NTPC Limited
(A GOVERNMENT OF INDIA ENTERPRISE)

FEROZE GANDHI UNCHAHAR THERMAL POWER PROJECT STAGE-IV, 1X 500MW

TECHNICAL SPECIFICATION FOR CHAIN PULLEY BLOCK

Specification No. PE-TS-401-563-A001 Rev 00

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERIING MANAGEMENT
NOIDA

	Title	Specification no.: PE-TS-401-563-A001
	TECHNICAL SPECIFICATION FOR CHAIN PULLEY BLOCK 1X500 MW FGUTPP	Rev. 00
		Date: OCT 2014
		Sheet 1 of 1

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Document Management System
Bidder to note that BHEL reserve the right for drg/doc submission through web based Document Management System. 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)".

Bidder to note that wherever "Singrauli" is mentioned in specification, same may please be read as "FGUTPP, Stage- IV"

VOLUME - IIB

SECTION – A

SCOPE OF ENQUIRY

1.0 SCOPE OF INQUIRY

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, demonstration test 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 1x **500 MW FGUTPP STAGE IV**

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 **NTPC** including their consultant as interpreted by BHEL in the relevant context.

VOLUME - IIB

SECTION – B

PROJECT INFORMATION
(PROJECT SPECIFIC)

1.00.00 **BACKGROUND**

Feroze Gandhi Unchahar Thermal Power Station, FGUTPS was conceived as a Load Centre coal based Power Station of 1050 MW capacity by UPSEB. The land for the project was acquired and stage-I (2x210MW) was implemented by UPSEB. The 2x210 MW Unchahar station was taken over by NTPC from Uttar Pradesh Rajya Vidyut Utpadan Nigam of Uttar Pradesh in 1992. Thereafter, NTPC implemented Stage- II (2x210 MW) and Stage-III (1X 210 MW).

The present expansion proposal is to install one additional unit of 500 MW under Stage-IV thus making the ultimate capacity of the FGUTPP 1550 MW.

1.01.00 **LOCATION AND APPROACH**

The plant is located in Raebareli district of Uttar Pradesh, having latitude and longitude of 25°54'50"N and 81°19'50"E respectively. It is bounded by villages Khnapur, Faridpur and Khaliqpur Khurd. Mustafabad town is located at a distance of about 3 Kms from the plant. Unchahar railway station on Allahabad-Raebareli broad gauge (BG) section of Northern Railway (NR) is 2 Kms away. The nearest airport is located at Lucknow a distance of approximately 110 km from the project site.

Vicinity Plan of the project is placed at **Annexure-I**

1.02.00 **LAND REQUIREMENT**

During the implementation of FGUTPS, Stage-I, II & III total area of about 2203 acres of land was acquired. The plant facilities, ash disposal and township for this expansion Stage-IV (1x500 MW) would be accommodated within the available land with dismantling and relocation of some buildings. No additional land has been envisaged to be acquired for this expansion project.

1.03.00 **WATER**

As per agreement between NTPC & Irrigation department, 105 Cusec of water is supplied through S.S Canal to NTPC-Unchahar. The Stage-IV (500MW) consumptive water requirement shall be accommodated within the existing commitment of water to FGUTPP. Sharda sahayak canal and Dalmau Pump House (DPH) on Purwa Branch Canal are available sources of water for the project and therefore, the make up water requirement for the plant is proposed to be drawn from these sources.

1.04.00 **COAL AVAILABILITY AND TRANSPORTATION**

1.04.01 **Coal Availability**

BHEL POWER PROJECTS PRIVATE LIMITED NTPC NBPPL

The coal requirement shall be about 2.7 Million tonnes per year.

The matter has been taken up with Ministry of Coal, Govt. of India for Long Term Coal Linkage for Stage-IV (1x500 MW)..Coal requirement for FGUTPP, Stage-I ,II & III is being met from North Karanpura Coal fields of CCL. For FR purposes, coal from North Karanpura Coal fields of CCL has been considered.

1.04.02 **Coal Transportation**

The envisaged mode of coal transportation from the coal mines to the power plant is by Indian Railways rakes. The rakes shall be unloaded at the track hopper.

1.04.03 **Coal Quality Parameters and Fuel Oil Characteristics**

The Coal quality parameters and Fuel Oil Characteristics are enclosed as **Annexures-II-1 and II-2** to this subsection.

1.05.00 **CAPACITY & POWER EVACUATION**

Stage- I	:	2x210 MW	Under Commercial Operation
Stage-II	:	2x210 MW	Under Commercial Operation
Stage-III	:	1x210 MW	Under Commercial Operation
Stage-IV		1x 500 MW	Present proposal

The existing capacity of plant is 1050 MW Step up/ power evacuation voltage for station is 220 KV. Presently 1000 MW is already being evacuated at 220 KV, addition of another 500 MW at 220 KV may cause overloading of 220 KV systems and lead to increase in fault levels at 220 KV system. Considering this 400 KV has been considered as step-up/power evacuation voltage for Stage-IV. Power Generated from FGUTPP- Stage IV, 500 MW unit would be stepped up to the evacuation voltage level through suitably rated Generator Transformer.

