

TECHNICAL SPECIFICATION NATURAL DRAFT COOLING TOWER 2 X 660 MW CSPGCL HTPS KORBA WEST TPP

PE-TS-530-165-W001	
Rev No 00	

Date : 22.05.2025

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General poin	s related to	Quality	Assurance:
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Genei	ral points related to Quality Assurance:
1	The inspection & testing of the cooling towers & its various components shall be as per quality plans approved by the purchaser/ Customer. Bidder shall submit the quality plans based on the guidelines given in specification & quality plans enclosed herein. The customer hold points of BHEL/ Customer/Customer nominated agency shall be marked in the QP at the contract stage, in the event of order & inspection/ testing shall be carried out as per same apart from various test certificates/ inspection records etc.
2	Equipments for which quality plan is not covered in the specification, bidder shall submit QP's for same on the basis of similar guidelines & submit for approval in the event of order.
3	Purchaser / Customer or their authorized representatives shall have the right to inspect at any stage of manufacture & construction, all materials, components & workmanship & testing of material. The bidder shall provide all facilities for inspection & testing without any extra cost to the purchaser/ Consultant.
4	The contractor/ manufacturer shall conduct the following minimum specific tests to ensure that the equipment shall conform to the requirements of specification and in full compliance with the requirements spelt out in applicable codes and standards
4.1	Material identification and testing of regulating valve assemblies, screen assemblies, all supporting structural assemblies, PVC fills, all nuts and bolts, sluice valves, nozzles and all other applicable components constituting each cooling tower.
4.2	Hydrostatic testing of hot water distribution piping regulating valves and all other pressure parts at a pressure and duration as spelt out in this specification.
4.3	Visual, dimensional checking of all components of each cooling tower.
4.4	Material testing of all components, hydrostatic testing of all pressure parts at a pressure and duration in compliance with this specification, static and dynamic balancing tests of all rotating components such as pump shaft, line shaft, impeller etc. and complete performance testing as minimum for each sludge pump in each cooling tower.
4.5	Tests for hoists, chain pulley blocks and all other lifting tackle shall be carried out as per relevant Indian/ equivalent international standards.

Any other tests deemed necessary for safe, reliable and satisfactory operation of the equipment.



other Tests	0	Υ2	₹3	Υ4					>	γ.	6.↓	Υ11	
est as per relevant Std/		>	>	>					\	>	\		
ydraulic / Water Fill	Н		Υ	Υ								γ10	
Т	Я					γ2		FOR ALL CHECKS					CTI-154
noianamiC]	>		>	Y	\	Y	6 FOR ALL	\	>	>	>	nform to
ssembly Fit up	Α	Υ	Y	Υ				REFER NOTE - 6		Υ	Υ	Υ	shall cor
alancing	В							REFE			Υ		The FRP pipes shall conform to CTI-154
IdW/Td	D		φ	\	٩Å	٩	٩Å			\	qΑ		The FR
ltrasonic test	Λ					>	γc				⊹		
/PS/PQR/Welder jualification						>				>	>		
laterial Test	M	Υ.	Хa		Ya	γa	Ya	γa	٧٧	γa	γa	γa	
TESTS/CHECK	ITEMS / COMPONENTS	PVC FILL & DRIFT ELIMINATOR	GATE/ GLOBE/ CHECK VALVES	BUTTERFLY VALVES	Body (Cast), Disc (Cast)	Body & Disc both fabricated	Shaft	ROLLED & WELDED PIPES.	WRAPPING & COATING OF PIPES	HOISTS & CHAIN PULLEY BLOCKS	VENTILATION FANS	RE JOINTS	Fiber Glass- Reinforced Pipes
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EPC PACKAGE FOR 2 X 660 MW SUPER CRITICAL

THERMAL POWER PROJECT,

HTPS, KORBA WEST

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QUALITY ASSURANC
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CLAUSE NO



Legend/ Notes:	a. One per Heat/Heat Treatment batch/Lot	 b. On machined surfaces only of castings and forgings. Also 100% after root run/ back gauging for butt welds and 10% after final butt welds.
	1.5	<u> </u>

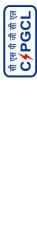
200	raye 2 of 4	t 50 7
SUB-SECTION- E-23	COOLING TOWER (NDCT)	
TECHNICAL SPECIFICATION	SECTION - VI, PART-B	BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023
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ú	UT shall be done for shafts with Diameter 50 mm or above & Plates of Thickness 25 mm or above.	oove & Plates of Thickness 25 mm or above.
-	PVC material shall meet the requirements of CTI Bull test may be done as per ASTM-D-635 with extinguish	PVC material shall meet the requirements of CTI Bulletin STD-136. However impact test may be done as per ASTM-D-256 and Flammability test may be done as per ASTM-D-635 with extinguishing type PVC. Density & VICAT softening temperature tests shall also be conducted.
2.	UV exposure shall be carried out on samples, at rengineering portion of the specification for cooling tow	at reputed third party laboratories as per ASTM -G26 method- C/standard specified in tower. Impact test before and after UV exposure shall be conducted as per ASTM D-256.
6.	Blue matching, Wear travel for Gate valves & reduced	Blue matching, Wear travel for Gate valves & reduced pressure test for Check valves shall be conducted as per relevant standards.
7	For POD of Butterily Valves refer respective engineering section of the technical specification. In case of fabricated construction of Butterfly Valves and companion flanges, UT on Plates of and RT on 100% Butt welds shall also be carried out. Welders and WPS shall be qualified.	For POD of Butterily Valves refer respective engineering section of the technical specification. In case of fabricated construction of Butterfly Valves and companion flanges, UT on Plates of Thickness 20 mm or above for body and disc, and RT on 100% Butt welds shall also be carried out. Welders and WPS shall be qualified as per ASMF section -IX. Stress reliving after
	complete welding shall be carried out as per ASME So	Section - IX
.9	Tests	Quantum of Check
	WPS, PQR, Welder Qualification Test	100%
	DPT on root run	100% on pipes up to 1200 mm diameter
	DPT after back gauging	100% on pipes above 1200 mm diameter
	RT/ UT by TOFD Technique/PAUT	5% (covering 100% of `T'-joints)
	DPT on finished welds	10%
	Hydraulic Test	100%, Test pressure = 1.5 times the design pressure or 2 times the working pressure whichever is higher.
	Note:- After erection, the complete piping system sl pressure whichever greater. No leakage/seepage is a RT test/ 100% UT by TOFD /PAUT Technique.	Note:- After erection, the complete piping system shall be tested at 1.5 times, the design pressure or two times the maximum working pressure whichever greater. No leakage/seepage is acceptable. Butt weld joints which would not be hydro-tested shall be subjected to 100% RT test/ 100% UT by TOFD /PAUT Technique.
7.	Spark test, adhesion test and material tests for primer	Spark test, adhesion test and material tests for primer & enamel and coal tar tapes as per IS: 10221 & IS 15337.

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SUB-SECTION- E-23	COOLING TOWER (NDCT)	
TECHNICAL SPECIFICATION	SECTION - VI, PART-B	BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023
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<u>&</u>	Ropes shall meet relevant Code requirements. All motions & safety features shall be tested at Works. Full load & 25% overload test shall also be conducted at works. At site, Full load test shall be conducted with all motions and safety features.
<u>ග</u>	One Fan of each type & size will be performance tested as per corresponding Code, for Air Flow, Static pressure, Total pressure, Speed, Efficiency, Power Consumption, Noise, and Vibration & Temperature rise. Also, all fans shall be subjected to run test of 4 hours during which Noise, Vibration, Temperature rise & current drawn shall be measured.
10.	During Hydraulic & Vacuum test at 30 mm Hg absolute in 3 different positions, the change in Circumference of the Arch should not be more than 1.5%. Permanent Set, after 24 hours of the test, should not exceed 0.5% of Arch.
11.	Tests on Rubber for Tensile, Elongation, Hardness, Hydraulic Stability as per ASTM D-471, Ozone Resistance test as per IS: 3400 Part 20, Aging test, Adhesion strength of Rubber to Fabric and Rubber to Metal shall be carried out.

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SUB-SECTION- E-23	TOOM GENERAL CONTROL	COOLING LOWER (NDC!)	
TECHNICAL SPECIFICATION	U + U * U - I * O I + O I O	SECTION - VI, PARI-B	BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023
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EDC DACKAGE EOD 2 X 660 MW SIIDED CDITICAL	LT C TACKAGE TOTA & A 000	THERMAI DOWER DRO IECT	

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PIPES, FITTINGS, BENDS, VALVES, COATING-WRAPPING, STRAINERS EXPANSION, JOINTS, TANKS, FASTENERS, LINING ETC.

	Tests/Check												
	Items / Components	Material Test	DPT/MPI / RT	Ultrasonic Test	WPS/ WQS/PQR	Hydraulic / Water Fill Test	Pneumatic Test	Assembly Fit up	Dimensions	Functional/operatio	Other Tests	All Tests as per	REMARKS
1	Pipes & Pipe Fittings	Ya	Yb			Y1			Υ			Υ	
2	Diaphragm Valves	Ya				Y ⁵			Υ		Y ⁶		
ЗА	Cast Butterfly Valves (Low Pressure)					Υ		Υ	Υ	Υ	Y ⁷		
	Body	Ya	Yb										
	Disc	Ya	Yb										
	Shaft	Ya	Υ	Yc									
3B	Fabricated Butterfly Valves								FER	NOT			
4	Gate/ Globe/Swing Check / Ball Valves	Ya	Yb	Yc		Y ⁵	Υ	Υ	Υ	Υ	Y8		
5	Dual Plate Check Valves	Ya	Yb	Yc		Υ	Υ	Υ	Υ	Υ	Y ⁴		
6	Rolled & Welded Pipes and Mitre Bends	Ya	Y 3		Y	Y ³			Υ		Y 3&15	Υ	
7	Coating & Wrapping of Pipes	Y ²									Y ²		
8	Tanks & Vessels	Ya	Yb		Υ	Υ			Υ		Y ¹⁶		
9	Strainers	Ya	Y ^b		Y #	Υ					Y ¹¹		#For Fabricated Strainer
10	Rubber Expansion Joints	Ya				Y ¹²		Υ	Υ		Y ¹³		
11	Internal Lining of Pipes	Ya							Υ		Y 9		
12	Site Welding		Y ¹⁰		Υ	Υ							
	NOTES (MEANING OF SU	PERS	CRIP	TS)									
а	One per heat/heat treatmer			-,									
b	On machined surfaces only			and	on bu	ıtt wel	ds.						
С	For shaft/spindles > or = 40												
1	100% Hydraulic test shall be of be subjected to 100% RT/PAL	arried JT.											•
2	Spark Test, Adhesion Test 91/ IS-10221 & IS 15337 as	appli	cable.								oal Tar	Tape	s as per AWWA-C-203-
3	Followings are the testing r	equire	ments				<u> </u>						
	<u>TESTS</u>					<u>NTUM</u>				_			
	WPS, PQR, Welder Qualific	cation	Test										er ASME- section IX
	DPT on root run										n diame		
	DPT after back gauging				100%	for pi	pes	abo	ve 12	200 m	m diam	eter	

EPC PACKAGE FOR 2 X 660 MW SUPER CRITICAL THERMAL POWER PROJECT, HTPS, KORBA WEST	TECHNICAL SPECIFICATION SECTION - VI, PART-B BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023	SUB-SECTION E-05 LP PIPING PACKAGE (MECHANICAL)	Page 2 of 3	
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CLAUSE NO.	QUALITY ASSURANCE	सी एस पी जी सी एल C∳PGCL
		CFGCL

	RT / UT by (TOFD/PAUT) Technique	5% (100% of T Joints)
	DPT on finished butt weld joints	10%
	Hydraulic Test	100%, 1.5 times the design pressure or 2 times the working-pressure
		whichever is higher.
4	Cycle test carried out earlier for same mate	spring for one lakh Cycles shall be carried out as a type test. If Dry rial & diameter, Test report shall be reviewed.
5	· · · · · · · · · · · · · · · · · · ·	alves, shall be done with by closing the valves with actuator.
6	spark test, bleed resistance test. In addition conducted.	per batch of rubber mix for tensile, Elongation, hardness, adhesion, type test for 50,000 cycles of each type of diaphragm shall also be
7	standard in presence of owner / owner's re Leakage by closing the valves with actuato portion in the technical specification.	trength shall be carried out in accordance with governing design epresentatives. Actuator operated valves shall be checked for Seat or. For Proof of Design Test refer respective chapters of engineering
8	valves shall be done as per relevant star valves to be tested for vacuum operation fo safe test for ball valve shall be done where	res, pneumatic seat leakage, and reduced pressure test for check adard. Maximum allowable vacuum loss is 0.5 mm of Hg abs. for a period of 15 minutes. Fire ever specified. In case of already carried out, the test report shall be over / owner's representatives. Valves shall be offered for hydro test
9		ravity, Lining Thickness, Humidity Check, Pipe temperature check,
	Adhesion Test and Holiday Detection Test	etc as per applicable standard shall be done for all lining material
	and application.	
10	10% of welds (Root and finished welds) s boiler & deaerator fill line.).	hall be subjected to DPT. (100% DPT for compressed air line and
11		h type and size as a special test shall be carried out. In case of I be submitted for review and acceptance by owner / owner's
12		nm Hg abs in 3 positions, the change in the circumference of arch the test permanent set in dimension should not exceed 0.5%.
13	Tests on rubber for tensile, elongation, resistance test as per ASTM D 1149/IS 3 rubber to metal adhesion shall be carried or	hardness, hydraulic stability check as per ASTM D 471, ozone 400 Part 20 aging test and adhesion strength of rubber to fabric, ut.
14	following test shall be done for Fabricated E a. UT as per ASTM A-435/IS 11630 8 plate thickness 25mm and above. b. 100% RT and DPT as per ASTM, other welds shall be done.	S IS 4225 on plate material for body and disc shall be carried out for Section-VIII, Division-I, on butt joins of body and disc. 10% DPT on SME, Section-VIII, Division-I on butt joints of body and disc.
15	Maximum number of segments in segm segmental flanges shall be examined by RT Segmental flanges exceeding 37.5 mm this	ental flanges shall be four (04) only. All butt weld joints in the
16	after welding. For pressure vessel welds RT shall be done	e as per design code requirements
10	I of prosourc vesser werds IVI strail be dolle	s do por design educatequirements.

All Valves shall be offered for inspection in unpainted condition.

No repair welding is permitted on Cast Iron / Alloy Cast Iron Castings.

EPC PACKAGE FOR 2 X 660 MW SUPER CRITICAL THERMAL POWER PROJECT, HTPS, KORBA WEST

TECHNICAL SPECIFICATION
SECTION - VI, PART-B
BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023

SUB-SECTION E-05 LP PIPING PACKAGE (MECHANICAL)

Page 3 of 3

###	MANUFA SUPPLIE	MANUFACTURER/ B SUPPLIER NAME & ADDRESS	BIDDER/	ZLS	ANDAR	D QUA	STANDARD QUALITY PLAN	SPEC. NO:				DATE:	
100	1000			CUSTOMER:				QP NO.: P	QP NO.: PE-QP-999-Q-006, REV-02	006, REV-02		DATE: 17.04.2020	THI:
3	1			PROJECT:				PO NO.:				DATE:	S IS
				ITEM: AC ELECT. MOTORS UPTO 50 KW (415V)	T. MOTO (415V)	RS	SYSTEM:	SECTION: II	п:			SHEET 1 of 2) PA
S. NO.		COMPONENT CHARACTERISTI & CS CS OPERATIONS	I CLA SS	TYPE OF CHECK	QUANTUM OF CHECK	TUM	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENC Y		REMARKS	RTOF
_	2	33	4	v	9 W	C C	7	∞	6	* C *	Z		TE
		1.WORKMANSHI P	MA	VISUAL	100%	ı	MFG. SPEC.	MFG. SPEC.	LOG BOOK	Р -			СНІ
		2.DIMENSIONS	MA	VISUAL	100%	1	MFG. DRG./ MFG. SPEC.	MFG. DRG./ MFG. SPEC.	LOG BOOK	- Ы	ı		NIC
1.0	ASSEMBLY	3.CORRECTNESS COMPLETENESS TERMINATIONS/ MARKING/ COLOUR CODE	MA	VISUAL	100%	ı	MFG.SPEC./	MFG.SPEC.	LOG BOOK	- d	ı		AL SPECIF
	-												IC
2.0	PAINTING	1.SHADE	MA	VISUAL	SAM PLE	ı	MFG. SPEC/ APPROVED DATASHEET	MFG. SPEC/ APPROVED DATASHEET	LOG BOOK	∨ P ∨	1		ATION
3.0	TESTS	1.ROUTINE TEST INCLUDING SPECIAL TEST	MA	VISUAL	100%	ı	IS-325 / IS- 12615/ APPROVED DATA SHEET	IS-325 / IS-12615/ APPROVED DATA SHEET	TEST/ INSPN. REPORT	> * d	1	* NOTE -1	PE-TS-
	-	2.OVERALL DIMENSIONS & ORIENTATION	MA	MEASUREME NT & VISUAL	100%		APPROVED DRG/ DATA SHEET	APPROVED DRG/ DATA SHEET	TEST/ INSPN. REPORT	V * V	ı	* NOTE -1 & NOTE-2	497-50
)1- <i>/</i>
		BHEL				B	BIDDER/ SUPPLIER		FOR CUST	FOR CUSTOMER REVIEW & APPROVAL	W & APP	ROVAL	50
	ENGINEERING	ING		QUALITY	S	Sign & Date		Doc No:					2

PPROVAL		Seal		
FOR CUSTOMER REVIEW & APPROVAL		Name		
FOR CUSTO		Sign & Date Name		
	Doc No:		Reviewed by:	Approved by:
BIDDER/ SUPPLIER				
Iddia	Sign & Date	Seal		
		Name	(Control of Control of	RITESH KUMAR JAISWAL
	QUALITY	Sign & Date	Copally open by such	Control age or and
BHEL			Checked by:	Reviewed RITESH KUMAR by:
IB	S)	Name	HEMA KUSHWAHA	PRAVEEN DUTTA
	ENGINEERING	Sign & Date	HEMA Optional Control of the Control	Reviewed PRAVEEN AT THE PAYEN A
			Prepared by:	Reviewed by:

of mer of mer	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN	ALITY PLAN	SPEC. NO:	DATE:
LI S DA IN		CUSTOMER:		QP NO.: PE-QP-999-Q-006, REV-02	DATE: 17.04.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: AC ELECT. MOTORS UPTO 50 KW (415V)	SYSTEM:	SECTION: II	SHEET 2 of 2

4	RT OF	ı	ECHI	Y
			100% 100% STANDARD / (#) STANDARD / (#) STANDARD / (#). REPORT < P W = (#) REFER NOTE =8	
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	>		≽	
	P		P	
			, 	1
	TEST/ INSPN. REPORT		INSPC. REPORT	
	SAME AS COL. 7 INSPN. REPORT V		AS PER MFG. STANDARD / (#).	
	IS-325 / IS-12615 / APPROVED DATA SHEET		AS PER MFG. STANDARD / (#)	
	-		100%	
vv (413V)	100%		100%	
MN 06 2110	MA VISUAL		MA VISUAL	
	MA		MA	
	3.NAMEPLATE DETAILS		SURFACE FINISH & COMPLETENESS	
			4.0 PACKING	
			4.	

- 1. Routine tests on 100% motors shall be done by the vendor. However, BHEL/ Customer shall witness routine tests on random samples. The sampling plan shall be mutually agreed upon. 2. For exhaust/ventilation fan motors of rating up to 1.5 KW, only routine test certificates shall be furnished for scrutiny

 - 3. In case test certificates for these tests on similar type, size and design of motor from independent laboratory are available, the same is valid for 5 years.
 - 5. After packing and prior to issue MDCC, photographs of items to be despatched shall be sent to BHEL for review. BHEL reserves the right to perform repeat test, if required.
- 6. In case of any changes in QP commented by customer at contract stage, same shall be carried out by bidder without any implication to BHEL/ Customer.
 - 7. Project specific QP to be developed based on customer requirement.
- 8. For export job, BHEL technical specification for seaworthy packing to be followed.
 - 9. Packing shall be suitable for storage at site in tropical climate conditions.
- 10. Latest revision/ year of issue of all the standards (IS/ ASME/ IEC etc.) indicated in QP shall be referred.

