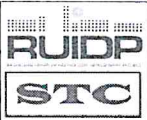


List of Standard Quality Assurance Plan for Electrical Equipment

S. NO.	QAP No.	QAP Description	No. of Sheets
1	E-01	415 V LT Switchgear Panels	4
2	E-02	11 kV Ring Main Unit	3
3	E-03	Distribution Transformers	4
4	E-04	HT Cable XLPE (11 KV-E)	5
5	E-05	LT XLPE/ PVC Insulated Cable Upto and Including 1100V	4
6	E-06	DG Sets	2

Awal Bhangra
10/5/2023

STANDARD QUALITY ASSURANCE PLAN												
		Manufacturer :		Equipment: 415 V LT Switchgear Panels			Project :					
				DOC NO: Std.QAP/23-24/E-01			Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT					
				REV NO : 00			Consultant: SHAH TECHNICAL CONSULTANT (STC)					
				DATE :			Contractor:					
Specifications: Approved Drawings/Project Specifications/IS 8623:1993 (Reaffirmed Year 2013) and latest amendments												
S. No.	Item/ Component & Operation	Characteristics	Class of Check	Type of Check	Quantum/ Frequency of check	Ref. Documents/ Standards	Acceptance Norms	Format of Record	Inspecting Agency			Remarks
									Vendor/ Sub Vendor	Contractor	Client/TPIA	
I Raw Material / Bought out items												
1.0	Panel Fabrication Sheet	Dimension	Minor	Measurement	Sample/Lot	IS 513 :2016 /IS1079:2017/ Project Specifications/Drawings	IS 513 :2016 /IS1079:2017/ Project Specifications/Drawings	Supplier TC/Inspection Report	P	R	R	
		Surface Finish	Minor	Visual	100%			Supplier TC/Inspection Report	P	R	R	
		Chemical Properties	Major	Chemical	Sample/Lot			Supplier Report/Third party Lab report	P	R	R	
		Mechanical Properties	Major	Measurement	Sample/Lot			Supplier Report/Third party Lab report	P	R	R	
2.0	Bus bar (Copper)	Size & Cross Section	Minor	Measurement	Sample/Lot	IS 613:2000 (Reaffirmed year 2016) /IS 5082:1998(Reaffirmed Year :2017)/Project Specifications	IS 613:2000 (Reaffirmed year 2016) /IS 5082:1998(Reaffirmed Year :2017)/Project Specifications	Supplier Report/Third party Lab report	P	R	R	
		Conductivity(Electrical Resistivity)	Major	Measurement					P	R	R	
		Mechanical properties (Elongation,Tensile,Hardness,Bend Test)	Major	Measurement					P	R	R	
		Chemical Properties	Major	Measurement					R	R	R	
3.0	Current Transformers	Make,Rating & Type	Minor	Visual	100%	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Functional/Routine Tests	Major	Measurement	100%	IS 2705:1992(Reaffirmed Year 2017)/IS 16227:2016/Project Specifications	IS 2705:1992(Reaffirmed Year 2017)/IS 16227:2016/Project Specifications	OEM TC/Inspection Report	P	R	R	


12/5/2023

STANDARD QUALITY ASSURANCE PLAN												
		Manufacturer :		Equipment: 415 V LT Switchgear Panels			Project :					
				DOC NO: Std.QAP/23-24/E-01			Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT					
				REV NO : 00			Consultant: SHAH TECHNICAL CONSULTANT (STC)					
				DATE :			Contractor:					
Specifications: Approved Drawings/Project Specifications/IS 8623:1993 (Reaffirmed Year 2013) and latest amendments												
S. No.	Item/ Component & Operation	Characteristics	Class of Check	Type of Check	Quantum/ Frequency of check	Ref. Documents/ Standards	Acceptance Norms	Format of Record	Inspecting Agency			Remarks
									Vendor/ Sub Vendor	Contractor	Client/TPIA	
4.0	Control Transformers	Make/Rating & Type	Minor	Visual	100%	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Functional/Routine Tests	Major	Measurement	100%	IS 11171:1985 (Reaffirmed Year 2016)/Project Specifications	IS 11171:1985 (Reaffirmed Year 2016)/Project Specifications	OEM TC/Inspection Report	P	R	R	
5.0	Meters	Make/Rating/Type	Minor	Visual	100%	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Functional/Routine Tests	Major	Measurement	100%	IS 1248:2003(Reaffirmed Year 2018)/Project specifications	IS 1248:2003(Reaffirmed Year 2018)/Project specifications	OEM TC/Inspection Report	P	R	R	
6.0	Relays	Make/Rating/Type	Minor	Visual	100%	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Functional/Routine Tests	Major	Measurement	100%	IEC 60255:2013/Project specifications	IEC 60255:2013/Project specifications	OEM TC/Inspection Report	P	R	R	
7.0	ACB/MCCB	Make/Rating/Type	Minor	Visual	100%	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Functional/Routine Tests	Major	Electrical	100%	IS60947-P-2:2016/Project Specification	IS60947-P-2:2016/Project Specification	OEM TC/Inspection Report	P	R	R	
8.0	Capacitors/Series Reactors(Where Ever Applicable)	Make/Rating/Type	Minor	Visual	100%	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Functional/Routine Tests	Major	Electrical	100%	IS13585:2012(Reaffirmed Year 2017)/IS13340:2012(Reaffirmed Year 2017)/IS 2026-6:2017/Project Specifications	IS13585:2012(Reaffirmed Year 2017)/IS13340:2012(Reaffirmed Year 2017)/IS 2026-6:2017/Project Specifications	OEM TC/Inspection Report	P	R	R	
9.0	Control Cables	Make/Rating/Size/Type	Minor	Visual	Sample/Lot	As per Approved Drawings/BOM	As per Approved Drawings/BOM	OEM TC/Inspection Report	P	R	R	
		Acceptance test/Routine Tests	Major	Electrical	IS 694:2010 (Reaffirmed Year 2020)	IS 694:2010 (Reaffirmed Year 2020)/Project Specifications	IS 694:2010 (Reaffirmed Year 2020)/Project Specifications	OEM TC/Inspection Report	P	R	R	
Vendor			Contractor				Client					
SIGNATURE :			SIGNATURE:				SIGNATURE:					
NAME:			NAME:				NAME:					




