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**TECHNICAL SPECIFICATION**  
**FOR**  
**MODIFICATION OF GIRDER FOR 5T EOT CRANE**

<b>PROJECT</b>	<b>CAPTIVE POWER PLANT(CPP) PACKAGE, VISAKH REFINERY MODERNIZATION PROJECT (VRMP), JOB No. B016</b>
<b>CUSTOMER</b>	<b>HINDUSTAN PETROLEUM CORPORATION LIMITED (HPCL), VIZAG</b>
<b>CONSULTANT</b>	<b>ENGINEERS INDIA LIMITED (EIL), NEW DELHI</b>

Ref. Doc

Revisions :00

Refer to record of  
revisions:

Prepared :

GIRISH

Checked


SBN


Approved :

MSSN

Date :

13.07.22

TD-106-2 Rev No. 5	Form No.	 <b>HYDERABAD</b>	<b>PRODUCT STANDARD</b> <b>BHEL, HYDERABAD -32.</b> <b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b>	<b>PY51859</b> Rev No. 00 Page 2 of 7
<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;"> <b>COPYRIGHT AND CONFIDENTIAL</b>  The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED .  It must not be used directly or indirectly in any way detrimental to the interest of the company. </div> <div style="flex-grow: 1;"> <p><b>1) INTENT OF SPECIFICATION</b></p> <p>The Specification is intended to cover Design, Engineering, Fabrication, Assembly &amp; Inspection and Testing at vendor's or sub-vendor's works or BHEL works or Site (as applicable), painting, proper packing and forwarding, shipment &amp; delivery at site, as applicable, for the items defined under the Scope of Supply of this specification.</p> <p><b>2) TECHNICAL DETAILS &amp; PRESENT STATUS :</b></p> <p>The scope of this specification is pertaining to 5T EOT crane proposed for DG Hall Building at VRMP project at HPCL Vizag site.</p> <p>Following are the technical details for the EOT crane supplied to this project:</p> <ul style="list-style-type: none"> <li>• Crane Capacity : 5 T</li> <li>• Type of Crane : Double-Girder EOT Crane</li> <li>• Span and Lift : 15m Span, 8.5 m Lift</li> <li>• EOT Supplier : M/s Mangla Hoists Pvt. Ltd., Noida</li> <li>• BHEL PO Details : T718A00363 (Sl.No.00040), Dt. 14.12.18</li> <li>• Type of Girder : Box type</li> <li>• MOC of Crane Girder : IS-2062, E250 B/R</li> </ul> <p>Please refer to <b>Annexure-I</b> for Project Details, Drawing &amp; Datasheet of existing EOT crane.</p> <p>At present, this crane is not yet erected and the material is available in stores located in BHEL-Vizag.</p> <p><b>3) SCOPE OF SUPPLY:</b></p> <p>The required nature of work in this specification is in two parts, as elaborated below.</p> <p><b>(i) <u>Modification of Existing Girder :</u></b></p> <p>Existing Girder is of span 15m (distance between LT wheels on either side). However, as per the present site requirement, the same has to be extended to 15.3m, ie., length of the girder to be increased by 0.3 length.</p> <p>The bidder has to include in their scope of supply the necessary modification in order to meet the above requirement.</p> </div> </div>				
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<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		<ul style="list-style-type: none"> <li>• The bidder shall follow proven procedure for the modification works and shall comply with the Applicable Design Codes &amp; Specifications [Latest revision of the standards as on the date of enquiry shall be applicable.]   ie., <b>IS:3177</b> - Code of Practice for Electric Overhead Travelling Cranes and Gantry Cranes other than Steel Work Cranes  <b>IS:807</b> - Design, Erection and Testing (Structural Portion) of Cranes and Hoists.  <b>IS:3443:</b> Specification for Crane Rail Sections</li> <li>• Bidder to specify the typical procedure / scheme / arrangement proposed for the modification in the offer.</li> <li>• Bidder shall perform analysis and load sizing calculations with the proposed modification, in order evaluate the suitability of the girder for the designed capacity of 5T, as per IS-3177 / IS-807 standard and to be submitted prior to the modifications for approval of purchaser during post-order stage. Any further details required by the purchaser in order to accept proposed modifications shall also be submitted.</li> <li>• All the items such as rail (for crab trolley movement) etc. which also may need extension alongwith the girder, shall also be included in the bidder's scope.</li> <li>• Due care to be taken by the bidder that all the fittings / associated items such as rail, motors etc fitted onto the existing girder shall not be damaged. In case of any damage to these items, to be repaired / replaced by the bidder so that its functionality is restored.</li> <li>• In case bidder has to disassemble / detach any of the fittings to the girder for carrying out the modification, the same shall be done by the bidder and those items to re-assembled back to the girder after modification. Any fittings / fasteners required to re-assemble, to be arranged by bidder.</li> <li>• Bidder may visit to our stores in order to acquaint himself about the condition and available material of the crane and girder.</li> <li>• The necessary material, consumables, tools &amp; tackles, modification works, painting after modification, applicable inspection &amp; testing shall be <b>part of the bidder's scope in ALL of the below proposed options.</b> Only the location of modification works &amp; manpower shall be as per Options below.</li> </ul>		
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**BHEL, HYDERABAD -32.**  
**PROJECT ENGINEERING & SYSTEMS DIVISION**

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Bidder shall submit the offer in the following options

(a) **Option-1 :**

- The modification works to be done **at purchaser's works (ie, BHEL-HPVP Vizag factory).**
- **The modification works to be done by bidder's personnel.** Competent and experienced personnel to be arranged by bidder. BHEL shall provide only the factory facilities for the proposed modification works, such as machinery, space, electricity etc.
- Movement of the girder from stores to shop/ factory and back will be arranged by purchaser.

(b) **Option-2 :**

- The modification works to be done **at purchaser's works (ie, BHEL-HPVP Vizag factory).**
- **Modification works will be done by BHEL personnel under the supervision of bidder's personnel** as per the proposed design of the bidder. Bidder shall depute competent and experienced personnel for the same.
- Movement of the material from stores to shop/ factory and back will be arranged by purchaser.

(c) **Option-3 :**


- The modification works to be done at Bidder's works by the resources of bidder.
- The transport of the material from our stores to bidder's works and back to be considered in bidder's scope.
- The material shall properly be packed for the transport of the material. The Packing & Forwarding (P&F) is in bidder's scope.