The power generated from Stage-IV is envisaged to be absorbed by Northern Region beneficiaries. For finalisation of Associated Transmission System (ATS) of the project, the matter would be taken up with Power Grid Corporation of India Ltd. (PGCIL)/CEA/appropriate authority depending on the various routes/options of power sale envisaged for the project.

1.06.00 **METEOROLOGICAL DATA**

Important meteorological data from nearest observatory at **Allahabad** is placed at **Annexure - III.**

1.07.00 **PLANT WATER SCHEME**

The Plant water scheme is described below.

1.07.01 **Source of Water**

The source of water for the project is normally from the Allahabad branch canal of the Sharda Sahayak link canal. During the canal closure period, water will be drawn from the Dalmau canal.

1.07.02 **Water Requirement**

Normal Make up water requirement for this project would be about 2000 Cu.M/hr with ash water re-circulation system in operation. However, whenever ash water system needs to be operated in once thru mode, water drawl shall be of the order of 3300 cum/hr.

1.07.03 **Raw Water System**

Raw water shall be drawn from the source by a gravity channel upto raw water pump house located inside the plant. It is envisaged to provide three (3) numbers (3 x 50 % Capacity) of raw water pumps for supplying water to Water PT Plant in the raw water pump house. In addition two (2) numbers (2 x 100% capacity) of pumps shall be provided to supply raw water for ash handling plant which shall be operated as and when required. Separate set of pipelines of carbon steel construction shall be provided from respective raw water pumps to Water treatment plant and Ash Water tanks.

1.07.04 The quality of Raw water and Clarified water is enclosed with this sub-section

1.08.00 **Criteria for Wind Resistant Design of Structures and Equipment**

All structures and equipment of the power plant, including plant auxiliary structures and equipment, shall be designed for wind forces as given in Sub-Section- D-01, Part-B, Section-VI, i.e. Technical Specification for Civil and Structural Works.

1.09.00 **Criteria for Earthquake Resistant Design of Structures and Equipment**

All power plant structures and equipment, including plant auxiliary structures and equipment shall be designed for seismic forces as given in Sub-Section- D-01, Part-B, Section-VI, i.e. Technical Specification for Civil and Structural Works.

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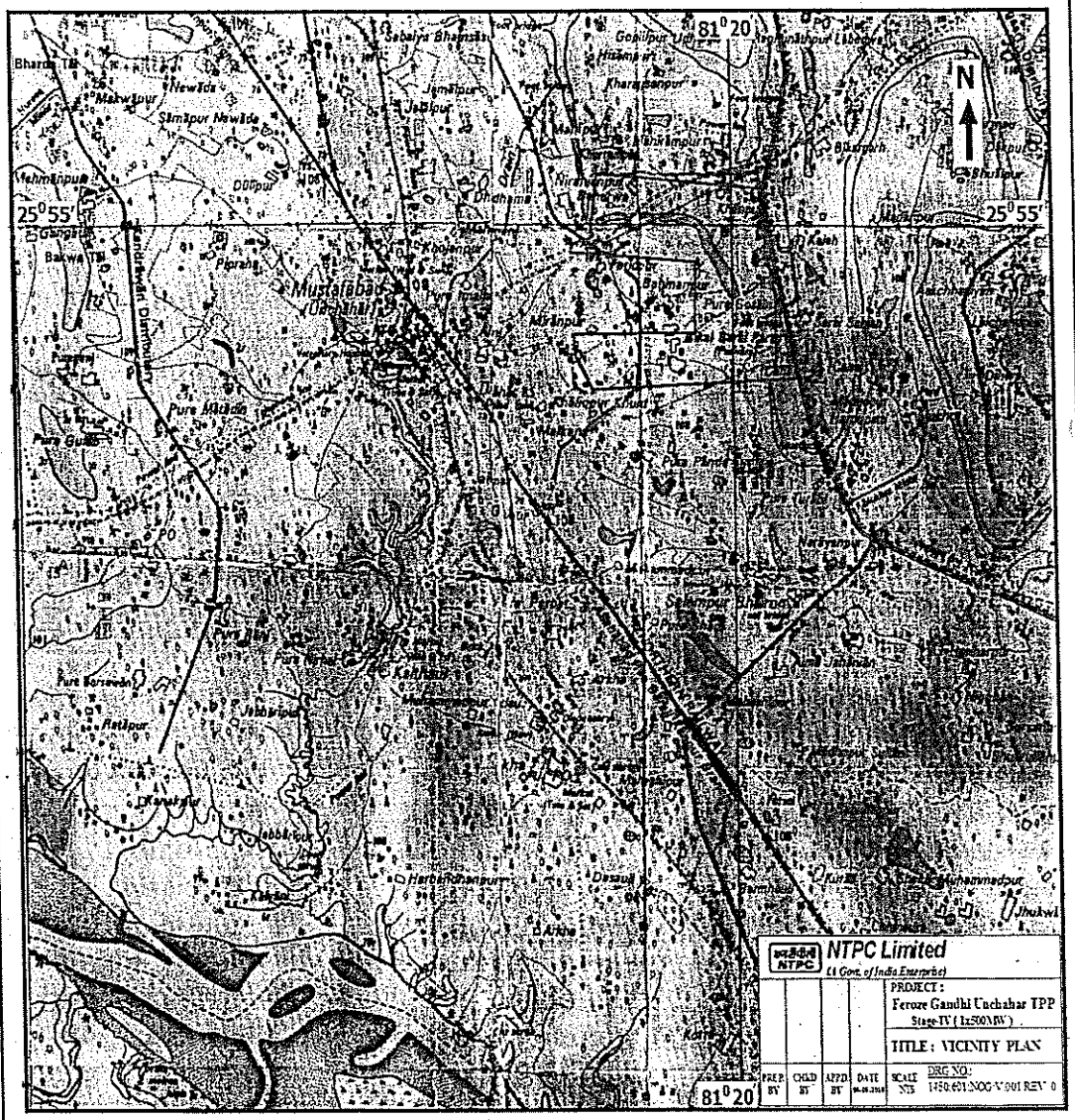
VICINITY PLAN