STANDARD QUALITY ASSURANCE PLAN												
		Manufacturer :		Equipment: 415 V LT Switchgear Panels				Project :				
				DOC NO: Std.QAP/23-24/E-01				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
				REV NO : 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
				DATE :				Contractor:				
Specifications: Approved Drawings/Project Specifications/IS 8623:1993 (Reaffirmed Year 2013) and latest amendments												
S. No.	Item/ Component & Operation	Characteristics	Class of Check	Type of Check	Quantum/ Frequency of check	Ref. Documents/ Standards	Acceptance Norms	Format of Record	Inspecting Agency			Remarks
									Vendor/ Sub Vendor	Contractor	Client/TPIA	
II In Process Inspection												
1.0	Assembly For Panel	1.Check for Panel Assembly										
		1.1.Alignment of panel	Major	Physical Verification	100%	As Per App.Drg	As Per App.Drg	Internal Inspection Record	P	R	R	
		1.2.Cable Entry	Major	Physical Verification	100%	As Per App.Drg	As Per App.Drg	Internal Inspection Record	P	R	R	
		1.3.Gasket Arrangement	Minor	Physical Verification	100%	As Per App.Drg	As Per App.Drg	Internal Inspection Record	P	R	R	
2.0	Assembly For Bus Bar	2.Check for Bus bar Mounting										
		2.1.Tightness of bus bar joints	Major	Physical Test by Torque Wrench	100%	Bus bar Should be Tightened properly	Bus bar Should be Tightened properly	Internal Inspection Record	P	R	R	
		2.2.Busbar jointing arrangements & Overlapping	Major	Physical Verification	100%	Bus bar Jointing to Should be done properly	Bus bar Jointing to Should be done properly	Internal Inspection Record	P	R	R	
		2.3.Busbar bending & Drilling	Major	Physical Verification	100%	Bednding and drilling to be done properly	Bednding and drilling to be done properly	Internal Inspection Record	P	R	R	
		2.4.Phase Identification & Clearance	Critical	Physical Verification	100%	As Per App.Drg	As Per App.Drg	Internal Inspection Record	P	R	R	
		2.5.Busbar Sleeving	Minor	Physical Verification	100%	As Per App.Drg	As Per App.Drg	Internal Inspection Record	P	R	R	
3.0	Wiring	3.1.Proper wire Clamping	Major	Visual Check	100%	All the Cables/Wires to be properly clamped	All the Cables/Wires to be properly clamped	Internal Inspection Record	P	R	R	
		3.2.Continuity & Ferruling as per wiring drawing	Major	Visual Check / Test	100%	As Per App.Drg	As Per App.Drg	Internal Inspection Record	P	R	R	
		3.3.Proper crimping of lugs / Connections tightening at terminals	Major	Visual Check / Test	100%	Lugs were to be properly crimped	Lugs were to be properly crimped	Internal Inspection Record	P	R	R	
4.0	Painting / Coating- In process and Testing Requirements	4.1 Raw material for Powder coating	Major	a) Storage b) Paint- UV resistant type	100%	As per IS 13871- 1993	a)As per IS 13871 1993 Clause 6.1.2 b) Powder Test certificates.	IR/ Log Book	P	R	R	
		4.2 Surface preparation - Feeder Panel	Major	Seven Tank cleaning process	100%	As per Manufacturer standard procedure.	Without any Visual defects	IH/ Log Book	P	R	R	
		4.3 Paint Shade and Thickness	Major	Visual & Measurement	Random Check	As per Approved Drwaings/Project Specifications	As per Approved Drwaings/Project Specifications	Internal Inspection Record/ Log Book	P	R	R	
Vendor			Contractor				Client					
SIGNATURE :			SIGNATURE:				SIGNATURE:					
NAME:			NAME:				NAME:					

Per Approved

STANDARD QUALITY ASSURANCE PLAN												
		Manufacturer :		Equipment: 415 V LT Switchgear Panels		Project :						
				DOC NO: Std QAP/23-24/E-01		Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT						
				REV NO : 00		Consultant: SHAH TECHNICAL CONSULTANT (STC)						
				DATE :		Contractor:						
Specifications/Approved Drawings/Project Specifications/IS 8623:1993 (Reaffirmed Year 2013) and latest amendments												
S. No.	Item/ Component & Operation	Characteristics	Class of Check	Type of Check	Quantum/ Frequency of check	Ref. Documents/ Standards	Acceptance Norms	Format of Record	Inspecting Agency			Remarks
									Vendor/ Sub Vendor	Contractor	Client/TPIA	
III Final Inspection												
1.0	Final Inspection	1. Physical check	Major	Physical	100%	Should be Free from Damages/Rust/scratches	Should be Free from Damages/Rust/scratches	Inspection report	P	W	W	
		2. Dimensional check of Enclosure, Bus bars & CRCA Sheet	Minor	Measurement	Random sample	As per Approved Drawing	As per Approved Drawing	Inspection report	P	W	W	
		3. Mounting Arrangements Of Name Plates & Identifications, Verification Of Component, Rating, BOM Arrangement As Per GA Drawing Make.	Minor	Physical Verification	100%	As per Approved Drawing /Approved BOM	As per Approved Drawing /Approved BOM	Inspection report	P	W	W	
		4. Wiring Check, size check	Minor	Physical	Random sample	As per project specifications/As per Approved Drawing	As per project specifications/As per Approved Drawing	Inspection report	P	W	W	
		5. Circuit Function/operational test of all the components/Inter logic check/APFC Relay Check	Major	Electrical	100%	As per project specifications/Approved Drawings	As per project specifications/Approved Drawings	Inspection report	P	W	W	
		6. Insulation resistance Test (Before and after HV)	Critical	Electrical	100%	As per project specifications/IS 8623:1993(Reaffirmed Year 2013)/IEC 61439:-1:2011	As per project specifications/IS 8623:1993(Reaffirmed Year 2013)/IEC 61439:-1:2011	Inspection report	P	W	W	
		7. HV Test (2.5kv For 60Sec)	Critical	Electrical	100%	As per project specifications/IS 8623:1993(Reaffirmed Year 2013)/IEC 61439:-1:2011	As per project specifications/IS 8623:1993(Reaffirmed Year 2013)/IEC 61439:-1:2011	Inspection report	P	W	W	
		8. Phase Identification	Major	Physical Verification	100%	As per Approved Drawing	As per Approved Drawing	Inspection report	P	W	W	
		9. Check For Bus Bar Clearance	Major	Physical Verification	100%	As per Approved Drawing	As per Approved Drawing	Inspection report	P	W	W	
		10. Final Painting										
		10.1. Shade	Major	Visual	Random sample	IS 13871:1993/As per project specifications	IS 13871:1993/As per project specifications	Inspection report	P	W	W	
10.2. Thickness	Major	Measurement	Random sample	IS 13871:1993/As per project specifications	IS 13871:1993/As per project specifications	Inspection report	P	W	W			
11. Function check of Thermostat and Space heater	Minor	Electrical	Random sample	As per project specifications	As per project specifications	Inspection report	P	W	W			
2.0	Type Test	1. Temperature rise	Major	Electrical	Sample/Design	As per project specifications/IEC 61439:-1:2011	As per project specifications/IEC 61439:-1:2011	Type Test Report	P	R	R	
		2. Short Circuit withstand test	Major	Electrical	Sample/Design	As per project specifications/IEC 61439:-1:2011	As per project specifications/IEC 61439:-1:2011	Type Test Report	P	R	R	
		3. Impulse withstand Test	Major	Electrical	Sample/Design	As per project specifications/IEC 61439:-1:2011	As per project specifications/IEC 61439:-1:2011	Type Test Report	P	R	R	
		4. IP Certificate Verification	Major	Physical	Sample/Design	As per project specifications/IEC 61439:-1:2011	As per project specifications/IEC 61439:-1:2011	Type Test Report	P	R	R	
IV	Final Documentation	1. As Built Drawing	2. Test Certificates	3. Packing List								
P-Perform			R-Review		W-Witness		OEM-Original Equipment Manufacturer					
Vendor			Contractor		Client							
SIGNATURE:			SIGNATURE:				SIGNATURE:					
NAME:			NAME:				NAME:					