The facilities required at purchaser's works (for Options 1 &2) shall be mentioned in the offer.

The further details / requirements to be mutually discussed based on the proposed modifications.

(ii) **E&C of EOT Crane :**

The EOT crane is to be erected in DG Hall building in the project site. Bidder's scope includes complete Erection & Commissioning of the EOT crane alongwith Girder, modified as per the above clause. The necessary tools & tackles to be carried by the bidder to the site.

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<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p>The commissioning has to be performed alongwith necessary tests including load test as per applicable IS-3177 codes. Quality plan for the same to be submitted by the bidder and will be reviewed &amp; finalized by the purchaser during post-order stage.</p> <p>The movement of the crane material from the stores to the site, material handling facilities required during E&amp;C, other utilities such as electricity required for E&amp;C are in the scope of the purchaser.</p> <p>The bidder to depute well experienced and competent engineers to the site for this activity.</p> <p>Complete BoM (Bill of Material) of the EOT crane alongwith Girder (modified by the bidder) will be arranged by the purchaser. The list of BoM and the other details will be furnished during post-order stage. The condition, adequacy &amp; suitability of the available material for carrying out E&amp;C shall be assessed by the vendor and to be discussed mutually with the purchaser.</p> <p><b><u>Bidder to note that Purchaser may place order either for Cl.No.3(i) alone OR both of the above (Cl.No.3(i) &amp; 3(ii)).</u></b> The details of the evaluation may please be referred in Price Bid Format (<b>Annexure-II</b>).</p> <p>Bidder shall also comply with the requirements, relevant to this scope, specified in Customer's specification (enclosed as <b>Annexure-IV</b>).</p> <p><b>4) TESTING :</b></p> <p>Inspection and testing of the supplied components &amp; materials used, as applicable for the proposed modification works, shall be carried out by the vendor at their works / BHEL Works as specified in each option above, inline with Customer approved QAP of earlier supplied EOT crane (Copy is enclosed herewith as <b>Annexure-III</b> and Test certificates shall be furnished to BHEL). The applicable clauses are marked with red in QAP.</p> <p><b>5) PRICE BID-FORMAT:</b></p> <p>Bidder shall mandatorily quote price as per the Price Bid Format enclosed as <b>Annexure-II without any deviations.</b></p> <p><b>6) QUALIFICATION CRITERIA:</b></p> <p>Bidder shall meet the qualification requirement specified in NIT.</p>		
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Any documents, other than those specified in PQC, necessary in order to understand the case and evaluate the bidder's qualification may be asked by the purchaser during the evaluation of the offer.

## 7) DOCUMENT SUBMISSIONS :

After award of the contract, bidder shall submit the documents (such as Modification drawings, Quality Plan / List of Inspections etc) at the earliest, not later than 4 days from PO date.

## 8) LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER:

Bidder **must submit the following documents** and information along with their technical bid so as to enable BHEL to evaluate their offer.

- Bidder's Proposed method & procedure of Modification to meet the increased span requirement from present 15.0 m to 15.3m
- List of the facilities required at BHEL factory for carrying out modification works (for Option-1 &2 defined in scope clause)
- Documents as specified in Qualification Criteria Clause
- Unpriced "Price-bid format" (**Annexure-II**)

**Bidder is requested to raise "Pre-Bid Queries (PBQs)" in case of any queries and get clarifications before submission of offer itself.**

## 9) VARIANT TABLE:

Variant	Item	Material Code (For BHEL Reference)
01	Modification of Girder for 5T EOT crane	PY9751859018
02	E&C of 5T EOT crane with Modified Girder	PY9751859026



# ANNEXURE - 1 PROJECT DATA & DATASHEET & GAD OF EXISTING CRANE

## PROJECT DATA

### a) PROJECT INFORMATION:

<b>Owner</b>	M/s HINDUSTAN PETROLEUM CORPORATION LIMITED,VIZAG
<b>Project</b>	CAPTIVE POWER PLANT(CPP) PACKAGE, VISAKH REFINERY MODERNIZATION PROJECT (VRMP),JOB No. B016
<b>Consultant</b>	ENGINEERS INDIA LIMITED (EIL), NEW DELHI

Site Location: State/Country: ANDHRA PRADESH/ INDIA

Nearest Railway Station: VISAKHAPATNAM

Nearest Town/ City: VISAKHAPATNAM

Nearest Airport: VISAKHAPATNAM

Nearest State Highway: NH5

Nearest Port: VISAKHAPATNAM

### METEOROLOGICAL DATA:

S.No.	Parameter	Unit	Min.	Nor.	Max.	Design
1	Barometric pressure	mmHg	735	750	760	760
2	Ambient temperature	°C	12.5	36	45	45
3	Relative humidity @ ambient temperature	%	60	80	95	95
4	Rainfall data for 1-hour period	mm		80	100	100
5	Rainfall data for 24-hour period	mm			293	293
6	Wind Velocity **	km/hr	1-5		185	185

Design ambient temp. : 45 Deg C  
Dry Bulb temp. : 42 Deg C  
Wet Bulb temp. : 29 Deg C  
Relative humidity : 95% [@ 45 Deg C]  
Site Elevation : 5.56 m above MSL



## Annexure 4 -A: EOT Crane Data Sheet

DATA SHEET FOR 5.0 T EOT CRANE

DG HALL

Doc. No.

B016-606-80-43-DS-0012

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<b>Bharat Heavy Electricals Limited</b>	
<small>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</small>	
<small>DESCRIPTION OF CODE:</small>	
<small>02 COMMENTS AS MARKED CLEARED FOR MANUFACTURE</small>	<small>03 COMMENTS AS MARKED TO BE OBTAINED FOR INFORMATION</small>
<small>REUSE OF CODE IS PROHIBITED UNLESS SPECIFIED</small>	
<small>This approval does not absolve the vendor from the responsibility to comply with BHEL's specification and all applicable codes and standards. Vendor to ensure safe and smooth operation and meet the intended performance of the equipment.</small>	
<small>Comments as marked On drawing</small>	
<small>HIDRABAD</small>	<small>DATE: 18-JUL-2019</small>

