

		MANUFACTURER'S NAME AND ADDRESS Component Fabrication Plant(CFP), RUDRAPUR		MANUFACTURING QUALITY PLAN				Customer : BANGALADESH INDIA FRIENDSHIP COMPANY PVT LTD, BANGALADESH Project : 2x660 MW MAITREE STPP Contract No : 16-013-X-2 Main - Supplier : BHEL RUDRAPUR						
				Item: DC Cable Sub-System:	QP No: QP/RTS/DCCABLE/MAITREE-01 Rev No: 05 Date: 19.11.2020 Page: 01 Of 05									
Sl. No	Component & Operations	Characteristics	Class	Type of check	Quantum of Check		Reference Document	Acceptance Norms/ Standard	Format of Records		Agency			Remarks
1	2	3	4	5	M	C/B			6	7	8	9	10	

Instructions: 1) Cable manufacturer to maintain records to show co-relation of raw materials to finished cables i.e. raw material batch/ lot no. should be traceable to the drum/reel number.
 2) Cable manufacturer to maintain all quality control records identified as per all QP stages enumerated below whether it is identified for BHEL verification / witness or not.

1.0	Raw material													
1.1	Conductor Copper	Type /Grade	Major	Visual	1 Sample per lot	-	BHEL Specification, TUV Specification, 2 Pfg 1169/08.2007 / EN 50618,	Class 5 conductor as per EN/IEC 60228, IS 8130	Manufacturer Incoming Inspection report & supplier Test Cert.		P	-	-	
		Diameter	Major	Measurement	--do--	--	--do--	--do--	--do--		P	-	-	
		Tensile strength	Major	Physical	--do--	-	--do--	--do--	--do--		P	-	-	
		Elongation	Major	Physical	--do--	-	--do--	--do--	--do--		P	-	-	
		Resistivity at 20 Deg C	Major	Electrical	--do--	-	--do--	--do--	--do--		P	-	-	
		Surface Finish	Major	Visual	--do--	-	Mnfr std	Mnfr std	--do--		P	-	-	
1.2	Tin (For tinning of copper)	Purity of Material	Major	Chemical	--do--	-	IS 26	BHEL Specification, IS: 26	--do--		P	-	-	
1.3	Insulation	Type /Grade	Major	Visual	1 Sample per lot	-	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618, BIFPCL ADS	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618, BIFPCL ADS	Supplier Test certificate		P	-	-	
		Tensile strength	Major	Physical	--do--	-	--do--	--do--	--do--		P	-	-	
		Elongation at Break	Major	Physical	--do--	-	--do--	--do--	--do--		P	-	-	
		Hot Set test	Major	Physical	--do--	--	--do--	--do--	Supplier Test certificate		P	-	-	
		Ageing Test	Major	Physical	--do--	--	--do--	--do--	--do--		P	-	-	
		Insulation Resistance (VR)	Major	Electrical	--do--	-	--do--	--do--	--do--		P	-	-	
1.4	Sheath:	Type /Grade	Major	Visual	1 Sample per lot	-	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618,	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618,	--do--		P	-	-	
		Tensile strength	Major	Physical	-	--	--do--	--do--	--do--		P	-	-	
		Elongation at Break	Major	Physical	-	-	--do--	--do--	--do--		P	-	-	

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			Item: DC Cable Sub- System:		QP No: QP/RTS/DCCABLE/MAITREE-01 Rev No: 05 Date: 19.11.2020 Page: 02 Of 05									
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					M	C/B					M	C	B	
1	2	3	4	5	6		7	8	9	D*	10			11