Dev
 Reviewer

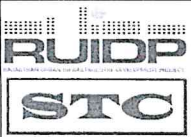
STANDARD QUALITY ASSURANCE PLAN											
 		MANUFACTURER/ VENDOR:		EQUIPMENT: 11 kV Ring Main Unit			Project :				
QAP NO: Sid QAP/ 23-24/ E-02				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT							
REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)							
DATE:				Contractor:							
Specifications: Approved Drawings/ Project Specifications/ IEC 62271 and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
Incoming Raw Materials											
1	2	3	4	5	6	7	8	9			10
1	CRCA Sheet / Stainless/Galvalite Steel	Finish & Dimension Check	Visual & Physical	Sample/ Lot	IS 513 Part-1:2016 / EN 1088-2 /ASME SA-240	IS 513 Part-1:2016 / EN 1088-2 /ASME SA-240	Vendor Test Certificates/Incoming Inspection Records	P	R	R	
		Chemical Composition	Chemical Test								
		Mechanical Properties	Mechanical Test								
2	Aluminum / Copper Bus Bars	Finish & Dimension Check	Visual & Physical	Sample/ Lot	IS 613:2000 (Reaffirmed year 2016) /IS 5082:1998(Reaffirmed Year :2017)/Project Specifications	IS 613:2000 (Reaffirmed year 2016) /IS 5082:1998(Reaffirmed Year :2017)/Project Specifications	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
		Chemical Composition	Chemical Test								
		Mechanical & Electrical Properties	Mechanical & Electrical Test								
3	Current Transformer	Make, Type, Class, CTR & Burden	Visual & Physical	100%	IEC 61869 - 1 & 2 :2012/ IS 2705:1992(Reaffirmed Year 2017)/IS 16227:2016/Project Specifications	IEC 61869 - 1 & 2 :2012/ IS 2705:1992(Reaffirmed Year 2017)/IS 16227:2016/Project Specifications	Vendor Test Certificates	P	R	R	
		Routine Test	Electrical Tests								
4	Vacuum Circuit Breaker	Routine Test	Mechanical & Electrical Tests	100%	IEC 62271-100 :2020/Project Specifications	IEC 62271-100 :2020/Project Specifications	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
5	Potential / Voltage Transformer & Auxiliary Transformer	Make, Type, Class, PTR & Burden	Visual & Physical	100%	IEC 61869 - 1 & 3:2020 / IS 16227:2016/Project Specifications/IS 11171:1985 (Reaffirmed Year 2016)/	IEC 61869 - 1 & 3:2020 / IS 16227:2016/Project Specifications/IS 11171:1985 (Reaffirmed Year 2016)/	Vendor Test Certificates	P	R	R	
		Dimensions	Measurement								
		Partial Discharge Test	Electrical Tests								
		Routine Test	Electrical Tests								
6	Relays	Make & Type	Visual & Physical	100%	IEC 60255:2013/Project specifications	IEC 60255:2013/Project specifications	Vendor Test Certificates	P	R	R	
		Calibration Test	Electrical Tests								
		HV Test	Electrical Tests								
		Performance Test	Electrical Tests								
		Routine Test	Electrical Tests								
7	Indicating Meters - Voltmeter & Ammeter, Energy Meter	Routine, Calibration & Performance Test,Make,Type,Model	Electrical Tests	100%	IS 1248:2003(Reaffirmed Year 2018)/13010:2002(Reaffirmed Year 2012)/Project Specifications	IS 1248:2003(Reaffirmed Year 2018)/13010:2002(Reaffirmed Year 2012)/Project Specifications	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
8	Voltage Presence Indicator & Fault Passage Indicator	Functional Test	Electrical Tests	100%	IEC 62271-206, IEC 61958 & IEC 6100	IEC 62271-206, IEC 61958 & IEC 6100	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
8	Multi Function Meter & Manometer	Calibration & Performance Test,Make,Type,Model	Electrical Tests	100%	IEC 62052-11 & IEC 62053-2 / IEC 61000	IEC 62052-11 & IEC 62053-2 / IEC 61000	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
9	Load Break Switch/ Disconnecter	Visual & Dimension Check	Visual & Physical	100%	IS/IEC 62271:103:2011 (Reaffirmed Year 2015)	IS/IEC 62271:103:2011 (Reaffirmed Year 2015)	Vendor Test Certificates	P	R	R	
		Routine Test	Electrical Tests								
10	Support Insulators	Creepage & Dimension Check	Visual & Mechanical Test	100%	IS 9431:1979 (Reaffirmed Year 2014)	IS 9431:1979 (Reaffirmed Year 2014)	Vendor Test Certificates	P	R	R	
		Mechanical Properties	Mechanical Tests								
		Dry Power Frequency Voltage Withstand Test	Electrical Tests								
		PD Test	Electrical Tests								
10	Gas to Air Bushing	Dimension Check	Visual & Mechanical Test	100%	IEC 60137:2017	IEC 60137:2017	Vendor Test Certificates	P	R	R	
		Mechanical Properties	Mechanical Tests								
		Partial Discharge Test	Electrical Tests								
		Dry Power Frequency Voltage Withstand Test	Electrical Tests								
11	High Tensile Bolt Fasteners	Dimensions	Measurement	On random basis	IS 1367 P-1:2014(Reaffirmed Year:2019)	IS 1367 P-1:2014(Reaffirmed Year:2019)	Vendor Test Certificates	P	R	R	
		Threading	Gauging								
		Hardness	Mechanical								
12	Wires/Cable	Visual & Finish	Visual & Finish	100%	IS 694:2010 (Reaffirmed Year 2020)/IS 7098 P-1:1988(Reaffirmed Year:2020)/Project Specifications	IS 694:2010 (Reaffirmed Year 2020)/IS 7098 P-1:1988(Reaffirmed Year:2020)/Project Specifications	Vendor Test Certificates	P	R	R	
		Routine Test	Electrical Tests								
13	A.Vacuum Bottle B. Tripping Coil C. Closing Coil	Visual & Finish	Visual & Finish	100%	As per approved Drawing	As per approved Drawing	Vendor Test Certificates	P	R	R	
		Routine Test	Electrical Tests								