GENERAL INFORMATION															
1	Project	VRMP						Tag No.	606-LZ-0004						
2	Client	M/s HPCL, Visakhapatnam						Quantity	1 NO.						
3	Project Location	Visakhapatnam						Service	Maintenance						
4	Job No.	B016						Manufacturer	MANGLA HOIST (P) LTD.						
5	Unit/Building	DG HALL													
<b>Purchaser's Requirement</b>															
6	Denotes Applicability														
7	■														
8	Applicable Specifications :EIL STD SPEC. 6-48-0002,IS:3177 & IS:807 (latest revisions)and specifications referred therein.														
9	Applicable to	Proposal	<input type="checkbox"/>	Purchase	<input checked="" type="checkbox"/>	As built	<input type="checkbox"/>								
<b>OPERATING DATA</b>															
11	Location	Indoor	<input checked="" type="checkbox"/>	Outdoor	<input type="checkbox"/>	Area Classification	Safe	<input checked="" type="checkbox"/>	Hazardous	<input type="checkbox"/>					
12	Duty Class	M1	<input type="checkbox"/>	M2	<input type="checkbox"/>	M3	<input type="checkbox"/>	M4	<input type="checkbox"/>	Power Collection	Shrouded dsl bus bar type conductor system				
13		M5	<input checked="" type="checkbox"/>	M6	<input type="checkbox"/>	M7	<input type="checkbox"/>	M8	<input type="checkbox"/>	Power Supply	415-440 V, 3 Phase , 50 Hz AC Supply				
14	Span(m)	15.0	Bay Length(m)	19.0 M			Control	Radio	<input checked="" type="checkbox"/> (1+1)	Pendant	<input checked="" type="checkbox"/>	Cabin	<input type="checkbox"/>		
15	Lift(m)	Main Hook	8.5	Auxiliary hook	N.A			Control Type	Radio Remote Control & Pendant						
16	HOIST	Capacity (MT)	Hoisting Speed (m/min)	Hoisting Accel. (cm/sec <sup>2</sup> )	Creep Speed (m/min)			Max. vertical Girder Deflection	As per IS:807						
17	Main Hoist	5	2	7	0.2			LT Speed (m/min)	15	CT Speed (m/min.)	10				
18	Aux. Hoist	N.A	N.A	N.A	N.A			LT Accel. (cm/sec <sup>2</sup> )	8	CT Accel.(cm/sec <sup>2</sup> )	7				
19	Type of Crane	Single Girder						<input type="checkbox"/>	Double Girder						<input checked="" type="checkbox"/>
20	Painting Specification	As per attached Painting Specification						<input checked="" type="checkbox"/>	As per Vendor's Painting Spec.						<input type="checkbox"/>
21	Environment	Corrosive	<input checked="" type="checkbox"/>	Highly corrosive	<input type="checkbox"/>	Anti-Spark Design	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>					
<b>MANUFACTURER'S DATA</b>															
23	Bridge Girder							Hoisting Mechanism	MH	AH					
24	Type of Construction	FABRICATED BOX TYPE						Winding Drum Type	2 WAY 4 FALL					N.A	
25	Material	AS PER IS:2062 , E250 B/R						Winding Drum Size (dia x length),(mm x mm)	220 X 1100					N.A	
26	Size	640 MM HEIGHT X 310 MM WIDTHX15300 MM Thickness:10mm LENGTH						Ratio of winding drum diameter to wire rope)	20					N.A	
27	End Carriage							Bearing type and make	SKF/FAG/NTN					N.A	
28	Type	FABRICATED BOX TYPE						Hoist Rope	MH					AH	
29	Wheel base	3000						Specification	AS PER IS:2266					N.A	
30	Material	AS PER IS:2062 , E250 B/R						Make	USHA MARTIN					N.A	
31	Max. wheel load without impact,TON	5.3						Number of falls	4					N.A	
32	Rail	LT	CT			Diameter/Construction	11 / 6X36					N.A			
33	Specification	AS PER IS: 3443			ASPER IS: 3443		Type of Core	FIBER					N.A		
34	Size	30 kg/m			30 kg/m		Factor of safety	5.2					N.A		
35	Length,m	2x19			2x15		Tensile strength	1770 N/mm2					N.A		
36	Bulb width,mm	57.15			57.15		Hook & Hook blocks	MH					AH		
37	Material	55C11			55C11		Type of Hook	POINT HOOK					N.A		
38	Wheel	Trolley	Bridge			Material of Hook	AS PER IS:15560					N.A			

39	Quantity	4	4	Type and size of bearing at hook support	THRUST 51209	N.A
40	Wheel diameter, mm	200	160	Safety latches provided	Yes	
41	Material of wheel core/hub	C55Mn75	C55Mn75	Buffers	Trolley	Bridge
42	Material of wheel tyre	C55Mn75	C55Mn75	Type of construction	Spring type	Spring
43	Surface hardness of Core/ tyre,BHN	300-350	300-350	Location	C.T ENDCARRAGE	L.T ENDCARRAGE
44	Thickness of tyre at tread, mm	15 MM	15 MM	Material	Steel	Steel
45	Bearing type and make	SPHERICAL ROLLER	SPHERICAL ROLLER	Quantity	4	4
46	<b>Bridge Drive Machinery and Trolley Drive Machinery</b>			Stoppers	LT	CT
47	Type of Bridge Drive Unit	GEAR MOTOR TYPE		Quantity	4	4
48	Type of Trolley Drive Unit	GEAR MOTOR TYPE		Type	Fabricated	Fabricated
49	Materials of :			Size	ISMB300X 300	ISMB-250X250
50	Gear / Pinions	EN-8 / EN-9		Material	M.S	M.S
51	Shafts	EN-8				
52	Housing	C.I				
53	<b>Gear boxes</b>	MH	A H	LT	CT	
54	Make/Model	OWN / HC-400	N.A	OWN / VC-320	OWN / VC-320	
55	Ratio	110 : 1	N.A	39 : 1	46 : 1	
56	Type of gear	HELICAL	N.A	HELICAL	HELICAL	
57	Service factor	2	N.A	2	2	
58	<b>Coupling</b>	MH	A H	LT	CT	
59	Type of Coupling	GEARED	N.A	HALF GEARED/HALF RIGID	HALF GEARED/HALF RIGID	
60	Between Motor and Gear Box	BDC-100	N.A	BDC-100	BDC-100	
61	Between Gear Box and Drum	GCA-250	N.A	GCA-170	GCA-170	
62	Make	OWN	N.A	OWN	OWN	
63	Quantity	1	N.A	2	4	
64	<b>Brakes</b>	MH	A H	LT	CT	
65	Make/Model	BCH/EMM/E&P/SOC/PETHE	N.A	BCH/EMM/E&P/SOC/PETHE	BCH/EMM/E&P/SOC/PETHE	
66	Type	THRUSTOR+EM DC DISC	N.A	THRUSTOR	THRUSTOR	
67	Quantity	1+1	N.A	2+1(PARKING BRAKE)	1	
68	Braking capacity at full load torque	3.58 kg-m	N.A	0.68 kg-m	0.30 kg-m	
69	Designed distance for complete stopping from full speed, mm	UPTO - 45MM	N.A	UPTO - 70MM	UPTO - 70MM	
70	<b>Motor</b>	MH	A H	LT	CT	
71	Make/Model	ABB/BBL/CROMPTON/MARATHON/SIEMENS	N.A	ABB/BBL/CROMPTON/MARATHON/SIEMENS	ABB/BBL/CROMPTON/MARATHON/SIEMENS	
72	kW rating	2.2	N.A	0.55	0.37	
73	Quantity	1	N.A	2	1	
74	Manufacturer	ABB/BBL/CROMPTON/MARATHON/SIEMENS/SEW	N.A	ABB/BBL/CROMPTON/MARATHON/SIEMENS/SEW	ABB/BBL/CROMPTON/MARATHON/SIEMENS/SEW	
75	RPM	900	N.A	890	880	
76	<b>Limit Switch</b>	MH	A H	LT	CT	

