trolley motion for hoists upto 3 tones capacity shall not be more than 43 Kg.

Effort for trolley motion for hoists above 3 tones capacity shall not be more than 55 Kg.

4.02.03 For Electric operated hoist both hoisting and trolley motion shall be motor operated.

4.03.00 **Lift**

4.03.01 **Lift above operating floor**

Highest position of the hook shall be such that during operation of hoists, the vertical distance between bottom of any equipment handled and top of any permanent structure or equipment in the operating area shall be at least one metre.

4.03.02 **Approach below operating floor**

To be decided by the Seller for safe and reliable handling of any equipment above half ton below the operating floor.

4.04.00 **Length of monorail hoist**

To be decided by the Seller depending on the floor and machine layout. The horizontal distance between the centre line of the hoist and centre line of any installed equipment in its operating shall not be more than half metre.

5.00.00 **DESIGN AND CONSTRUCTION**

5.01.00 All parts requiring replacement or lubrication shall be easily accessible without the need for dismantling of other equipment and structures.

Robust construction and ample rating merging which experience has shown to be necessary shall be ensured throughout manufacture.

5.02.00 All components of hoists of identical capacity and duty shall be interchangeable. The hoists of identical capacity and duty shall be identical in all respects unless otherwise required. The hoist design shall be such that these can be quickly removed from one monorail beam and fixed on another beam without disassembling major components.

5.03.00 All machinery and equipment included under this specification must be equipped with safety devices and clearances to comply with recognized standards and specification requirements.

5.04.00 Cast iron parts wherever used, shall conform to IS:210 - FG 260. Also no wood or other combustible materials shall be used.

5.05.00 Defects in material like fractures, cracks, blowholes, laminations, pitting etc. are not allowed. Rectifications of any such flaw is permissible only with the acceptance of the Buyer.

5.06.00 Each hoist shall be permanently and legibly stamped with the tag number, manufacturer's name, safe working load, grade of load chain (where applicable), range of lift etc.

5.07.00 Load chain (where applicable) shall be of grade T(8) as per IS:6216 and Hand chain shall be as per IS:2429 (Part-I) grade 30.

5.08.00 Wheels in trolley unit travel shall be single flanged with straight/tapper/barrel shaped tread to suit the monorail. Wheels should be preferably of forged steel construction. Material of construction for wheels of traversing block and hoist gear for hoist used in hazardous areas shall be of non-ferrous material to avoid spark during operation.

5.09.00 All gears shall be hardened and tempered steel with machine out teeth.

5.10.00 **Hoist (Manually Operated)**

5.10.01 Manually operated hoists shall be of spur gear chain pulley block type. It shall be suspended from the trolley by a hook. The design of the hoist shall conform to IS:3832 (Specification for hand operated chain pulley blocks).

The hooks and brakes of hoist shall conform to the requirements stipulated in (a) and (b) below

a) Hooks shall conform to IS:3832. The load hook shall be swievelling type fitted with a locking device.

b) The pulley blocks shall be fitted with an automatic mechanical load brake to prevent self-lowering of load in all working positions. The load brake shall also allow smooth lowering of load without serious overheating.

c) All manually operated hoists, unless stated otherwise, shall be trolley suspended type.

5.10.02 The trolley of hoists shall be manually operated.

5.10.03 The hoists shall be of Mechanism class 2 as per IS:3832.

5.11.00 **Electric Hoist**

5.11.01 Electric hoist shall be electric wire rope trolley suspended type. The design, operation, testing of electric hoist shall conform to IS:3938 (Specification for electric wire rope hoist).

Minimum speed for hoisting shall be 3 m/min. and that of for trolley motion shall be 15 m/min.

5.11.02 Lifting hook shall conform to IS 15560 as applicable.

5.11.03 Wire rope for hoists shall conform to IS-2266.

5.11.04 Electro-mechanical brakes of fail to safety type shall be provided for hoist motion as well as per trolley motion for electrically driven trolley. Load brake shall allow smooth lowering of load and arrangement shall be such as it can not be released accidentally. Capacity of brake and other relevant data shall conform to IS:3938.

5.11.05 The trolley of the hoists shall be electrically driven.

5.11.06 For other components of hoist such as rope, sheave, drum, bearings, gears etc. stipulations of IS: 3938 shall be followed.