Per Engineer

STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: 11 kV Ring Main Unit				Project :				
			QAP NO: Std QAP/ 23-24/ E-02				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IEC 62271 and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10
Incoming Raw Materials											
In-process											
13	Panel Fabrication	Dimensions Cable Entry Alignment of Panel	Measurement Visual & Physical Visual & Physical	100%	Approved Drawing	Approved Drawing	Internal Inspection Record	P	R	R	
13	Tank Fabrication	Dimensions Machining & Fabrication	Measurement Visual & Physical	100%	Approved Drawing	Approved Drawing	Internal Inspection Record	P	R	R	
14	Panel Assembly	Alignment of panel & Bus bar Check for Bus bar Mounting Tightness of bus bar joints % Bushings Busbar jointing arrangements & Overlapping Busbar bending & Drilling Phase Identification & Clearance Busbar Steeving - Joints, Tap points, Droppers etc	Visual & Physical Visual & Physical Visual & Physical Visual & Physical Visual & Physical Physical & Measurement Visual & Physical	On random basis	Approved Drawing	Approved Drawing	Internal Inspection Record	P	R	R	
15	Breaker, LBS/Disconnecter & Earth Switch Assembly	Visual & Dimension Check Alignment of Components & Mechanical (Manual/Electrical) Operation	Visual & Finish Physical & Mechanical/Electrical	100%	Approved Drawing	Approved Drawing	Internal Inspection Record	P	R	R	
16	Wiring	Visual, Finish, Make & Size Continuity & Ferruling as per wiring drawing Proper crimping of lugs / Connections tightening at terminals	Visual Visual & Physical Visual & Physical	On random basis	Approved Drawing	Approved Drawing	Internal Inspection Record	P	R	R	
Painting / Coating- In process and Testing Requirements											
1	Surface preparation - Blast cleaning for Panel Stands (Which are spray painted)	Sa 2.5 Very thorough blast cleaning	Measurement & Visual	100%	NACE SSPC VIS 1 / Sa 2.5	Mill scale, rust and foreign matter shall be removed to the extent that the only traces remaining are slight stains in the forms of spots or stripes. Finally, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush.	IR	P	R	R	
2	Raw material for Powder coating	a) Storage b) Paint- UV resistant type	Visual	100%	As per IS 13871- 1993	a) As per IS 13871 1993 Clause 6.1.2 b) Powder Test certificates.	IR/ Log Book	P	R	R	
3	Surface preparation - Feeder Panel	Seven Tank/ Eleven tank cleaning process	Visual	100%	As per Manufacturer standard procedure	Without any Visual defects	IR/ Log Book	P	R	R	
4	Temperature control to be monitored for Panel Stands (Which are spray painted)	Relative Humidity, Dew Point temperature, Air temperature, Delta Value, Steel temperature	Measurement	100%	RH - Not greater than 80%. Steel tempr shall be 3° Deg C higher than dew point temperature.	RH - Not greater than 80%. Steel tempr shall be 3° Deg C higher than dew point temperature.	IR/ Log Book	P	R	R	
5a	Final Inspection	a) Paint Shade b) DFT Thickness c) Cross Cut Adhesion Test. d) Scratch hardness test	Measurement	Random sample (10% of every lot)	As per IS 13871-1993- Table 1	a) Paint shade- As per approved drawing b) DFT thickness in the range 80-100 microns. c) No visible damage or detachment of film. d) No such scratches as to show bare metal.	IR	P	W	W	

Dev Bhangar

STANDARD QUALITY ASSURANCE PLAN											
 		MANUFACTURER/ VENDOR:		EQUIPMENT: 11 kV Ring Main Unit			Project :				
				QAP NO: Std QAP/ 23-24/ E-02			Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
				REV.NO: 00			Consultant: SHAH TECHNICAL CONSULTANT (STC)				
				DATE:			Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IEC 62271 and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
Incoming Raw Materials											
1	2	3	4	5	6	7	8	9			10
Final Testing											
18	RMU	General Arrangement & Workmanship, Measurement of Dimensions of Verticles, Power/Control/Earthing Busbars, Thickness of sheets Doors/ Load bearing/ Non Load Bearing Members/Gland Plate	Visual/Measurement	100%	Approved Drawings	Approved Drawings	Test Report	P	W	W	
		Verification of Components - Make, Rating/Type/Model, Tightness of Control Wiring/Busbar (Torque Marking)	Visual/Measurement	100%	Approved Drawings	Approved Drawings					
		Bus bar clearances/ Barriers -Acrylic/Polycarbonates/FRP sheet arrangement, Earthing Wires & Danger /Caution Sticker Visibility	Visual / Physical / Measurement	100%	Approved Drawings	Approved Drawings					
		Mimic, Nameplates of Panel, Rating plates with System Voltage grade, Current Rating, Fault Levels etc.	Visual	100%	Approved Drawings	Approved Drawings					
		Power-frequency voltage withstand test & Functional Test of VPI	Electrical Tests	100%	IEC 62271:200 & IEC 61958	IEC 62271:200 & IEC 61958					
		Dielectric tests on auxiliary and control circuits	Electrical Tests	100%	IEC 62271:200	IEC 62271:200					
		Control & Power Circuit Circuit/Functional/Scheme Check/ Interlocking Check/ DI & DO of FRTU	Electrical Tests	100%	Approved Drawings	Approved Drawings					
		Gas Filling Pressure & Leakage Test	Visual & Physical	100%	Custom Method by handheld Sniffing and leak detection Equipment	No leakage & pressure drop					
		Measurement of resistance of main circuit/Contact Resistance Measurement / mV Drop Test	Electrical Tests	100%	IEC 62271:200	IEC 62271:200					
		Primary Current Injection for Relays, FPI & Meters	Electrical Tests	100%	IEC 62271:200	IEC 62271:200					
		Lighting Impulse Voltage Withstand Test	Type Tests	One Sample of similar design	IEC 62271 & IEC 60529	IEC 62271 & IEC 60529	Type Tests Report	P	R	R	
		Temperature Rise Test on main circuit and on auxiliary and control equipment									
		Internal Arc Withstand Test									
		Partial Discharge Test									
		Short-time and pick withstand current test									
Ingress Protection - RMU & SF6 Filled Tank											
P- Perform			R-Review of Documents		TPIA-Third Party Inspection Agency		W- Witness		OEM- Original Equipment Manufacturer		
Manufacturer / Vendor					Contractor				Client/ TPIA		
Signature:					Signature:				Signature:		
Name:					Name:				Name:		

STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: Distribution Transformers				Project :				
			QAP NO: Std QAP/ 23-24/ E-03				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 1180 & 2026 and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
A) Raw Materials											
1	Copper conductor	a) Width & thickness of bare conductor (Bared and Covered conductor)	Measurement	One Sample/ Lot	Mfr. Plant standard / IS 13730 / IS 12444 / IS 7404	Mfr. Plant standard / IS 13730 / IS 12444 / IS 7404	QC Record / Supplier's TC/ Mill test reports	P	R	R	
		b) Surface finish	Visual					P	R	R	
		c) Corner Radius	Visual					P	R	R	
		d) Mechanical properties: Tensile strength, Elongation and Hardness	Mechanical					P	R	R	
		e) Electrical Properties: Resistivity, Conductivity and Purity	Electrical					P	R	R	
2	CRGO Core Lamination	a) Dimensions	Measurement	One Sample/ Lot	Mfr. Plant standard / IS: 3024-2015	Mfr. Plant standard / IS: 3024-2015	QC Record / Supplier's TC	P	R	R	
		b) Lamination thickness	Measurement					P	R	R	
		c) Flatness (Wave factor)	Measurement					P	R	R	
		d) Density	Electrical					P	R	R	
		e) Specific core loss/ Watt loss measurement	Electrical					P	R	R	
		f) Stacking factor	Electrical					P	R	R	
		g) Cutting end edge burrs	Visual					P	R	R	
3	Insulating oil	a) Appearance	Lab test	Oil Sample/ Lot	Mfr. Plant standard / IS 335-2018 / IS 1866-2017	Mfr. Plant standard / IS 335-2018 / IS 1866-2017	QC Record/ Supplier TC	P	R	R	
		b) Density									
		c) Viscosity									
		d) Interfacial tension									
		e) Flash point									
		f) Pour point									
		g) Total Acidity									
		h) Corrosive sulphur									
		i) Break down voltage									
		j) Tan delta at 90 deg C									
		k) Oxidation Stability									
		l) Pressure of oxidation inhibitor									
		m) Water Content									
4	Gasket	a) Dimension	Mechanical	One Sample/ Lot	Mfr. Plant standard / IS 4253	Mfr. Plant standard / IS 4253	QC Record/ Supplier TC	P	R	R	
		b) Hardness									
		c) Tensile strength									
		d) Compressibility									
		e) Recovery									
		f) Compression set at 110 deg for 24 Hrs % Max									
		g) Flexibility									
		h) Ageing in Air & Oil									
		i) pH Value of Water content									
		j) Density									
5	Press boards	a) Thickness	Lab test	One Sample/ Lot	Mfr. Plant standard/ IEC60641-2-2004	Mfr. Plant standard/ IEC60641-2-2004	QC Record/ Supplier TC	P	R	R	
		b) Apparent Density									
		c) Tensile strength									
		d) Compressibility									
		e) Shrinkage									
		f) PH & conductivity of Aqueous extract									
		h) Ash content									
		i) Electric Strength in Air									