77	Type	ROTARY+GRAVITY	N.A	2 WAY LEVER TYPE	2 WAY LEVER TYPE
78	Make/Model	BETTIS/HONEYWELL AUOTMATION/SOC/EMM	N.A	BETTIS/HONEYWELL AUOTMATION/SOC/EMM	BETTIS/HONEYWELL AUOTMATION/SOC/EMM
79	Quantity	1+1	N.A	1	1
80	Location	ON M.H DRUM	N.A	L.T ENDCARRIAGE	C.T ENDCARRIAGE
81	<b>Platforms on Bridge Girders</b>		<b>Illumination fitting on bridge</b>		
82	Type of construction	<b>FABRICATED</b>	Numbers	<b>4</b>	
83	Material	<b>M.S</b>	Type/Make	<b>250 W HPMV/BAJAJ ,CROMPTON /PHILIPS</b>	
84	Minimum width, mm	<b>750</b>	Portable hand lamp with wiring	<b>60 W 1 NO.</b>	
85	Nos. (Full length platform)	<b>1</b>			
86	No. of Short Platforms	<b>2</b>			
87	Length of each short platform, mm (min.)	<b>900</b>			
88	Handrail height,mm, (min.)	<b>1100</b>			
<b>MH: Main Hoist</b>		<b>AH: Auxiliary Hoist</b>	<b>LT: Long Travel</b>	<b>CT: Cross Travel</b>	

**Notes:**

- 1) End carriage/crab is designed so as to enable the track wheels to withdrawn readily. Jacking pads are provided for jacking up the crane for changing crane wheels.
- 2) The approach to the repair cage will be provided from bridge platform by ladder.



**ANNEXURE II**



**BHARAT HEAVY ELECTRICALS LIMITED  
PROJECT ENGINEERING & SYSTEMS DIVISION  
RAMACHANDRAPURAM: HYDERABAD - 502 032**

**PRICE BID FORMAT (Rev00)**






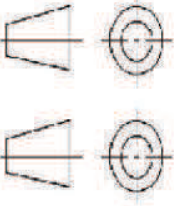
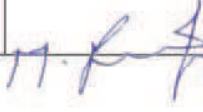

**5T POWER PLANT(CPP) PACKAGE, VISAKH REFINERY MODERNIZATION PROJECT (VRMP)**


<b>CUSTOMER</b>	HINDUSTAN PETROLEUM CORPORATION LIMITED (HPCL), VIZAG					
<b>CONSULTANT</b>	ENGINEERS INDIA LIMITED (EIL), NEW DELHI					
Bidder's Name : <Bidder to indicate>						
Bidder's Offer No. & Dt. : <Bidder to indicate>						
Bidder's Ref No. & Dt. : <Bidder to indicate>						
BHEL Enq. No. & date : <Bidder to indicate>						
Sl.No.	Item Description	Qty.	Unit	Bidder's confirmation (Quoted/ Not Quoted)	HSN / SAC Code	GST (%)
<b>I</b>	<b>MAIN OFFER</b>					
<b>A</b>	<b>Modification of Girder for 5T EOT crane (Material code: PY9751859018)</b>					
1	<b>Option 1</b> (Modification Works at HPVP Vizag, manpower by bidder and further requirements are as per specification PY51859)	1	No.			
2	<b>Option 2</b> (Modification Works at HPVP Vizag, manpower by BHEL and Supervision by Bidder and further requirements are as per specification PY51859)	1	No.			
3	<b>Option 3</b> (Modification Works at Bidder's works and transport by Bidder and further requirements are as per specification PY51859)	1	No.			
<b>B</b>	<b>E&amp;C of 5T EOT crane with Modified Girder (Material code: PY9751859026)</b>					
1	Complete E&C of 5T EOT Crane (with Modified Girder, Crane BoQ material by BHEL and further details & requirements are as per specification PY51859)	1	No.			
	<b>Grand total price for Sl.No. A and B (Inclusive of Packing &amp; Forwarding, Freight and Exclusive of insurance and GST)</b>					
<b>Packing &amp; Forwarding, Freight, Insurance and GST :</b>						
(i)	Packing & Forwarding :	In bidder's scope	Included in basic price			
(ii)	Freight:	In bidder's scope	Included in basic price			
(iii)	Insurance:	In BHEL's scope	--			
(iv)	GST	Extra at actuals	Extra at actuals			
(v)	Any other:	shall be included in	Included in basic price			
<b>Notes:</b>						
1	Bidders should mention the applicable HSN/SAC code along with GST% against respective line items.					
2	Bidders shall NOT fill/edit/modify anything else in the Price Bid Format, other than those relevant for bidder.					
3	The Total Bid Value quoted by the Bidder shall represent the total landed cost for this enquiry and shall include Packing & Forwarding Charges, Freight and all applicable taxes and duties, other than GST & Insurance. GST shall be paid extra by BHEL at applicable rates.					
4	<p>Purchaser will place order on any one of 3 Options defined in Sl.No.A above. However, Bidder is requested to quote for all the three Options defined under Sl.No.A above. In case, bidder is unable to quote for any of the options, the same may be mentioned as "Not Quoted" and may submit the reasons for the same separately in the offer.</p> <p>Purchaser reserves a choice to order both the Sl.No. A &amp; B or only Sl.No.A.</p> <p><b>Bidder will be informed about the Option &amp; Choice (as referred above) selected for ordering by purchaser, before Price Bid Open (PBO) stage.</b></p> <p>Purchase Order for Sl.No. A shall be placed by BHEL- PE&amp;SD Hyderabad. For Sl.No.B , LOI shall be placed by BHEL-PE&amp;SD and PO By BHEL-Power sector region.</p>					
5	Evaluation of offer shall be done on the basis of total bid value quoted for Sl.No.A (or) both Sl.No.(A & B), as the case may be, based on the choice of ordering selected by Purchaser, as defined in the above clause.					
6	Bidder to quote as per BHEL's NIT requirements.					
7	<b>Unpriced price bid format indicating as "Quoted" against each applicable item shall be submitted duly signed &amp; stamped</b> along with technical offer by bidder as a token of concurrence that prices are submitted in this format only. The offer shall be liable for rejection in case if un-priced price bid format is not submitted or any modification is carried out in price bid format.					