ANNEXURE- I



CLIMATOLOGICAL TABLE

ANNEXURE-III
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जलवायवी सारणी CLIMATOLOGICAL TABLE

इलाहाबाद / ALLAHABAD — अक्षांश LAT 25°27' N — देशांतर LONG 81°44' E — समुद्री तल माध्य से ऊँचाई HEIGHT ABOVE M.S.L. — मीटर 98 METRES

1951 से 1980 तक के प्रेक्षणों पर आधारित — BASED ON OBSERVATIONS FROM 1951 TO 1980

	स्टेशन का सतह दाब STATION LEVEL PRESSURE (एच.पी.ए. hPa)	वायु तापमान AIR TEMPERATURE — माध्य MEAN: शुष्क बल्ब DRY BULB (°C)	नम बल्ब WET BULB (°C)	दैनिक अधिकतम DAILY MAX (°C)	दैनिक न्यूनतम DAILY MIN (°C)	माह में उच्चतम HIGHEST IN THE MONTH (°C)	माह में निम्नतम LOWEST IN THE MONTH (°C)	चरम EXTREMES: उच्चतम HIGHEST (°C)	दिनांक और वर्ष DATE AND YEAR	निम्नतम LOWEST (°C)	दिनांक और वर्ष DATE AND YEAR	आर्द्रता HUMIDITY: सापेक्ष आर्द्रता RELATIVE HUMIDITY (%)	वाष्प दाब VAPOUR PRESSURE (hPa)	मेघ की मात्रा CLOUD AMOUNT: समस्त मेघ ALL CLOUDS (Oktas of sky)	निम्न मेघ LOW CLOUDS (Oktas of sky)	वर्षा RAINFALL: मासिक योग MONTHLY TOTAL (mm)	वर्षा के दिनों की संख्या NO. OF RAINY DAYS	वर्ष सहित सबसे नम महीने का योग TOTAL IN WETTEST MONTH WITH YEAR (mm)	वर्ष सहित शुष्कतम महीने का योग TOTAL IN DRIEST MONTH WITH YEAR (mm)	24 घंटों की सबसे भारी वर्षा HEAVIEST FALL IN 24 HOURS (mm)	दिनांक और वर्ष DATE AND YEAR	माध्य पवन गति MEAN WIND SPEED (कि.मी. प्र.घं. Kmph)
I	1006.2	12.5	10.6	23.6	8.7	27.9	4.5	31.1	29	2.0	07	78	11.3	2.1	0.7	19.2	1.6	126.0	0.0	70.9	24	3.4
II	1003.1	20.6	16.0						1934		1972	53	12.7	2.0	0.5			1900			1900	
I	1003.8	16.0	12.6	27.2	11.2	32.4	6.1	30.1	27	1.1	02	66	11.9	1.7	0.6	15.6	1.4	103.9	0.0	51.3	11	4.1
II	1000.6	24.8	16.6						1896		1905	40	12.1	1.8	0.6			1920			1898	
I	1000.8	23.0	16.0	33.6	16.5	39.0	10.9	42.5	30	7.2	02	46	12.6	1.8	0.4	9.2	0.9	81.0	0.0	35.5	11	4.8
II	996.9	31.4	18.6						1973		1900	26	10.8	2.0	0.5			1944			1978	
I	996.5	30.2	19.1	39.4	22.5	43.5	17.3	45.1	29	12.7	01	92	13.1	1.5	0.2	5.7	0.6	43.7	0.0	26.6	01	6.9
II	992.3	37.3	20.5						1979		1965	18	10.6	1.9	0.5			1933			1965	
I	991.0	33.6	22.2	42.3	26.7	46.0	22.5	47.0	20	17.2	11	30	17.4	1.4	0.5	9.9	0.7	62.3	0.0	54.0	18	7.0
II	987.4	40.1	22.0						1966		1924	20	13.6	1.5	0.6			1971			1971	
I	986.0	32.8	25.3	40.1	28.5	46.2	24.0	48.8	08	19.4	21	65	25.0	3.8	1.4	85.4	4.4	526.5	0.0	176.0	23	8.0
II	984.2	37.3	25.6						1979		1930	41	23.2	4.2	2.1			1916			1916	
I	988.0	29.2	26.4	34.1	26.4	39.3	23.5	45.6	01	22.0	22	80	32.1	6.4	3.6	300.1	12.8	702.1	26.2	229.4	15	7.4
II	985.0	31.5	27.0						1901		1975	71	32.0	6.5	3.7			1925	1918		1963	
I	989.7	28.3	26.3	32.7	25.7	36.5	23.6	42.7	03	21.1	23	85	32.5	6.6	3.9	307.6	14.4	914.7	53.3	335.3	20	6.2
II	986.5	30.2	26.9						1972		1953	77	32.7	6.6	3.8			1953	1883		1953	
I	993.0	28.2	25.5	33.2	24.7	36.2	22.3	39.6	11	18.3	22	80	30.4	4.8	2.8	189.6	8.7	781.5	0.5	266.2	04	5.7
II	990.6	30.4	26.1						1960		1912	71	30.4	5.0	2.9			1970	1907		1936	
I	1000.0	25.9	21.6	33.1	20.5	35.8	15.9	40.6	03	11.7	31	69	23.1	1.9	0.8	40.1	2.2	576.8	0.0	160.3	04	3.4
II	996.7	29.7	22.9						1898		1898	55	22.5	2.0	1.0			1894			1894	
I	1004.0	19.8	15.8	29.7	13.8	32.7	9.6	35.9	07	5.6	30	65	15.0	1.3	0.2	11.7	0.5	110.1	0.0	96.0	01	2.4
II	1001.4	25.2	18.4						1965		1941	49	15.8	1.4	0.3			1956			1956	
I	1006.6	14.0	11.7	24.8	9.3	28.4	6.3	31.1	02	-0.7	26	75	12.1	1.8	0.3	3.4	0.6	60.3	0.0	54.6	11	2.6
II	1003.6	20.7	15.6						1946		1961	50	13.8	1.7	0.3			1885			1886	
I	997.6	24.5	19.4	32.0	19.5	48.1	3.8	48.8		-0.7		64	19.8	2.8	1.3	1017.7	48.8	1935.5	410.5	335.3		* 6.1
II	994.0	29.9	21.3									40	19.2	3.1	1.4			1894	1968			
I	30	30	30	30	30	30	30	100		100		30	30	30	21	29	29	99	99	99		24
II	30	30	30									30	30	30	21							