Over
 Date

S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
1.1	Transformer Tank	Pressure Test	Mechanical	100%	IS 1180: 2014 with latest amendments.	IS 1180: 2014 with latest amendments.	Test Certificate	P	R	R	Tank Pressure test shall be carried out on all transformer tanks at Manufacturing Unit.
1.2		Pressure Test (Type Test) Vacuum Test (Type Test) DP TEST on Weld Joints & Load bearing Joints (Random locations)	Mechanical	100%	IS 1180: 2014 with latest amendments.	IS 1180: 2014 with latest amendments.	Stage Inspection report	P	W	W	Pressure & vacuum test shall be carried out as per IS 1180: 2014.
1.3		a) Surface preparation b) Paint Shade c) Paint Thickness	Physical Visual Measurement	100%	As per Plant Standard/ Customer Specifications/ Approved vendor painting procedure	As per Plant Standard/ Customer Specifications/ Approved vendor painting procedure	Test certificate	P	W	W	a) External and Internal Surfaces of tank should be covered with paint. B) Internal surface of tank shall be painted with white Hot Oil, Heat resistance, non-corrosive varnish or paint or epoxy to achieve DFT>=25 microns. C) External surfaces of paint shall be covered with Primer coat, Intermediate undercoat and Polyurethane/ Synthetic enamel finish coat to achieve DFT > 130 microns.
2	Core Building	a) Dimensional Check	Measurement	100%	Approved data sheets/ Plant standard design	Approved data sheets/ Plant standard design	Stage Inspection report	P	W	W	
		b) Limb & stack thickness	Measurement					P	W	W	
		c) Core Diameter	Measurement					P	W	W	
		d) Window height	Measurement					P	W	W	
		e) Leg center	Visual					P	W	W	
2.1	Test on core	a) Dimensional check	Measurement	100%	Approved data sheets/ Plant standard design	Approved data sheets/ Plant standard design	Stage Inspection report	P	W	W	
		b) Pre-Core loss measurement	Test					P	W	W	
3	Winding	a) Conductor size	Measurement	100%	Approved data sheets/ Plant standard design	Approved data sheets/ Plant standard design	Stage Inspection report	P	W	W	
		b) ID, OD & Axial length	Measurement					P	W	W	
		c) Radial depth of winding	Measurement					P	W	W	
		d) No. of Turns	Measurement					P	W	W	
		e) Transposition & cross overs	Visual					P	W	W	
		f) Insulation arrangement and alignment	Visual					P	W	W	
		g) Continuity Test	Visual					P	W	W	
4	Core coil Assembly	a) Cleanliness of core	Visual	100%	Approved data sheets/ Plant standard design	Approved data sheets/ Plant standard design	Stage Inspection report	P	W	W	
		b) Alignment Insulations b/w Core and Coil	Visual					P	W	W	
		c) Cleaning of core before core coil assembly	Visual					P	W	W	
		d) Arrangement of Top & Bottom Insulation	Visual					P	W	W	
		e) Tightness	Visual					P	W	W	
		f) Dielectric Insulation Test of core, (2KV for 1 min)	Test					P	W	W	
		g) Earthing of core	Visual					P	W	W	
		h) Ratio test on all taps	Test					P	W	W	
		i) Vector group & Polarity	Test					P	W	W	
		j) Magnetic Balance test	Test					P	W	W	
								P	W	W	
6	Connection & tap switch assembly	Lead disposition Brazing of lead joints Brazing of lead terminals Insulation over joints	Visual -do- -do- -do-	100% -do- -do- -do-	Mfr Drg./Plant std -do- -do- -do-	Mfr Drg./Plant std -do- -do- -do-	QC Record -do- -do- -do-	P	W	W	
7	Overning & tanking	a) Cleaning of tank	Visual	100 %	Mfr Drg./Plant std	Mfr Drg./Plant std	QC Record	P	W	W	
		b) Drying	Visual	100 %	-do-	-do-	-do-				
		c) Check tightness of clamped blocks and measurement of winding heights	Visual	100 %	-do-	-do-	-do-				
		d) Electrical Clearances	Visual	100 %	-do-	-do-	-do-				
		e) IR Values	Electrical	100 %	-do-	-do-	-do-				
		f) Oil Filling & Air release.	Visual	100 %	-do-	-do-	-do-				
C)	Final Inspection										
		a) Visual Examination	Visual	100%				P	W	W	
		b) Dimensional checks & BOM check, Rating and valve plate, Terminals Marking	Measurement & Physical	One Job/ Rating				P	W	W	
		c) Measurement of Winding resistance at all taps	Electrical	100%				P	W	W	
		d) Measurement of voltage Ratio at all taps	Electrical	100%				P	W	W	
		e) Polarity & vector group test	Electrical	100%				P	W	W	