LEGENDS:

- *RECORDS, INDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION,
- ** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, C: CUSTOMER,

PE-TS-497-501-A502

- P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE
 - MA: MAJOR, MI: MINOR, CR: CRITICAL
 - D: DOCUMENTATION

APPROVAL		Seal		
FOR CUSTOMER REVIEW & APPROVAL		Name		
FOR CUST		Sign & Date Name		
	Doc No:		Reviewed by:	Approved by:
BIDDER/ SUPPLIER				
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		Name	Months of the Company	d RITESH RITESH KUMAR KUMAR IASWAL
	QUALITY	Sign & Date	A CONTROL OF THE PROPERTY OF T	RITESH I I
BHEL			Checked by:	Reviewed RITESH KUMAR by:
H B	NG.	Name	HEMA KUSHWAHA	PRAVEEN DUTTA
	ENGINEERING	Sign & Date	HEMA SOSPENSESSES FOR THE PROPERTY OF THE PROP	Reviewed PRAVEE Transfer II.
			Prepared bv:	Reviewed by:

COPPER BY WITE CARE CONTROL ON GREAKES The Machanical Control of Street Contro	Strant solutions. Strang additionalities. Str. No. ITEM Characteristics 1 COPPER WIRE dual Coated enameled Council Council Council Componer wire Str. No. 2 Str. No. 1 Copper wire Str. No. 2 Str. No. 3 Str. No. 3 Str. No. 2 Str. No. 3 Str.			THE PERSON NAMED IN	NETERENCE GUALITY FLAN	MA				A ABBD
Comparison LT Inductron Mortors Control Mo	Strang selection. Strang selection. Str. No. ITEM Characteristics The Copper Wire dual Toimension coated enameled Tound Tou		Item lequipmen		OP No.: NTPC-ROP 1		OP No.: 0000-89	9- Reviewed hv:		Behround Du-
State	Sr. No. ITEM Characteristics 1		LT INDUCTION	TORS	Rev. No.:'4'		QVE-P-044 Rev. No.: 4	V SHRIVASTAVE	Die Marie	September 1
Check Machine Class Type of Class Cl	Sr. No. ITEM Characteristics 1		curb-everfam .		PAGE: Page 1 of 5		Date :-20-6-12		130	AKGARG
Second Common C	1 COPPER WIRE dual 1. Dimension coated enameled 2. Elongation round 3. Mandrel Winding Test copper wire 5. BD Voltage Test 5. BD Voltage Test 6. Cut Through Test 7. Heat Shock Test 8. Resistance 8. Springiness 10. Abrasion Test 11. Continuity Tes		Tuno of				Valid upto:19-06-	15		10:10
Component Sample Internal In	1 COPPER WIRE dual 1. Dimension coated enameled 2. Elongation round 3. Mandrei Winding Test copper wire 5. BD Voltage Test 6. Cut Through Test 7. Heat Shock Test 8. Resistance 9. Springiness 10. Abrasion Test 11. Continuity Te		Thorn		m of check	Reference	Acceptance	Format of		Remarks
Machine Mach	COPPER WIRE dual 1.Dimension COPPER WIRE dual 1.Dimension Copper Wire 2.Elongation Copper wire 3.Mandrel Winding Test Copper wire 5.BD Voltage Test Cut Through Test	T	CHECK	IM		Documents	Norms		MC	- -
MA Measurement 1 Sample/fort 1 Sample/fort MSA-072-R0 MSA-072-D2RO Inspir. Record P V V V V V V V V V			0		0	7	0	n	10	1.1
Max Mechanical -do- -d	peled		Measurement	1 Sample / lot	1 Sample/lot	MSA-091-02-R0	MSA net noon	Panney Donney	- 12	
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Control MA Fest Control Co	7. Heat Shock Test 8. Resistance 9. Springiness 10. Abrasion Test 11. Continuity Test	MA	Electrical	-00-	-do-	8	- - -		> :	
Max	8. Resistance 9. Springiness 10. Abrasion Test 11. Continuity Test	MA	Fest	-do-	S op	7 0	- P	-OP-	-	7/1
The state MA	9. Springiness 10. Abrasion Test 11. Continuity Test	MA	Flectrical	000	-00	00-	-op	-00-	_	19
The first bound Mark Mar	10.Abrasion Test 11.Continuity Test	MA	Mochanical	5 6	5 -	op-	-op-	-op-	_	
The composition of the composi	11.Continuity Test	MAA	Dorfermond	-00-	-00-	op	-op-	-do-	_	(19)
Thermal	T. Conmittelly less	NIN.	Triangle Co	-00-	-00-	op	-op-	-op-	> 6	1//
The material The	The state of the s	W.		-00-	-00-	op-	op	-do-	-	777
Machanical Name	test	MA		cach supplier once i month	-op-	-op-	-op-	-op-	>	
MA Measurement 1 Sample/lot/heat		MA	Measurement	1 Sample/lot/heat	-op-	MSA-072-01R0	MSA-072-01R0	Supp TC	N A A	
Chemical 1 Sample/lot/heat	Straightened steel bar in 2. Hardness	MA	Measurement	1 Sample/lot/heat	-do-	Ċ	200	op op		
trength MA Mechanical nethanical rest 1 Sample/Tot/heat rest -do-do-do-do-do-do-do-do-do-do-do-do-do-		Σ	Chemical	1 Sample/lot/heat	-00-	100-	90-	5 6		
ngth MA Mechanical Nechanical Isample/lot/heat of test -do-do-do-do-do-do-do-do-do-do-do-do-do-	4. Tensile strength	MA	Mechanical	1 Sample/lot/heat	-op-	000	000	9 6		
tition MA Mechanical application 1 Sample/Lot -do-do-do-do-do-do-do-do-do-do-do-do-do-	5. Yield strength	MA	Mechanical	1 Sample/lot/heat	-op-	-do-	9 6	þ		
MA Mechanical 100%	6.% Elongation	MA	Mechanical	1 Sample/lot/heat	-dp-	Ť	0 0	0 0		
aphlic test MA Chemical 1 Sample/Lot -do-	7,Ultrasonic test	MA	Mechanical	100%	-op-	-do-	-dp-	þ		
ng MA Mechanical 100% -do- <	8.Metallographic test	MA	Chemical	1 Sample/Tot/heat	-op-	-dp	-op-	-00-	>>	
np. MA 1 Sample/Lot - 00000000000000	9 Nomalizing	MA	Mochanical	4000	4	(-	154		8	
np. MA 1 Sample/Lot IS4026:1992 IS4026:1992 Supp. TC V	Surgina Con Control Co	Citi	Medialical	100%	-00-	-OP	-op-	-op-	>	
	3 AL INGOTS EC GRADE Chem. Comp. PURITY 99:5%	MA		1 Sample/Lot	100	1S4026:1992	1S4026:1992	Supp. TC	-	

Format No.: QS-01-QAI-P-10AT-r1

Engg. Div./QA&I

	MANUFACTURER'S NAME & ADDRESS	05		REFERE	EFERENCE QUALITY PLAN	N	NTPC	To be filled in by NTPC	NTPC	AN ARREST
5	CROMPTON GREAVES		Item /aquipment :	t:	QP No.: NTPC-RQP 1	SIGN OF MANIEACTIBED	QP No.: 0000-999- Reviewed by:	Reviewed by:	4	Pathowed River
Strong regitionships.	LT MOTORS DIVISION A-8/2, MIDG AHMEDNAGAR - 414111 MAHARASHTRA		LT INDUCTION MOTORS (50KW TO 200 KW) sub-system:	MOTORS KW)	Rev. No.:'4' Date:- PAGE: Page 2 of 5	Mig	Rev. No.: 4 Date:-20-6-12	V SHRIVASTAV RAJIV GARG P K BASU	A MILLER	GARG
Sr. No.	Characteristics	Class	Type of	Quant	Quantum of check	Reference	Accombance	To make on the contract of the contract of the contract on the		
			Check	IM	C/N		Acceptance	rormat or	Agency	Remarks
1 2	2	d	NZ.			Documents	Norms	Record	D. M.C. N	
NCOMING INSPECTION: RA	A. INCOMING INSPECTION: RAW MATERIAL / COMPONENT				0		0	n	10	1.1
4 CI CASTING	1.Surface defects	MA	Visual	100%	100%	MSA-02-04	No defect	Inone Dec	I to let	
(Body, End Shields,	2. Dimn. Conformity	MA	Measurement	1 Sample / heat	1	Comp. Drg.	Comp. Dra	-do-)) L O	
1.50x, bearing covers)		MA	Mechanical	1 Sample / lot	1 Sample / lot	IS 210:1993	IS 210:1993	Supp. TC	\ \ \	
	5. Chemical comp.	Z Z	Verification	-0p	- - 00-	ф	-op-	-op-	_	
SALUMINUM FAN	1 Dimension	MA	Measurement	1Camplefeigeflet	-00-	-00-	-op-	-op-	_ ^ _	
NAME OF THE OWNER OWNER OF THE OWNER OWNE	2.Protective paint	MA	Visual	-dn-	1 1	Fan Drg.	Fan Drg.	Inspn Rec.	1	
BIVARNISH & THINNER	L.	MAA	Endoun	4 Completion		-On-	-00-	-op-	1 d	
	-	MA	Verification	-dn-	1 1	MFGRS	MFGR's	Inspn. Rec.	1 1	
7 Bearing	HTGIW/GO/GI	MAA	Magairomont	4 Commis I lot		anfinian	Catalogue	Label	- A	
		S	Madasura	Loampie / 101	1	MFGR's Catalogue	MFGR's Catalogue	Inspn. Rec.	 	Surveillance verification By NTPC
8 BRAZING ALLOYS	Chemical comp.	MA	Chemical	1 Sample / lot	1	MSA-203-01R0	MSA-203-01R0	-do-	Λ	2110
(DMC)	1. Dimension	MA	Measurement	1 Sample / lot		As per drg	As per drg	Supp. TC		
	2.Chem. Comp.	MA	Chemical	-op-	1 Sample / lot	òP	-010-	-00-	_	
	3.Comparative Tracking Index	MA	Electrical	-op-	•	MSA-086-01	MSA-086-01	2	>	
10 PAINT	Viscosity at 32 Deg C	MA	Measurement	-op-		MFGR's Catalogue	MFGR's Catalogue	Inspn. Record	1-	
11 SPACE HEATER	1.IR value & HV	MA	Electrical	100%	1sample/Rating/lot	MSA-023-01R0	MSA-023-02R0	Inspn Report	1	
	2. Resistance	MA	-op-	100%	-op-	-0p-	-op-	-op-	I Di	
12 STAMPINGS	1. Thickness	MA	Measurement	1 Sample / lot	-op-	Stamping dra	Comp. dra	Supp TC	N N N	
	2. Waviness	MA	Vsual	÷	-do-	MSA-060-01R0	MSA-060-01R0	-02-		
	3. Burr height	MA	Measurement	-op-	-do-	-do-	<50 micron	-00-	>>	
	4.Coating Thickness	MA	Mechanical	-op-	-do-	-dp-	MSA-060-01	-op-		
	5.Permeability	MA	Electrical	-op-	-op-	-op-	-op-	-do-	^ ^	
	6. Specific core loss	MA	Electrical	-op-	-op-	-do-	-op-	-op-	>	
The state of the s	Z.IR	MA	Electrical	-op-	-op-	-op-	-op-	-op-	> >	
JEACTURER SUB-SUPPLIER C. I	LEGENDS: RECORDS IDENTIFIED WITH 1 CK V SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION MANUFACTURERY SUB-SUPPLIER IN QA DOCUMENTATION	ALLY IN	CLUDED BY SUPPL	JER IN QA DOCUMEN		"M. Note:# NTPC Inspection Engineer to check, approval data/ revision no. of reference documents at	n Engineer to check, a	approval date/ rev	ision no. of refere	nce documents a
PPROPRIATE CHP. NTPC SHALL	L BE INDICATED IN COLUMN N' AS	.//.				the time of Inspection				
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Engg. Div./QA&1

	ADDRESS	ŏ			REFERENCE QUALITY PLAN	AN	magatal	To be filled in by NTPC	TPC	
5	CROMPTON GREAVES		Item /equipment :		QP No.: NTPC-RQP 1	SIGN OF	QP No.: 0000-939- Reviewed by:	-Reviewed by:	4	Approved By:
Smalt solutions. Strong relationships.	LT MOTORS DIVISION A-8/2, MIDC AHMEDNAGAR - 414111 MAHARASHTRA		LT INDUCTION MOTORS (60KW TO 200 KW) sub-system :	MOTORS (W)	Rev. No'4' Date:- PAGE: Page 3 of 5	MIQ	Rev. No.: 4 Date:-20-6-12	RAJIV GARG		orgelica
Sr. No. ITEM	Characteristics	Class	Type of	Quant	Quantum of check	Reference	Acceptance	5 Format of	Anomony	panouridy *
			Check	M	C/N	Nocumente	Mormo	o limat o	Agency	Kemarks
7	2	t	10		9	7	NOTHER	Record		No.
13 STATOR CORE PACK	1.Dimn. Conformity (core length, & Dis.)	MA	Measurement	1 Sample / lot		MSA-060-02R0	MSA-060-02R0	Inspn. Report	2 0.	1
	2. Alignment of slot	MA	Visual	-op-	1	-0p-	-op-	-dp-	0.	Ĭ
	3.Deburring and cleanliness	MA	Visual	-op-	4:	-op-	-op-	-op-	1 n_	Ĭ.
14 SLOT INSULATION	1. Tensile Strength	MA	Mechanical	1 Sample/lot	r	MSA-088-09R0	MSA-088-09R0	Supp TC	0	
(Class'F')	2. Elongation at break	MA	-op-	-op-	1	-op-	-op-	-dp-	->	1. 7
	3.BDV as recd. & after laceing	CR	Electrical	-op-	1 Sample / lot	-op-	-op-	-00		
	-	MA	Electrical	-op-	1	-op-	-00-	-do-	^	
15/VARNISH FG SLEEVE (Class 'F')	1. Dimn Bore dia Thickness	MA	Measurement	1 Sample/lot	1	MSA-088-07R0	MSA-088-07RC	Supp.TC	- 0	
	2.BDV as recd. &after	CR	Electrical	-op-		-do-	-op-	-op-	a.	1
	3 RVatue	MA	do	0						
	4. Glass content conformity	MA	Chemical	1 Sample/lot	ľ	-do- MSA-088-07R0	-do- MSA-088-07R0	-do- Supp. TC	d >	1.1
	5. Varnish compatibility	MA	Chemical	-OP-	1	0	OF	i i	_	
	6. Bending before and	MA	Mechanical	-op-	1	8 -9	þ	- 6	> >	t i
	after aging 7. Voltage proof test in air at room temp & at 150C	MA	Electrical	-op-	í	î p	op-	ę ę	- //	1 1
	8. Stability of coating	MA	Chemical	dp	1	, co	Č	1	_	
	9. Self extinguishing	MA	Chemical	-op-	1	ф	-0	p c	> >	0.00
18 GASKET	1.Shore hardness	MA	Mechanical	1 Sample/lot	1	MSA 162-01R0	MSA 162-01R0	Inspn Record	+	
	2.Ageing fest	MA	Thermal	-op-	1	-OP-	-op-	Supp.TC	. >	1
	3.Flame test	MA	Chemical	-op-	1 Sample / lot	-dp-	÷	-op-	>	>
	4. Neoprene conformity	MA	Chemical	-op-	-op-	op	-op-	-op-	>	>
SOCRADOS DEPOSIDOS INTERIOR MATERIAL STORES	k	MA	Mechanical	1 Sample /lot	p		Gasket Drg	Inspn Record	1	1
ANUFACTURER/ SUB-SUPPLIER C. N.	MAIN SUPPLIER N. NTPC. P. PER	SFORM 1	CLUDED BY SUPPLI	N. NTPC. P. PERFORM W. WITHES V. VERIFICATION	TATION "* M;		n Engineer to check,	approval date/ revis	sion no. of re	ference documents a
AS APPROPRIATE CHP. NTPC SHALL BE INDICATED IN COLUMN IN AS "W	L BE INDICATED IN COLUMN IN A	W. S				the time of Inspection				
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	The same in the last of the same in the sa			THE PROPERTY OF THE PROPERTY OF						
	CROMPTON GREAVES		Item /equipment :	t:	QP No.: NTPC-RQP 1	SIGN OF	QP No.: 0000-999-Reviewed by:	Reviewed by:	4	Approved By:
Smart solukone. Strang retationships.	LT MOTORS DIVISION A-6/2, MIDC AHMEDNAGAR 414111		LT INDUCTION MOTORS (50KW TO 200 KW)	MOTORS KW)	Rev. No.:'4' Date:- PAGE: Page 4 of 5	Mig	QVE-F-044 Rev. No.: 4 Date:-20-6-12	RAJIV GARG	IN SECTION	AN SARGE PRO
NO NO			sub-system:				Valid upto:19-06-15	15		Approved
	Characteristics	Class	Type of	Quant	Quantum Of check	Reference	Acceptance	Format of	Agency	Remarks
2			Check	M	C/N	Documents	Norms	Record	D* I M IC N	
2	in in	4	. 2		10	7	8	6	4	1000
IN PROCESS INSPN.: MACHINED CASTINGS 1.Dmn.	S 1.Dmn.	CR	Measurement	100%		Comp. Dr.	Comp	O money		No blow-holes
(BODY, END SHIELDS, T.BOX, BEARING		MA	Mechanical	10%		-op-	- op	-op-	1 1	surface of
COVERS	of machined surface	2.2.2		1		MAN SERVICE				& no welding on
		MA	Visual	100%		No blow hole	No blowhole	-dp-	_	casting permitted
	(For Flameproof	MA	Mechanical	100%	%001 %001	MSA-02-02R0	MSA-02-02R0	Inspn Record	> >	
COIL FORMING	1. Conductor dia	MA	Measurement	100%	3	Winding MO	Winding MO	-00-	Q	
	2. No. of turns	MA	Visual	100%		-op-	-do-	50	1 0	
WOUND STATOR	1. Resistance	MA	Electrical	100%	4	-op-	-op-	-do-	1	
	2.HV Test	MA	op	-op-	1	-0/0-	-00-	-00	0	
	3.Interturn (Surge Test)	MA	-do-	op		-00-	-op-	S C	- 0	
	4. Polarity	MA	-op-	-00-	1	-00-	-do-	3 6	_ 0	
	5. Impregnation : VPI	MA	Mechanical	100%	1/RATING/LOT	SP05	SP05	Inspn. Record	>	
	6. Workmanship (joints, Slot Wedges, lightness & connections)	MA	Visual	100%	H	-dp-	ф	-op-	1	
MACHINED SHAFT	1. Dimn Conformity	CR	Mechanical	100%		Chaft Dra	Ohoth Day			
	S Contemptation of Charles	5 5		500		Shart Dig.	Shaft Drg.	Inspn. Record	0	
	3. Michig finish, radius,	MA	Visual	÷ ÷	1. 1	op op	\$ \$	÷ ÷	1 1	
IN OTHER PROPERTY.	chamfer									
DIE CAST ROTOR	1. Core length	MA	Measurement	100%	1	M.O.	M.O.	Inspn. Record	ф Д	
	Z. Free from Blow-holes, dracks	MA	Visual	100%	T.	-op-	-op-	-op-	1 0	
MACHINED ROTOR	1. Dimn OD	CR	Measurement	100%	1 Sample / lot	-op-	-op-	Inspn. Record	- d	
	2 Concentricity w.r.t. Bearing seat	MA	Mechanical	10%	op	-op-	-op-	-op-	1	
ROTOR	Dynamic balancing of Rotors at rated speed . 4	MA	Mechanical	100%	400 %	A18 R0 & TS A16 R1	ISO: 1940 Grade, G.2.5	Inspn. Record	v P V	
FAN		MA	Mechanical	100%	100%	TS-A19-R0	ISO: 1940 Grade -G2 5	Inspn.Record	> a	
ASSEMBLED	Name Plate data,	MA	Visual	400%	1 Sample / lot	TS: AZOR5	TS: A20 R5	Inspn. Record	> d	
	Flame path joint Gap for Flame proof motors 4	MA	Mechanical	100%	100%	IS2148	IS2148	Inspn. Record	> a.	