CLIMATOLOGICAL TABLE

ANNEXURE-III
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जलवायवी सारणी
CLIMATOLOGICAL TABLE

स्टेशन : इलाहाबाद
STATION : Allahabad

मास MONTH		मौसम परिघटना WEATHER PHENOMENA — No. OF DAYS WITH: PPT 0.3mm or more	HAIL	THUNDER	FOG	DUST STORM	SQUALL	पवन WIND — No. OF DAYS WITH WIND SPEED (Km. p. h.): 62 or more	20-61	1-19	0	PERCENTAGE No. OF DAYS WIND FROM: N	NE	E	SE	S	SW	W	NW	CALM	मेघ CLOUD — No. OF DAYS WITH CLOUD AMOUNT (ALL CLOUDS) OKTAS: 0	T-2	3-5	6-7	8	No. OF DAYS WITH LOW CLOUD AMOUNT OKTAS: 0	T-2	3-5	6-7	8	FOG 8	दृश्यता VISIBILITY — No. OF DAYS WITH VISIBILITY: UP TO 1 Km	1-4 Kms	4-10 Kms	10-20 Kms	OVER 20 Kms
जनवरी JAN	I	3.0	0.2	1.3	4.5	0.1	0.1	0	0	19	12	2	5	9	4	5	10	25	3	31	16	5	4	3	3	26	2	2	1	1	0	1.8	12.7	14.8	0.5	1.2
	II							0	0	18	13	8	11	6	2	0	1	21	16	35	15	7	4	4	1	24	4	2	1	0	0	0.1	2.0	26.0	2.0	0.0
फरवरी FEB	I	2.8	0.1	2.3	1.3	0.0	0.2	0	0	19	9	4	4	6	4	4	10	29	5	26	16	4	4	3	1	23	2	2	1	0	0	0.6	6.3	20.7	0.4	0.0
	II							0	1	22	5	0	9	5	1	2	2	31	26	16	15	5	4	3	1	22	3	2	1	0	0	0.0	1.3	20.3	5.2	1.2
मार्च MAR	I	1.7	0.0	2.9	0.1	0.4	0.7	0	1	25	5	4	4	8	5	6	19	30	7	15	16	6	5	3	1	26	3	2	0	0	0	0.0	2.0	27.0	2.0	0.0
	II							0	2	26	3	12	6	3	1	1	2	29	38	8	14	6	5	5	1	25	4	2	0	0	0	0.0	1.3	21.0	0.7	0.0
अप्रैल APR	I	1.0	0.1	2.3	0.0	0.9	0.4	0	2	24	4	2	6	10	6	8	16	32	10	11	18	5	4	3	0	27	2	1	0	0	0	0.0	3.0	24.7	2.3	0.0
	II							0	4	24	2	13	8	3	1	1	2	26	45	2	15	8	5	3	1	23	6	2	0	0	0	0.0	1.0	22.5	5.0	0.6
मई MAY	I	1.3	0.0	2.7	0.0	1.5	0.5	0	2	24	5	8	10	19	8	6	9	27	9	11	18	6	4	3	0	26	3	2	0	0	0	0.0	3.7	22.5	3.6	1.2
	II							0	3	26	2	18	15	5	1	2	3	18	30	2	9	10	6	4	2	20	6	5	0	0	0	0.1	3.6	23.8	3.5	0.0
जून JUN	I	6.5	0.0	0.0	0.0	2.7	1.1	0	4	23	3	3	11	21	0	5	12	25	9	0	7	5	7	7	4	15	7	5	2	1	0	0.1	2.2	24.7	3.0	0.0
	II							0	5	24	1	12	19	14	3	3	6	18	21	4	0	4	10	11	5	10	9	10	1	0	0	0.3	3.1	23.1	3.5	0.0
जुलाई JUL	I	16.8	0.0	12.0	0.0	0.2	0.4	0	3	25	3	2	8	23	6	10	17	21	4	9	0	2	6	13	11	5	7	11	7	1	0	0.0	0.9	24.5	5.6	0.0
	II							0	2	25	4	5	12	10	6	8	13	20	8	10	0	1	5	16	9	1	7	17	5	1	0	0.2	1.8	22.1	0.9	0.0
अगस्त AUG	I	18.2	0.0	12.0	0.0	0.5	0.4	0	2	25	4	2	9	23	7	7	12	19	6	15	0	1	4	15	11	4	5	12	9	1	0	0.0	1.3	23.1	6.4	0.2
	II							0	1	26	5	7	14	17	4	6	9	23	8	13	1	0	5	16	8	1	7	17	5	1	0	0.0	0.9	19.6	10.4	0.1
सितम्बर SEP	I	11.5	0.0	8.4	0.1	0.0	0.6	0	2	24	4	4	9	20	0	6	11	23	7	14	4	4	6	10	6	9	6	8	6	1	0	0.0	0.8	21.7	7.3	0.2
	II							0	1	22	7	10	13	16	3	2	6	17	15	16	2	4	8	11	5	3	10	12	4	1	0	0.0	0.8	17.5	10.6	1.1
अक्तूबर OCT	I	3.5	0.0	2.7	0.4	0.1	0.2	0	0	20	11	3	7	10	8	8	10	20	6	32	16	6	4	3	2	24	3	3	1	0	0	0.0	1.2	23.7	6.1	0.0
	II							0	1	14	16	11	9	7	1	0	2	7	14	49	12	9	5	3	2	16	10	4	1	0	0	0.0	0.2	21.2	8.9	0.7