5.11.07 Motor shall be rated for duty S4, CDF 40% and 150 starts per hour. Service class of motor shall be "4" as per IS:3938. Conditions given in IS:3938 for hoist motor shall be followed over and above the specification of electric motor in Volume II-F/1.

In case of any contradiction of the aforesaid standard and the motor specification, the conditions, which are more stringent, shall be considered. All the motors shall be suitable for reversing, frequent starting and braking. Motors shall be provided with suitable space heating arrangement.

5.11.08 Hoist shall be designed so that remote control can be effected by means of pendant push button switch from the operating floor. Operation, arrangement etc. of pendant push button switch shall conform to IS:3938.

5.11.09 Micro-speed attachment in hoist shall be provided if considered necessary by the Seller.

5.11.10 The hoists shall be of mechanism class 2 as per IS-3938.

5.12.00 Ball and roller bearings of reputed make shall be used throughout.

5.13.00 Suitable lubrication system shall be provided for all gear drives.

5.14.00 **Other Electrical Items**

5.14.01 The cross conductor on monorail for power supply to the hoist shall be of festoon type flexible insulated cable conductors. All fixtures and accessories shall be provided by the Seller for this purpose.

5.14.02 Necessary insulators, supports, clamps and all other accessories shall be provided as per standard design.

5.14.03 Each hoist shall be provided with a starter panel with protective relays.

5.14.04 One main isolating switch shall be used to cut-off the supply to the hoist assembly.

5.14.05 One main electro-magnetic contactor together with magnetic overload relay (hand reset) for each motor circuit shall be housed in the protection panel.

5.14.06 The operation of overload relay shall interrupt the main magnetic contactor.

5.14.07 Adequate short circuit protection shall be provided for main and individual circuits.

5.14.08 415V ± 10%, 3 Phase, 4 Wire, 50 Hz ± 5%, power supply for the hoist shall be arranged through switch-fuse unit mounted at standing height at a convenient location near each hoist.

The above switch fuse unit and the connecting cables between switch fuse unit and the cross conductor are included within the scope of this specification.

5.14.09 Transformers to step down the voltage and rectifiers as necessary shall be provided by the Seller.

5.14.10 All external and internal power, control and auxiliary circuit wiring of the electrical drive and accessories and panels shall be provided. The wiring shall be done with 1100 V grade PVC insulated stranded aluminium conductor cable of suitable size not less than 2.5 sq.mm nominal equivalent copper area of cross-section. All control and auxiliary circuit wiring shall be done with 1100 V grade PVC insulated, 2.5 sq.mm stranded copper conductor. Control wire terminations to the panels shall be made with compression type connectors. Multiway terminal blocks shall be furnished for terminating panel wiring and outgoing cable.

5.14.11 The hoist structure, motor frame and metal cases of all electrical equipment including metal conduit shall be effectively connected to earth. All grounding materials shall be supplied under this specification to grounding risers.

5.14.12 Single speed control shall be used for both hoist and trolley travel in each direction of motion.

5.15.00 Final painting at manufacturer's works, shall be provided by the Seller.

6.00.00 INSPECTION AND TESTING

6.01.00 The manufacturer shall conduct all tests required to ensure that the equipment furnished shall conform to the requirements of the specification and in compliance with the requirements of the latest edition of IS:3832 or equivalent standards for manually operated hoists and shall be as per IS:3938 for electrically operated hoist.

6.02.00 All the mono-rail hoists shall be tested at site by other Contractor to be engaged by the Buyer as per the stipulation of relevant Indian Standards.

7.00.00 DRAWINGS, DATA AND INFORMATION

7.01.00 General arrangement drawings incorporating all dimensions information on head rooms, lift, wheel loads, hook suspension arrangement and other relevant data for all the hoists.

7.02.00 Design calculation for selection of electric motor capacities for electric hoist.

7.03.00 Complete list of location, number and capacity of hoists provided.

7.04.00 Required instruction manual and data for erection, site testing and commissioning.

SECTION - D

CHAIN PULLEY BLOCK

1. GENERAL

1.1 This specification covers the design, manufacture, assembly, painting, inspection and testing at manufacturer's works of hand operated chain pulley block.