Engg. Div./QA&1

-		MANUFACTURER'S NAME & ADDRESS	ංජ 111		REFERE	FERENCE QUALITY PLAN	N	MIPC	To be filled in by NTPC	NTPC		
	N	CROMPTON GREAVES		Item lequipment	nt:	QP No.: NTPC-RQP 1	SIGN OF MANUFACTURER	QP No.: 0000-999- Reviewed by: QVE-P-044 V SHRIVASTA	Reviewed by:	5	-	Approved ByA.g.s.
Strang	Strong retationalisms	LT MOTORS DIVISION A-6/2, MIDC AHMEDNAGAR - 414111 MAHARASHTRA		LT INDUCTION MOTORS (50KW TO 200 KW) sub-system :	M MOTORS KW)	Rev. No.:'4' Date:- PAGE: Page 5 of 5	MIQ	Rev. No.: 4 Date:-20-6-12 Valid up(o:19-06-15		B	: Mg	AKTONEG THERE
Sr. No.	ITEM	Characteristics	Class	Type of	Ouan	Quantum of check	Reference	Accordance	Eormatof	Anna	7007	Designation
				Check	N	CIN	Documents	Norms	Record	D* I W IC	CIN	Кепатк
+	2	in.	d.	10		9	7	8	Gi Ci	7	+	11.
		VERIFICATION OF TYPE TEST CLEARANCE FROM N	PETE	ST CLEARANG	CE FROM NTPC ENGG	NGG						
	FINAL INSPECTION:	1. Marking on the Name Plate	MA	Visual	100%	100%	IS:325/ NTPC Specn/	IS:325/ NTPC Specn/	70	D.	3	
	ROUTINE TEST	2. a) Paint Shade	MA	Mechanical	-op-	-op-	Appd D/S,&Drg	Appd D/S,&Drg	TC	a.	W	
		b) Paint Thickness 4 (On casting surface)	MA	Mechanical	1 sample /Lot	1 sample /Lot	-op-	Min 100 microns	70	д >	W	
		c) Scratch Test	MA	Mechanical	-op-	-op-	-0p-	No Peel-off				
		3. ocation of T.Box.	MA	Visual	100%	100%	Appd D/S	Appd D/S	TC	<u>a</u>	3	
		4. R fest before & after HV on Main wdg. & Sp. Heater,	MA	Electrical	-op-	-op-	IS-325	S-325	27		3	
		5.HV on Main Wdg. & Space Heaters	MA	-op-	-op-	-dp-	-0p-	-op-	TC	D >	×	
		6.Measurement of Wdg. Res.	MA	-op-	-dp-	-op-	-op-	CGL-TS-35	TC	n. >	3	
		7.No Load Test	MA	-op-	-op-	-op-	-do-	Appd D/S,&Drg	TC	7	3	
		8.Locked Rotor Test at reduced voltage	MA	-op-	-op-	-op-	-op-	CGL-TS-35	TC	2	3	
		9. Reduced voltage running in both directions (1/n3 Un)	MA	-op	-00-	-op-	-dp-	15325	TC	<u>م</u>	% %	
		10 Overspeed test (120% of rated speed) for 2 min.	MA	Mechanical	-op-	-op-	-0p-	-op-	70	7	W	
		11. Vibration Test at rated speed & voltage	MA	Mechanical	-op-	-op-	1S12075	IS12075	TC	2	× ×	
		12 Degree of Protection By insertion of 1 mm thick wire	MA	Mechanical	-op-	-ор-	-op-	IS:325/IS:4029	70	7	3	
		13.Mounting & overall dimension	MA	Measurement	-op-	1Sample/rating/Lot	-op-	As per D/S & Drg	TC	D.	% %	
	DISPATCH INSPECT-	Case Marking.	MA	Visual	100%	3	Manufacturing Order	Manufacturing Order	Manufacturing Order	Œ.	1	

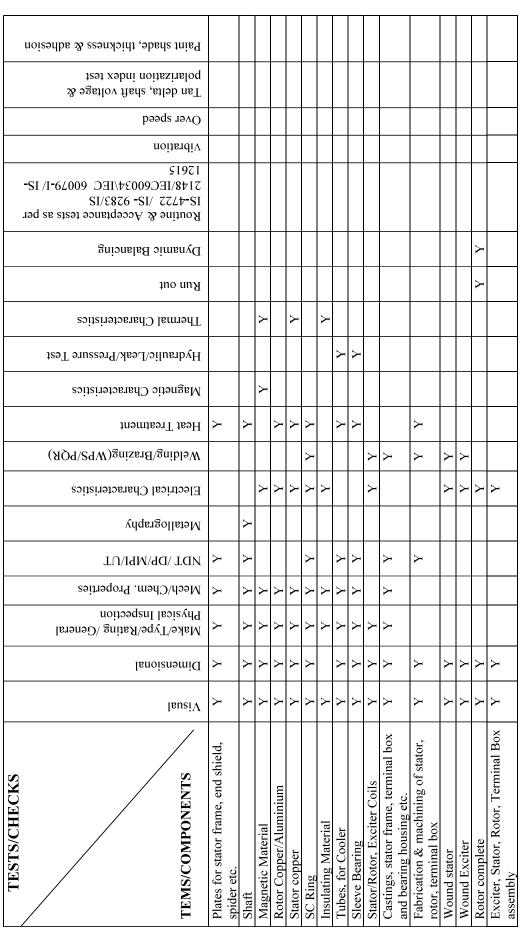
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CHAPTER NAME

MOTOR



TESTS/CHECKS																	u	
EMS/COMPONENTS	IsusiV	Dimensional	Make/Type/Rating /General Physical Inspection	Mech/Chem. Properties	TU\I¶M\¶DT \DN	Metallography	Electrical Characteristics	Welding/Brazing(WPS/PQR) Heat Treatment	Magnetic Characteristics	Hydraulic/Leak/Pressure Test	Thermal Characteristics	Run out	Dynamic Balancing	Routine & Acceptance tests as po	Vibration Over speed	Tan delta, shaft voltage & polarization index test	Paint shade, thickness & adhesio	
lates for stator frame, end shield, oider etc.	Y	Y	>	Y	Y				Y									
haft	Y	Y	Y	Y	Y	Y			Y									
fagnetic Material	Y	Y	Y	Y			Y		Y		Y							
otor Copper/Aluminium	Y	Y	Y	Y			Y	Y	2									
tator copper	Y	Y	Y	Y			Y	Y	2		Y							
C Ring	Y	Ā	Y	Y	Y		Y	λ	Y									
Isulating Material	Y		Y	Y			Y				Y							
ubes, for Cooler	Y	Ā	Y	Y	Y			Ā	2	Y								
eeve Bearing	Y	Ā	Y	Y	Y				Y	Y								
tator/Rotor, Exciter Coils	Y	Å	Y				Y	Y										
astings, stator frame, terminal box	Y	Y	Y	Y	Y			Y										
nd bearing housing etc.																		
abrication & machining of stator,	Y	Υ			Y			<u></u>										
otor, terminal box																		
ound stator	Y	Y					Y	Y										
ound Exciter	Y	Y					Y	Y										
otor complete	Y	Y					Y					Y	Y					
xciter, Stator, Rotor, Terminal Box ssembly	Y	Y					7											
				-	-			<u> </u> 							<u> </u> 			
EPC PACKAGE FOR 2 X 660 MW SUPER	2				TECH	TECHNICAL SPECIFICATION	PECIFIC	VOITA'						PART - B		Page 1 of 2	of 2	
CRITICAL THERMAL POWER PROJECT, HTPS, KORBA WEST				BID	DOCNC	SECTION – VI, PART-B NO.: 03-05 / 2X660 MW / /	-VI, PAI -X660 N	SECTION – VI, PART-B BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023	/ 2023				SUB E42	SUB-SECTION-VI E42- MOTORS			! }	

CLAUSE No.



Accessories, RTD, BTD, CT, Space heater, antifriction bearing, gaskets	Y	Y	У									
etc.												
Complete Motor	Y	Y	Y					Y	Y	Λ .	Y1	Y

Note:

supporting documents during QP finalization. However, following methodology to be followed for Inspection Categorization: 1. The manufacture is to furnish a detailed Quality Plan indicating the practices & Procedure followed along with relevant

Note for LT Motor:

- "It is hereby confirmed that the above mentioned motor /motors was/ were manufactured taking care of NTPC specific requirements regarding ambient temp., voltage frequency variation, hot i) Motor rating up to 50 KW: Inspection CAT- III: Acceptance of Motor up to 50 KW is based on COC of the Manufacturer and Main Contractor confirming as follows:
- ii) Motor rating above 50 KW & less than 75 KW: Inspection CAT-II as per NTPC approved MOP: Acceptance of Motor rating above 50 KW & less than 75 KW is based on NTPC rev report as per IS:12615 - 2018 (including latest revision) duly witnessed by main contractor along with COC of the Manufacturer and Main Contractor confirming as follows: KVA/KW, temperature rise, distance between center of stud gland plate and tested in accordance with approved drawing /data sheets."
 - "It is hereby confirmed that the above mentioned motor /motors was/ were manufactured taking care of NTPC specific requirements regarding ambient temp., voltage frequency variation, hot KVA/KW, temperature rise, distance between center of stud gland plate, space heater and tested in accordance with approved drawing /data sheets."
 - iii) Motor rating 75 KW & above: Inspection CAT-I: As per NTPC approved MQP.
- 2. Additional routine tests for Flame proof motors shall be applicable as per relevant standard
 - 3. Makes of major bought out items for HT motors will be subject to NTPC approval.
 - 4. Y1 = for HT Motor / Machines only.
- Compliance of relevant standard IS:12615/IEC requirement. In case actual results are not within the tolerance limit as declared by manufacturer during QP submission, 5. For LT Motors, stator core stack length & grade, no load loss and winding resistance w.r.t. type tested motor for IE2/IE3 shall be checked/verified in addition to the motor shall be subjected to efficiency test.

EPC PACKAGE FOR 2 X 660 MW SUPER CRITICAL THERMAL POWER PROJECT, HTPS, KORBA WEST BID DOC NO.: 03-05/2X660 MW / T-13/2023

SHEET 1 OF REMARKS DATE: DATE: DATE: B C SPEC. NO: OP NO.: PE-QP-999-509-E001, R3 AGENCY M D REFERENCE ACCEPTANCE NORMS RECORD 6 PO NO.: ∞ SYSTEM: EARTHING STANDARD QUALITY PLAN QUANTUM OF CHECK ITEM: ABOVE GROUND EARTHING MATERIALS Σ CLASS TYPE OF CHECK MANUFACTURER BIDDER/ SUPPLIER NAME & ADDRESS CUSTOMER: PROJECT: COMPONENTS CHARACTERSTICS & OPERATIONS Sl. No.

1.0	RAW MATERIAL:													
	MILD STEEL	1.CHEMICAL & PHYSICAL PROPERTIES	MA	VERIFICATION OF TC'S	100%		15 2062	IS 2062	MILLTC	>	۵	>	E E	REFER REMARKS AT SL. NO. 3.1
1.1	AS PER	2. DIMENSIONS	MA	MEASUREMENT	100%		IS 1730	IS 1730	QC RECORD	>	Ь			
	SPECIFICATION	3.SURFACE FINISH	MA	VISUAL	100%		IS 1079	IS 1079	QC RECORD	>	Ь			
1.2	ZINC	1.CHEMICAL COMP.	MA	CHEM. TEST	SAMPLE		IS 209	IS 209	QC RECORD	>	۵	>		
2.0	IN PROCESS:													
2.1	CUTTING, DRILLING	1.DIMENSIONS	MA	MEASUREMENT	100%	T.	IS 1730	IS 1730	QC RECORD	,	Ь	>		
2.2	SURFACE	1. CLEANING, PICKLING, RINSING & FLUXING	MA	VISUAL	100%		IS 2629	15 2629	QC RECORD	>	d			
		2. SURFACE FINISH	MA	VISUAL	100%		15 2629	IS 2629	QC RECORD	,	Ь	•	•	
2.3	GALVANISING	1.TEMPERATURE OF BATH	MA	MEASUREMENT	CONTINUO		IS 2629	15 2629	QC RECORD	>	4	1		
		2. DROSS	MA	VISUAL	PERIODIC		15 2629	15 2629	QC RECORD	1	Ь		3 6	GALVANIZATION IS TO BE DONE AT GALVANIZATION
		3.RATE OF IMMERSION	MA	VISUAL/ MEASUREMENT	100%		15 2629	IS 2629	QC RECORD	>	۵	•	1 2 2	PLANT LISTED IN ANNEXURE-1 TO QUALITY PLAN,
		4. SURFACE FINISH	MA	VISUAL	100%	-	15 2629	FREE FROM BURRS, ROUGHNESS, SLAG, FLUX, STAIN	QC RECORD	>	0.	,		
3.0	FINISHED ITEMS:												•	
3.1	MS FLATS	1. CHEMICAL COMP.	MA	CHEM. TEST	1 No./LOT/SI ZE		1S 2026	15 2026	LAB TC	7	۵	>	2 1 8 0	NOTE: SAMPLE FOR CHEMICAL TEST SHALL BE SELECTED BY BHEL& TESTING SHALL BE DONE AT NABL/ GOVT. AFPD.
		2. DIMENSIONS	MA	MEASUREMENT	IS 2500 (PART 1) LEVEL S-4	IS 2500 (PART 1) LEVEL S-4	IS 1730	IS 1730	INSPECTIO N REPORT	>	a	3		
	BIDDER/SUPPLIER	ER			BHEL	1:			FC	DR CU	STOME	R REVIE	W & A	FOR CUSTOMER REVIEW & APPROVAL
						-				-	-	***************************************	Samuel of Samuel	the state of the s

Seal

Name

Sign & Date

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QUALITY
Sign & Date

Name MANN Checked

ENGINEERING Sign & Date

Sign & Date

Checked bxin

Reviewed by:

Name

The same

Sandey Reviewed (

В SPEC. NO: QP NO.: PE-QP-999-509-E001, R3 AGENCY Σ + 0 REFERENCE ACCEPTANCE NORMS RECORD 6 PO NO.: 00 SYSTEM: EARTHING STANDARD QUALITY PLAN B QUANTUM OF CHECK ITEM: ABOVE GROUND EARTHING MATERIALS M CHARACTERSTICS CLASS CHECK MANUFACTURER BIDDER/
SUPPLIER NAME & ADDRESS CUSTOMER: PROJECT: COMPONENTS (A OPERATIONS SI No.

SHEET 2 OF

DATE: DATE: DATE: REMARKS

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*	*	>	3	W			>
۵	۵	۵	۵	Ь			۵
>	>	>	>	>		-	>
QC RECORD	INSP. REPORT	INSP. REPORT	INSP. REPORT	INSP. REPORT	COMPLIANCE		INSPC. REPORT
FREE FROM BURRS, ROUGHNESS, SLAG, FLUX, STAIN ETC.	FLATS 5 MM THICK AND OVER 610 GM/SQ.M. FLATS UNDER 5 MM, BUT NOT LESS 2 MM 450 GM/SQ.M.	15-2633	FLATS S MM THICK AND OVER=AVG 86 MICRON AND MINIMUM 75 MICRON. FLATS UNDER 5 MM THICK, BUT NOT LESS 2 MM =AVG 65 MICRON	IS 2629	D ON COC (CERTIFICATE OF		BHEL APPROVED DOC
	15-6745	15-2633	IS-4759	IS 2629	BE CLEARED BASE		BHEL APPROVED DOC
(PART 1)	15 4759	15-4759	15-4759	15-4759	ST LINK WILL		100%
IS 2500 (PART 1)	IS 4759	15-4759	15-4759	15-4759	DING MAST/TE		100%
VISUAL	CHEM. TEST	CHEM. TEST	MEASUREMENT	MECH. TEST	RE/ GS ROD/ SHIELI		VISUAL
AA	Ā	MA	MA	MA	AID/ GI WII		MA
3. SURFACE FINISH	4.MASS OF ZINC COATING	S.UNIFORMITY OF ZINC COATING	6. THICKNESS OF ZINC COATING	7. ADHESION	NOTE: ITEMS LIKE PIPES/ FLEXIBLE COPPER BRAID/ GI WIRE/ GS ROD/ SHIELDING MAST/ TEST LINK WILL BE CLEARED BASED ON COC (CERTIFICATE OF COMPLIANCE)		SURFACE FINISH & COMPLETENESS
					NOTE: ITEMS LIKE P		PACKING
							4.0

NOTES:

1 LATEST REVISION/ YEAR OF ISSUE OF ALL THE STANDARDS (IS/ASME/IEC ETC.) INDICATED IN QP SHALL BE REFERRED. LEGENDS:

*RECORDS, INDENTIFIED WITH "TICK"(V) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION, D: DOCUMENTATION C CUSTOMER, P: PERFORM, W: WITNESS, Y: VERIFICATION, AS APPROPRIATE MA: MAJOR, MI: MINOR, CR: CRITICAL

FOR CUSTOMER REVIEW & APPROVAL	Doc No:	me Sign & Date Name Seal	nay Reviewed by:	Approved by:
		Name	Suman	Hain
		te		- \

** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: BHEL/ THIRD PARTY INSPECTION AGENCY.

	ENGINE	Sign	The state of the s	Reviewed	. To
BIDDER/SUPPLIER	Sign & Date	Seal			

				QUALILIT	
	Sign & Date Name	Name		Sign & Date	Name
Checked by	snd .	MEEND Che	MEEND Checked	· known	Suman
Reviewed	188 M	Sandley	Reviewed by:	1 her the	Hainst I

INSTRUCTIONS FOR FILLING QUALITY PLAN

The Quality Plan shall include all the Quality Control Measures and Checks adopted by the Vendor to ensure that the material/component/assembly/services supplied by him meet/will meet the requirements as per specifications and good practices. They shall include all stages of operation such as materials, processes, manufacture, assembly, packing and despatch. The following

Column 1-	Serial	Number
-----------	--------	--------

Column 2-

Component/Operation- The component and/or operation being checked shall be given here. Characteristics check- The characteristics being checked shall be given here, e.g., chemical composition, mechanical Column 3-

Column 4= Category -'CR' stands for critical characteristic

'MA' stands for major Characteristic

'MI' stands for minor characteristic

affecting safety of equipment and personnel affecting safety of equipment and personnel

Column 5affecting appearance etc.

Type/Method of check e.g. chemical analysis tensile testing, hydraulic test, visual examination radiography etc. Column 6-Extent of check, such as, 100, 10, 1 percent etc.

Column 7-

Reference Documents - Documents, such as technical specification, drawings, standard specifications (IS, BS ETC.) procedure, etc. according to which check is done. Column 8-

Acceptance Norms - Standards etc. according to which acceptability or otherwise of the characteristics being checked is Column 9-

Format of Record - Formats, log shets, reports, etc. in which the observations are recorded. Standard log sheets, reports, formats etc. of the Vendors shall be numbered and such reference numbers shall be included here.

Column 10-Agency - The agency which performs the test/instruction shall be written in sub-column 'W' The agency which verifies test certificates/inspection records and carries out audit check of the components/operation shall be written in sub-column 'V'

The agencies are codified as 1,2 & 3

'1' stands for (BHEL)

11' means the operation shall be cleared by BHEL before the start of the next operation.

'2' Stands for Vendor

'3' stands for sub-Vendor of the Vendor and so on.

Example:

Entry

'3' in column 'P' means test./inspection to be performed by sub-Vendor's QC

'2' in column 'W' means test./inspection to be witnessed by Vendor's QC Entry

'1' in column "V" means verification shall be done by BHEL and next stage to be started only arrespectation point is cleared Entry

by BHEL

Remarks - Any special remarks shall be given here. Column111-

NOTES:

- In absence of correlation with the test certificate(s) (e.g. material identification) samples shall be drawn bgy BHEL and all tests as per relevent specifications shall be carried out in their presence or in recognized Government Laboratory.
- When materials and components are initially identified and stamped by BHEL QS engineer, the identification marks shall be presserved till despatch. Wherever this is not possible, the identification mark shall be transferred to the components in the presence of BHEL QS Engineer unless other wise agreed.
- For castings and forgings integral test specimens shall be provided, When this is not possible for casting, they shall be poured in the presence of BHEL OS Engineer unless otherwise, if witnessing of test by BHEL is called for.
- When welders qualified by reputed inspection agencies or statutory bodies are not available, qualification tests shall be conducted in the presence of BHEL QS Engineer.
- This Quality Plan is liable to be modified as per the requirements of approved drawings and changes in technical specifications/drawings. If there are contradictions in respect of column 7 & 8 between this Quality Plan and the approved drawings specifications, the latter shall prevail.
- Wherever inspection by BHELs Purchaser/Third Party/Statutory authoritics are mandatory, this shall be compiled with
- Inspection reports, log sheets, test reports/certificate, etc. shall be furnished to BHEL at the appropriate stages inspection, as required.
- This Quality Plan is also applicable to spares, if any, under scope of supply of Vendor.
- The quality plan shall be submitted in minimum 4 copies with a soft copy of the same or in line with contract re

LIST OF GALVANIZERS IS ATTACHED SEPARATELY.

OR QP AN (RQP / SQP/R <i>FQP/SFQP</i>)	एन्स्वेषक्ष To be filled in by NTPC	"	PROJECT SPECIFIC QP NUMBER ALLOTTED	IDA OP NO: 9585_001_215_OVE_0_024		REV. NO.: 01 DT: 24,11,2021	FORATED TYPE)			(TICK APPLICABLE)	The QP is endorsed for this project without any	however the same do	val, however the same The QP is endorsed for this project with changes as indicated.		NTPC (Reviewed /Approved by/ Date & Seal)
ENDORSEMENT SHEET FOR QP REFERENCE / STANDARD / FIELD QUALITY PLAN (RQP / SQP/RFQP/SFQP)	TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION	3x800 MW NTPC PATRATU STPP EXPANSION, PHASE-1	434	M/S. BHARAT HEAVY ELECTRICALS LTD., PEM, NOIDA	M/S INDUSTRIAL PERFORATION (INDIA) PVT LTD, 327, R.N. GUHA ROAD DUM DUM. KOLKATTA-700028	M/S INDUSTRIAL PERFORATION (INDIA) PVT LTD , KATAKHAL GANGANAGAR 24-PGS NORTH KOLATA-700132	CABLE TRAY & ITS ACCESSORIES (LADDER & PERFORATED TYPE)		0000-999-QOE-S-021, T01 DATED 06.02.04	VER APPLICABLE)	I. That the item/ component is identical to that considered for QP approval. ee	II. That there are minor changes in the item/ component with respect to that considered for QP approval, however the same do not affect the contents of QP.	III. That there are minor changes in the item/component with respect to that considered for QP approval, however the same affect the QP clickets, as indicated below in attached sheet.	red galvanizer list.	PUT LIGHT OF THE PARTY OF THE P
REFER	Y SUPPLIER AT T				RKS & ADDRESS	ADDRESS	YSTEM/		JP/SQP/RFQP/SFQP	oplier (TICK WHICHE)	nt is identical to that con	thanges in the item/ com	changes in the item/ ea	re-A for NTPC approv	
	TO BE FILLED IN B	PROJECT NAME	CONTRACT NO.:	MAIN SUPPLIER	MANUFACTURER WORKS & ADDRESS	GALVANIZER WORKS & ADDRESS	ITEM /EQUIPMENT / SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL	TYPE/SIZE/RATING etc.	APPROVED QP NO.: RQP/SQP/RFQP/SFQP	Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE	I. That the item/ componer	H. That there are minor chan not affect the contents of OP.	III. That there are minor changes in the item component affect the OP clienth, as indicated below, in attached cheer.	NOTES: 1. Kindly refer Annexure-A for NTPC approved galvanizer list. 2. Kindly refer Annexure-B for additional Notes.	O THE ROLL