नवम्बर NOV	I	0.8	0.0	0.2	0.4	0.0	0.0	0	0	15	15	2	3	3	3	3	11	28	5	42	19	5	3	2	1	28	1	1	0	0	0	0.0	7.6	21.5	0.9	0.0
	II							0	0	10	20	9	4	2	0	0	0	8	12	65	17	7	3	2	1	27	2	1	0	0	0	0.0	1.3	26.5	2.2	0.0
दिसम्बर DEC	I	0.9	0.0	0.4	3.7	0.0	0.0	0	0	17	14	1	2	6	2	3	13	29	3	42	19	5	3	3	1	29	1	1	0	0	0	1.3	15.7	13.0	0.1	0.0
	II							0	0	10	21	0	8	4	0	0	0	12	9	63	16	7	4	3	1	28	2	1	0	0	0	0.0	2.9	25.0	2.2	0.0
वार्षिक योग या माध्य ANNUAL TOTAL OR MEAN	I	68.0	0.4	55.2	10.5	6.4	4.6	0	16	260	89	3	6	13	5	6	14	26	6	21	149	64	53	68	41	241	42	50	27	5	0	3.8	67.4	282.0	38.2	2.0
	II							0	20	246	99	10	11	8	2	2	4	19	21	23	118	68	64	81	38	200	69	75	18	3	0	0.7	21.1	270.4	69.1	3.7
वर्षों की सं. NUMBER OF YEARS	I	26						24				30									27					27						27				
	II							24				30									27					27						27				

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VOLUME - IIB

SECTION – C

SCOPE OF WORK

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. Packaging.
d. O&M manuals, drawings and documents etc.
e. 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 inspection & testing requirement / 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

a. Over load test
b. Rated load test
c. 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)

Note: All maintenance tools & tackles are to be supplied in a tool box.

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.

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.
Hook	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 attached painting specification

11.00 Packing

In general packing shall be wooden box packing.

SCOPE OF CHAIN PULLEY BLOCKS

ANNEXURE-1

A	Chain pulley blocks (CPB)					
Sl no.	Area description	Type	QTY.	CAPACITY (T)	LIFT (M)	Remark
1	TG BUILDING MAINTENANCE (GENERAL PURPOSE)	CPB with TT	1	1	9	
2	TG BUILDING MAINTENANCE (GENERAL PURPOSE)	CPB without TT	2	2	9	
3	For handling oil barrel in lube oil unloading	CPB with TT	1	1	9	

	MANUFACTURER'S NAME & ADDRESS :	**MANUFACTURING QUALITY PLAN** **ITEM :** Chain Pulley Block **QP No.:** PE-TS-401-563-A001 **REV**.:0, **Date.: OCT 2014, PAGE**: 1 OF 4	**PROJECT : 1X500 MW FGUTPP** **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

	MANUFACTURER'S NAME & ADDRESS :	**MANUFACTURING QUALITY PLAN** **ITEM :** Chain Pulley Block **QP No.:** PE-TS-401-563-A001 **REV**.:0, **Date.: OCT 2014, PAGE**: 2 OF 4	**PROJECT : 1X500 MW FGUTPP** **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.
1.4.	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		
SIGNATURE		REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY & SEAL