## ANNEXURE - 3 APPROVED QAP OF EOT CRANE

COMPLIANCE SHEET		
PROJECT	Captive power plant(CPP) Package, Visakh Refinery Modernization Project(VRMP) Job No.B016	
CUSTOMER	Hindustan Petroleum Corporation Limited,Vizag	
PACKAGE	MQP for EOT crane for STG hall,GT hall,DG hall & GIS building	
MANGLA REPLY TO BHEL COMMENT ON DRAWING NO. PY-LE-1-M104-2019-01 REV. 03		
S.No.	Client's comment	Mangla confirmation
D.1	INSPECTION OF SPARES TO BE INCORPORATED IN MQP	NOTED AND INCORPORATED



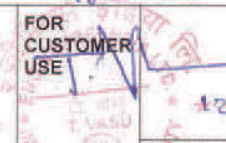
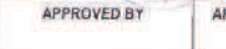


<b>EIL DOC.NO. 6-48-0002 RE.NO. 06</b>						
<b>OWNER:-</b> M/S HINDUSTAN PETROLIUM CORPORATION LIMITED (HPCL),VISAKHAPATNAM						
<b>PROJECT :-</b> VISAKH REFINERY MODERNIZATION PROJECT(CAPTIVE POWER PLANT(CPP)PACKAGE						
<b>CONTRACTOR</b>				BHARAT HEAVY ELECTRICAL LIMITED HYDERABAD PROJECT ENGINEERING DIVISION		
<b>VENDOR</b>				MANGLA HOISTS PVT. LTD. 3C/2, UDYOG VIHAR, ECOTECH-2, GREATER NOIDA		
				<b>MQP</b>	<b>NAME</b>	<b>SIGN</b>
				DRN.	KAMLESH	
				CHD.	P.D.SHARMA	
				APPD.	P.D.SHARMA	
<b>TITLE:-</b> MQP for DOUBLE GIRDER EOT CRANE CAP-UP TO 20T <b>MHPL CONTRACT NO. 1445</b>						
				SACLE VARIES		
						
				<b>BHEL DRG. NO.</b> PY-LE-1-M104-2019-01REV. 03		
				<b>SHEET 01 OF 07</b>		<b>REV 01</b> APPROVED BY
						
						
01	2 <sup>nd</sup> SUBMISSION	P.D.SHARMA	03.08.2019			
00	1 <sup>st</sup> SUBMISSION	P.D.SHARMA	03.01.2019			
<b>RE</b>	<b>DESCRIPTION</b>	<b>NAME</b>	<b>DATE</b>			
<b>V</b>						

	Manufacturer's Name and Address: M/S. MANGLA HOISTS PVT LTD. 3C/2, ECOTECH II, UDYOG VIHAR, GREATER NOIDA - 201306	<b>MANUFACTURING QUALITY PLAN</b>			PROJECT : VRMP OF HPCL ✓ PACKAGE : DG EOT CRANE. ✓ MAIN SUPPLIER : HPCL VIZAG ✓ CONTRACT NO : 1445 ✓ EIL Feb. 2016 ✓
	ITEM : DOUBLE GIRDER EOT CRANE CAPACITY : UP TO 20 TON (3-ST, 5T & 20T)	EIL DOC NO. : 6-48-0002 REV.06 ✓ BHEL DOC NO. : PY51387 REV.00 ✓			

SL. NO	COMPONENT & OPERATIONS	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.	D	10	11.	

RAW MATERIAL INSPECTION												
A.1	MS PLATES FOR BRIDGE GIRDER, END CARRIAGE, CRAB FRAME, ROPE DRUM & PULLEY (IF FABRICATED)	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS /DRAWINGS.	MTC/LAB TEST REPORT	✓	P	V	in the absence of correlated TC check testing shall be done. **	
		MECHANICAL PROPERTIES	MAJOR	TENSILE, % ELONGATION & YIELD STRESS	1 SAMPLE / HEAT			✓	P	V		
A.2	ROPE DRUM (IF SEAM LESS PIPE USED),	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT / SIZE	RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS /DRAWINGS.	LAB TEST REPORT / MTC	✓	P	V	**	
		MECHANICAL PROPERTIES	MAJOR	TENSILE STRENGTH, % ELONGATION, YIELD STRESS.	1 SAMPLE / HEAT / SIZE			✓	P	V		
A.3	FORGINGS / ROLLED BARS FOR GEARS, PINIONS WHEELS & SHAFTS	CHEMICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT / SIZE	RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS /DRAWINGS.	LAB TEST REPORT / MTC	✓	P	V	in the absence of correlated TC check testing shall be done	
		MECHANICAL PROPERTIES	MAJOR	TENSILE, ELONGATION, YIELD STRESS	1 SAMPLE / HEAT / SIZE			✓	P	V		
A.4	CI CASTING FOR PULLEY	MECHANICAL PROPERTIES, HARDNESS	MAJOR	TENSILE, % ELONGATION, YIELD STRESS, HARDNESS	1 SAMPLE / HEAT / HT BATCH	RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEETS /DRAWINGS.	LAB TEST REPORT / MTC	✓	P	V		

	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" ( ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER, C:TUV SUD, P: PERFORM, W: WITNESS AND V: VERIFICATION. AS APPROPRIATE.	FOR CUSTOMER USE 12/9/19	APPROVED BY 
		REVIEWED BY 	APPROVAL SEAL 