Page 1 of 4

SI COMPONENT & OPERATIONS 1 2 FINISHED CABLE TRAYS & ACCESSORIES.	-	Ladder	CABLE IRAYS (Perbrated & Ladder type) & ACCESSORIES	SE.	4				PAGE: 1 OF 1	00 00 00	2 1		Rang-Johns Cally Anti- Glar
										10.40.00			O.P. Nirenjan
	COMPONENT &		CHARACTERSTICS	CLASS	TYPE	no Offi	QUANTUM OF	REFERENCE	ACCEPTANCE	FORMAT	4.	AGENCY	1
FINISHEI TRAYS & ACCES	SHOUN		* 100 March 1 100		CHECK	N /	CARCIA	COCOMEN	NOKWIS	RECORD	>	0	2
FINISHEE TRAYS & ACCES	2		€.	4	5		. 9		80	6	# 5	-	=
TRAYS & ACCES	CABLE	_	In Black Condition								+		A VOTE
& ACCES	- 400	(B)	Weld Quality	Major	Visual		100% Random	Manufacturer's	Manufacturer's	Inspection	,Д	17	- At Inc cashe trays shall be galvanised - at NTPC approved sources only.
	SORGES	3	Burs	Major	Viens	Randorn		Plant Std	Plant Std	report	Ç		-
		7 7	After Galvanising			-			eing ou	3	-		of steel from main produces like
		2.1	General Physical	Major.	Visual	IS-4759	5 sample/lot		1S-2629-1985	ф	Д	≱.	W SAIL/IISCO,Rastriya Ispat/Ispat Ind.
***	×		Relyanising Outling	2.		-1990		13-4/39-1996	18-4759-1996				Jindal/Esser/Lloyda/IIS Co. and
			Defects, Dicromating,		-/1-	1				·		te xe	Zinc from Hindustan Zinc Ltd.
	27		White rusting etc.	*									welders as per supplier system.
36		2.2	Dimensional check &	Major	Measur	ф	o	NTPC/Main Supplier	NTPC/Main Supplier	op-	Ь	*	M ·
			Sheet Thickness	7	ement		***	Approved Drawing	Approved Drawing				D) Pre-tretment of fabricated cable
2		2 (8	Coating thickness	Critical	Critical Measure	- 6	<u>-</u>	7601-0547-51	16 4750 1006	-		100	-
	-	ш	measurement survey		ment			IS-3203-1982	Table-I	}	-	-	w process as per 13 2029. All the process
		_	by Elcometer								110		femerature density of to be
		b). N	Mass of zinc coating	Critical	Measur	-op-	I coupon	IS-6745-1972	IS-4759-1996	-op-	Д.	M	W maintained and recorded by the
					ment		sample of	IS-2633-1986	Table - I				Galvaniser
						. 2	each		the state of the s		14.		E)The process of pretreatment shall.
*0			y s				thickness						be varified by NTPC on surveillance
	***	0	2	Critical	Measur	- op	op .	IS-2629-1985	IS-4759-1996	-op-	۵.	×	W basis during Inspection of cable trays
		3	coatmik nip test		mem			0861-5507-51	ol. 9.3				
							ò	13-4/39-1990					"F" One piece each of 2.5 meter length
		d) . A	Adhesion test	Critical	Visual	op	. 	1S-2629-1985	18-2629-1985		Δ.	M M	size of cable tray of 300 mm & above
								•			-	-	-
		2.4 D	Deflection Test	Critical Measu		l sample	l sample I sample	*14	*F*	-op-	Ь	WW	
	*				rement	from cac	from each from each						uniformly distributed load of 76kg/
	1.					size type	size type/	4		11			meter along the length of cable tray.
i.										,			The maximum deflection at mid span
'ND: RECC	RDS IDE	NTIFIE	O IDENTIFIED WITH	"TICK"	SHALL	BE ESSE	NTIALLY	LEGEND: RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY THE CONTRACTOR IN OA INCLIMENTATION	VIRACTOR IN OA DO	CIMENTATI	NO	1	WILL DOOR OF THE PROPERTY OF THE PARTY OF TH

LIST OF CUSTOMER APPROVED GALVANIZERS IS ATTACHED SEPARATELY

REFER	ENDORSEMENT SHEET FOR QP REFERENCE / STANDARD / FIELD QUALITY PLAN (RQP / SQP/RFQP/SFQP)	r <u>QP/SFQ</u> P)
TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION	TIME OF SUBMISSION	(raditial) To be filled in by NTPC
PROJECT NAME	3x800 MW NTPC PATRATU STPP EXPANSION, PHASE-1	2REVIEW & ENDORSEMENT BY NTPC PROJECT SPECIFIC OP NIMBER ALL OTTED
CONTRACT NO.:		
MAIN SUPPLIER	M/S. BHARAT HEAVY ELECTRICALS LTD., PEM, NOIDA	OP NO: 9585-001-215-OVE-O-009
MANUFACTURER WORKS & ADDRESS	M/S INDUSTRIAL PERFORATION (INDIA) PVT LTD, 327, R.N. GUHA ROAD DUM DUM, KOLKATTA-700028	
GALVANIZER WORKS & ADDRESS	M/S INDUSTRIAL PERFORATION (INDIA) PVT LTD, KATAKHAL GANGANAGAR 24-PGS NORTH KOLATA-700132	REV. NO.: 01 DT: 24.11.2021
ITEM /EQUIPMENT / SYSTEM/	CABLE TRAY SUPPORT SYSTEM – BOLTABLE	
SUB-SYSTEM DETAILS i.e. MODEL TYPE/SIZE/RATING etc.		
APPROVED QP NO.: RQP/SQP/RFQP/SFQP	3120-104A-01-QVE-007 REV. NO: 00 DATED: 14.01.2019	
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)	:VER APPLICABLE)	(TICK APPLICABLE)
I. That the item/ component is identical to that considered for QP approval. $^{\lambda}$	nsidered for QP approval. λ	The QP is endorsed for this project without any
H. That there are minor changes in the item/com	II. That there are minor changes in the item component with respect to that considered for QP approval, however the same do not affect the contents of QP.	change
III. That there are minor changes in the item/ component affect the QP slightly, as indicated below / in attached sheet.	III. That there are minor changes in the item/component with respect to that considered for QP approval, however the same affect the QP slightly, as indicated below/in attached sheet.	The QP is endorsed for this project with changes as indicated.
NOTES: 1. Kindly refer Annexure-A for list of NTPC approved galvanizers. 2. Kindly refer Annexure-B for additional Notes.	S approved galvanizers. Notes.	
SIGN.: (Main Supplier) DATE :	SIGN: (Manufacturer)	NTPC (Reviewed /Approved by/ Date & Seal)

Page 1 of 5

CONFORMING TO	U	9	ATING, SI	RATING, SIZE ETC.) GALVANISE		STANDAKU QUALLIY PLAN	SUALLI V		REV.:00 DATE: 01.09.04 PAGE 1 OF 2	1.09.04	S.D.SINGH		2	\ \{\	ANII OIDEM	
COMPONENT & CHARACTERISTICS CLASS TATA C Speciment atom CONFONENT & CHARACTERISTICS CLASS TATA C Speciment atom CHARACTERISTICS CLASS TATA C Speciment atom CHARACTERISTICS CLASS TATA C SPECIMENT CHARACTERISTICS CLASS TATA C SPECIMENT CLASS CHARACTERISTICS CLASS CL	E.S.	≅ ∪	UPPOR	LECABLE IRAYS		ONFORM ODE: Des	IING TC	or ar	VALID UPTO:31.00	8.07	O.P.NIRANJA	2 10	\$	1		1
1. Else El	SL.	COMPONEN	NT &	CHARACTERISTICS	CLASS	TYPE	QUANT	UMOF	REFERENCE	ACCEPTANCE	FORMAT OF RECORD		GENC	-	SINO	
Plackble cable trays 1, m Black Candition Major Visual 100% Random Manufacturer's Manufacturer				00		CHECK	Σ	CN				-		Z		
Flexible cable trays 1 hr Black Condition Major Visual 100% Random Manufactuer's Manufactuer's Report P V V V	1.	2.		3.	4.	5.		6.	7	8		+	+	-	11	
Finished Galvanized 2 After Galvanising important arrived Galvanized 2 Critical Measurem conting dip test and a Coebing Mass of Zinc conting of the Coeping Conting of the Coeping Coeping Critical Measurem conting of the Coeping Coeping Coeping Critical Measurem conting of the Coeping Coeping Critical Measurem conting Critical Me	ŀ	Flexible cable Support Struct	e trays ture	I. In Black Condition a) Weld Quality	Мајог	Visual	100%	Random	Manufacturer's Plant Std	Manufacturer's Plant Stc	Inspection	The state of the s		>	0	20
Finished Galvanized 2. After Calvanising Association Control Physical Major Visual 100% Sample/L IS-2629-1985 IS-2629-198				b) Burs	Major	Visual	Rando	3	No Burs	No Burs	-op-		0.	*		
21 General physical representation of the physical representation foundating continued and a continued and a continued and a continued and assurem	2	Finished Galva	'anized	2. After Galvanising		5								-		-
Sheek & Major Measurem -do- -do- ATPC/Main NTPC/Main -do- -do- Supplier Supplie				2.1 General physical inspection including Galvanizing Quality/Defects, Dicromating, White Rusting etc.	Major	Visual	700%	Sample/L ot	IS-2629-1985	IS-2629-1985	-op-			3		
Sets Critical Measurem IS- -do- IS-4759-1996 IS-4759-1986 IS-4759-1996 IS-4759-1998 IS-4759				2.2 Dimensional Check & Thickness Check	Major	Measurem	-op-	-op-	Approved Drg.	NTPC/Main Supplier Approved Drg.	-op-			Α		
survey Critical Measurem IS- -do- IS-4759-1996 IS-4759-1996 -do- IS-4759-1996 -do- P W W survey Critical Measurem -do- 1 coupon IS-4759-1996 IS-4759-1996 -do- P W W ach cach Inicloress IS-2633-1986 IS-4759-1996 IS-4759-1996 IS-2633-986 -do- P W W t critical Measurem -do- -do- IS-2633-1986 IS-2633-986 -do- P W W t critical Visual -do- IS-2639-1985 IS-2629-1985 -do- P W W				2.3 Galvanizing Tests												
pating Critical Measurem -do- 1 coupon IS-6745-1972 IS-6745-1972 -do- P W W sample of critical Incomposition IS-6745-1972 -do- P W W sample of critical Incomposition IS-6745-1972 -do- P W W sach -do- -do- IS-2633-1986 IS-2633-1986 -do- P W W critical Visual -do- IS-2659-1985 IS-2629-1985 -do- P W W				a) Coating thickness measurement survey by Elcometer	Critical	Measurem	1S- 4759- 1996	-op-	IS-4759-1996	IS-4759-1996 IS-3203-1982	-0P-			*	#	
the Critical Measurern -dodo- 1S-2633-1986 1S-7633-986 -do- P W		8		b) Mass of zinc coating	Critical	Measurem	-op-	I coupon sample of each thickness	IS-6745-1972	IS-6745-1972 IS-4759-(996	op) the	-	> -	er H	
Criucal Visual -dodo- 15-2629-1985 15-2629-1985 -do- P W				c) Uniformity of zinc coating/dip test	Critical	Меаsurem	-op-	-op-	IS-2633-1986 IS-4759-1996	IS-2633- 986 IS-4759- 996	-op-			*	W.	
				d) Adhesion Test	Critical	Visual	-do-	-do-	IS-2629-1985	IS-2629-:985	-do-	ile.	M	W		SINE
	CHI	CHI BI NITC SHALL DE IDENTIL	OAT DIO	ECOMATANO OS 01 OAT B 10/E3 BO	11 00				173			DINIO	THICK PIN 10 A.E.I.	3.4 K.1		1



E	मुख्य	ITEM: (MATERIAL, RATING, SIZE ETC.)	ITEM: (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.)	20.03	STANDARD QUALITY PLAN	A.	QP NO. 0000- REV.:00 DAT PAGE 2 OF 2	QP NO. 0000-999-QOE-S-38 REV.:00 DATE: 01.09.04 PAGE 2 OF 2	S.D.SINGH	REWIEWED BY	, BY		- Y	APPROVED BY	No. of the second	
,≥	2			OOZ	CONFORMING TO CODE: Design as per NTPC Specification	G TO as per	VALID UPTO: 31.08.07	O: 31.08.07	5	Graten Jane	1/2			10 *	CE TO SACONE DE	
SL.	COMPONENT & OPERATIONS	NENT &	CHARACTERISTICS	CLASS	TYPE	QUANT	QUANTUM OF CHECK	REFERENCE	ACCEPTANCE NORMS	FORMAT OF RECORD	OF	AGENCY	4CY	_	C. New De	
			W		CHECK	M	CN	2				M	0	Z		
1		2.	3.	4.	só.		6.	7	3	6	D*	*	10	į		
N: y	8		Proof Load Test as per note 6 Followed by Die Penetration Test (For 600 mmand above cable tray support system)	¥	Meas/Vis	One Sample from each offered	One Sample from each offered lot	NTPC Technical Specification/ No visible cracks should develop on the weld part	NTPC Technical Specification/ No visible cracks should develop on the weld part	Inspection Report		a,	>	₩	~	**
Note			The CAN CTICA Beatives from Hindurston CAN CTICA Beatries teneral and finial/Record Involed/IS Ca and Zine from Hindurston Zine 11d	preori	I've can mis	idae O	ya Isnat/Isnat	Ind findal/Fessor/Flor	de/IIS Co and Zine f	rom Hindusdan	Zinc It			T		
		piner to cusare	process to manufacture and another second	Todance a			ander ander af					i				
2		g shall be done	Welding shall be done by qualified welders as per supplier system.	ner system												
3		I shall be galva	Material shall be galvanized at NTPC approved sources only	only.						92						
4		trnent of cable	Pre-treatment of cable trays support system shall be carried maintained and recorded by the galvaniser.	nied out in	seven tank pre	ocess as per	r IS-2629. Al	I the process paramete	out in seven tank process as per IS-2629. All the process parameters e.g. Corcentration, temperature, density etc. to be	temperature,	density e	tc. to be				
90	3000	cess of pre-trea	The process of pre-treatment shall be verified by NTPC on surveillance basis during inspection of Galvanised Flexible Cable Trays support system.	on surveil	ance basis du	ring inspec	tion of Galvar	nised Flexible Cable 1	rays support system.							niki hi kelera samu
9	3	on Main suppo ec.	(i) Test on Main support Channel shall be done if only CI channel are in scepe of supply and cantilever arms shall be fitted on one side. lesh. Spec.	CI channel	are in secpe o	f supply an	id cantilever a	inrs shall be fitted on	one side. This test sh	This test shall be same as test 4 of type test as per	test 4 of	type tes	t as per			
	(ii) Test tests T	on Main Supp hen test at (1) a	(ii) Test on Main Support Channel shall be done with C2 Channel and cantilever arms fitted on both sides, if C2 channels are in scope of supply. This test shall be same as test 2. A of type tests. Then test at (i) above shall not be repeated.	2 Channel	and cantilever	arms fitter	d on both side	s, if C2 channels are i	n scope of supply. Th	nis test shall be	same as	test 2 /	of type		CILVE	/:
	(III) Nut	slip characteri	(iii) Nut slip characteristic test (It shall support minimum load of 350 Kg. Before Nut Slips with bolt torque of 65 NM). This test shall be same as test 5 B of type tests.	m load of 3	50 Kg. Before	Nut Slips	with boll torq	lue of 65 NM). This t	est shall be same as te	st 5 B of type I	lests.				H	(P)
	(iv) The	procedure for	(iv) The procedure for carrying out above test shall be as per		details given ir Type Tests Specification	e Tests Sp	ecification								THE WAY	m Du
LEGEI **M N	ND. RECOR	DS IDENTIFI TURER/SUB-S SHALL BE IDI	LEGEND. RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLLIDED BY THE CONTRACTOR IN QA DOCUMENTATION ***M. MANUFACTURER/SUB-SUPPLIER, C.: Main Supplier, N. NTPC. INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE "CHP" BY NTPC SHALL BE IDENTIFIED IN COLUMN "N" AS "W"	SSENTIA r, N. NTPC S "W"	LLY INCLUI	DED BY T	HE CONTRA	CTOR IN QA DOCL	MENTATION VERJFICATION AS	APPROPRIAT	in in			-	18/8/	
FORM	AT NO. QS.	FORMAT NO. QS-01-QAI-P-10/F3-R0	F3-R0					2/2		ENG	ENGG DIV /QA&I	QA&I				



CABI	INC	5, E	ARTI	HING	, LIC	GHT	NIN	G P	ROT	ECI	ΓΙΟΝ	V		
ATTRIBUTES / CHARACTERISTICS		,												ion
ITEMS/COMPONENTS / SUB SYSTEMS	Dimension	Paint shade, paint thickness, adhesion	Pre-treatment of sheet	IP protection	Proof load*	Surface finish	Deflection test*	HV & IR	Galvanize Test (If Applicable)	Functional	Bought out items/Bill of material	Routine tests as per relevant standard & specification	Acceptance tests as per relevant standard & specification	Constructional feature as per NTPC Specification
Wall Mounted-Lighting Panel (IS-513, IS:5, IS:2629, 2633, 6745)	Y	Y	Y	Y		Y		Y		Y	Y	Y	Y	Y
Switch box/junction box/ Receptacles Panel (IS-513, IS:5, IS:2629, 2633, 6745)	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y
Cable glands (BS-6121)	Y													Y
Cable lug	Y													Y
Lighting wire (IS-694)	Y											Y		
Flexible conduits	Y											Y		Y
Conduits (Galvanize & Epoxy) IS- 9537 & IS-2629, 2633, 6745	Y		Y						Y			Y		Y
RCC Hume Pipe (IS-458)												Y		
Cable termination & straight through joint (IS 13573)	Y											Y		Y
Cable Trays, bends, tees, crosses, Flexible supports system & accessories IS-513, 2629,2633,6745	Y		Y		Y	Y	Y		Y			Y	Y	Y
Trefoil clamp	Y													Y
GI flats for earthing & lighting protection (IS 2062, 2629, 6745,2633)	Y		Y						Y			Y		Y
GI wire (IS-280)	Y											Y		
Fire Sealing System (BS –476)												Y	Y	Y

EPC PACKAGE FOR 2 X 660 MW SUPER	TECHNICAL SPECIFICATION	SUB-SECTION	Page 1 of 2
CRITICAL THERMAL POWER PROJECT,	SECTION – VI, PART-B	E29- CABLING, EARTHING,	
HTPS, KORBA WEST	BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023	LIGHTNING PROTECTION	

CLAUSE No.	CHAPTER NAME
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Note:

- 1. This is an indicative list of tests /checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
- 2.* Deflection Test on cable trays and Proof Load test on cable trays support system will be as per details given in the NTPC technical specification & approved MQP. The above acceptance tests shall be done only on one sample from each size of offered lot. This test is not applicable on bends, tees & crosses.
- 3. Make of all items will be subject to NTPC approval.

	44 6 611		ITEM: LIG	ITING	S	TANDAI	RD QUA	LITY PLAN	THE PERSON NAMED IN COLUMN TO SERVICE AND ADDRESS OF THE PERSON NAMED IN COLUMN TO SE	REVIEWED I		0	1	APPROVED BY
		Ш	FIXTURES						Rev No.: 00	SWAPNESWAR N			سكوس	// KMJan
153	1444	Ш	Conventional an.	(LED type)	COMORMING TO	CODE ; A:	s app icable		Jate: 02/11/85	VIKRAM TALW		Me	/	1 000
	TIPE)	Ш	E-25-2010 (3-2010) (3-032) (2-25		14 1 17 14				/ALID UPT@; 01/11/18	SUNIL MALANI	W	1	/	a cyed
SI No	COMPONENT & OPERATIONS		CHARACTERISTICS / INSTRUMENTS	CLASS-IF CHECZ	T'PE OF CHECK	NAME OF STREET	1 OF CIECK	REFERENCE DOCUMENT	ACC :PTANCE NORMS	FORMATION RECORD	1		E	BEMARKS
	2	-		4	5	6M	6 D/N	7	1	9) • •			n C.C.
	North 13, 1 interior	. 6	ctuese oursline to or	russ that areas	to a threat Contract	of the light	inn Kuma	(conventional & LED ype) are	- NITTO - Garding -			1.0	_	0.30
								whether it is identified for NTPO						
							7		Mingle of the Company	7				12
	Conventional	ty	e Lighting Fix	ure						N E di				
A	Bought outitems / n-process c tecks									7 - 1 7 - 1				
1	Lamps		Make, rating &	Major	Visul	1 sample	1 sample	N°PC specification	NTPC specification		V		-	
			type			per ype	Elizabeth Company	requirements for rating & type, Make to be BIS approved with CNL number	requirements for raing & type, Male to be B S approved with CM_number					
1.1	Hectronic Eallast (if applicable)	а	Certificat: of complian:e	Major	Visual		1 1	NIPC speci ication requirements	ballast manufacturer /	Certificate of compliance	,		-	
		b	THD and pf check	Major	Elecrical	Mn'r std.	-	NIPC specification requirements	THD <=10%, pf == 0.9 for FH type and pf >= 1.95 for other type of flores:ent lighting fixtures	Inspection report	P	-	-	P/V • - means test will be performed either by lighting fi supplier of their sub-vendor as Verified by lighting fixture sup
1.2	Castings		Freedom from defects	Major	Visual	Mn r std.		NIPC specification recuirements	Castings shall be free from any defects such as blow holes, surface blisters, cracks and cavities etc.	Inspection report	P/	,		P/V * - means test will be performed either by lighting fi supplier or their sub-wendor ar Verified by lighting fixture sup
1.3	Sheet metal Farming and Fibrication		Freedom from defects	Major	Vistel	Mn r std.		NIPC specification recuirements	sheet me al fabrication / forming etc should be as per manufacturer drgs	Inspection report	F Y	•		P/V * - means test will be performed either by lighting fi supplier of their sub-sendor at Verified by lighting fixture su
1.4	Fre-treatment and powder coating		Pre-treatment process checks, Powder coatin; finish, thicl-ness, uniformity of coating and adhesion	major	Visual, chemical & nech	Mn† std.	į	Mafr standa.d., NTPC specification requirements	Nominal :oating thickness 54 microns cr more	Inspection report	F V	-		P/V * - means test will be performed either by lighting fi supplier or their sub-wendor an Verified by lighting fixture sup

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (*) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIEF IN QA DOCUMENTATION. ** M: MANUFACTURER / SUB-SUPPLIER: C: MAINSUPPLIER, N: NT P: PERFORM W: WITNESS AND N: VERIFICATION. CHP: CUSTOMER HOLDPOINT BY PTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "V" AS "W. Format No.: QS-01-QAI-1-10/F3-R0.