1.5	Spool-Wooden Drum used	Hot Set test	Major	Physical	-	-	--do--	--do--	--do--	P	-	-	
		Ageing Test	Major	Physical	1 Sample per lot	-	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618,	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618,	--do--	P	-	-	
		Halogen Content	Major	Physical	--do--	-	--do--	--do--	--do--	P	-	-	
		Surface finish & anti-termite treatment, if required	Minor	Visual	1 Sample per lot	-	Manufacturer's Standard	Manufacturer's Standard	Manufacturer incoming inspection report	P	-	-	
		Construction	Minor	Visual	--do--	-	Manufacturer's Standard	Manufacturer's Standard	Manufacturer incoming inspection report	P	-	-	
		Nail Protrusion	Minor	Visual	--do--	-	Manufacturer's Standard	Manufacturer's Standard	-	P	-	-	
2.0	IN-PROCESS INSPECTION												
2.1	Wire Drawing-Tinning & Annealing	Diameter	Major	Physical	1 Sample per lot	-	Manufacturer's Standard	Manufacturer's Standard	Manufacturer in-process inspection report	P	-	-	
		Annealing Test (Copper)	Major	Physical	--do--	-	EN/IEC 60228, IS-8130	EN/IEC 60228, IS-8130	Do	P	-	-	
		Persulphate Test	Major	Chemical	--do--	-	--do--	--do--	--do--	P	-	-	
		Surface finish	Major	Visual	--do--	-	Manufacturer's Standard	Manufacturer's Standard	--do--	P	-	-	
2.3	Stranding/Bunching	Number of Strands	Major	Physical	1 Sample per lot	-	Class 5 as per EN/IEC 60228, IS 8130, BIFPCL ADS	Class 5 as per EN/IEC 60228, IS 8130, BIFPCL ADS	Manufacturer in-process inspection report	P	-	-	
		Conductor diameter	Major	Physical	--do--	-	--do--	--do--	--do--	P	-	-	
		Max DC Resistance at 20 Deg C	Major	Electrical	--do--	-	--do--	--do--	--do--	P	-	-	
		Lay length & Direction	Minor	Visual	--do--	-	Manufacturer's Standard	Manufacturer's Standard	--do--	P	-	-	
		Surface Finish	Minor	Visual	--do--	-	--do--	--do--	--do--	P	-	-	

Signature

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1		2	3	4	5	M	C/B	7	8	9	M	C	B	11
 MANUFACTURER'S NAME AND ADDRESS Component Fabrication Plant(CFP), RUDRAPUR MANUFACTURING QUALITY PLAN Item: DC Cable Sub-System: QP No: QP/RTS/DCCABLE/MAITREE-01 Rev No: 05 Date: 19.11.2020 Page: 03 Of 05 Customer : BANGLADESH INDIA FRIENDSHIP COMPANY PVT LTD, BANGLADESH Project : 2x660 MW MAITREE STPP Contract No : 16-013-X-2 Main - Supplier : BHEL RUDRAPUR														
2.3	Insulation extrusion	Thickness	Major	Physical	--do--	-		BIFPCL ADS	BIFPCL ADS	Manufacturer in Process inspection report	P	-	-	
		Hot Set	Major	Physical	--do--	-		TUV Specification, 2 Pfg 1169/08.2007 / EN 50618	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618,	--do--	P	-	-	
2.4	Sheath Extrusion	Radial Thickness	Minor	Physical	1 Sample per extrusion lot	-		TUV Specification, 2 Pfg 1169/08.2007 / EN 50618, BIFPCL ADS	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618, BIFPCL ADS	Manufacturer in-process inspection report	P	-	-	
		Color/Cable Identification	Minor	Visual	--do--	-		--do--	--do--	--do--	P	-	-	
		Surface finising	Minor	Visual	--do--	-		--do--	--do--	--do--	P	-	-	
		Cable Marking/Printing	Major	Visual	--do--	-		--do--	--do--	--do--	P	-	-	
		Overall Diameter	Major	Physical	--do--	-		--do--	--do--	--do--	P	-	-	
		Spark Test /High Voltage Test	Major	Electrical	100%	-		--do--	No Failure	--do--	P	-	-	
3.0	FINAL CABLE TEST (Type test clearance from BIFPCL Engineering as per specification requirements to be verified during final inspection is envisaged by tach specs)													
3.1	Routine Test													
A		High voltage	Major	Electrical	100%	1 Sample per offered lot		TUV Specification, 2 Pfg 1169/08.2007 / EN 50618	TUV Specification, 2 Pfg 1169/08.2007 / EN 50619	Manufacturer Routine Test	V	P	V	V
B		Conductor Resistance at 20 Deg. C	Major	Electrical	100%	1 Sample per offered lot		EN/IEC 60228, IS-8130	BIFPCL approved data sheet EN/IEC 60228, IS 8130	--do--	V	P	V	V
3.2	Acceptance Test													
3.2.1	Electrical													
A		Conductor Resistance at 20 Deg. C	Major	Electrical	Sampling as per IS 7098	Sampling as per IS 7098		EN/IEC 60228, IS-8130	BIFPCL approved data sheet EN/IEC 60228, IS 8130	--do--	V	P	W	V