	Manufacturer's Name and Address: M/S. MANGLA HOISTS PVT LTD. 3C/2, ECOTECH II, UDYOG VIHAR, GREATER NOIDA - 201306		<b>MANUFACTURING QUALITY PLAN</b>				PROJECT : VRMP OF HPCL		
	ITEM : DOUBLE GIRDER EOT CRANE CAPACITY : UP TO 20 TON		EIL DOC NO. : 6-48-0002 REV.06 BHEL DOC NO. : PY51387 REV.00		PACKAGE : DG EOT CRANE. MAIN SUPPLIER : HPCL VIZAG CONTRACT NO : 1445				

SL NO	COMPONENT & OPERATIONS	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.	D	10	11	

A.5	CI CASTING FOR GEAR BOX HOUSING	MECHANICAL PROPERTIES HARDNESS	MAJOR	TENSILE, % <del>ELONGATION</del> <del>WELD STRESS</del> HARDNESS	1 SAMPLE / HEAT/HT BATCH	SPECIFICATION / DATA SHEETS			LAB TEST REPORT / MTC	√	P	V	In the absence of correlated TC check testing shall be done
<b>B. BOUGHTOUT ITEMS</b>													
B.1	RAILS ( IF APPLICABLE)	CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS, MECHANICAL PROPERTIES	1 SAMPLE / HEAT	SAIL PRODUCT / APPROVED DATA SHEETS / DRAWINGS			MTC / CHECK TEST REPORT	√	P	V	Test to be carried out in absence of Mill T.C
		VISUAL & DIMENSIONAL	MAJOR	VISUAL MEASURE	& RANDOM 25% (EACH SIZE)				IR	√	P	V	
B.2	HOOKS	CHEMICAL & MECHANICAL PROPERTIES	MAJOR	CHEMICAL ANALYSIS, TENSILE STRENGTH, % ELONGATION	1 SAMPLE / HEAT/HT BATCH	MATERIAL AS PER APPROVED DATA SHEETS / DRAWINGS			MTC	√	P	V	**
		PROOF LOAD TEST & DIMENSION	MAJOR	MECHANICAL	100%	100%	IS 15560/IS:5749	IS 15560/IS:5749	TEST REPORT	√	P	V	
		UT AFTER PROOF LOAD TEST	CRITICAL	NDT	100%	100%	ASTM A 388	REFER NOTE-5	UT REPORT	√	P	V	On shank portion only
		DPT TEST AFTER PROOF LOAD TEST	CRITICAL	NDT ON MACHINED SURFACE	100%	100%	ASTM E 165	ASTM E 165	PT REPORT	√	P	V	
B.3	WIRE ROPES	IDENTIFICATION DIMENSIONAL CONFORMITY & BREAKING STRENGTH	MAJOR	CONSTRUCTION DIAMETER, TENSILE DESIGNATION, BREAKING LOAD	100% (EACH BATCH)	IS-2266 / APPROVED DATA SHEET			MTC	√	P	V	

	<b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER, C:TUV SUD. P: PERFORM, W: WITNESS AND V: VERIFICATION, AS APPROPRIATE.		<b>APPROVED BY</b>	
	MHPL MANUFACTURER/SUB-SUPPLIER	BHEL MAIN SUPPLIER	FOR CUSTOMER USE 	
		REVIEWED BY	APPROVED BY	APPROVAL SEAL

	Manufacturer's Name and Address:		<b>MANUFACTURING QUALITY PLAN</b>				PROJECT : <b>VRMP OF HPCL</b>					
	M/S. MANGLA HOISTS PVT LTD. 3C/2, ECOTECH II, UDYOG VIHAR, GREATER NOIDA - 201306		ITEM : DOUBLE GIRDER EOT CRANE CAPACITY : UP TO 20 TON		EIL DOC NO. : 6-48-0002 REV.06 BHEL DOC NO. : PY51387 REV.00		PACKAGE : DG EOT CRANE. MAIN SUPPLIER : HPCL VIZAG CONTRACT NO : 1445					
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTI CS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD		AGENCY	REMARKS
					M	C/N				M	C	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.	11.

B.4	MOTOR	MAKE / TYPE / RATING ROUTINE TESTS	MAJOR	VISUAL REVIEW	100%	100%	BHEL APPROVED DRAWING / DATA SHEET / BHEL SPECIFICATION / IS 325	IR, MTC / COC	✓ ✓	P V	V V	REFER NOTE - 1 EIL APPROVED SOURCE
B.5	BRAKES -EM / EHT	MAKE / TYPE / RATING FUNCTIONAL CHECK INCLUDING IR-HV	MAJOR	VERIFICATION REVIEW	100%	100%	BHEL APPROVED DRAWING / BHEL SPECIFICATION / IS 3177	IR, MTC	✓ ✓	P V	V V	
B.6	CABLES - LT POWER / CONTROL	MAKE / TYPE / RATING ROUTINE ACCEPTANCE TESTS	MAJOR	VERIFICATION REVIEW	100%	100%	BHEL APPROVED DRAWING / BHEL SPECIFICATION / IS 1554 / IS 694 / IS 9968 / IS 4289 / IS 7098	IR, MTC	✓ ✓	P V	V V	
B.7	MCCB / MCB / OVERLOAD RELAY/ SFU / CONTACTOR / AUX(CONTROL) RELAY, CONTROL TRANSFORMER.	MAKE / TYPE / RATING FUNCTIONAL CHECK	MAJOR	VERIFICATION	100%	100%	BHEL APPROVED DRAWING / BHEL SPECIFICATION	IR	✓	P	V	

APPROVED BY

	<b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER, C:TUV SUD, P: PERFORM, W: WITNESS AND V: VERIFICATION, AS APPROPRIATE.	<b>FOR CUSTOMER USE</b>  12/2/19	
MHPL MANUFACTURER/SUB-SUPPLIER	BHEL MAIN SUPPLIER	REVIEWED BY	APPROVED BY
			APPROVAL SEAL