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		1	ITEM: LIGI	HTIMG	S	TANDA	RD QUA	LITY PLAN	QP.NO:000-999-QO 3-S-062	REVIEWED	PY		,	APPROVED BY
			FIXTURES				STATE OF THE PARTY		Rev Nc: 00	SWAFNESWAR	MSHR	A	mod	CONTRACTION A
4	रस्प्रम		(Conventional and	d LED type)	CONFORMING TO	ODE: A	s applicable		Date: 0311/15	VIKRAM TALV	VAR I	W	M	12 a a 22
_	IPC		C - 5100 - 111111111111111111111111111111	THE NAME OF					VALID IPTO: 01/11/18	SUNIL MALANT	IN			The state of the s
SI No	COMPONENT & OPERATIONS		CHAPACTERISTICS / INSTRUMENTS	CLASS OF C JECK	TYPE OF CHECK	50,000,000) F CHECK	REFERENCE DOCUMENT	ICCEPTANCE NORMS	FORMAT OF RECORD	Ħ	1		REMARKS Dt
_	2	-	3	4	5	6 M	6 C/N		ls .	0	D ··		C N	11 100
	Acceptance Tests on conventional Lighting fixture		Details of lot offered and Centificate of compliance that lighting fixture supplier has inspected the offered lot as per their	Majcr	Visual			lighting fature supplier to submit the details of lot offered for NTPC inspection (Type of lighting fatures, their batch number, sub-vendor	coc	List	P	10	V	The list may be used by NTPC for sample selection
		ь	own standard Lamp make	Мајст	Visual	D0%	-00%	name, quintity) Make to be BIS approved with CML number	Make o be BIS approved with CML number	Certalicate of compliance	v	V	, v	
		С	Constructional features including: Internal wiring, lerminal block, earthing terminal, safety chain (if applicable)	Мајс	Visual	Isample pr type		NTPC specification and NTPC approved data sheet/drg.	NTPCspecification and approved data sheet/drg.	Inspection report	P	V	v w	
			Electronic Ballast (if applicable for offered lighting fixtures) THD and of check	Majcr	Electrical	Isample per type	sample ger type	NTPC specification	THD <=10%, of >= 0.9 for FH type and pf >= 0.95 for other type of florescent lighting fixtures	Inspection report	P	V	v w	At lighting fixture suppler test lib
			Resistance to moisture test in case of lighting fixtures having IP 34 and above rating	Мајст	Mechanical	Isample pr type	I sample ger type	NTPC approved data Sheet	IS 10322 Part 1	Inspection report	P	V	v w	
			Resistunce to dust (applicable if IP5X and above)	Мајст	otical	Mnfr ≤d.	Mnfr std	NTPC approved Dita sheet and accepted type lest reports	Certificate of compliance	Certificate of compliance	P/V	9 8	v	P/V *- means tes will be performed either by lighting beta supplier or their sub-vendor and Verified by lighting fixture suppl
		f	Photometry chesk	Major	cptical	Mnfr sd.	Mnfr std	NTPC ac:epted tyre test reports	Certificate of compliance for the batch: that offered lighting fixLire LOR is not be less than 90% ("efer IS 1610") with reference to type test reports	Certificate of compliance	P/ V *	V	v	P/V * - means tes will be performed either by lighting fatu supplier or their sab-vendor and Verified by lighting fixture suppli
		g	Dimersions	Major	Visual	Isample pr type	sample per type	NTPC specification and approved data shee/drg.	NTPCspecifica ion and approved data sheet/drg.	Inspection report	P	V	v w	
		h	HV &IR test	Majcr	Visual	£	Ē	IS 10322 part 1	IS 10322 part 1	Inspection report	P	V	v w	# As per Table 1 (inspectionLev S2) and Table 2CAQL 2.5 o'lS 2500

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (1) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN Q2 DOCUMENTATION, ** Mc MANUFACTURER / SUB-SUPPLIER: C: MAIN SUPPLIER, N: N'PC P: PEPFORM W: WITHESSANG V: VERFICATION, CHP: CUSTOMER HOLD POINT BY N TPC SHALL BE DENTIFIED UNDERAGENCYCOLUMN "N" AS W'.

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	ITEM: LIGH	ITING				LITY PLAN	Rev No.: 01	REVIEWED SWAPNESWAR	MISHE	1.4	~	APPROVED BY
HPC	(Convertional and	l LED (ypc)	CONFORMING TO	COE:	As applicable		Date: 02/18/5 VALID UPT0: 01/11/18	VIKRAM TALV SUNIL MALANI			w	Significant
COMPONENT & OPERATIONS	CHARACTERISTICS / INSTRUMENTS	CLASS DF CHECK	TOPE OF CHECK	QUATU	M OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMA OF RECORD	Ħ			REMARKS TO THE PARTY OF THE PAR
2	3	•	5	1,00		7		9.	D* •	10		n \ P.C., \
LED type Li	ighting fixture		i i							1		
Bought out item in-process check		T.E.	1.2.3									
LED Chip	LED chie efficacy	Major	Vistal	Mnr Std	Mndr Std.	N°PC Spec. Appd. Data sheet/ LM 8) report	NTPC Spec/ Appd Data sheet	LM 80 report	1	V	V	At the time of final inspect
	LED chip CRI and CCT	Major	Visial	Mnr Std	Mndr Std	NTPC Spec. Appd. Data sheet/ LM 8) report	NTPC Spec/ Appd Data sheet	LM 80 report	3	V	V	
	Reported TM21 (L80) lifetime of LED chip	Мајог	Visial	Mnr Std	Mrufr Std.	NTPC Spec. Appd. Data sheet/ LM 8) report	NTPC Spec/ Appd Data sheet	LM 80 report	•	V	V	At the time of final inspect
LED Driver	a Compatibility with LED module/chip, controls & protection features as per N°PC spec	Major	Visial			N°PC spec requirements	Certificate of compliance by LED driver manufacturer / lighting fixture supplier that driver meds all NTFC specification requirements	Certificate of compliance		V	V	
1	b THD and pf check	Major	Electrical	Mnr std.		N°PC specification	THD < 13% and ps >= 0.9	Inspect on report	1	-	-	P/V * - means test will be performed either by lighting fixt supplier or their sub-vendor and Verified by lighting fixture supp
Castings	Freedom from defects	Major	Visial	Mnir std.		NPC specification requirements	Castings shall be fee from any defens such as blow holes, su face blisters, crack; and cavites etc.	Inspect on report		/-		P/V * - means test will be performed either by ighting fixt supplier •r their sub-vendor and Verified by lighting fixture supp
Sheet metal forming and abrication	Freedom from defects	Major	Visial	Mnir std.	•	N°PC specification requirements	sheet mgal fabria tion / forming ee should be as per manufacurer standards and good engs practices	Inspection report	1	-		P/V * - means test will be performed either by ighting fixt supplier *r their sub-endor and Verified by lighting axture supp
Pre-treatment and powd:r coating	Pre-treatment process checks, Powder coating finish, thiexness, uniformity of coating and adhesion	major	Visial, chemical & nech	Mnir std.		Mifr standard, NTPC specification requirements	Nominal coating thickness 50 microns or more	Inspection report		/ -		P/V * - means test will be performed either by ighting fixt supplier or their sub-vendor and Verified by lighting ixture supp

LEGEND.* RECCRDS, INCENTIFIED WITH "TICK" (*) SHALL BE ESSENTIALLY INCIDIDED BY SUPPLIER IN QA COCUMENTATION.** M: MANUFACTURER / SUB-SUPPLIER: C:MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFI: ATION. CHP: CUSTOME HOLD POINT BY 1TPC SHALL BE IDINTIFIED UNDER A SENCY COLUMN "N" AS "W".

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		Ī	ITEM: LIGI FIXTURES	HTING	S	TANDAI	D QUA	LITY FLAN	Rev Nr: 00	REVIEWED SWAPNESWAR	MSHR/	1		APPROVED BY
1	र्ग विश्व		(Corventional and	d LED type)	CONFORMING TO	O (ODE : A	mapplicable		Date: 0/11/15 VALID 0PTO: 01/11 18	VIKEAM TALV	AR VA	Sh	1	(Barlo)
l No	COMBONENT & OPERATIONS		CHATACTERISTI'S / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	QUANTUM 6 M	OF CHECK	REFERENCE DOCUMENT	ACCEPTAN€E NORMS	FORMAT OF RECORD		1		Dt
_	2	۲	3	4	:	b M	- BON	7	8	9	I* **	10	N	" K.P.C 100/
	Accep ance Tests on LED Lighting fixture	а	Details of lot offered and Certificate of compliance that lighting fixture supplier has inspected the offeree lot as per tieir own stindard	Мајог	/isual			lighting fixture supplier to submit the details of lot offered for NTPC inspection (Type of lighting fixtures, their batch number, sub-vendor name, quantity)		List	P	V	V	The list may be used by NTFC for sample selection
		b	LED chip make	Мај-эг	√isual	lЗ		NTPC accepted type test reports (LM80/LM79) report		Certificate of compliance	V	٧	٧	
			Constructional features including: Internal wiring, terminal block, earthing terminal, safety chain (if applicable)	Majər	/isual	sample er type	per type	NTPC specification and NTPC approved data sheet/drg.	NTPC specification and approved data sheet/drg.	Inspection report	P	W	W	
1			Resis ance to moistare test in case of lighting fixtures having IP X4 and above rating	Мајэг	Mechanical	sample er type		NTPC approved data Sheet		Inspection report	P	w	W	
	1 -1		Resis ance to dist (applicable if If5X and above)	Мај∍г	optical	Anfr td.	Mnfr std	NTPC accepted type test reports	Certifeate of compliance	Certificate of compliance	P/ V *	V	٧	P/V * - means test will be perfermed either by lighting fixtur suppier or their ab-vendor and Yeriled by lighting fixture supplie
		f	Photemetry check	Majər	optical	Anfr td.		NTPC accepted type test reports, LM 79, IS16106, 15 16107	Certificate of compliance for the batch: that offered lighting fixture LOR and lighting fixture efficacy i; not be less than 90% (refer 18 1610*) with reference to type 1st reports	of compliance	P/ V *	V		P/V * - means test will be performed either by lighting fixture supplier or their sub- ventor and Varified by lighting fixture supplier

LEGEND: * RICORDS, INDENTIFED WITH "TICK" (/) SHALLBE ESSENTIALLY INCLUDEDBY SUPPLIER IN QA DOCUMENTATION. ** MI: MANU FACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATIO I. CHP: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENC* COLUMN "N" AS 'W'.

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			ITEM: LIGI	HTING	S	TANDAL	D OUA	LITY PLAN	QP.NO:000-999-QO:-S-062	REVEWED	EY	1		APPFOVED BY
		11	FIXTURES					AND THE PROPERTY OF	Rev No.: 00	SWAINESWAR		Fa	المين	N. A.
N	TPC	116	(Corventional an	d LE I type)	CONFORMING TO	OCODE : A	s-applicable		Date: 0/11/15 VALID JPTO: 01/11/18	VIKFAM TALM	du	101	~	क्रिके जादित
SINo	COMDNENT & OPEIATIONS		CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK	TYPE OF CHECK	STEASON	COF CHECK	REFIRENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF R.CORD		H		ARNARISed (0
2		+	3	4		6 M	6.C/N	7	8	9	E* **		N	11 3
	-11	g	Dimensions	Majer	/isual	sample ser type		NTPC specification and approved data short/drg.	NTPC specification and approved data spect/drg.	Inspection	P	W	W	1.3
		ì	LED driver: THD and pf check	Majer	Electrical	THE STREET STREET	The state of the s	NTPC specification	THD < 10% and pf >= 0 9	Inspection report	P	W	W	At lighting fixture supplier test ab
		j	LED driver: Precision current control check	Major	Electrical		I sample per type	NTPC specification	NTPC specification and NTPC approved data shœt	Inspection report	P	W	w	
		k	LED driver: Open circuit protection simulation check	Мајэг	Electrical		I sample per type	NTPC specification	NTPC specification and NTPC approvel data sheet	Inspetion report	P	W	w	
		1	LED driver: Short circuit protection simulation check	Мај п	Electrical		I sample per type	NTPC specification	NTPC specification and NTPC approvel data shæt	Inspection report	P	W	W	
		m	LED driver: Over temperature protection simulation check	Major	Electrical		l sample per type	NTPC specification	NTPC specification and NTPC approvel data sheet	Inspection report	P	W	W	
		n	LED driver: Overload protection simulation check	Мајэг	Electrical	LACTICIPATION.	1 sample per type	NTPC specification	NTPC specification and NTPC approved data sheet	Inspection report	P	W	W	
		0	LED driver: Surge protection compliance check	Мајэг	Electrical			NTPC specification	Certificate of compliance that surgeprotection is provided	Cerificate of compliance	V	٧	V	

Note: Packing shall be witnessed as per Annexure-I to Quality Plan

LEGEND: * R'CORDS, NDENTIRED WITH "TICK" (V) SHALL BE ESSENTIALLY I VOLUDEEBY SUPPLIER IN CA DOCUMENTATION. ** M: MANUFACTURER/ SUB-SUPPLIER: C: MAIM-SUPPLIER, N: MTPC P: PREFORM W: WITNESSAND V: VEFIFICATION. CHP: CUSTOMER HOLD POINT 3Y N TPC 3HALL BEIDENTIFIED UNDER AGENC'T COLUMN "N" AS'W'.

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PACKING SPECIFICATIONS- LIGHTING FIXTURES, LAMPS & MISC. ITEMS ANNEXURE-I

PACKING

- 1. The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.
- 2. Lighting Fixtures, Lamps, Receptacles, Switchboards, 24V Supply modules, 24V sockets, Junction Boxes, Exit signs shall be clean and dry prior to packaging.
- 3. All items specified at sl. No.2 above shall be supplied in packed cartons. The tapes used for packing shall not bleed, leave residue, or damage the item when removed.
- 4. Fixtures & other lighting material shall be wrapped in weather proof material such as polythene sheets, air bubble sheets/ thermocol etc. The lighting fixtures shall be placed in a corrugated paperboard/ fibreboard container/ mono carton.
- 5. The mono cartons shall be wrapped or bagged or tied in place in master cartons. The master carton shall be taped and then wrapped with cushioning material.
- 6. The dimensions of cartons shall be as per manufacturer's recommendations.
- 7. For items like step ladder, wheel mounted ladder and flexible conduits, packing shall be as per manufacturer standard.

Note: In case Manufacturer has a different packing standard which is equivalent or better same to be submitted for approval during contract stage.



	STATION	LIGHTING
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STATION LIGHTING													
Item Components Sub System Assembly Attributes Characteristics	Make, Type, Rating/ TC	Dimension	Pre-Treatment of sheet	Paint Shade Thickness Adhesion & Finish	Galvanization Tests	IP Test	Bought Out Items/ Bill of Material	HV & IR	Functional Check as per spec.	Constructional Feature as per NTPC spec.	Routine Test as per relevant std and spec	Acceptance Test as per relevant std and spec	Item to conform to relevant standard
Luminaries (IS-10322 Part- 5 Sec.1 (non –LED type)	Y					Y		Y			Y	Y	Y
Electronic Ballast	Y										Y	Y	Y
Lighting Wire (IS-694)	Y										Y		
Fans (IS-374)	Y										Y		
Pole (IS-2713)	Y			Y						Y	Y	Y	
Lamps (IS-9800, IS-9974)	Y										Y	Y	
Lighting Mast (with raise & lower lantern type)	Y	Y			Y					Y	v	Y	
Wall Mounted Lighting Panel (IS-513, IS-5)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Switch Box/ Junction Box/Receptacles/ Local Push Button Station / Lighting Panel (IS-513, 2629, 2633, 4759, 6745)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Cable Gland (BS-6121)	Y	Y									Y		
Cable Lug (IS-8309)	Y	Y									Y		
Flexible Conduit	Y										Y		
Lighting Transformer (IS-11171)	Y									Y	Y		
Epoxy & Galvanized Conduit (IS-9537, 2629, 2633, 4759, 6745)	Y	Y									Y		Y

EPC PACKAGE FOR 2 X 660 MW SUPER CRITICAL THERMAL POWER PROJECT.	ICAL SPECIFICATION CTION – VI, PART-B : 03-05 / 2X660 MW / T-13 / 2023	SUB SECTION E44- STATION LIGHTING	Page 1 of 2
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LED Luminaire quality requirements:

- 1) LED modules to conform to IS: 16103 part 2. Manufacturer to issue a certificate of compliance for the same.
- 2) Control gear to conform to IS 15885-part 2 section 13. Manufacturer to issue a certificate of compliance for the same.
- 3) LED luminaire to conform to IS 16107-part 2 section 1. Manufacturer to issue a certificate of compliance for the same.
- 4) LED luminaire marking to be as per IS 16107-part 2 section 1. Manufacturer to issue a certificate of compliance for the same.
- 5) Acceptance tests as per IS 16107-part 2 section 1 to be carried out on LED luminaire except long duration tests i.e. a) Chromaticity coordinates & correlated color temperature (CCT); b) Color rendering index (CRI). Manufacturer will submit a COC for above tests i.e. CCT & CRI
- 6) LED driver make, model, type & rating may be as per recommendations of LED module manufacturer.

Notes:

- 1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
- 2. Make of all major Bought Out Items will be subject to NTPC approval.

*Approval doesn't absolve the EPC contractor of it's responsibility as specified in the Contract.

FOR REFERENCE ONLY

	REFERENCE / ;	ENDORSEMENT SHEET FOR Q.P. / STANDARD / FIELD QUALITY PLAN (RQP / SQP / SFQP)	.P. S <u>op</u> / rfqp / Sf	<i>QP</i>)
TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION	F SUBMISSION			NTPC To be filled in by NTPC
PROJECT NAME	3X660 MW NORTH KA	KARANPURA TPS		REVIEW & ENDORSEMENT BY NTPC
CONTRACT No.				PROJECT SPECIFIC Q.P. NUMBER ALLOTTEL
~	BHEL			O.P. No.: 4410-001-213-QVE-Q-002
R WORKS & ADDRESS	M/S GOVIND CABLE I	E INDUSTRIES (7/36-37, SITE-IV, SAHIBABAD INDUSTRIAL AREA	TRIAL AREA	
ITEM/ EQUIPMENT/ SYSTEM/	LT XLPE POWER CABLE	SLE		REV. No.:00 DATE: 04.07.2016
SUB-SYSTEM DETAILS i.e. MODEI TYPE/ SIZE/ RATING etc				
APPROVED Q.P. No.: RQP/ <u>SOP</u> /RFQP/SFQ <mark>H</mark> 0000-999-QOE-S-004	0000-999-QOE-S-0041	REV. No.: 00 DA7	DATE: 03/02/2012	
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)	IEVER APPLICABLE)			(TICK APPLICABLE)
I. That the item/component is identical to that considered for $Q.P.$ approval.	ıt considered for $Q.P.$ app	proval. OR		$\sqrt{\ }$ The Q.P. is enclosed for this project without any
 That there are minor changes in the item/ component with respect not affect the contents of O.P. OR 		to that considered for Q.P. approval, however the same do		change.
III. That there are minor changes in the item/ component with reaffect the Q.P. slightly, as indicated below/ in attached sheet.	component with respect to in attached sheet.	III. That there are minor changes in the item/ component with respect to that considered for Q.P. approval, however the same affect the Q.P. slightly, as indicated below/ in attached sheet.		The Q.P. is enclosed for this project with changes as indicated.
				A) RQP/SQP: I. MAIN SUPPLIER (with a copy of Q.P.) 2. MANUFACTURER 3. RIO 4. CQA-SPL 5. CQA-O/C B) RFQP/SFQP: I. MAIN SUPPLIER (with a comy of Q.P.)
				2. MANUFACTURER 3. NTPC FQA (with a copy of Q.P.) 4. NTPC Erection (with a copy of Q.P.) 5. CQA-SPL 6. CQA-O/C
SIGN.: (Main Supplier)	DATE:	SIGN.: (Manufacturer) DATE:	TE:	NTPC (Reviewed / Approved by / Date & Seal)

Date: 17-Dec-2018

*Approval doesn't absolve the EPC contractor of it's responsibility as specified in the Contract.