20/11/20

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1	2	3	4	5	M	C/B	7	8	9	M	C	B	11
B		High Voltage Test	Major	Electrical	--do--	--do--	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618	Manufacturer Acceptance test report	V	P	V	V
C		Insulation Resistance at 20 Deg c and 90 Deg c	Major	Electrical	--do--	--do--	--do--	--do--	--do--		P	V	V
3.2.2. Non-Electrical													
A		Annealing Test on copper	Major	Physical	Mnfr std	Mnfr std	EN/IEC 60228, IS 8130	BHEL specification, EN/IEC 60228, IS 8130	Manufacturer Acceptance test report	V	P	V	V
B		Quality documents review	Major	Visual	1drum / reel per size per offered lot	1drum / reel per size per offered lot	Check raw material to finished product quality documents on the selected drum/reel, manufacturer's standard	Quality documents / TCs should be in line with national/international/ manufacturer's standard			P	V	V
C		Cable Construction, cable OD, Ovality, Thickness and color of Insulation & sheath	Major	Physical	5 sample per size of offered lot	5 sample per size of offered lot	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618 BIFPCL approved data sheet	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618 BIFPCL approved data sheet	--do--	V	P	W	V
D		Hot set test	Major	Physical	Sampling as per IS 7098	Sampling as per IS 7098	--do--	--do--	--do--	V	P	W	V
E		Tensile strength & elongation at break test for insulation and sheath before ageing	Major	Physical	--do--	--do--	--do--	--do--	--do--	V	P	W	V
F		Flame resistance test, vertical flame propagation test	Major	Chemical	--do--	--do--	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618/ IEC-60332-1	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618/ IEC-60332-1	--do--	V	P	W	V

Signature

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G		Outer surface finish marking & Length verification	Major	Visual	--do--	one sample per size per offered lot	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618 BIFPCL approved data sheet	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618 BIFPCL approved data sheet	--do--	V	P	W	V
H		Tensile strength & elongation at break test for insulation and sheath after ageing	Major	Physical	one sample per size per offered lot	one sample per size per offered lot	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618	TUV Specification, 2 Pfg 1169/08.2007 / EN 50618	--do--	V	P	V	V
3.3 Packing & Marking													
A		Cable end sealing	Minor	Visual	As per manufacturer standard SQC Ensuring 100% Compliance	-	Mnfr std.	Mnfr std.	--do--		P	-	-
B		Length in meters	Major	Physical	--do--	-	--do--	--do--			P	-	-
C		Month & year of manufacturer	Major	Visual	--do--	-	--do--	--do--			P	-	-
Note: Makes shall be as per vendor list in approved Inspection Categorisation Plan: MAITREE-00-BAA-DA-500027-RDP. After finalization of vendor, vendor's MQP will be submitted to the customer.													
		LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, B: BIFPCL P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: BIFPCL SHALL IDENTIFY IN COLUM "B" AS 'W'. IR : Inspection report TC: Test Certificate, TDS : Technical Data Sheet.				Doc. No:		Rev----- CAT					
Manufacturer/ Sub-Supplier		Main- Supplier											
Signature						For BIFPCL Use							
								Reviewed By		Approved By		Approval Seal	