	MANUFACTURER'S NAME & ADDRESS :	**MANUFACTURING QUALITY PLAN** **ITEM :** Chain Pulley Block **QP No.:** PE-TS-401-563-A001 **REV**.:0, **Date.: OCT 2014, PAGE**: 3 OF 4	**PROJECT : 1X500 MW FGUTPP** **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.
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	
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

	MANUFACTURER'S NAME & ADDRESS :	**MANUFACTURING QUALITY PLAN** **ITEM :** Chain Pulley Block **QP No.:** PE-TS-401-563-A001 **REV**.:0, **Date.: OCT 2014, PAGE**: 4 OF 4	**PROJECT : 1X500 MW FGUTPP** **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.
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

CLAUSE NO.	QUALITY ASSURANCE	एनटीपीसी NTPC

OTHER CRANES AND HOISTS

1.00.00	**OTHER CRANES & HOIST**
1.01.00	HOOKS :
1.01.01	All Tests including proof load test as per relevant IS shall be carried out.
1.01.02	MPI / DPT shall be done after proof load test.
1.02.00	STEEL CASTINGS :
1.02.01	DPT on machined surface shall be carried out.
1.03.00	GIRDERS, END CARRIAGE, CRAB, GEAR-BOX AND ROPE DRUM
1.03.01	The plates of thickness 25mm and above shall be ultrasonically tested.
1.03.02	NDT requirements on weldments shall be as follows
	(a.) Butt welds in tension:- 100% RT & 100% DPT
	(b.) Butt welds in compression:- 10% RT & 100% DPT
	(c.) Butt weld in rope drum:- 100% RT & 100% DPT
	(d.) Fillet welds:- random 10% DPT
1.04.00	Forgings (Wheel, Gears, Pinions, Axles, Hooks & Hook Trunion)
1.04.01	All forgings greater than or equal to 50mm dia. or thickness shall be subjected to Ultrasonic Testing
1.04.02	DPT/MPI shall be done after hardfacing and machining
1.05.00	Wire Rope shall be tested as per relevant standard
1.06.00	Reduction Gears shall be tested for reduction ratio, backlash & contact pattern. Gear Box shall be subjected to No load run test to check for oil leakage, temp. rise, noise and vibration
1.07.00	The cranes shall be completely assembled at shop for final testing. All tests for dimension, deflection, load, overload, hoisting motion, cross travel etc. as per IS-3177 shall be carried out at shop
1.08.00	All Electric Hoist shall be tested as per IS-3938 and Chain Pulley Blocks shall be tested as per IS-3832.

ANNEXUE – IV

PAINTING SPECIFICATION

CLAUSE NO.	TECHNICAL REQUIREMENTS एनटीपीसी NTPC
17.03.00	Unless specified otherwise, paint shall not be applied to surfaces of insulation, surfaces of stainless steel/nickel/ copper/brass/ monel/ aluminum/ hastelloy/lead/ galvanized steel items, valve stem, pump rods, shafts, gauges, bearing and contact surfaces, lined or clad surfaces.
17.04.00	All pipelines shall be Colour coded for identification as per the NTPC Colour-coding scheme, which will be furnished to the contractor during detailed engineering..
17.05.00	**SURFACE PREPARATION**
17.05.01	All surfaces to be painted shall be thoroughly cleaned of oil, grease and other foreign matter. Surfaces shall be free of moisture and contamination from chemicals and solvents.
17.05.02	The following surface schemes are envisaged here. Depending upon requirement any one or a combination of these schemes may be used for surface preparation before application of primer. SP1 Solvent cleaning SP2 Application of rust converter (Ruskil or equivalent grade) SP3 Power tool cleaning SP4 Shot blasting (shot blasting shall be used as surface preparation method for hot worked pipes prior to application of primer) SP4* Shot blast cleaning/ abrasive blast cleaning to SA21/2 (near white metal) 35-50 microns SP5 Phosphating SP6 Emery sheet cleaning/Manual wire brush cleaning.
17.06.00	**APPLICATION OF PRIMER/PAINT**
17.06.01	The paint/primer manufacturer's instructions covering thinning, mixing, method of application, handling and drying time shall be strictly followed and considered as part of this specification. The Dry film thickness (DFT) of primer/paint shall be as specified herein.
17.06.02	Surfaces prepared as per the surface preparation scheme indicated herein shall be applied with primer paint within 6 hours after preparation of surfaces.