FOR REFERENCE ONLY

STANDARD QUALITY PLAN (CONFORMING TO CODE: IS 1554 PAKT 1, IS 7098 Part-I AND NTPC TECHNICAL SPECIFICATION)	3pe of check Quartum of check Referen	9	Instructions: 1) Cable manufactures to maintain recurds to show to relation of raw materials to finisher cables it raw material back/ lot no. should be trazeable to the cable drum. 2) Cable manufactures to maintain all quality control records identified as per all QP stages enumerated below whether it is identified for NIPC verification or winess or not.	Special and a second a second and a second a	100%	Elect As per Cable Mafr Sid	do 100%	100% 100%	Verify As per As per NI manulech-ror manufectu norms rer norms	Verifydodo MANUFACT	Verify –do- –do- NT		L sample from each size / lot	As per 15 - 3975	As per 100%, manufacturer norms	Verity 100% 100% NT	Verify As per As per NT manufacturer manufacturer renancia
LITY PLAN E: IS 1554 PART PC TECHNICAL ON)	Quantum of check	9	raterials to finisher ca I QP stages enumerated	2000					E01/E			7	ample – n each c / los				
OP NO 0000-699-OOE-S-041 REV-20 DATE: 08-02-12 Page of 11	Reference Document	7	ables i.e raw material bach/lot no. she id below whether it is identified for N		MANUFACTURER APPROVED SOURCES	155022	MANUFACTURER APPROVED SOURCES	NTPCADS	NTPC ADS	MANUFACTURER APPROVED SOURCES	NTPC ADS	MANUFACTURER APPROVED SOURCES	NTPC APPROVED DATA SHEET & S 3975	IS 3975	MANJFACTURER APPROVED SOURCES	NIPC ADS	NTPC-ADS
NDERLIT SINGH AND VIKAAM TALWAR AND VIKAAM TALWA	Acceptance	00	hould be traceable to the o		ED MANUFACTURE R APPROVED SOURCES	155082	ED MANUFACTURE R APPROVED SOURCES	NTPCADS	NTPCADS	MANUFACTURE R APPROVED SOURCES	NTPC ADS	ED MANUFACTURE RAPIROVED SOURCES	APPROVED DATA SHEET & IS 1975	1S 3975	MANUFACTURE R AFPROVED SOURCES	NTPC ADS	NIPCADS
Santon Salvan	Record	6	sable drum.		OCR.	op-	op	0p	-op-	-op-	do	100	-op	Supplie		CCR	QCR.
A. K. Garg	Agency Remarks	10			- - - -	1	; A	A A A	>	> >	V V V	> > > >	i i	- ^ ^	, ,	^ ^ ^	V V Refer note 1

Date: 17-Dec-2018

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FOR REFERENCE ONLY

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Garg	Remarks	11	POIE	SCON		845	GOVINO	mon man					Refer St.	dp								XLPE/ PVC ompound shall be preferably saided in to extrader by suction
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REVIEWED BY INDERLIT SINGH GALLEN VIKRAM TALWAR WAS	Acceptance	00	NTPC ADS	NTPC ADS/ IS 10810 Part 58	NTPC ADS /	15:04:18	CABLE MANUF STD	op-	do		SHOULD BE SMOOTH & FREE FROM SCRATCHES	NTPC ADS	qp	do	NTPC ADS	do	op	op	188130	op	IS\$130/ NTPC ADS	SHOULD BE SMOOTH, NO POROSITY IS PERMUTED.
QP NO. 0000-999- QOE- S-041 REV-30 DATE ; G-02-12 Page 2 of 11 VALID UP TG: 02-02-15	Reference Document	7	MTPCADS	NTPC ADS/1S 10810 Pert 58	VTPC ADS / IEC60754	15 10418	CABLE MANUE STD	op	do		SHOULD BE SMOOTH & FREE FROM SCRATCHES	NTPCADS	-op-	do	NTPCADS	qo	qo	qo-	IS 8130	qo	IS8130/NTPC ADS	NTPC spec
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STANDARD QUALITY PLAN (CONFORMING TO CODE: IS 15S1 PART 1, 18, 798 Part I AND NIPC TECHNICAL SPECIFICATION)	Ousrtum of check	9	One sample / Batch	-dp-	One sample / Batch	Manuf. Std.	Cable marsif	db	dp		One sample/Settm g of each size	-dp-	dp	do	do	op-	-dp-	dp	-40-	qp	-op-	One sample/Settin g of each size
NDARD QU	Type of check	5	Chens	Chem	Chem	Meas	Chem	Meas	Meas		Visual	Meas	Mech	Mech	Meas	Meas	Meas	Visual	Verify	Visual	Meas	Visuai
STA (CONFOI Part-I A	Class	4	MA	MA	MA	IW	MI	MI	IW		MA	MA	CR	CR	MA	MA	MA	MA	MA	MA	CR	MA
1.1 KV (XLPE & Insulated cables	Characteristics	SFI	4 Therma Stability	5. Chygen Index	6 Acid Gas Emission	1. Dimension	2. Anti termite treatment	1. Dimension	2. Surface finish	inspection	l Surface finish	2. Wire Dismeter	3. Tensile test	4. Wrapping test	I. No of wires	2 Line of wire	3. Dimension of Conductor	4 Direction of lay	5 Records of strand breakage / welding during conductor streading	6. Surface finish	7. DC Resistance	1. Surface finish
Power PVC)	Component &	2		S.	9	Vooden 1.	ei B	Steel Dram 1.	2	Process & Stage Inspection	Vire Drawing	ci	rs.		1	Transing 2	m ŭ	4	5 F E E W	9	7.	insulation 1.
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LEGEND: *RECORDS, IDENTIFIED WITH "TICK" UNDER COLUMN "D" SHALL BE ESSENTALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
MEMANUEACTUREEKSIPPLIER, C.MAIN SUPPLIER, NEMPC, P.PERFORM WEWTNESS, P.PERFOCATION AS APPROPRIATE, CIIP. MTPC SHALL IDENTIFY IN COLUMN "IN" AS "W"
FORMAT NO. QS-401-QALF-101-B1.

Date: 17-Dec-2018

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												Sails	uotto	13	1	1	
A STATE	Samorte	Therman				1 Spark test fallure record is to be verified 2 Core repairing tost permitted	Sample is to be taken from both top & bottom	7				ASSOCIATION & CONTRACTOR & CONT	18	30	MADON		
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REVIEWED BY INDERLIT SINGH AND CAL VIKRAM TALWAR WALL RAHEN GARATO	Acceptance	Narms	00	NTPC ADS	NTPC ADS	No FAILURE	IS 7053- Part 1	IS 1554 [Part I] & IS 7098- Part I	-(0)-	NTPCADS	-03-	FISH EYE, BLOW HOLE NOT PERMITTED	NTPC ADS	ор	00	00	IS 1554 (Part 1) &
QP NO 0000-999-QOE S-041 REV-40 DATE: 09-02-12 Page 3 of 11 VALID UP TO: 0242-15	Reference Document		7	NTPC ADS	NTPC ADS	CABLE MANUF.STD.	15.7098- Part I	IS 1594 (Part I) & IS 7098-Part I	-do-	NTPCADS	-op	NTPC SPECIFICATION	NTPC ADS	op	qo	0p	IS 1559 (Part I) & IS 7098- Purt I
LAN ATION)	check	m Ü			:	2001	1	1	J	1							
JALITY P 18 1554 PART ICAL SPECIFIC	Quantum of check	M	9	One sample/Settin g of cach size	qo	96701	Orze sample/Sertin g of each size	pp	dp	do	00-	100%	One sample/Settin g of each size	qp-	qp	qp	-do-
STANDARD QUALITY PLAN (CONFORMING TO CODE 18 1554 PART 1, 13 7198 Pat-LANIC NTPC TECHNICAL SPECIFICATION)	Type of check		5	Visual	Moes	Esca Esca	Medi	Visual	Visual	Meas	Visual	Visual	Mcas	Meas	Meas	Meas.	Visual
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	Characteristics		3	2.Colour of cores	3 Thickness	4 Spark I os	5. Hot Set	I. Core sequence	2. Darection of lay	3. Dia over laid up	1.Colour	2. Surface Finish	3. Huckness	4. Dia over inner shoats	I Dimension	2 No. of wires / strip	3. Direction of lay
Power Power PVC) FRES	Compensaria	Operations	7			*		Laying up	+	eri 23	Irner Sheath 1.	ri e	ń	th s) Surmit	As Applicable)	ri
	15 %	2	-					4			2.05			1	3.06		7

Date: 17-Dec-2018

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Ž.	SI Com	-	-		-	2.07 Duter						C Frais	3.01 Type test reports clearance from NIPE Engineering
POWER POWER PACE) FRES	Component	Operations	7			Outer Sheath						Finished Cables	Total Control
f	Churacteristics		3	4.Coverage & Quality of armouring.	5 Dia over armouning	I. Surface finish	2. Coloar of sheath	3 Dia over outer sheath	4 Thickness of outer sheath	5 Embrissing quality	6. Sequencial marking		All type tasts as per NFPC specification
(CONFC)	Class		. 4	MA	MA	MA	MA	MA	CR	MA	MA		ag Ca
CONFORMING TO CODE 18 154 PART 1, 1S 758 Part AND NIPCTECHNICAL SPECIFICATION)	Type of check		5	Meas	Meas.	Visual	Visual	Meas	Mens	Visual	Visual		Doc.
E IS 1554 PART	Quantum of check	M	9	100%	One sample/Scalin g of each size	100%	One sample/Settm g of each size	op	qp	106%	Full kngth		7,000
1, IS 7098	Fehred	CS			E.		*	T.					% 101%
REV00 DATE: 63-02-12 Page 4 of 11 VALD UP TC: 00-02-15	Reference Document		7	Min area of coverage of amourting shall be 50%. The gap between amour vives / formed wires shall not exceed one amour vives / formed wire space & there shall be no cross over over riding of amour wire / formed wire. Zn rich paint shall be applied on amour joint surface of U.S. Wire formed wer. The breaking load of amour wire joint shall not be less than 95% of that amour wire iformed wire, (As per NIPC specification)	NTPC ADS	Pinnye, Fish Eys, Burnt particles, Blow Hole not permitted Repairing on outer sheath not permitted. (As per NIPC specification)	NTPCADS	MIPCADS	-47)	Drum no., IS1554-1/IS7098-1, Cable size, Voltage grade, & Wwits, "FRLS at every 5 meter is to be embossed. Embessing shall be automate, it line & marking shall be feet and the continuous shall be also with the statement of the specification."	Sequencial marking of length of cable in meer at every or neter is to be embossed printed. Enbossing / printing shall be progressive automatic, in line & marking shall be begibte & indelible. (A s per NIPC specification)		MTIC SPECIFICATION/MIFC ADS/1S 1554 (Part) & 15 7098- Partl
INDERUT SINGH JINGOV VIKKAM TALWAR RAJEN GAROT	Acceptance	Norms	80	g shall be 90%. The med wires shall not e space & there shall mout wire / formed in of a mour joint (be breaking load of n 95% of that amour ecification)		s, Blow Hole not h not permitted. (As	NTPC ADS	NTPC ADS	op	e size, Voltoge grade er is to be embossed e & marking shall be pecification]	inted Embossing / iomatic, in line & le. (A s per NTPC		NTPC SPECIFICATION / NTPC ADS / IS 1554 (Part) & IS 7098 - Part 1
1 mg 3 mg	Record	Format	6	OCR.		-op-	qp	-op-	qp	-gp	op		4
and a Mile	AgA). N	10	a	2.	a.	a.	0.	0	4	Q -		5
Ack. Garg	Agency. C.	1		1	1		1	1	1	1	:		>
Carr	Remarks	Z			ı	- PVC FRLS compound shall be preferably loaded in to cortrider by suction method		1	1	- Drum no on cable may be cable may be carbossed/print ad	I STATE	0	WINDSH

LEGEND: "RECORDS, IDENTIFIED WITH "TICK" UNDER COLUMN "D" SHALL BE ESSENTALLY INCLUBED BYSUPPLIER IN QA DOCUMENTATION.
"MAMANUFACTURERSUIPLIER, CAMAIN SUPPLIER, NINTPC, P. PERFORM W: WITNESS, Y: PERFICATION AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLLIMN "N" AS "W"
FORMAT NO: QALP-10(F3-K1

Date: 17-Dec-2018

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eed of the state o	Burnach	Pullinging		Refer note 3	Refer note 2		B						SIRIES	N. C.		Kel	-GOV	1	
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OP. NO. 0000-996- QOE- S-041 REV-(0. DATE: 08-02-12 Page 5 of 11	Reference Decument		7	NTPC ADS / IS 1534 (Part I) & IS 7098- Part I	NTPC ADS / 15 1554 (Part I) & 15 7098- Pert I		NIPC ADS	NTPC ADS / IS 1554 (Part.)) & 15 7058- Part I	Dp	NTPC A3S	0 <u>0</u> ,	- op -	NTPC ADS //S1554 Partly/153973	op	qo	qp	op	dp	op
LITY PLAN 1554 PART 1, 13 70% L. SPECHECATION)	unum of ch	M Cyt	9	100% 100%	189% 180%		Each type & size of colless as per sampling plan off5 1554 (Per I) & 18 700% Part I	100	(<u>]</u>]	op	- op -	-ap-	op	op	qp	qp	ap	dp	90
STANDARD QUALITY PLAN (CONFORMING TO CODE: 18 1534 PART 1, 18 7108 Part AND NIPC TECHNICAL SPECIFICATION)	Type of check		5	Elect	Elect		Meas, East	Visual	Visual	Visual	Meas	Visual	Meas	Mech	Mech	Mech	Mech	Mech	Mech
STA (CONFO Part-LA	Class		4	5	CR		MA	S.	5	MA	CR	MA	e c	CR.	CR	ő	CR	CR	CR
(KIPE & PVC) Insulated FRLS cables	Characteristics		170	Lifigh Voltage test at room temperature	2.Conductor Resistance	uls.	1. OD of Cubb	2 Litying of core	3. Core identification	4 Colour of outer sheath	5. Inner sheath thukmess	6. Inner sheath colour	1 Dimensions	2. No of wires/ formed wire	3. Tensile test	4. Islongation test	5 Tonsion test (for round wires only)	6. Wrappingtest	7 Resistance test
(XLPE Insulated cables	Component	Operations	61	Routine Tests		Acceptance Lesis	Construction o'finished Cabic							agrikatile)					
(Pa)								-	-						-	400	17.5	-	-

LEGEND: "*RECORDS, DENTHERD WITH "TICK" UNDER COLUMN 'D" SHALL BE ESSENTALLY INCLUDED BY SUPFLIER IN QA DOCUMENTATION.
"M:MANUEACTURERSUPPLIER, G:MAIN SUPPLIER, N:NT?C, P:PERFORM W:WITNESS,V:PERPICATION AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUMN "N" AS "W" "
"ORMAT NO:OS-01-0,04-P-10F-3.R1

Date: 17-Dec-2018

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47 no. 0000 391-001-5-041 REV-10 DATE: 00-02-12 Page 4 of 11 VALID UP TO: 02-02-15	Reference Excument	7	NTPC ADS /IS1554(Parti)/IS3975	-op-	-dp-	qo		qc-	NTPC ADS/1S 8130	op
CONFORMING TO CODE IS 1554 FART 1, IS 7098 Part I AND NIPC TECHNICAL SPECIFICATION)	Quantum of check M C/4	9	Each type & size of cables as per sampling plan of 1S 1554 (Part 1) & 1S 7098-	-gp-	ap	qp		cp	Each type & size of carles as per sampling plan of 1S 1SS4 (Part 1)/7098(fart-1)	qo
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100	Characteristics	ee)	8.Mass of Zine coating	9. Uniformity of Zine Coating	10 Adhesion test	1) Freedom from detects		i Resistance Test	2. Tensile use (For aluminum ecoductor onty)	3 Wrapping test (For alternment conductor only)
Power PVC)	Component Operations	2					Conductor			
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LEGEND: "RECORDS, IDENTIFIED WITH "JICK" UNDER COLUMN"FD" SHALL BE ESSENTALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
MAMANUFACTURERNIPPLIER, C.MAIN SUPPLIER, N.NTPC, F.PERFORM WIWTINESS, P.PERFICATION AS APPROPRIATE, CHP. NTPC SHALL IDENTIFY IN COLUMN "N" AS "W"
FORMAT MO-QS-61-QALP-SOFF-SI

Date: 17-Dec-2018

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MTPC	3°5 82	1	(V) PVC (V) PEU PVC						
PVC) FRES	Compon cal & Operatio		/Ki		~ 8 5 M	4 5 5	75.0	e R le	7 10
er (XLPE &) Insulated S cables	Chuaderisios	3	I. Thickness of sistantian & PVC. Sheath	Tensile strength & congetion at break of insulation & outer seeath (before ageing)	Tensile strength & consultation at treak or insulation & outer steat (after Ageing)	4 Insulation resistance (Volume resistivity method)	5.High voltage test at Kom femperature	6. Hor Set text for XLPE insulation only)	7.Thermal stability on PVC Insulation and outer sheath
(CONFC Part-1)	Chass	17	Š	8	CR	CR	CR	8	8
STANDAKU QUALITY PLAN (CONFORMING TO CODE 18 1854 PARTT, 18 7098 Part-I AND NIPC TECHNICAL SPECIFICATION)	Typ# of check	8	Meas	Mech	Mech	Sleat	Elect	, ku _d	Chem
UALLIY F	Quantum of check M C//	. 9	Each type & size of cebles as per samping plan of 1S 1S 1554 (Part 1V1S7098 (Part-1)	Each type & size of calles so per sampling plan of 1S IS 1554 (Part 1)/IS7095(Part-1)	Refer Note 3	Each type & size of cables as per sampling plan of 18 1554 (Part 1) & 18 7098- Part 1	Each type & size of tables as per sampling plan of IS 1554 (Part 1) & IS 7098-Part 1	-dp	One sample of each offered lot of all offered sizes
LAIN L, IS 7098 ATION)	C/N -		e of cables plan of 1S Pan art-1)	c of calica plan of IS Part art-1)	6.0	plan of IS	plan of IS plan of IS IS 7098-		ch officed d stres
OF NO. 0000-3585-005-3547 REV-00 DATE: 05-02-12 Page 7 of 11 VALID UP TO: 02-02-15	Reference Document		NTPC ADS/1S 1554(Part) & 1S 7098 Part I	NTPC ADS/15 1554(Parti) & IS 7098 Part l	+-0f	op	op	10	+O]1-
INDERLIT SINGH ON THE VIKERAM TALWAR	Acceptance Norms	0	NTPC ABS/ IS 1554(Patt) & IS 7098 Patt I	NIPC ADS/ IS 1554(Part) & IS 7098 Part 1	op	-op-	qp	09-	-09-
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100 N	Remarks			Refer Note 3 Alse	Refe Note 3 ath.)		P.S.S.	INI ET	SON SON

LEGEND: "RECORDS, IDENTHERD WITH "T.CK" UNDER COLUMN"D" SHALL BE ESSENTALLY INCLUDED BY KUPPLIER IN QA DOCUMENTATION,
MEMANUFACTUREROSUPPLIER, CAIAIN SUPPLIER, N.N. PC, P.PERFORM WEWTNESS, VERFECATION AS APPROPRIATE, CHP. NTPC SHALL IDENTIFY IN COLUMN "N" AS "W"
FORMAT NO: QS-G-QAL-P-10FE3-RI

Date: 17-Dec-2018

*Approval doesn't absolve the EPC contractor of it's responsibility as specified in the Contract.

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									KORAN TERM	*GOV/W
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PE E	Record	9	-op-	-09-	Test	0p	-0	÷	QCR	OCR
REVIEWED BY INDERLIT SINGH JIPPE VIKRAM TALWAR INER RANEEY ERGGOOF LES	Acceptance	89	NIPCADS	NTPC ADS	NTPC ADS	NTPC ADS	88-1, Cable size, Voltage erry 5 meter is no be automatic, in the & del ble. (3) Sequential for at every one meter is sixing printing shall be legible marking shall be legible	aball be 90%. The ned wires shall not space & there shall nour wire / formed ed on armour joint) The surface of the hall be covered with s of cables shall be PVC/ rubber caps	
OP NO 0000-999- 00E- \$-041 REV-00 DATE: 03-02-12 Page 8 0111 VALID UP TO: 02-02-15	Riference Document	7	NTPCADS / 1S10810 Part 58	NTPCADS & ASTAD2843	NTPC ADS & IEC 50754-1	NTPC ADS & IEC 6032 Part-3 (Category-B)	(1) Drum no. (2) IS1554-1/IS7098-1, Cable size. Voltage grade & Vinde - FRUZe at every 3 in meter it to be embossed. Embossing shall be automatic, in line & marking deliangle of the pepple & indel ble. (3) Sequential marking deliangle of the pepple of the in meter is every one meter is to be emicossed / printing. Embossing / printing shall be progressine, automatic, in line & marking shall be legible & indelible.	Min. area of coverage of ermouning shall be 90%. The gap between armour wines / formed wires shall not exceed one smour wind formed wire space & these shall be exceed one rinfing of amour wire / formed wire. Zn rich paint, shall be applied on armour joint surface of G.S. Wire /farmed wire.	(1))S1554Part-1, & 187098-Part 1 (2). The surface of the drum and the outer most cable layer shall be covered with water proof a cover (3) Both the ents of cables small be properly sueled with heat shrinkable PVC/rubbet caps secured by "1," rails.	Sealing shall be visible
LAN L.IS 7098 ALION)	CUN		ach offeres ed sizes	ach offerer ed sizes	ach offerer ed sizes	Refer Note 4	One length of cach size	One length of each size	110%	100%
IS 1554 PART CAL SPECIFIC	Quantum of check	9	One sample of each offerer lot of all offered sizes	One sample of each offerer lot of all offered sizes	One sample of each offerer for of all offered sizes	Refer Note 4	One ength of each size	One length of each size	100%	100%
STANDAKU QUALITY PLAN (CONFORMING TO CODE IS 1554 PART 1, 1S 7098 Part AND NIPC TECHNCAL SPECIFICATION)	Type of check	5		Chem	Chem	Cham	Visual & Mens	Visual & Mens	Wisual	Visual
CONFO Fart A	Class	TT.	CR	8	CR	CR	5	R	<u> </u>	MA
Power (XLPE & PVC) Insulated FRLS	Characteristics	5	8.Cxygen indox Test on oober sheath	#.Smake density rating test on outer sreath	IU Acid gas generation test on cuter sheath	Il Flammabilly test on completed cable	12. Surface finals & length measurement.	13. Sequence of constantial control of constantial control of constantial control of constantial of control of	- Seating	NTPC Sealing
H S S H	Compon ent & Operatio	2							Packing	dentific
		100							100000000000000000000000000000000000000	4.01

LEGEND: "RECORDS, IDENTIFIED WITH "HCK" UNDER COLUMN "D" SHALL BE ESSENTIALLY INCLUDED BYBUPPLIER IN OA DOCUMENTATION.
"HEMANUFÄCTURERISUPPLIER, CHALIN SUPPLIER, MNFPG, P.PERFORM WENTINESS, VÆRPICATION AS APPROPRIATE, CHP: NIPC SHALL IDENTIFY IN COLUMN "N" AS "W""
FORMAT NO: QS-01-QALP-10F3-81

Date: 17-Dec-2018

*Approval doesn't absolve the EPC contractor of it's responsibility as specified in the Contract.