2. CODES AND STANDARDS

2.1 The design, manufacture, inspection and testing and performance of hand operated chain pulley blocks shall confirm to latest editions of the following standards : -

2.1.1 IS: 3832 Specification for hand operated chain pulley block OR BS 3243

2.1.2 IS 807:1976 Codes of Practice for Design, Manufacture, Erection and Testing (Structural Portion) of cranes and hoists.

2.1.3 IS: 3109(Part II) Calibrated load chain for pulley blocks and other lifting appliances

2.1.4 IS: 2429(Part II) Calibrated hand chain for pulley blocks and other lifting appliances

2.1.5 IS: 4460 Method for rating of machine cut spur and helical gears

2.1.6 IS 6216 : 1982 Short Link Chain, Grade T (8), Calibrated for Pulley Blocks and other Lifting Appliances

2.1.7 IS:15560: 2005 Point Hooks with Shank up to 160 Tonne - Specification

2.1.8 Material Specification IS or approved

3. EQUIPMENT

3.1 Chain Pulley Block – The block shall be so designed that all components shall withstand without failure, an application to the block of a load equal to at least four times the working load limit.

3.1.1 Frame

Frame shall be robust in design and of welded construction .The frame shall be selected in such a way that head room requirement is minimum. Frame shall maintain alignment under all expected conditions of services.

3.1.2 Chain

i. The load chain shall be electrically welded, accurately calibrated, and pitched arid polished conforming to IS: 6216 Grade 80(T8)/ IS 3109 (Part 2).

ii. The hand chain shall also be electrically welded, calibrated, pitched and polished and shall conform to IS: 2429 (Part II) Grade 30. The length of chain and link dimension shall be as per IS: 3832.

3.1.3 Hook

The forged hook shall be properly heat treated and so designed that in loaded condition, it is free to swivel without twisting the load chain. The hook shall conform to IS: 15560

3.1.4 Reduction Gear

The reduction gear shall be either spur or worm/ worm wheel type. The spur gear and worm shall be of high grade carbon steel and heat treated. The worm wheel shall be of bronze. A detachable steel cover shall be provided for total enclosure of the gear train and ample lubrication to be provided.

3.1.5 Brakes

Brakes shall be of screw friction disc type self-actuating or any other superior type. Brake capacity shall be ample and humid atmosphere shall not affect materials used. The brake shall prevent self lowering of load and arrest and sustain load in all working positions. The load brake shall also allow smooth lowering of the load without serious overheating which may impair working of block

3.1.6 Bearing

Bearing used shall be as per guidelines laid down in IS: 3832.

3.1.7 Chain Wheels

The load chain wheel shall be made of heavy duty malleable casting and shall be designed to ensure, effective operation of the chain. Load chain wheels shall be mounted on two ball bearings. Hand chain wheel shall be made from malleable casting/pressed sheet steel. The idler wheel shall be so shaped as to avoid the twisting of the chain during operation. The P.C.D of idler wheels shall be such that the bending action of the link is avoided. The hand chain wheel shall be provided with flanges and designed to ensure effective operation with hand chain.

3.1.8 Other components

All other components of chain pulley block such as anchorage, guide, pawl, stripper etc. shall be designed and provided as per IS: 3832.

3.1.9 Trolley

Monorail trolley frame shall be of heavy section rolled steel, held together by bolts. Wheels shall be of high grade cast iron/steel mounted on ball bearings. Axles and shafts shall be of carbon steel, accurately machined and suitably supported. The trolley shall be suitable for variations in I section beams. The trolley shall be geared travel type.

The hand chain required for trolley travel shall be as per clause 3.1.2 of this specification.

Hand chain wheel shall be as per clause 3.1.7 of this specification.

3.1.10 The effort required for hoisting and travel shall be as stipulated in IS 3832.

Master drawing list and submission schedule

Sl. No.	BHEL DRG.NO	DRAWING TITLE	REMARKS	SUBMISSION SCHEDULE - WEEK NUMBER FROM DATE OF P.O
	PE-TS-391-563-A001	**REV 00**		
1	PE-V0-387-563-A200	Manufacturing Quality Plan	INFORMATION	2
2	PE-V0-387-563-A201	GA Drawing for Chain Pulley Block with detail BOM with painting details	INFORMATION	2
3	PE-V0-387-563-A202	O & M Manual	INFORMATION	4
4	PE-V0-387-563-A204	Erection procedure	INFORMATION	4
NOTE:	1	VENDOR SHALL RESUBMIT THE REVISED DRAWINGS WITHIN 7 DAYS OF RECIEPT OF COMMENTS.		
	2	INCOMPLETE DRAWINGS/DOCUMENTS SHALL NOT BE TREATED AS SUBMITTED.		
	3	MANUFACTURING SHALL BE STARTED ON RECIEPT OF CAT II APPROVED DRAWINGS.		