CLAUSE NO.	TECHNICAL REQUIREMENTS	एनटीपीसी NTPC
17.06.03	Where primer coat has been applied in the shop, the primer coat shall be carefully examined, cleaned and spot primed with one coat of the primer before applying intermediate and finish coats. When the primer coat has not been applied in the shop, primer coat shall be applied by brushing, rolling or spraying on the same day as the surface is prepared. Primer coat shall be applied prior to intermediate and finish coats.	
17.06.04	Steel surfaces that will be concealed by building walls shall be primed and finish painted before the floor is erected. Tops of structural steel members that will be covered by grating shall be primed and finish painted before the grating is permanently secured.	
17.06.05	Following are the Primer/painting schemes envisaged herein: PS3 - Zinc Chrome Primer (Alkyd base) by brush/Spray to IS104. PS3* - Zinc Chrome primer (Alkyd base) by dip coat. PS4 - Synthetic Enamel (long oil alkyd) to IS2932. PS5 - Red oxide zinc phosphate to IS-12744. PS9 - Aluminum paint to IS 2339. PS9* - Heat resistant Aluminum paint to IS-13183 Gr.-I (for temperature above 400 °C) and to IS-13183 Gr.-II (for temperature 200 °C - 400 °C) PS13 - Rust preventive fluid by spray, dip or brush. PS14 - Weldable primer-Deoxaluminate or equivalent. PS16 - High Build Epoxy CDC mastic `15'. PS17 - Aliphatic Acrylic Polyurethane CDE134 ,%V=40.0(min.) PS18 - Epoxy based TiO2 pigmented coat PS19 - Epoxy based Zinc phosphate primer (92% zinc in dry film (min.), %VS=35.0(min.). PS20 - Epoxy based finish paint.	

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CLAUSE NO.	TECHNICAL REQUIREMENTS
17.06.06	All weld edge preparation for site welding shall be applied with one coat of weldable primer.
17.06.07	For internal protection of pipes/tubes, VCI pellets shall be used at both ends after sponge testing and ends capped. VCI pellets shall not be used for SS components and composite assemblies.

17.07.00 **Primer/Painting Schedule**

Sl. No	Description		Surface Preparation	Primer Coat			Intermediate Coat			Finish Coats			Total Min. Painting DFT (Microns)	Colour Shade
				System	Coat	Min. DFT / coat (Microns)	System	Coat	Min. DFT/ Coat (Microns)	System	Coat	Min. DFT/ Coat (Microns)		
1.	**All insulated Pipings**, fittings/ components, Pipe clamps, Vessels/Tanks, Equipments etc.		SP3/SP4	PS 5	2	25	-	-	-	PS-4	01	25	75	As per NTPC Colour shade/ coding scheme
2.	**All un-insulated Piping,** fittings/ components, Pipe clamps, Vessels/Tanks, Equipments etc.	Design temperature <60 °C	SP3/SP4	PS 5	2	25	-	-	-	PS 4	3 $	35 $	155 $	
		Design temperature 60 °C-200 °C	SP3/SP4	PS 9	1	20				PS 9	1	20	40	
		Design temperature > 200 °C	SP3/SP4	PS9*	1	20	-	-	-	PS9*	1	20	40	
3	Constant Load **Hanger** (CLH), Variable Load Hanger (VLH) and other supports		SP4*	PS19	1	40	-	-	-	PS17	1	30	70	
4.	**Valves**													
	Cast /Forged	Design temperature <95 °C	SP1/SP2/SP 3	PS9	1.	20	-	-	-	PS9	1	20	40	
		Design temperature 95 °C-200 °C	SP1/SP2/SP 3	PS9	1	20	-	-	-	PS9	1	20	40	
		Design temperature > 200 °C	SP1/SP2/SP 3	PS9*	1	20				PS9*	1	20	40	
5.	All Structural Steel components	Outside TG building and in SG envelope	SP4*	Inorganic Ethyl Zinc Silicate	1	75	PS18	1	75	a))Epoxy coat b)Final coat of paint PS17	2 1	35 30	250	

		Within TG building	SP4*	-do-	1	35	PS18	1	35	a))Epoxy coat b)Final coat of paint PS17	2 1	25 30	150	
6.	Weld Edges		SP6 (Hand cleaning by wire brushing)	PS13 (Weldable primer)	1	25	-	-	-	-	-	-	-	
$ The first 2 finished coats (total min.DFT of 70 microns) shall be done at shop and the 3rd finish coat (min.DFT 35 Microns) shall be applied at site.														

15.00.00Testing Requirements:

The detailed testing requirements for power cycle piping and its components are given in the subsection for Quality Assurance(QA) .The requirements pertaining to testing given in this subsection if in variance with that given in QA subsection, then the more stringent of the two shall be followed.

SECTION – D

GENERAL TECHNICAL REQUIREMENTS

GENERAL

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

CODES AND STANDARDS

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

IS: 3832	Specification for hand operated chain pulley block.
IS 807:1976	Codes of Practice for Design, Manufacture, Erection and Testing (Structural Portion) of cranes and hoists.
IS: 3109(Part II)	Calibrated load chain for pulley blocks and other lifting appliances
IS: 2429(Part II)	Calibrated hand chain for pulley blocks and other lifting appliances
IS: 4460	Method for rating of machine cut spur and helical gears
IS 6216 :1982	Short Link Chain, Grade T (8), Calibrated for Pulley Blocks and other Lifting Appliances
IS:15560: 2005	Point Hooks with Shank up to 160 Tonne - Specification

EQUIPMENT

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.

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.

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

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.

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

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.

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

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

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.

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.

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.