	<b>Manufacturer's Name and Address:</b> M/S. MANGLA HOISTS PVT LTD. 3C/2, ECOTECH II, UDYOG VIHAR, GREATER NOIDA - 201306		<b>MANUFACTURING QUALITY PLAN</b>				PROJECT : <u>VRMP OF HPCL</u>			
	ITEM : DOUBLE GIRDER EOT CRANE CAPACITY : UP TO 20 TON		EIL DOC NO. : 6-48-0002 REV.06 BHEL DOC NO. : PY51387 REV.00		PACKAGE : <u>DG EOT CRANE.</u>		MAIN SUPPLIER : <u>HPCL VIZAG</u>		CONTRACT NO : 1445	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTI CS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD		AGENCY		REMARKS
					M	C/N				D	M	C	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10	11	

B.8	ASSEMBLED PANEL AND PENDENT STATION (EXCLUDING VVVF DRIVE)	MAKE / TYPE / RATING OF BOIs PANEL, HV-IR FUNCTIONAL AND INTERLOCKS. DOP BY PAPER INSERTION METHOD	MAJOR	VISUAL MEASURE	100%	100%	BHEL APPROVED DRAWING / BHEL SPECIFICATION / LIST OF MAKES FOR BOI	IR	√	P	V		
B.9	VVVF DRIVE (AS APPLICABLE)	MAKE, TYPE, RATINGS & ROUTINE TEST.	MAJOR	VISUAL	100%	100%	BOI LIST & NTPC APPROVED DRAWING/DATA SHEET	IR	√	P	V		
C INPROCESS INSPECTION													
C.1	GEARS, PINIONS & WHEELS	DP TEST ON TOOTH AREA OF GEAR & PINION & TREAD OD OF WHEELS HARDNESS TEST	MAJOR	NDT - DP TEST	100%	100%	ASTM E 165	ASTM E 165	IR	√	P	V	
			MAJOR	HARDNESS TEST	100%	10% RANDOM	IS-3177 / APPROVED DATA SHEET / APPROVED DRAWING.		IR	√	P	V	
C.2	WELDING OF BOX GIRDER, CRAB, END CARRIAGES, ROPE DRUM (IF FABRICATED) GEAR BOX CASINGS, ETC	WPS, PQR & WPQ	MAJOR	VISUAL & MECHANICAL TESTS	100%	100%	APPROVED WPS, ASME SEC-IX	ASME SEC-IX	GW-481-484	√	P	V	SEE NOTE - 1
		DP TEST ON WELD JOINT	MAJOR	NDT	100% FOR BW JOINTS & CRITICAL FILLET WELD JTS	100% FOR BW JOINTS & 10% FOR FW	ASTM E 165	ASTM E 165	DPT REPORT	√	P	V	(BW-BUTT WELD) (FW-FILLET WELD)
		RADIOGRAPHY OF BUTT WELD JOINTS	CRITICAL	NDT TEST	100% IN TENSION ZONE & 25% IN COMPRESSION ZONE		ASME -SEC-V	ASME -SEC-VIII DIVISION - I, UW 51 & UW-52	RT FILMS & REPORT	√	P	V	RT FILMS SHALL BE REVIEWED BY BHEL/BHEL REPRESENTATIVE

**100% RT and DPT on Weld joints of modified Girder and Rail**

	<b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER, C: TUV SUD, P: PERFORM, W: WITNESS AND V: VERIFICATION, AS APPROPRIATE.		<b>APPROVED BY</b>	
	MHPL MANUFACTURER/SUB-SUPPLIER	BHEL MAIN SUPPLIER	<b>FOR CUSTOMER USE</b>  REVIEWED BY	 APPROVED BY APPROVAL SEAL

	Manufacturer's Name and Address:	<b>MANUFACTURING QUALITY PLAN</b>				PROJECT : <b>VRMP OF HPCL</b>			
	M/S. MANGLA HOISTS PVT LTD. 3C/2, ECOTECH II, UDYOG VIHAR, GREATER NOIDA - 201306	ITEM : DOUBLE GIRDER EOT CRANE CAPACITY : UP TO 20 TON	EIL DOC NO. : 6-48-0002 REV.06 BHEL DOC NO. : PY51387 REV.00	PACKAGE : DG EOT CRANE. MAIN SUPPLIER : HPCL VIZAG CONTRACT NO : 1445					

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTI CS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD		AGENCY	REMARKS
					M	C/N				D		
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10	11

C.3	GEAR BOXES	REDUCTION RATIO	MAJOR	MEASUREMENT	1 PER STAGE		IS:4460 , APPROVED DRAWING / APPROVED / DATA SHEET	IR	√	P	V	
		NO LOAD RUN OF GEAR BOXES ( DURATION - 4 HOURS)	MAJOR	SOUND LEVEL, TEMP RISE & OIL LEAKAGE	100% EACH		APPROVED DRAWING / APPROVED / DATA SHEET	IR	√	P	V	

**D FINAL INSPECTION**

D.1	SPARES	VISUAL VERIFICATION OF BOQ	MAJOR	VISUAL	100%		PO/SPARES LIST	IR	√	P	V	
D.2	COMPLETE ASSEMBLED CRANE AT SHOP FLOOR FOR NO LOAD / FULL LOAD/125% OVER LOAD TEST ALONG WITH ACTUAL CONTROL PANEL,VVFD,PUSH BUTTON PENDENT.	OVERALL: DIMENSIONS SPEED,CURRENT DURING NO LOAD TEST & FULL LOAD DEFLECTION OPERATION OF BRAKES OIL FULL LOAD TEST. <i>over load travel tests</i> LIMIT SWITCH OPERATION OF ALL MOTIONS WITH PENDENT. CHECKING OF SAFETY INTERLOCKS. FUNCTIONAL TEST. DOP CHK BY PAPER INSERTION, CURRENT.	MAJOR	VISUAL & MEASURE (SEE NOTE -6) / Performance test	100%	100%	IS-3177/APPROVED DRAWING / APPROVED DATA SHEET. data sheet B016-606-80-43-DS-0012 spech:PY51511 r.00 cl:8 AS PER EIL SPECH 6-48-0002 R.6 CL:5.0	IR	√	P	W	AS PER DRG CT,LT,Deflection bridge girder witness by TPI. HV TEST,IR TST FOR F BOM VERIFICATION
D.3	PAINING OF CRANE	VISUAL & DFT MEASUREMENT	MAJOR	VISUAL SHADE VERIFICATION DFT & MEASUREMENT	100%	100%	AS PER EIL SPECH 6-48-0002 R.6 CL:5.0	IR	√	P	RW	PACKING LIST VERIFICATION AS PER TDC/DRG

packing and marking, identification to be verify as per drg, data sheet AS PER EIL SPECH 6-48-0002 R.6 CL:6, packing and dispatch as pper spech AA0490004 R.01