Done
 Date

S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
1.1	Routine / Acceptance Tests	f)Magnetic Balance Test	Electrical	100%	IS 1180-2014/ IS 2026 CBIP Manual-317	IS 1180-2014/ IS 2026 CBIP Manual-317	Witness test report	P	W	W	
		g)Measurement of Insulation resistance of winding, PI Value	Electrical	100%				P	W	W	
		h) Separate Source Power Frequency/Voltage Withstand test	Electrical	100%				P	W	W	
		i)Induced OverVoltage Withstand test	Electrical	100%				P	W	W	
		j)Measurement of No-load losses & magnetising Current at Rated, 90 % and 110% of rated voltages	Electrical	100%				P	W	W	
		k)Measurement of impedance voltage/ short circuit impedance at principal tap and load loss measurement at principal tap. (50% and 100% Load) Load loss measurement at two extreme taps.	Electrical	100%				P	W	W	
		l) Spill current measurement in neutral, (limit <3%)	Electrical	100%				P	W	W	
		m) Measurement of Efficiency and Regulation at 25%, 50%, 75% & 100% load	Electrical	Random samples				P	W	W	
		n) Oil Leakage Test: -without Radiators fixing (Duration 8 Hours). -with radiator fixing on one transformer (Duration 8 Hours).	Mechanical	100%				P	W	W	
		o) Marshalling Box Operational & Functional Test: (Bucholz relay,OTI,WTI,MOG,PRV Check)	Electrical	100%				P	W	W	
		p) Oil BDV Test	Electrical	Random samples				P	W	W	
		q) Paint Shade & DFT thickness, Adhesion test	Electrical	Random location on transformer				P	W	W	
		q)WTI CT Ratio, Neutral CT ratio check during full load test.	Electrical	100%				P	W	W	
		r) Tests on OCTC operational tests	Electrical	100%				P	W	W	
		s) Pressure relief device operation check.	Physical	100%				P	W	W	
		t) Measurement of Magnetization current at Low Voltage/ Measurement and recording of currents with application of 400volts 3ph, ac supply on HV side and LV side shorted. (At all the taps)	Electrical	100%				P	W	W	
		u) Measurement of Efficiency and Regulation at Quarter, Half, 3/4th and Rated load- Calculations to be submitted.	Electrical	100%				P	W	W	
		v) Pressure Test	Physical	100%				P	W	W	
1.2	Type Tests/ Special Tests	a) Temperature rise test	Electrical	Similar rating of Transformer	IS 1180: 2014	IS 1180: 2014	Type test report	P	R	R	Note: Manufacturer should have type test (Govt. Lab/ NABL accreditation) within 2 years from the date of inspection for same/ higher ratings & reports to be submitted to Inspector during the inspection.
		b) Lightning Impulse (Full wave and Chopped wave)	Electrical		IS 1180: 2014	IS 1180: 2014	Type test report	P	R	R	
		c) Short Circuit Dynamic Withstand Test	Electrical		IS 1180: 2014	IS 1180: 2014	Type test report	P	R	R	
		d) Pressure Test	Physical	100%	IS 1180: 2014	IS 1180: 2014	Type test report	P	R	R	
		e) Marshalling Box IP 55 Certificate	Test	Identical design	As per IEC 60529	As per IEC 60529	Type test report	P	R	R	
		a) Measurement of acoustic noise level	Measurement	One sample/ Lot	IS 1180/ 2026/ CBIP	IS 1180/ 2026/ CBIP	Witness test report	P	R	R	
b) Measurement of Zero sequence impedance	Electrical	One sample/ Lot	IS 1180/ 2026/ CBIP	IS 1180/ 2026/ CBIP	P	R		R			
1.3	Pre- Despatch	a) Final Paint Touch up	Physical	100%	Mfr Standard	Mfr Standard	QC Record	P	-	-	
		b) Packing Main unit and loose item	Physical	100%	Mfr std / Packing List / Chalan	Mfr std / Packing List / Chalan	QC Record	P	-	-	
		c) Project Name Marking	Physical	100%	Mfr std / Packing List	As per Contract Specifications/ IS 2026/ CBIP Manual- 317	QC Record	P	-	-	
		d) Accessories as per client requirements	Physical	100%	Mfr std / Packing List		QC Record	P	-	-	
Note:	1. BEE marking is mandatory on transformers and BIS license copy to be submitted during inspection of design. 2. All the Distribution Transformers shall be manufactures as per IS 1180- 2014 considering the Latest Amendments. 3. Type test reports has to be submitted of Similar Rating Transformers considering the BEE Star Labeling-I or higher/ with same design specifications as per the offered Jobs. 4. If suppliers are not having Similar Rated Transformers Type test reports, then the same to be considered to perform the Type test as per IS 1180- 2014 during order finalization.										
	P- Perform		R-Review of Documents		TPIA-Third Party Inspection Agency		W- Witness	OEM- Original Equipment Manufacturer			
Manufacturer / Vendor			Contractor				Client/ TPIA				
Signature:			Signature:				Signature:				
Name:			Name:				Name:				

Robert Brown

STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: HT Cable (11 KV-E)				Project :				
			QAP NO: Sid QAP/ 23-24/ E-04				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-2:2011 (Reaffirmed Year :2021) / Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10
In-process Inspection											
7	Wire Drawing - Aluminium/ Copper	Type & Diameter of Wire	Measurement	1 Sample / Bobbin	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 2	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 2	Inprocess Reports	P	R	R	
		Tensile strength (Only for Aluminium)	Mechanical	1 Sample / Bobbin							
		Elongation at Break (Only for Copper)	Mechanical	1 Sample / Bobbin							
		Wrapping Test (Only for Aluminium)	Mechanical	1 Sample / Bobbin							
		Resistivity	Electrical	1 Sample / Bobbin							
		Surface Finish	Visual & Physical	Continuous							
8	Conductor Stranding -Aluminium	Type of Conductor, Wire Diameter & No. of Strands	Visual & Measurement	At Start Up	Approved Drawing & Manufacturers Specification+F51:G69	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Sequence & Lay Direction	Visual	At Start Up							
		Shape of Conductor & Surface Finish	Visual	At Start Up							
		Bunched Conductor Diameter	Physical & Measurement	At Start Up							
		Conductor Resistance	Electrical	Every Drum							
9	Insulation	Type Of Compound	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Diameter Over Conductor	Measurement	Continuous							
		Thickness of Conductor Screen, XLPE Insulation & Insulation Screen	Measurement	Every Drum							
		Diameter Over Insulation Screen	Measurement	Continuous							
		Thickness Eccentricity & Core Ovality	Measurement	Every Drum							
		Surface Finish & Length	Visual & Measurement	Continuous							
		Tensile strength and elongation at break	Measurement	Every Drum							
		Hot Set Test	Measurement	Every Drum							
10	Tapping / Screening - Copper Tape	Type of Tape, Width & Thickness	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		No. of Tape, % Overlapping & Diameter Over Tape	Measurement	Continuous							
		Direction of Taping	Visual	At Start Up							
		Core Identification Tape	Visual	Continuous							
11	Laying Up	Core Sequence, Lay Direction & Length	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing	Inprocess Reports	P	R	R	
		Thickness of Tape, % Overlapping & Diameter Over Laidup Cores	Measurement	Continuous							
12	Inner Sheathing	Type Of Compound	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Thickness & Diameter over Sheathing	Measurement	At Start Up							
		Colour & Surface Finish	Visual	Continuous							