FOR REFERENCE ONLY

	Si, Component No & & Operations	1 1	Notes:				LEGEND:
Item: Power PVC) FRLS	Component: Ab Operations	The same of	1) If the company to be	(a) 1 Reg Insp (b) 2(b) Cen	3) Ref	4) For For For	
1.1 KV (XLPE & Insulated cables	Characteristics	m	ne compound ipound manu e reviewed	Regional Office of In Case of In Case of In Case of In Case of Centre/ Region Manufacturer into	Refer table on	PVC insulatex cables where XLPE insulate	NTPC ADS: NTPC approved data STD- cable manufacturer's intel COC- certificate of conformance
ST. (CONFC Part-I.	Class	4	manul facture (quan	of manuf ffices :- R e of manu gional Off	page	OD is	PC ap nufac e of ce
ANDARD Q DRMING TO CCDI	Type of check	5	facturer Is ca er Is not carr tum of ageli	facturers / Soutine Test ifacturers / Fices,:- Roul	10 & 11of 1	more than ower cable:	proved dat turer's inte
STANDARD QUALITY PLAN CONFORMING TO CODE: 15 1554 PART 1, 15 T98 Part-LAND NIPC TECHNICAL SPECIFICATION)	Quantum of check M C/N	9	arrying out Ageing ying out ageing te ng test sample sha	supplier who has of manufacturer if supplier WHO tine Test are to be verified by NT	1 for Sampling	For cables with (30 mm, clubbing to Clubbing to be do	a sheet, QCR: q ernal plant stand
OP. NO. 0000-889, QOE- S-041 REV-00. DATE: 48-02-12 Page 3-of 11 VALD UP TO: 03-02-15	Reference Document		If the compound manufacturer is carrying out Againg test, test report of compound manufacturer is to be reviewed. If the compound manufacturer is not carrying out ageing test, then cable manufacturer is to carry out ageing test & test report is to be reviewed (quantum of ageing test sample shall be one sample /batch)	(a) In case of manufacturers / supplier who have supplied cables in the past through Corporate Centre/Regional Offices: Routine Test of manufacturer internal test report are to be verified by NTPC at the time of final inspection. 2(b) In case of manufacturers / supplier WFO HAVE NOT SUPPLIED cables in the past through Corporate Centre/Regional Offices,: Routine Test are to be witnessed by Main Contractor & NTPC. This is in addition to manufacturer internal test report to be verified by NTPC at the time of final inspection.	on page 10 &11of11 for Sampling & Acceptance criteria.	4) For PVC insulated LT power cable: For cables with OD less than equal to 30 mm, any size of cable may be clubbed For cables where OD is more than 30 mm, clubbing to be done for cables having similar ODs. For XLPE insulated LT Power cable: Clubbing to be done for cables having similar ODs.	NTPC approved data sheet, QCR: quality control records of cable manufacturer, CABLE MANUF manufacturer's internal plant standard, MI: minor, MA: major, CR: critical, cate of comformance
REVIEWED BY INDERLIT SINGH CAN VIKRAM TALWAR NUM RAJIEV GARGY	Acceptance Record	C	pound manufacturer rer is to carry out ag)	the past through (be verified by NTPC cables in the past ractor & NTPC. This spection.		mm, any size of cabling similar ODs.	is of cable manufar najor, CR: critical,
A. A. Garan	D* M C N	10	s to be reviewed. If	or fine	SNI 3	e may be clubbed	durer, CABLE MAN
1	rks		the rt is	FARIES	E INOS	30 N S	F

LEGEND: "RECORDS, IDENTIFIED WITH "TICK" UNDER COLUMN "D" SHALL BE ESSENTIALLY INCLUDED BYSUPPLIER IN QA DOCUMENTATION.
"M:MANUEACTURERSUPPLIER, C:MAIN SUPPLIER, N:NITC, P.PERSORM W:MINESS,V:VERFICATION AS APPROPRIATE, CHP. NIPC SHALL IDENTIFY IN COLUMN "N" AS "W"
FORMAT NO:QS-01-QALF-10/F3.

Date: 17-Dec-2018

*Approval doesn't absolve the EPC contractor of it's responsibility as specified in the Contract.

FOR REFERENCE ONLY

size/ type of catle in the offered lot shall be tessed for Tensile Strength & Elongation (before ageing). The values will be compared with corresponding values mentioned in the Type Test report accepted by NTPC. These values of Tensile Strength & Elongation (before ageing) should be within +/ - 15% tolerance (final values should be more than the minimum values indicated in relevant standard) of the Type Test
Manufacturers/ Supplier who have supplied cables in the past through Corporate Centre / Regional offices

Date: 17-Dec-2018

*Approval doesn't absolve the EPC contractor of it's responsibility as specified in the Contract.

FOR REFERENCE ONLY





EGEND:- "RECORDS, IDENTHEID WITH "TICK" UNDER COLLIMN"D" SHALL BE ESSENHALLY INCLUED BY SUPPLIER IN QA DOCUMENTATION.
-MEMANUFACTURERSUPPLIER, CEMAIN SUPPLIER, NEMPC, P.PERFORM WEWIINESS, VEVERFICATION AS APPROPRIATE, CHP. NTPC SHALL IDENTIFY IN COLUMN "N" AS "W"
FORMAT NO: OS-01-QALP-REFER



LT Power Cables & Control Cables

	_										1		
FRLS Tests					>							>	
specification													
Routine & Acceptance Tests as per relevant standard &													
	_											-	
Constructional requirements feature as per specification												>	>
Anti termite coating on wooden													>
Thermal stability				Y	Y	>						\	
S & elongation before & after ageing on outer sheath & significantion			>	Y	Y							\	
Sequential marking/ Batch marking/ surface finish/ cable length											\	Υ	
Armour coverage, cross over, looseness, gap between two										Α		>	
Lay length & Sequence							>					\	
Hot Set Test' Eccentricity & Ovality			>			\							
Electrical properties	-	>		X									
Spark Test(as applicable)						X							
Chemical Composition	>	>											
Mechanical properties	>	>	>	Υ	Υ			Υ					
Dimension/surface finish	>	>				>		Υ	Υ	Υ	>		>
Make, Type & T.C as per relevant standard		~	>	7	7			X	Т				
Attributes / Characteristics Item / Components / Sub System Assembly	Aluminum (IEC 60228)	Copper (IEC 60228)	XLPE Compound (IEC 60502-2 (2005))	PVC insulation Compound (IEC 60502)	FRLS PVC Compound (IEC-60754 Part-1)	Extrusion & curing /Manufacturing of Core (PVC / XLPE)	Core Laying	Armour wire/strip	Inner sheath	Armoring	Outer Sheathing	Finished Cable (IEC-60754 Part-1, IEC 60332 part III cat B/relevant standard)	Wooden drum(relevant standard) /Steel Drum

- Notes:

 1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.

 2. Make of all major Bought out items will be subject to Owner's approval.

Page 1 of 3	
SUB-SECTION	E40- L1 POWER & CONTROL CABLE
TECHNICAL SPECIFICATION	SECTION – VI, PART-B BID DOC NO.: 03-05 / 2X660 MW / T-13 / 2023
IVOILIGO GEGIES MIN USS A C GOE ESVADAG DEE	THERMAL POWER PROJECT, HTPS, KORBA WEST



ROUTINE TESTS	Following insulated)	Following routine tests shall be carried out on each drum of finished cables for all types (PVC / XLPE insulated) & sizes.
1)	Conducto	Conductor Resistance test
2)	High voltage test	age test
ACCEPTANCE TESTS	Following	Following Acceptance tests shall be carried out on each size of each type (PVC / XLPE insulated) of cables,
	in the offered lot.	fered lot.
A) For Conductor (as per s	ampling pl	sampling plan mentioned in IEC Pub 502 (1983)/ BS 6346:1969/ IEC 60502-2 (2005))
	1	Annealing test (Copper)
	2)	Tensile Test (Aluminum)
	3)	Wrapping Test (Aluminum)
	4)	Resistance test
B) For Armour Wires / Formed Wires (If apl (2005))	ed Wires (If applicable) (as per sampling plan mentioned in IEC Pub 502 (1983)/ BS 6346:1969/ IEC 60502-2
	1.	Measurement of Dimensions
	2	Tensile Tests
		Elongation Test
	4	Torsion Test For Round wires only
	5.	Wrapping Test
	.9	Resistance Test
	7.	
	89	Uniformity of Zinc coating For G S wires / Formed wires only
	6	Adhesion test For G S wires / Formed wires only
	10.	Freedom from surface defects
C) For PVC / XLPE insulation	on & PVC Sheat	heath (as per sampling plan mentioned in IEC Pub 502 (1983)/ BS 6346:1969/ IEC 60502-2 (2005))
		Test for thickness
	2)	Tensile strength & Elongation before ageing(for tests after ageing see "D")
	3)	Hot set test (For XLPE insulation)
D) Ageing test:		
If the compound manufacture	r is carrying	If the compound manufacturer is carrying out Ageing test, test report of compound manufacturer is to be reviewed. If the compound manufacturer is
not carrying out ageing test, then ca	hen cable m hatch)	not carrying out ageing test, then cable manufacturer will carry out ageing test & the test report will be reviewed by owner (quantum of ageing test sample shall be one sample /batch)
E) Following tests will be carried out on co	arried out o	n completed cables as per relevant standard on each size of each type (PVC / XLPE insulated)

Page 2 of 3

CLAUSE No.



	1)	Insulation resistance test (Volume resistivity method)
	2)	High voltage test
F) Following tests shall be carried	out on or	F) Following tests shall be carried out on only one size of offered lot (comprising of all sizes & types)
	1	Thermal stability test on PVC insulation and outer sheath
	2)	Oxygen index test on outer sheath
	3)	Smoke density rating test on outer sheath
	4)	Acid gas generation test on outer sheath
G) Flammability test as per IEC 60332 - Part-	32 - Part	3 (Category- B) on completed cables as per following sampling plan:
		This test will be carried out using composite sampling i.e. irrespective of size; cables of one
		particular type (i.e. armoured PVC insulated, unarmoured PVC insulated, armoured XLPE insulated,
		unarmoured XLPE insulated) will be bunched together, as per calculations in line with the IEC. All
		sizes of PVC & XLPE insulated, armoured & unarmoured cables shall be covered.
		For one particular type, cables with OD less than or equal to 30 mm shall be clubbed together in
		touching formation while cables with OD greater than 30 mm shall be clubbed together leaving a
		gap equal to OD of cable having least diameter. Cable OD shall be taken as nominal overall
		diameter as per approved datasheet.
H) Following tests shall be carried on one le	on one le	ngth of each size of each type (PVC / XLPE insulated) of offered lot:
	(1)	Constructional / dimensional check, surface finish, length measurement, sequence of cores, armour
		coverage, Gap between two consecutive armour wires / formed wires, Sequential marking, drum /
		Batch (outer sheath extrusion batch)number marking on sheath
	2)	Measurement of Eccentricity & Ovality
GENERAL NOTE:		
(a) In case of manufacturers / supplier w	tho have si	(a) In case of manufacturers / supplier who have supplied cables in the past through Corporate Centre. Routine Test of manufacturer internal test report are to be
verified by owner and Main Contractor at the time of	the time of	final inspection. Owner and Main Contractor will also witness routine tests on cables on 10% sample basis.
(b) In case of manufacturers / supplier WHO HAVE	HO HAVE	NOT SUPPLIED cables in the past through Corporate Centre:- Routine Test of manufacturer internal test report
are to be verified by Owner at the time of	final inspe	are to be verified by Owner at the time of final inspection. Owner will witness routine tests on cables for the first order on 10% sample basis and Main Contractor will
witness routine tests on cables for the first order on	t order on	100% basis.
1. For Smoke Density rating test: if the test result	test result	without conditioning is within (-)10% of the maximum specified value, then, retesting is to be carried out with
conditioning of samples as per standard and the test	ind the test	results after conditioning shall be final for acceptance/rejection.

2. For Acid Gas Generation test: if the test result without conditioning is within (-)10% of the maximum specified value, then, retesting is to be carried out with

conditioning of samples as per standard and the test results after conditioning shall be final for acceptance/rejection.

3. For Oxygen Index test: if the test result without conditioning is within (+)7% of the minimum specified value, then, retesting is to be carried out with conditioning of samples as per standard and the test results after conditioning shall be final for acceptance/rejection.

4. In case the test results without conditioning do not meet the maximum/minimum specified value, the manufacturer may exercise the option of retesting the samples

after conditioning as per standard.



PE-TS-530-165-W001 Rev. No. 00 Date: 22.05.2025 Note: This is an indicative list of tests/checks. The manufacturer is to furnish a detailed quality plan indicating the Practices and Procedure adopted alongwith relevant supporting documents.

MEASURING INSTRUMENTS									
Item Components Sub System Assembly	(유) anoianemiO	Маке, Model, Type, Rating (R)	Process / Electrical connection (R)	Calibration (R)	Test as per standard(R)	(저) esistance (서)	PR Certification (As applicable)(R)	Нуdro Test(R)	(Я) Material Test certificate
Pressure Gauge (IS-3624)	٨	Ϋ́	Å	\	\				
	R-Routine Test A- Acceptance Test Y – Test applicable	eptance Test	/ – Test app	icable					

PROCESS CONNECTION AND PIPING													
Tests	_	noit	yflaring,hy saednass sag se s (A) brabna:			@gnih	or TC for sessivebytn	ło ytilida	8	(A)test onby		& gnilling & bly blic and	% s
ltems	8 IsuaiV bienami⊡	of compo construc feature,	drotest,	Compor Ratings	⊕ gniniW	Маке, М Туре, Ra		(R) Accesss TBs/Dev) gniduT	Гезк/Н}	Chemic: propertie material	Proof proform of the state of t	se stseT standard specifica
Junction Box	\	Υ*		+		>	-						
Impulse pipes and tubes	¥		Y			\					>		
Socket weld fittings ANSI B-16.11	Υ.					>					>		>
Compression fittings	λ									Υ	\	Y	
Instrument valves & Valve manifolds	λ					Α.				Υ	\		
*-applicable for painted junction boxes.													
		®-Routi	®-Routine Test A-Acceptance Test Y – Test applicable	ceptance	Test Y – T	est applica	eldi						



PE-TS-530-165-W001 Rev. No. 00 Date: 22.05.2025

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				PAINT	PAINTING REQUIREMENT	JIREMENT							_
SI no	o Condition	Surface	Primer Coat	No. of	DFT	Intermediate	No. of	DFT	Final Coat No. of	No. of	DFT	Total	ι
		Preparation		Coats	(Microns)	Coat	Coats	(Microns)		Coats	(Microns)	DFT	
EXTE	ERNAL SURF	EXTERNAL SURFACE - OVER GROUND PIPING	ROUND PIPING										_
_	Clarified	Shot blasting/	Shot blasting/ Zinc Chrome Primer	2	25	Synthetic	_	30	Synthetic	2	35	150	
	Water	Abrasive blasting or	Alkyd base) by Brush/ spray to IS 104 OR Red			Enamel (Long Oil Alkvd) to			Enamel (Long Oil				
		Power tool	Oxide Zinc Phosphate			IS 2932			Alkyd) to				
		cleaning.	primer (Alkyd Base) to IS 12744						IS 2932				
INTE	RNAL SURF	ACE (FOR PIPE	INTERNAL SURFACE (FOR PIPE 1000 NB AND ABOVE)										-
2	Clarified	Shot blasting/	Epoxy based Zinc rich	_	20	1	ı	1	Hot Coal-	2	75	200	
	Water	Abrasive	primer						Tar				
		blasting or							Enamel				
		Power tool							OR Coal				
		cleaning.							Tar Epoxy				
BUR	RIED CW PIP	BURRIED CW PIPING (CONCRETE ENCASED)	TE ENCASED)										
က	CW Pipe in	η Bidder's scope	CW Pipe in Bidder's scope shall be Concrete encased steel lined ducts. Concrete Encasement shall be min 500mm thick with square shape outside.	steel lin	ed ducts. C	oncrete Encase	ment sha	all be min 50	0mm thick w	ith squa	ire shape ou	side.	
	M20 Grade	PCC encaseme	M20 Grade PCC encasement shall be provided other than locations of Duct crossing Road, Rail or any other facility where RCC encasement of	than loca	ations of Du	ct crossing Roa	d, Rail or	any other fa	acility where I	RCC en	casement of		
	Grade M25	shall be adopte	Grade M25 shall be adopted. Top of CW Duct encasement shal	ment sh	all be min 1	be min 1.5M below FGL.							
CTD	STDIICTIIDAI STEEL												_
		 - - -	i -						-	,	-	1	_
4	Clarified Water	Shot blasting/ Abrasive	Sealed Zinc spray as per BS 5493.		250	zinc Phosphate		30	coal tar Epoxv	က	75	505	
		blasting or				Epoxy			paint				
		Power tool											
		cleaning.											
CIVIL	CIVIL STRUCTURES	ES											ı —
5			RE	FER CIV	'IL SPECIFI	REFER CIVIL SPECIFICATION (BOOK 2 OF 2)	< 2 OF 2)						_



PE-TS-530-165-W001

Rev. No. 00

Date: 22.05.2025

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID SI. No. DOCUMENT TITLE 1 PQR CREDENTIALS (PROVENNESS DOCUMENTS) 2 COMPLIANCE SHEET (DULY SIGNED AND STAMPED) 7 SCHEDULE OF PERFORMANCE GUARANTEE (DULY SIGNED AND STAMPED) 3 GENERAL ARRANGEMENT DRAWING FOR COOLING TOWER, INCORPORATING ALL RELEVANT DIMENSIONS, COLD WATER CHANNELS / SLUDGE CHAMBER/ SCREENS/ GATES IN THE COLD WATER CHANNEL, STAIRCASE ETC. PUMPING HEAD CALCULATIONS 4 5 THERMAL DESIGN CALCULATIONS 6 TOWER PERFORMANCE CURVES 8 TECHNICAL DEVIATION SCHEDULE (IF ANY) UNPRICED COPY OF THE PRICE SCHEDULE (INDICATING "QUOTED" FOR THE LISTED 9 ITEMS). Notes -Along with the thermal design calculations as specified above, bidder has to submit the calculations for:

DOCUMENTATION REQUIREMENT

Total height of Natural Draft Cooling Tower

- Basin sizing
- Height of the hot water distribution header
- Drift Eliminator sizing
- Inlet Louver Sizing
- Sludge pit sizing

iii

The GA drawing/ calculations shall be only for reference purpose, same shall not be reviewed/commented by purchaser at this stage and shall be subject to approval only during contract). However, diameter and height of CT during contract stage shall not be less than the proposal dimensions as offered in the bid.

Apart from above no other drgs./docs./data sheets etc. are required to be submitted at bid stage and even if furnished shall not be taken cognizance of.

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT ALONG WITH SUBMISSION SCHEDULE

SI. No.	DOCUMENT TITLE	SUBMISSION SCHEDULE
	BASIC DRAWINGS / DOCUMENTS	
1	GENERAL ARRANGEMENT OF NATURAL DRAUGHT COOLING TOWER	6 WEEKS FROM LOI
2	GA OF C.W. BASIN OF COOLING TOWER	6 WEEKS FROM LOI
3	THERMAL DESIGN & FRICTION LOSS CALCULATIONS AND CHARACTERISTIC & PERFORMANCE CURVES FOR NDCT	6 WEEKS FROM LOI
4	CIVIL DESIGN BASIS OF NDCT	8 WEEKS FROM LOI
5	METHODOLOGY STATEMENT FOR PILING WORKS (IF APPLICABLE)	12 WEEKS FROM LOI

बीएच ई एल	TECHNICAL SPECIFICATION	PE-TS-530-165-W001	
	NATURAL DRAFT COOLING TOWER	Rev. No. 00	
HIJEL	2 X 660 MW CSPGCL HTPS KORBA WEST TPP	Date : 22.05.2025	
6	STRUCTURAL DESIGN OF XXX MM DIA. BORED CAST IN-SITU TEST PILES FOR COOLING TOWERS PACKAGE (IF APPLICABLE)	12 WEEKS FROM LOI	
7	LOCATION OF BORED CAST IN SITU TEST PILES FOR COOLING TOWERS (IF APPLICABLE)	12 WEEKS FROM LOI	
8	NUMERATION AND RC DETAILS OF TEST PILE (IF APPLICABLE)	12 WEEKS FROM LOI	
9	ANALYSIS AND DESIGN OF FOUNDATION, PEDESTAL & RAKER COLUMN OF NDCT	15 WEEKS FROM LOI	
10	ANALYSIS & DESIGN OF POND WALL, POND FLOOR	15 WEEKS FROM LOI	
11	ANALYSIS & DESIGN OF NDCT SHELL	16 WEEKS FROM LOI	
12	LAYOUT AND DETAILS OF POND FLOOR AND GRILLAGE COLUMN FOOTINGS	16 WEEKS FROM LOI	
13	R.C. DETAILS OF PILECAP/FOUNDATION, POND WALL AND PEDESTAL	16 WEEKS FROM LOI	
14GA OF SHELL FOUNDATION AND PEDESTAL OF NDCT16 WEEKS FROM15SHELL PROFILE AND THICKNESS.16 WEEKS FROM16GA & RC OF RAKER COLUMNS OF NDCT16 WEEKS FROM			
17	25 WEEKS FROM LOI		
Note: Complete MDL for NDCT covering all aspects of Mechanical, Electrical, C&I and CIVIL etc. shaped be finalized after award of contract.			
3	Bidder to ensure first submission of basic drawing/documents as per ab schedule & subsequent submission shall be within 10 days of from the o		
4	All design calculations, drawings, BOI Documents etc shall be furnished approval of the purchaser.	l by the supplier for	



PE-TS-530-165-W001 Rev. No. 00

Date : 22.05.2025

	DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT
SI. No.	DOCUMENT TITLE
1	APPROVED DOCUMENTS
2	CALIBRATION CERTIFICATES
3	O&M MANUAL
4	ALL TEST CERTIFICATES



PE-TS-530-165-W001
Rev. No. 00
Date : 22.05.2025

PRE QUALIFICATION REQUIREMENT (TECHNICAL)	



PRE-QUALIFYING REQUIREMENTS (TECHNICAL) NATURAL DRAFT COOLING TOWER

ATURAL DRAFT COOLING TOV (NDCT) DOC NO: PE-TS-530-165-W001 REV NO: 00 DATE: 15.05.2025

SHEET: 1 of 1

ENQUIRY NO.:

PROJECT: 2 X 660 MW CSPGCL KORBA WEST TPP

1.0 to 4.2 BLANK

4.3 Natural Draught Cooling Tower

<u>4.3.1</u> Bidder should have designed, constructed and commissioned of at least one (1) number Natural Draught Cooling Tower in RCC Construction of capacity not less than 30,000 m3/hr which has been in successful operation for at least one (1) year as on 03.04.2025.