DRAWING AND DOCUMENTS FOR SUBMISSION

S.N.	Drawings and documents	Soft and Hard Prints
1.0	DRAWING FOR APPROVAL	
1.1	For approval	Soft+2 Hard Print
1.2	For customer approval	Soft+2 Hard Print
1.3	For final distribution	Soft+2 CD +5 Hard Print
2.0	DRAWING FOR REFERENCE	
2.1	For reference	Soft+2 Hard Print
2.2	For final distribution	Soft+2 CD+5 Hard Print
3.0	CERTIFICATE, REPORTS ETC.	Soft+2 Hard Print
4.0	AS BUILT DRAWINGS (IF REQUIRED)	Soft+2 CD+8 Hard Print
5.0	O&M MANUAL	
5.1	Draft for approval	Soft +3 CD+ 5 Hard Print
5.2	For final distribution	Soft +3 CD + 8 Hard Print
6.0	QUALITY PLAN / Field quality plan / PG test	Soft + 2 Hard Print

Note:
1.0 The number of hard copies may change.
2.0 Bidder to note that all the drawings and documents shall also be submitted on CD's (compact disc) in following software.
a) All the drawings shall be prepared in AutoCAD.
b) All the documents shall be prepared MS word / EXCEL.
c) PDF files for all drawings/documents shall also be submitted.

DOCUMENTS TO BE FURNISHED WITH OFFER FOR TECHNICAL EVALUATION

1) SCHEDULE OF TECHNICAL DEVIATION (IF ANY)
   OR

   'NO DEVIATION CERTIFICATE' – Clearly mentioning that bidder has considered 'No - Deviation' from the technical specification provided by BHEL.

2) SIGNED AND STAMPED COPY OF COMPLIANCE CUM CONFIRMATION CERTIFICATE.
3) Unpriced format, duly mentioned 'Quoted' against each Sl.no. below each column.

NOTE:

i) NO OTHER DOCUMENTS OTHER THAN THOSE LISTED ABOVE ARE REQUIRED TO BE S UBMITTED FOR TECHNICAL EVALUATION. IN CASE ANY OTHER DOCUMENT IS FURNISHED, THE SAME WILL NOT BE TAKEN INTO CONSIDERATION FOR TECHNICAL EVALAUATION.

ii) BIDDER TO CLEARLY MENTION "QUOTED" AGAINST EACH ITEM. IN CASE ANY ITEM IS NOT APPLICABLE THEN "NA" SHOULD BE CLEARLY MENTIONED AGAINST THE SAME.

COMPLIANCE CUM CONFIRMATION CERTIFICATE

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

a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions other than those mentioned under "exclusion" in section C and those resolved as per 'Schedule of Deviations', if applicable, with regard to same.

b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'.

c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ CUSTOMER approval & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This shall be within the contracted price with no extra implications to BHEL after award of the contract.

d) All drawings/ data-sheets/ calculations etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ CUSTOMER approval in the event of order.

e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified/ intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre - bid discussions, otherwise BHEL/ Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

   For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.

g) All sub vendors shall be subject to BHEL/ CUSTOMER approval in the event of order.

h) Guarantee for plant /equipment shall be as per relevant clause of GCC /SCC /Other Commercial Terms & Conditions.

i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price and within purview of the tender specification even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities.

j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's/ Customer's/ Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.

k) As built drawings shall be submitted as and when required during the project execution.

l) The bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.