	<b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER, C: TUV SUD, P: PERFORM, W: WITNESS AND V: VERIFICATION. AS APPROPRIATE.	APPROVED BY	
		 REVIEWED BY 	 APPROVED BY 
MHPL MANUFACTURER/SUB-SUPPLIER	BHEL MAIN SUPPLIER		APPROVAL SEAL

	<b>Manufacturer's Name and Address:</b> M/S. MANGLA HOISTS PVT LTD, 3C/2, ECOTECH II, DVOC, VIHAR, GREATER NOIDA - 201306		<b>MANUFACTURING QUALITY PLAN</b>				PROJECT : VRMP OF HPCL					
	ITEM : DOUBLE GIRDER EOT CRANE CAPACITY : UP TO 20 TON		EIL DOC NO. : 6-48-0002 REV.06 BHEL DOC NO. : PY51387 REV.00		PACKAGE : DG EOT CRANE.		MAIN SUPPLIER : HPCL VIZAG		CONTRACT NO : 1445			
SL. NO	COMPONENT & OPERATIONS	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.	D	10	11	

1. NTPC/BHEL APPROVED WPS SHALL BE USED FOR FABRICATION ONLY NTPC/BHEL APPROVED WELDERS SHALL BE ENGAGED FOR WELDING.
2. HV TEST ON CONTROL PANEL WILL BE DONE ISOLATING VVVF DRIVE AND OTHER ELECTRONIC PARTS HV TEST AT 2KV FOR POWER AND 1.5 KV FOR CONTROL CIRCUIT.
3. ALL CRITICAL DIMENSIONS SHALL BE MEASURED DEFLECTION SHALL BE MEASURED AT SWL THE CURRENT AND SPEED FOR HOISTING MOTION AND CROSS TRAVEL MOTION SHALL BE CHECKED AT DURING NO LOAD AND SWL THE SPEED AND CURRENT FOR LONG TRAVEL MOTION SHALL BE CHECKED DURING FREE RUNNING TEST. ALL INTERLOCKS, BRAKES CONTROL PANEL/PUSH BUTTON AND SAFETY MEASURES SHALL BE CHECKED DURING FINAL INSPECTION.
4. SAFE WORKING LOAD TEST AND OVER LOAD TEST (125% ) SHALL BE CONDUCTED AT SHOP WITH ACTUAL PANEL, SHOP WIRE ROPE AND TEMPORARY CABLES.
5. UT SHALL BE DONE AS PER ASTM A388/A-388M, APPENDIX 12.12.3. A) BACK WALL ECHO SHALL BE SET AT 100% OF FULL SCREEN HEIGHT AT THE BAR USING NORMAL PROB OF 2MHZ TO 4MHZ AT THIS SENSITIVITY LEVEL A DEFECT ECHO > 20% FSH IS NOT ACCEPTABLE. B) ALSO LOSS OF BWE > 20% IS NOT ACCEPTABLE.

**\*\*ALL RAWMATERIA AND BOUGHT ITEMS PROCURED FROM M/s EIL APPROVED SOURCE ONLY.**

Approved  
  
 T. VASU  
 12/1/17  
 INSPECTION AUTHORITY  
 APPROVED BY

	<b>LEGEND:</b> * RECORDS, IDENTIFIED WITH "TICK" ( ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER, C:TUV SUD, P: PERFORM, W: WITNESS AND V: VERIFICATION. AS APPROPRIATE.		FOR CUSTOMER USE		
	MHPL MANUFACTURER/SUB-SUPPLIER	BHEL MAIN SUPPLIER	REVIEWED BY	APPROVED BY	APPROVAL SEAL

# ANNEXURE - 4

## EXCERPTS FROM CUSTOMER'S SPECIFICATION

### 4.3 Performance Testing and Guarantees

4.3.1 A field performance test shall be conducted by the vendor to demonstrate the performance of the equipment after commissioning in accordance with PG test procedure prepared as per EIL Standard 7-76-0103.

The procedure of performance testing shall be submitted for Purchaser's review and shall be mutually agreed between the purchaser and the vendor.

4.3.2 A field performance test shall be conducted by the vendor to demonstrate the performance of the Crane after commissioning as per clause 28 of IS-3177. Following parameters shall be guaranteed.

- i) SWL of Main and Auxiliary Hoists
- ii) LT, CT and Hoisting Speeds.
- iii) Deflection of bridge girder

4.3.3 All parts of the crane shall operate satisfactorily with no undue friction, noise or display of any other unfavourable characteristics during the performance test.

4.3.4 All equipment and component parts shall be guaranteed by the vendor against defective material and design for a period as specified in Purchaser's general purchase conditions.

4.3.5 If any defect occurs during the guaranteed period the Vendor shall make all necessary alterations, repairs and replacement at their own cost.

4.3.6 Necessary instruments for the performance testing shall be arranged by the vendor, and shall be tested and calibrated before undertaking the performance test. Only test load shall be provided by purchaser near test site.

### 5.0 PROTECTION AND PAINTING

5.1 Unless otherwise specified in job specification, surface preparation and painting system for fabricated items shall be as below:

Surface preparation	Primer	Finish Paint
SSPC-SP-10 (SA-2 ½)	<ul style="list-style-type: none"> <li>• One (1) coat of F-9 (Inorganic zinc silicate) @ 65-75 µm DFT/coat.</li> <li>• One (1) coat of P-6 (Epoxy zinc phosphate) @ 40 µm DFT/coat.</li> </ul>	<ul style="list-style-type: none"> <li>• Two (2) coats of F-6A (High build epoxy finish coating cured with polyamine hardener) @ 100 µm DFT/coat</li> <li>• One (1) coat of F-2 (Acrylic-Polyurethane finish paint) @ 40µm DFT/coat.</li> </ul> <p>Total DFT of Primer + finish shall be 345 (minimum).</p>

Refer Table no. 6.1, 6.2 6.3 & 6.4 attached at the end of this specification for the properties of different paints (primer/finish paint) as mentioned above.

Refer Annexure-I for the List of recommended manufacturers of paints attached at the end of this specification.

- 5.2 Surface preparation and paintings for all bought out components shall be as per respective sub-vendor's standards suitable for industrial corrosive environment.
- 5.3 The colour of Crane shall be golden yellow, unless otherwise specified.
- 5.4 All machined and bearing surfaces shall be protected against rust with a thick coat of grease.