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

DATA SHEET-A

1.00.0	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)	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
c)	Hand Chain	:	
i)	Type	:	Link type
ii)	Material	:	Mild steel (grade 30) as per IS 2429 Part I
d)	Load Hook & Hook Block	:	
i)	Type of load hook	:	Plain shank- Trapezoidal section
ii)	Load hooks conforms to:		IS: 15560
iii)	Type of hook suspension	:	Swiveling
iv)	Type of make of bearing of hook suspension	:	Thrust ball bearing
e)	Gears / pinion	:	
i)	Type	:	Spur / Helical
ii)	Material	:	Alloy steel / carbon steel
iii)	Type of bearing used		: Antifriction ball bearing / Roller
f)	Sprockets		
i)	Type of bearings used	:	Antifriction ball bearing / Roller
g)	Method of lubrications Used		
i)	Bearings	:	Grease
ii)	Gearing & Pinions	:	Grease
iii)	Sprockets	:	Grease

h) Brakes :

i) Type : Screw and friction disc type

6.00.0 Trolley & Bridge Drive

a) Trolley

i) Type : Geared (Manually operated)

ii) Material of frame : Rolled structural 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 : As per IS 3832

iv) Type of bearings need : Antifriction

d) Gears/ Pinions

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 : As per IS 3832

g) Hand chain wheel

i) Material : As per IS 3832

Annexure- V

Master drawing list and submission schedule

Sl. No.	BHEL DRG.NO	DRAWING TITLE	REMARKS	SUBMISSION SCHEDULE - WEEK NUMBER FROM DATE OF P.O
1	PE-V0-401-563-A200	Manufacturing Quality Plan	INFORMATION	2
2	PE-V0-401-563-A201	GA Drawing for Chain Pulley Block with detail BOM with painting details	INFORMATION	2
3	PE-V0-401-563-A202	O & M Manual	INFORMATION	4
4	PE-V0-401-563-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.		

Note:
1.0 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.

CLAUSE NO.

ANNEXURE- V
Part of specification PE-TS-401-563-A001

S.NO	DESCRIPTION OF DOCUMENTS		NO OF PRINTS	NO. OF CD-ROMs
1.	PLANT DEFINITION MANUAL		2 Sets	4 CD-ROMs
2.	Drawings "FOR APPROVAL"			
	i) Layout drawings / P&IDs		6	2 CD – ROMs
	ii) Other drawings		2	2 CD - ROMs
3.	Drawings "FOR INFORMATION"		2	2 CD – ROMs
4.	Drawings "FINAL DRAWING"		15	4 CD-ROMs
5.	Drawings "AS BUILT "		15	4 CD-ROMs
6	DATASHEETS, DESIGN CALCULATIONS, PURCHASE SPECIFICATIONS, etc. and Other type of documents			
	(i)	For Approval	2	2 CD – ROMs
	(ii)	FINAL	15	4 CD-ROMs
	(iii)	Analysis reports of equipments/ piping/ structures components/ systems employing software packages as detailed in the specifications	2	2 CD - ROMs
7.	Erection manual "1st Submission"		4 Sets	2 CD – ROMs
8	Erection manual "FINAL"		4 Sets	4 CD ROMs
9	Operation & Maintenance manual "1st submission"		4 Sets	2 CD - ROMs
10	Operation & Maintenance manual "FINAL"		4 Sets	4 CD-ROMs
11	Plant Hand Book "1st Submission"		4 Sets	2 CD ROMs
12	Plant Hand Book "FINAL"		4 Sets	4 CD ROMs
13	Commissioning and Performance Procedure manual "1st Submission"		4 Sets	2 CD-ROMs
14	Commissioning and Performance Procedure manual "FINAL"		4 Sets	4 CD ROMs

S.NO	DESCRIPTION OF DOCUMENTS		NO OF PRINTS	NO. OF CD-ROMs
15	Performance and Functional GURANTEES TEST REPORT		4 Sets	4 CD ROMs
16	Project completion report		15	4 CD ROMs
17	QA programme including Organisation for implementation and QA system manual (with revision-servicing)		1	1 CD ROM
18	Vendor details in respect of proposed vendors including contractor's evaluation report.		1	1 CD ROM
19	Manufacturing QPs, Field QPs, Field welding schedules and their reference documents like test procedures, WPS, PQR etc.			
	(i)	For review/comment	2	2 CD-ROMs
	(ii)	For final approval	2	2 CD ROMs
20	Welding Manual, Heat Treatment Manuals, Storage & preservation manuals			
	1st Submission		4 Sets	2 CD ROMs
	Final		4 Sets	4 CD ROMs
21	QA Documentation Package for items / equipment manufactured and despatched to site		2 Sets	4 CD ROMs
22	QA Documentation Package for field activities on equipment / systems at site		2 Sets	4 CD ROMS

PRE-BID CLARIFICATION SCHEDULE

S. No.	Section/Clause /Page No.	Statement of the referred clause	Clarification Required

The bidder hereby certifies that above mentioned are the only clarifications required on the technical specification for the subject package.

SIGNATURE: _____

NAME: _____

DESIGNATION: _____

COMPANY: _____

DATE: _____

COMPANY SEAL

VOLUME III
DEVIATION SHEET (COST OF WITHDRAWAL)

PROJECT:- 1X500 MW FGUTPP (STAGE IV)

PACKAGE:- Chain Pulley Blocks, SPECIFICATION NO.: PE-TS-401-563-A001

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWL OF DEVIATION (POSITIVE/ NEGATIVE)	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, wherever applicable.
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 have been clubbed together shall be considered as NIL.
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.

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.

f) 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.

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

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

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

j) 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.

k) 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.

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

m) 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.

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.