2X660 MW OPGCL IB VALLEY TPS - CHAIN PULLEY BLOCKS DTD 07.04.2015									
SUGGESTIVE PRICE FORMAT REV 00, VOL III									
Sl No.	Description of equipment / item	Total quantity required	Unit Price (Ex-works)	Total Price (Ex-works) i.e. (3 x 4)	ED	CST	FREIGHT	INSURANCE	TOTAL (FOR SITE) (5+6+7+8+9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.0	Total lumpsum firm price for design, engineering, manufacturing, inspection and testing at vendor's works, painting, supply/delivery duly packed at FOR Site (Banharpalli Odisha) including freight, for the following chain pulley blocks along with 1 Set of Maintenance tools & tackles (as per Annexure-I) and all other accessories in line with drawings/ documents/ test procedures approved by BHEL/Customer for the total scope given below and technical parameters as per technical specification PE-TS-391-563-A001 taking into account all clarifications, confirmations and agreements till date	1 LOT							
1.1	One (1) chain pulley block with travelling trolley of 1T capacity 8 M lift for Oil Barrel Handling in Central Lube oil System At EL +0.0 M (Straight path).	1 No.							
1.2	Two (2) chain pulley block with travelling trolley of 1T capacity 4 M lift for Overload Valves Below TG Deck (Straight path).	2 Nos.							
1.3	Two (2) chain pulley block with travelling trolley of 2T capacity 6 M lift for AC Plant for ESP-1 & ESP-2.	2 Nos.							
1.4	Two (2) chain pulley block without travelling trolley of 2T capacity 13 M lift for General Purpose Maintenance for TG Building.	2 Nos.							
1.5	Ten (10) chain pulley block without travelling trolley of 1 T capacity 10 M lift for General Purpose Maintenance .	10 Nos.							
1.6	Ten (10) chain pulley block without travelling trolley of 3 T capacity 10 M lift for General Purpose Maintenance .	10 Nos.							
1.7	Eight (8) chain pulley block without travelling trolley of 5 T capacity 10 M lift for General Purpose Maintenance .	8 Nos.							
1.8	Three (3) chain pulley block without travelling trolley of 10 T capacity 10 M lift for General Purpose Maintenance .	3 Nos.							
1.9	Total lumpsum firm price for one set of Maintenance Tools and Tackles as per Annexure I.	1 set							
						(Bidder's Signature with Company Seal)			

ANNEXURE-I

2X660 MW OPGCL IB VALLEY TPS - CHAIN PULLEY BLOCKS **REV 00**

List of Maintenance Tools & Tackles **DATE 07.04.2015**

Sl.no	Description	Unit	Unit Ex-works price	Total ex-works price	ED	CST	FREIGHT	Total
1	2	3	4	5	6	7	8	4 to 8
1	Adjustable spanner	1 Set						
2	Wrench spanner	1 Set						
3	Oil gun	1 No.						
4	Set of Screw driver	Min 6 nos. (of different sizes Suiting different types and capacities of Chain Pulley Blocks)						
5	2 lb hammer with wooden handle	1 No.						
6	Grease Gun	1 No.						
7	Any additional tools and tackles							
	Note: 1) The tools shall be supplied in one tool box							
	2) Any additional tools and tackles required for maintenance shall be supplied.							
	Date: _____							
					Company Seal			
	Bidder's / bidder's representative signature							

DEVIATION SHEET (COST OF WITHDRAWAL)

PROJECT:- 2x660MW OPGCL IB VALLEY TPS

PACKAGE:- Chain Pulley Blocks, SPECIFICATION NO.: PE-TS-391-563-A001

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

SL NO	LME/ SECT	PAGE NO.	CLAUSE NO.	CIFICATION/ TENI	DESCRIPTION OF	WITHDRAWL OF D	HICH COST OF WI	L OF DEVIATION	REASON FOR QUOTING DEVIATION
TECHNICAL DEVIATIONS									
COMMERCIAL DEVIATIONS									

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATIONS	SIGN & DATE	

NOTES:

1. For self manufactured items of bidder, cost of withdrawl of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. For directly dispatchable items, cost of withdrawl of deviation will be applicable on the basic price including taxes, duties & freight.
3. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
4. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
5. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawl of deviation" column of the schedule above along with their Techno-commercial offer, wi
6. Bidder shall furnish price copy of above format along with price bid.
7. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
8. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
9. For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawl of deviation shall be taken as NIL.
10. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
11. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
12. Cost of withdrawl is to be given seperately for each deviation. In no event bidder should club cost of withdrawl of more than one deviation else cost of withdrawl of such deviations which ha
13. In case nature of cost of withdrawl (positive/negative) is not specified it shall be assumed as positive.
14. In case of descrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.