In case the reference cooling tower has been designed by a party other than the Bidder, the Bidder shall employ a Design Agency, who has independently designed a Natural Draught Cooling Tower of capacity not less than 30,000 Cu.M/Hr in RCC construction and which has been in successful operation for at least one (1) year as on 03.04.2025. In such a case, Bidder shall be required to furnish a letter of support from the Design Agency for successful performance of Natural Draught Cooling Tower as per the format enclosed in the bidding document.

<u>OR</u>

4.3.2 Bidder who does not meet the requirements under clause 4.3.1, can also participate in collaboration/association with a firm who fully meets the requirements at clause 4.3.1, provided the Bidder has executed projects involving RCC works of tall structures of minimum height of 100m using slip/jump form shuttering as on 03.04.2025.

In such a case, the Bidder shall be required to furnish a Deed of Joint Undertaking executed by the Bidder and its Collaborator/Associate for the successful performance of Cooling Tower, as per the format enclosed with the bidding documents. The Deed of Joint Undertaking (DJU) shall be submitted along with the bid/offer. In case of award, Bidder and Collaborator/Associate shall each be required to furnish an on-demand bank guarantee for INR 65 million (Sixty Five Million only) in addition to the contract performance security to be furnished by the bidder.

General notes of the PQR are as under:

- Bidder to submit supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
- 2. Notwithstanding anything stated above, BHEL/Customer reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in overall interest of BHEL/Customer.
- 3. Consideration of offer shall be subject to customer's approval of bidder.
- 4. After satisfactory fulfilment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all other terms of the tender.

PREPARED BY:	REVIEWED BY:	APPROVED BY:
NAME:	NAME:	NAME:
DESIGNATION / DEPT.:	DESIGNATION / DEPT.:	DESIGNATION / DEPT.:

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FORM OF DEED OF JOINT UNDERTAKING

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

DEED OF JOINT UNDERTAKING TO BE EXECUTED BY THE COLLABORATOR / ASSOCIATE ALONG WITH THE CONTRACTOR FOR NATURAL DRAUGHT COOLING TOWER FOR FORM OF JOINT DEED OF UNDERTAKING

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

DEED OF JOINT UNDERTAKING TO BE EXECUTED BY THE
ASSOCIATE/COLLABORATOR ALONG WITH THE BIDDER AND SUBVENDOR
FOR PERFORMANCE OF NATURAL DRAUGHT COOLING TOWER OF EPC PACKAGE FOR SUPER
CRITICAL THERMAL POWER PROJECT,
HTPS, KORBA WEST STPP STAGE-IV (2X660 MW)
(AS PER CLAUSE 4.3 OF BDS)

Registered Office at
in favour of, having its Registered Office at NTPC Bhawan, Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi-110003 INDIA ("Employer" which expression shall include its successors, administrators, executors and assigns).
WHEREAS, the Employer invited Bids for design, engineering, manufacture, supply, transportation to site, construction, installation, testing, commissioning and conductance of guarantee tests for the EPC Package for SUPER CRITICAL THERMAL POWER PROJECT, HTPS, KORBA WEST STPP STAGE-IV (2x660MW) (hereinafter referred to as "Plant") vide its Bidding Document No. : CS-03-05 / 2x660 MW / T-13 / 2023
And whereas WHEREAS M/s (Bidder) is submitting its proposal in response to the aforesaid Invitation for Bid by the Employer bearing proposal No
AND WHEREAS Clause 4.3.2 of Sub-Section-IA, Part-A, Section-VI of Bidding Document stipulates that bidding is open to a Bidder/Bidder's Sub-Vendor who do not meet the requirements stipulated in Clause

Signature of authorized signatory.....

4.3.1 of Sub-Section-IA, Part-A, Section-VI and collaborates/associates with a firm who in turn fully meets the stipulated requirements as per Clause 4.3.1 provided the bidder/its sub-vendor has executed projects involving RCC works of tall structures of minimum height of 100m using slip/jump form shuttering

AND WHEREAS M/s.....(Bidder/Bidder's Subvendor) himself does not meet the requirements of clause no. 4.3.1 of Sub-Section-IA, Part-A, Section-VI of Bidding Documents but has executed projects involving RCC works of tall structures of minimum height of 100m slip/jump form shuttering and hence desires to Collaborate/Associate using M/s...... (hereinafter referred to as Collaborate/Associate) who have designed, constructed and commissioned of at least one(1) number Natural Draught Cooling Tower in RCC Construction of capacity not less than 30,000 m3/hr which has been in successful operation for at least one(1) year and as a pre-condition for submitting the bid, the Bidder/Bidder's sub-vendor and the Collaborate/Associate are required to jointly execute and furnish at the time of placement of order on approved sub vendor, an irrevocable Deed of Joint Undertaking that they shall be held jointly and severally responsible and bound unto the Employer for successful performance of the relevant system (i.e. Natural Draught Cooling Tower) to be designed, manufactured, supplied and installed under the EPC Package for SUPER CRITICAL THERMAL POWER PROJECT, HTPS, KORBA WEST STPP STAGE-IV (2x660MW) fully meeting the parameters guaranteed as per the Bidding Documents, in the event the Bid is accepted by the Employer resulting in a Contract (hereinafter called the "Contract").

W

NOW THEREFORE, THIS UNDERTAKING WITNESSETH AS UNDER:

- That in consideration of the Award of the Contract by the Employer to the Bidder, we, the aforesaid Collaborate/Associate, Bidder and Bidder's Subvendor, do hereby declare and undertake that we shall be jointly and severally responsible to the Employer for the successful performance of the Natural Draught Cooling Tower and perform all the contractual obligations including the technical guarantees for the Natural Draught Cooling Tower.
- In case of any breach of the Contract committed by the Bidder/Bidder's Subvendor, we, the Collaborate/Associate, do hereby undertake, declare and confirm that we shall be fully responsible for the successful performance of the Natural Draught Cooling Tower and undertake to carry out all the obligations and responsibilities under the contract in order to discharge the Bidder's/Subvendor/s obligations and responsibilities stipulated in the Contract. Further if the Employer sustains any loss or damage on account of any breach of the Contract, we, the Collaborate/Associate and Contractor, jointly and severally undertake to promptly indemnify, and pay such losses/damages caused to the Employer on its written demand without any demur, reservation, contest or protest in any manner whatsoever.

This is without prejudice to any rights of the Employer against the Bidder under the Contract and/or guarantees. It shall not be necessary or obligatory for the Employer to first proceed against the Contractor before proceeding against the Collaborator/Associate, nor any extension of time or any relaxation given by the Employer to the Contractor would prejudice to any rights of Employer under this Deed of Joint Undertaking to proceed against Associate/Collaborator. The liability of the contractor, his sub-vendor the associate/collaborator shall be limited to and amount equal to 100% of the value of the contract** between the contractor and the sub supplier for the equipments/systems.

3. Without prejudice to the generality of the undertaking in paragraph 1 above, the manner of achieving the objectives set forth in paragraph 1 above shall be as follows:

Signature of authorized sig	anatory
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(a) The Collaborator/Associate will be fully responsible for design, manufacture, supply, erection, putting into satisfactory operation, commissioning and carrying out the guarantee tests as well as meeting all stipulated technical requirements and guaranteed parameters for **Natural Draught Cooling Tower** to the satisfaction of the Employer.

Further, the Collaborator/Associate shall depute their technical experts from time to time to the Bidder's/Subvendor's works/Employer's project site as required by Employer and agreed to by the Contractor/Associate to facilitate the successful performance of the **Natural Draught Cooling Tower** as stipulated in the aforesaid Contract.

Further the Collaborator/Associate shall ensure proper design, manufacture, supply erection, testing and successful performance of the **Natural Draught Cooling Tower** in accordance with the specifications and stipulations of the Bidding Documents and if necessary the Collaborator/Associate shall advise the Bidder/Bidder's Sub-vendor suitable modifications of design and implement necessary corrective measures to discharge the obligations under the Contract.

- (b) In the event the Collaborator/Associate and Bidder/ Bidder's Subvendor fail to demonstrate successful performance of the **Natural Draught Cooling Tower** as set forth in paragraph 1 above, the Collaborator/Associate and the Contractor shall promptly carry out all the measures at their own expense and shall promptly provide corrected designs to the Employer.
- (c) Implementation of the corrected designs and all other necessary repairs, replacements, rectifications or modifications to the Natural Draught Cooling Tower and payments of financial liabilities, penalties and fulfillment of all other obligations as provided under the Contract shall be the joint and several responsibilities of the Contractor and Collaborator/Associate.
- 4. We, the Bidder/ Bidder's Subvendor and Collaborator/Associate do hereby undertake and confirm that the Undertaking shall be irrevocable and shall not be revoked till the expiry of defect liability period of the Plant under the Contract and further stipulate that the Undertaking herein contained shall terminate after 90 days of satisfactory completion of such defect liability period. In case of delay in completion of defect liability period, the validity of this Deed of Joint Undertaking shall be extended by such period of delay. We further agree that this undertaking shall be without any prejudice to the various liabilities of the Bidder, including the Contract Performance Security as well as other obligations of the Bidder in terms of the Contract.
- 5. The Bidder/Subvendor and Collaborator/Associate will be fully responsible for the quality of all equipment/main assemblies/components manufactured at their works or at their Vendor's works or fabricated/constructed at site, and their repairs or replacement, if necessary, for incorporation in the Natural Draught Cooling Tower and timely delivery thereof to meet the work schedule under the Contract.
- 6. In case of Award, in addition to the Contract Performance Security furnished by the Bidder, the Bidder's Sub-vendor and Collaborator/Associate shall each furnish "as Security" an on demand Performance Bank Guarantee in favour of the Employer in a form acceptable to Employer as per provisions of the Bidding Documents. The value of such Bank Guarantee shall be equal to INR 65 million (Rupees Sixty million only) and it shall be guarantee towards the faithful performance/compliance of this Deed of Joint Undertaking in accordance with the terms and conditions specified herein. The Bank Guarantee shall be unconditional, irrevocable and valid for entire period of Contract, i.e. till ninety (90) days beyond the end of the Defect Liability period of

Signature of authorized	signatory
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the EPC Package Contract. In case of delay in completion of the defect liability period, the validity of this Bank Guarantee shall be extended by the period of such delay. The Bank Guarantee amount shall be promptly paid to the Employer on demand without any demur, reservation, protest or contest.

- 7. Any dispute that may arise in connection with this Deed of Joint Undertaking shall be settled as per arbitration procedure/rules mentioned in the Contract Document. This Deed of Undertaking shall be construed and interpreted in accordance with the Laws of India and the Courts of Delhi shall have exclusive jurisdiction.
- 8. We, the Collaborator/Associate, Bidder and Bidder's Subvendor agree that this Undertaking shall be irrevocable and shall form an integral part of the Contracts. We further agree that this Undertaking shall continue to be enforceable till the successful completion of Contract and till the Employer discharge it.
- 9. That this Deed shall be operative from the effective date of the Contract.

IN WITNESS WHEREOF, the Collaborator/Associate, Bidder and Bidder's Subvendor, through their authorised representatives, have executed these present and affixed common seals of their respective companies on the Day, Month and Year first mentioned above.

		FOR M/S
		(COLLABORATOR/ASSOCIATE)
	WITNESS:	
1.		
	(SIGNATURES)	(SIGNATURE OF THE AUTHORISED
		REPRESENTATIVE)
		NAME :
	(NAME & OFFICIAL ADDRESS)	
		DESIGNATION :
		COMMON SEAL OF THE COMPANY
		FOR M/S
		(SUBVENDOR)
	WITNESS:	
1.		

Signature of authorized signatory.....

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(SIGNATURES)	(SIGNATURE OF THE AUTHORISED
	REPRESENTATIVE)
	NAME :
(NAME & OFFICIAL ADDRESS)	
	DESIGNATION :
	COMMON SEAL OF THE COMPANY
	FOR M/S
	(BIDDER)
1	
(SIGNATURES)	(SIGNATURE OF THE AUTHORISED
	REPRESENTATIVE)
	NAME :
(NAME & OFFICIAL ADDRESS)	
	DESIGNATION :
	COMMON SEAL OF THE COMPANY

Note: * Bidder/Bidder's Subvendor and his Collaborator/Associate to strike out whichever is not

Signature of authorized signatory.....

applicable.

** Copy of priced purchase order for the equipment shall be furnished by Bidder.

Signature of authorized signatory.....

PROVENNESS OF NATURAL DRAFT COOLING TOWER

I. (D) Details of RCC Natural draught Cooling Towers (as per clause 4.3 of Sub-Section-IA, Part-A, Section-VI of Bidding Documents

In support of Sub-Qualifying Requirements of Clause 4.3 of Sub-Section-IA, Part-A, Section-VI of Bidding Document, we confirm that We/our Sub-vendor have designed, constructed and commissioned at least one(1) number Natural draught cooling tower in RCC Construction of capacity not less than 30,000 m3/hr which has been in successful operation for at least one(1) year..

We/our Sub-vendor furnish a letter of technical support from the Design Agency for successful performance of natural draft Cooling Tower. The details of the reference cooling tower is furnished below:

SI.	Description/Details	Plant
No.		
1.	Description of Work and	
	Name of Client	
2.	Location/Address of the Plant/works	
3.	Address of the Client (including	
	Contact Person Name, TelephoneNo,	
	e-mail etc.)	
4.	No. of Cooling Towers/Chimney	
5.	Capacity of each Cooling	
	Tower (Cu.M/hr.)/ height of chimney	
6.	Type of Fill (splash/modular/trickletype)	
7.	Type of Construction	
8.	Whether scope of works included	
	(a) Construction of Cooling Towers/chimney	
	By Bidder/its Sub-vendor	YES*/NO*
	Name of the construction agency	
	(b) Construction of cooling towers/	YES*/NO*
	Chimney by Bidder/its Sub-vendor	
	(c) Commissioning of cooling towers/	YES*/NO*
	chimney	
9.	Date of Commissioning of the	
	Cooling tower/Chimney	
10.	Certificate from client to	

ATTACHMENT - 3K PAGE 130 OF 325

		YES*/NO
	*substantiate Bidder's QR data is	
	enclosed at Annexure	
	to this Attachment-3K	
11.	Whether the reference cooling tower/Chi	mney
		YES*/NO
	*at sl. No. 1 is constructed by the bidder/	sub vendor
12.	Whether the reference cooling tower/Chi	mney
		YES*/NO
	*at sl. No. 1 is constructed by	
	Sub-vendor's own engineers	
13.	Whether Documentary evidence/	Yes* /
	No*certificate(s) from client enclosed	
	for the above data	
• *	Strike off whichever is not applicable.	
Date		(Signature)
Place		(Printed Name)
1 1400	· ·	(Designation)
		(Common Seal)
		(Designation)
		(Common Seal)
		(common coal)
(Bidde	r / Sub vendor / Designer / Construction Ag	ency)

Sub : Provenness Criteria for Civil Works

FORMAT FOR FILLING THE DETAILS OF PROVENNESS LETTER OF SUPPORT FOR SATISFACTORY PERFORMANCE OF (EQUIPMENT/SYSTEM NAME) FOR SUPER CRITICAL THERMAL POWER PROJECT HTPS, KORBA WEST (2X660 MW), EPC PACKAGE

TO [EMPLOYER'S NAME & ADDRESS] Sub: Letter of Technical Support submitted From (name of the Design Agency*/Associate*/ Collaborator*/ Technology provider* / Licensor* / Holding Company*) undertaking the responsibility for satisfactory performance of(Name of the equipment/system*).
Dear Sirs,
 In accordance with the Award of the Contract by (Name of the Contractor) to M/s (Name of the sub-vendor), we, the aforesaid Design Agency*/Associate*/Collaborator*/Technology provider*/Licensor*/Holding Company, (M/s) shall be fully responsible for the satisfactory performance of the (Name of the equipment/system*).
 Further, the manner of achieving the objective set forth in point 1 above shall be as follows For (Name of the equipment/system*): (a) We shall be fully responsible for design, engineering & commissioning and extending all necessary support for putting in to satisfactory operation and carrying out the Guarantee Tests for(Name of the equipment/system*) to the satisfaction of the Employer.
(b) We shall depute technical experts to Bidder's/sub-vendor's works for supervision during manufacturing, assembly, inspection, as and when required by Employer. We shall participate in site erection, commissioning and final testing (as and when necessary) of the(Name of the equipment/system*).
(c) We shall participate in Technical Co-ordination meetings (TCMs) from time to time, as and when required by Employer.
(d) We shall promptly carry out all the corrective measures and shall promptly provide corrected design and shall undertake replacements, rectifications or modifications to the equipment/system* as and when required by Employer in case the equipment/system* fails to demonstrate successful performance as per contract at site.
3. We, the Design Agency*/Associate*/Collaborator*/Technology provider*/Licensor*/Holding company* do
hereby undertake and confirm that this Letter of Technical Support shall be valid for a
Signature of authorized signatory

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period of seven (7) years or up to the end of defect liability period of the contract, whichever is later.

Signature of the Authorised Representative:
For M/s
(Design Agency*/Associate*/Collaborator*/Technology provider*/Licensor*/Holding
company)
Name
Designation
Date:
Common Seal of the Company

^{*:} Strike off whichever is not applicable.



CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE

i.	Item/Scope of Sub-contracting			
ii.	Address of the registered office	Details of Contact Person		
		(Name, Designation, Mobile, Email)		
iii.	Name and Address of the proposed Sub-vendor's works	Details of Contact Person:		
	where item is being manufactured	(Name, Designation, Mobile, Email)		
iv.	Annual Production Capacity for proposed item/scope of sub-contracting			
v.	Annual production for last 3 years for proposed			
	item/scope of sub-contracting			
vi.	Details of proposed works			
1.	Year of establishment of present works	Ţ		
2.	Year of commencement of manufacturing at above works			
3.	Details of change in Works address in past (if any)	ļ		
4.	Total Area			
	Covered Area			
5.	Factory Registration Certificate	Details attached at Annexure – F2.1		
6.	Design/ Research & development set-up	Applicable / Not applicable if manufacturing is as		
	(No. of manpower, their qualification, machines & tools	per Main Contractor/purchaser design)		
	employed etc.) Details attached at Annexure – F2.2			
		(if applicable)		
7.	Overall organization Chart with Manpower Details	Details attached at Annexure – F2.3		
	(Design/Manufacturing/Quality etc)			
8.	After sales service set up in India, in case of foreign sub-	Applicable / Not applicable		
	vendor			
	(Location, Contact Person, Contact details etc.)	Details attached at Annexure – F2.4		
9.	Manufacturing process execution plan with flow chart	Details attached at Annexure – F2.5		
	indicating various stages of manufacturing from raw			
	$\it material\ to\ finished\ product\ including\ outsourced\ process, if$			
	any			
10.	Sources of Raw Material/Major Bought Out Item	Details attached at Annexure – F2.6		
11.	Quality Control exercised during receipt of raw	Details attached at Annexure – F2.7		
	material/BOI, in-process, Final Testing, packing			

Format No. : QS-01-QAI-P-04/F2-R0 DATED 19.01.18 1/2 Engg. div./QA&I



CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE

12.	Manufacturing facilities			Details attached at Annexure – F2.8			
	(List of machines, special process facilities, material handling etc.)						
13.	Testing facilities			Details attac	ched at Annexure -	- F2.9	
	(List of testing equipment)						
14.	If manufacti	ıring process involves fa	brication then	!-	Applicable /	Not applicable	
	List of qualif	ied Welders			Details attac	ched at Annexure -	- F2.10
İ	List of qualif	fied NDT personnel with	area of specia	alization	(if applicabl	e)	
15.	List of out-	sourced manufacturin	g processes	with Sub-	Applicable /	Not applicable	
	Vendors' na	mes & addresses					
					Details attac	ched at Annexure.	–F2.11
					(if applicabl	e)	
16.	Supply refer	ence list including recen	t supplies			ched at Annexure -	- F2.12
		-			(as per form	at given below)	
Project		Supplied Item (Type/Rating/	Model	PO ref	no/date	Supplied Quantity	Date of Supply
packag	e Name	/Capacity/Size etc)					
17.	Product	satisfactory perfe	ormance	feedback	Attached at	annexure - F2.13	
	letter/certific	ates/End User Feedback	ī				
18.	Summary of	Type Test Report (Type	Test Details, 1	Report No,	Applicable /	Not applicable	
	Agency, Date	e of testing) for the prope	osed product				
	(similar or higher rating)		Details attached at Annexure – F2.14				
	Note:- Repor	rts need not to be submit	ted		(if applicable)		
19.	Statutory / m	andatory certification fo	or the proposed	d product	Applicable / Not applicable		
					Details attac	hed at Annexure -	- F2.15
					(if applicabl	e)	
20.	Copy of ISO	9001 certificate					
20.	(if available)	•					
21.	Product technical catalogues for proposed item (if available)				Details attached at Annexure – F2.17		
					I		
Name	: :		Desig:		Sig	n:	Date:
	my's Coal/Cta		6				

Company's Seal/Stamp:-



PE-TS-530-165-W001

Rev. No. 00

Date: 22.05.2025

	COMPLIANCE CERTIFICATE
1	It is hereby confirmed that the technical specification (Book 1 and 2) has been read and understood. We confirm compliance to the tender specification including any prebid clarification and amendments issued prior to techno-commercial bid opening without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked by BHEL in NIT shall not to be considered as part of bid and shall not be evaluated by BHEL.
	re of authorised Representative and Designation :
Name &	Address of the Bidder
Date	