Approved
 Date: _____
 Signature: _____

STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: HT Cable (11 KV-E)				Project :				
			QAP NO: Std QAP/ 23-24/ E-04				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-2:2011 (Reaffirmed Year :2021) / Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
1	2	3	4	5	6	7	8	9			10
13	Armouring GI / Aluminium (Wire / Strip)	Dimension of Armour Wires / Strips & Finsih	Measurement	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		No. of Armour Wires / Strips	Measurement	At Start Up							
		Direction of Lay & Lay Length	Visual	100%							
		Strip/Wire Welding	Visual	100%							
		Diameter Over Armour	Measurement	At Start Up							
14	Outer Sheath	Material & Type of Compound	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Thickness & Overall Diameter	Measurement	At Start & End							
		Colour & Surface Finish	Visual	Continuous							
		Embossing	Visual	100%							
Routine Test											
15	HT Cable	Conductor Resistance Test	Electrical	100%	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 2:2011 (Reaffirmed Year :2016)	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 2:2011 (Reaffirmed Year :2016)	Internal Routine Test Report	P	R	R	
		Partial Discharge Test	Electrical								
		High Voltage Test	Electrical								
Acceptance Test											
16	HT Cable	Thickness of Insulation & Sheath (Inner & Outer)	Measurement	Sampling Plan as per IS 7098 Part 2 :2011 (Reaffirmed Year :2016) (Below Table) Amendment Number 2 :2022	IS 7098 Part 2 IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	IS 7098 Part 2 IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	Inspection Test Report	P	W	W	
		Measurement of Eccentricity & Ovality, Stripability	Measurement								
		T.S. & Elongation at break for Insulation & Sheath	Mechanical								
		Overall Diameter, Type of Cable, Dimensions of Armour, Copper Tape, No. of Strands, Colors of Sheath, Thickness of Semi-Conductor Screen, Diameter over Armour & Inner Sheath	Visual & Mechanical								
		Insulation Resistance (Volume resistivity)	Electrical								
		High Voltage Test @ Room Temp. on full drum for 5 Min. & on sample length for 4 Hrs.	Electrical								
		Hot Set Test & Permanent Set for Insulation	Thermal								
		Conductor Resistance Test at ambient temperature	Electrical								
		Partial Discharge Test	Electrical								
		Visual Check for Cable- Finish, Marking/Printing, Top & Bottom Length Verification	Visual & Physical								
		Visual Check - Drum Stenciling, Drum No., Quantity, Net & Gross Weight, Type & Size of Cable, Direction of Rotation	Visual & Physical								
		Type Test									
17	Test On Conductor	Annealing test (for copper)	Mechanical Test	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS : 8130-2013 (Reaffirmed Year 2018)	Type Test Report	P	R	R	
		Tensile test (for aluminium)	Mechanical Test								
		Wrapping test (for aluminium)	Mechanical Test								
		Resistance test	Electrical Test								

Rev. 01/2021

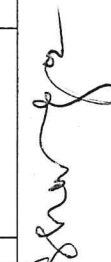
STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:	EQUIPMENT: HT Cable (11 KV-E)				Project :					
		QAP NO: Std QAP/ 23-24/ E-04				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT					
		REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)					
		DATE:				Contractor:					
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-2:2011 (Reaffirmed Year :2021) / Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
1	2	3	4	5	6	7	8	9			10
18	Tests for round steel wire/formed steel wire (strip) armour	Dimensions	Measurement	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016) IS 3975:1999 (Reaffirmed Year :2014)/IS 4826:1975 (Reaffirmed year 2016)	IS 692 & IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	Type Test Report	P	R	R	
		Tensile strength	Mechanical Test								
		Elongation at break	Mechanical Test								
		Torsion test for round wires	Mechanical Test								
		Winding test for formed wires	Mechanical Test								
		Uniformity of zinc coating	Chemical Test								
		Mass of zinc coating	Chemical Test								
Resistivity	Electrical Test										
19	Test for thickness of insulation and sheath	Thickness & Eccentricity of Insulation	Measurement	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	Type Test Report	P	R	R	
		Ovality of Core	Measurement								
		Thickness of Inner Sheath & Outer Shaeth	Measurement								
20	Physical tests for insulation	Tensile strength and elongation at break	Measurement	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	Type Test Report	P	R	R	
		Ageing in air oven	Mechanical Test								
		Hot set test	Mechanical Test								
		Shrinkage test	Mechanical Test								
		Water absorption (gravimetric)	Electrical Test								
21	Tests on Extruded Semi-conducting Screen	Strippability Test	Mechanical	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	Type Test Report	P	R	R	
		Resistivity of Semi-conducting Screen	Electrical Test								
22	Physical tests for outer sheath	Tensile strength and elongation at break	Measurement	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 5831:1984 (Reaffirmed Year:2016)	Type Test Report	P	R	R	
		Ageing in air oven	Mechanical Test								
		Loss of mass in air oven	Mechanical Test								
		Shrinkage test	Mechanical Test								
		Hot deformation	Thermal Test								
		Heat shock test	Thermal Test								
		Thermal stability	Thermal Test								
Flamability Test on Single Cable	Flame Test										
23	Partial discharge (PD) test	Quality of Insulation	Electrical Test	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 7098 Part 2 :2011 (Reaffirmed Year :2016)	Type Test Report	P	R	R	
24	Bending test followed by PD	Bending as 20D ± 5%	Mechanical Test				Type Test Report	P	R	R	
25	Dielectric power factor (DPF) test	As a function of voltage	Electrical Test				Type Test Report	P	R	R	
		As a function of temperature	Electrical Test				Type Test Report	P	R	R	
26	Insulation resistance (volume resistivity test)	Measurement of Insulation resistance	Electrical Test				Type Test Report	P	R	R	
27	Heating cycle test followed by DPF & PD	Heat Cycles	Electrical Test	Type Test Report	P	R	R				

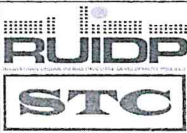
Shah
 20/11/2021

STANDARD QUALITY ASSURANCE PLAN																													
	MANUFACTURER/ VENDOR:		EQUIPMENT: HT Cable (11 KV-E)				Project :																						
			QAP NO: Std QAP/ 23-24/ E-04				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT																						
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)																						
			DATE:				Contractor:																						
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-2:2011 (Reaffirmed Year :2021) / Latest amendments																													
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks																		
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10																		
28	Impulse withstand test	Dielectric Test	Electrical Test				Type Test Report	P	R	R																			
29	High voltage test	High voltage test for 4 Hrs.	Electrical Test				Type Test Report	P	R	R																			
30	FR/FRLS Test on PVC Outer Sheath	Oxygen & Temperature Index Test	Flame Test	One sample from each Size & Type per offered Lot	ASTM D 2863	29.0 % Min. at 27±2°C & 250° Min.	Type Test Report	P	R	R																			
		Smoke Density Rating	Flame Test		ASTM D 2863	60 % Max. Light Absorption																							
		HCL Acid Gas Evolution Test	Chemical Test		IEC 60754-1	20 % Max. by weight																							
		Flammability Test on Single Vertical Cable & Bundled Cable	Flame Test		IS 10810:1984 (Reaffirmed Year: 2016) Part-53	Un-affected Length from the lower edge of the top clamp- 50 mm (Min.) & Burning less than 60 Sec after removal of Flame																							
		Swedish Chimney Test (As applicable)	Flame Test		SS 424-14-75 Class F3	SS 424-14-75 Class F3																							
		Anit-Rodent & Termite Repulsion Test	Chemical Test		Ammonium Acetate of PVC compound turns sodium sulphide solution Black	Presence of Lead in PVC																							
Note:	Sampling of Cable Drums <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>No. of Drums In the Lot</th> <th>No. of Drums to be Taken as Sample</th> <th>Permissible No. of Defectives</th> </tr> </thead> <tbody> <tr> <td>Up to 25</td> <td>3</td> <td>0</td> </tr> <tr> <td>26 to 50</td> <td>5</td> <td>0</td> </tr> <tr> <td>51 to 100</td> <td>8</td> <td>0</td> </tr> <tr> <td>101 to 300</td> <td>13</td> <td>1</td> </tr> <tr> <td>301 and above</td> <td>20</td> <td>1</td> </tr> </tbody> </table>			No. of Drums In the Lot	No. of Drums to be Taken as Sample	Permissible No. of Defectives	Up to 25	3	0	26 to 50	5	0	51 to 100	8	0	101 to 300	13	1	301 and above	20	1								
	No. of Drums In the Lot	No. of Drums to be Taken as Sample	Permissible No. of Defectives																										
	Up to 25	3	0																										
	26 to 50	5	0																										
	51 to 100	8	0																										
	101 to 300	13	1																										
301 and above	20	1																											
P- Perform			R-Review of Documents		TPIA-Third Party Inspection Agency		W- Witness	OEM- Original Equipment Manufacturer																					
Manufacturer / Vendor			Contractor				Client/ TPIA																						
Signature:			Signature:				Signature:																						
Name:			Name:				Name:																						




STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: XLPE/ PVC Insulated Cable Upto and Including 1100V				Project :				
			QAP NO: Std QAP/ 23-24/ E-05				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-1:1988 (Reaffirmed Year :2020) and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10
Incoming Raw Materials											
1	Aluminium / Copper Wire Rod	Surface Finish & Diameter	Visual & Measurement	1 Coil per Material Lot	IS 4026:2007 (Reaffirmed Year:2017), IS 5484:1997 (Reaffirmed Year :2017), IS 613:2000 (Reaffirmed Year :2016) IS 10810:1984 (Reaffirmed Year: 2016), ASTM B233	IS 4026:2007 (Reaffirmed Year:2017), IS 5484:1997 (Reaffirmed Year :2017), IS 613:2000 (Reaffirmed Year :2016) IS 10810:1984 (Reaffirmed Year: 2016), ASTM B233	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
		Tensile strength ((Only for Aluminium)	Mechanical								
		Elongation at Break (Only for Copper)	Mechanical								
		Conductivity/ Resistivity	Electrical Tests								
		Annealing Test for Copper	Mechanical								
		Chemical Composition	Chemical Test								
2	XLPE Compound for Insulation	Tensile Strength	Mechanical	Each Lot	IS 7098, IS 10810:1984 (Reaffirmed Year: 2016) & ASTM D-257	IS 7098, IS 10810:1984 (Reaffirmed Year: 2016) & ASTM D-257	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
		Elongation at break & Under Load	Mechanical								
		Thermal Stability	Thermal Test								
		Hot Set & Permanent Set	Mechanical								
		Electrical Properties	Electrical Tests								
3	Sheathing Compound PVC Type	Tensile Strength & Elongation	Mechanical	Each Lot	IS 7098, IS 10810:1984 (Reaffirmed Year: 2016) & ASTM D-257	IS 7098, IS 10810:1984 (Reaffirmed Year: 2016) & ASTM D-257	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
		Thermal Stability	Thermal Test								
		Oxygen & Temperature Index Test	Flame Test								
		Smoke Density Rating	Flame Test								
		Flammability Test	Flame Test								
		HCL Acid Gas Evolution Test	Chemical Test								
4	Armours (Galvanised Steel Flat Strip / Wire)	Dimensions	Measurement	1 Coil per Material Lot	IS 10810:1984 (Reaffirmed Year: 2016)/IS 3975:1999 (Reaffirmed Year :2014)/IS 4826:1975 (Reaffirmed year 2016)	IS 10810:1984 (Reaffirmed Year: 2016)/IS 3975:1999 (Reaffirmed Year :2014)/IS 4826:1975 (Reaffirmed year 2016)	Vendor Test Certificates / Incoming Inspection Records	P	R	R	
		Tensile Strength & Elongation	Mechanical								
		Uniformity of Zinc Coating	Chemical Test								
		Mass of Zinc Coating	Chemical Test								
		Chemical Composition	Chemical Test								
		Dip Test	Chemical Test								
		Wrapping/Winding Test	Flame Test								
		Resistivity	Electrical Tests								
In-process Inspection											
5	Wire Drawing - Aluminium/ Copper	Type & Diameter of Wire	Measurement	1 Sample / Bobbin	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 1	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 1	Inprocess Reports	P	R	R	
		Tensile strength (Only for Aluminium)	Mechanical	1 Sample / Bobbin							
		Elongation at Break (Only for Copper)	Mechanical	1 Sample / Bobbin							
		Wrapping Test (Only for Aluminium)	Mechanical	1 Sample / Bobbin							
		Resistivity	Electrical	1 Sample / Bobbin							
		Surface Finish	Visual & Physical	Continuous							




STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: XLPE/ PVC Insulated Cable Upto and Including 1100V				Project :				
			QAP NO: Std QAP/ 23-24/ E-05				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-1:1988 (Reaffirmed Year :2020) and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
								Vendor/ Sub Vendor	Contractor	Client / TPI	
1	2	3	4	5	6	7	8	9			10
6	Conductor Stranding -Aluminium/ Copper	Type of Conductor, Wire Diameter & No. of Strands	Visual & Measurement	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Sequence & Lay Direction	Visual	At Start Up							
		Shape of Conductor & Surface Finish	Visual	At Start Up							
		Bunched Conductor Diameter	Physical & Measurement	At Start Up							
		Conductor Resistance	Electrical	Every Drum							
7	Insulation	Type Of Compound	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Diameter Over Conductor & Core	Measurement	Continuous							
		Thickness of Insulation	Measurement	Every Drum							
		Spark Test	Measurement	Continuous							
		Surface Finish & Length	Visual & Measurement	Continuous							
		Volume Resistivity	Electrical Test	Electrical Test							
		Tensile strength and elongation at break	Measurement	Every Drum							
		Hot Set Test	Measurement	Every Drum							
8	Laying Up	Core Sequence, Core Identification, Lay Direction & Length	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing	Inprocess Reports	P	R	R	
		Diameter Over Laidup Cores	Measurement	Continuous							
9	Inner Sheathing	Type of Compound & Sheathing	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Thickness & Diameter over Sheathing	Measurement	At Start Up							
		Colour & Surface Finish	Visual	Continuous							
10	Armouring GI / Aluminium (Wire/ Strip)	Dimension of Armour Wires / Strips & Finsih	Measurement	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		No. of Armour Wires / Strips	Measurement	At Start Up							
		Direction of Lay & Lay Length	Visual	100%							
		Strip/Wire Welding	Visual	100%							
		Diameter Over Armour	Measurement	At Start Up							
11	Outer Sheath	Material & Type of Compound	Visual	At Start Up	Approved Drawing & Manufacturers Specification	Approved Drawing & Manufacturers Specification	Inprocess Reports	P	R	R	
		Thickness & Overall Diameter	Measurement	At Start & End							
		Colour & Surface Finish	Visual	Continuous							
		Embossing	Visual	100%							
Routine Test											
12	LT Cable	Conductor Resistance Test	Electrical	100%	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 1:1988:Reaffirmed Year :2020) / IS 1554P-1:1988	IS 8130:2013 (Reaffirmed Year 2018) & IS 7098 Part 1:1988:Reaffirmed Year :2020) / IS 1554P-1:1988	Internal Routine Test Report	P	R	R	
		High Voltage Test	Electrical								

Desh Deshpande

STANDARD QUALITY ASSURANCE PLAN											
 	MANUFACTURER/ VENDOR:		EQUIPMENT: XLPE/ PVC Insulated Cable Up to and Including 1100V				Project :				
			QAP NO: Std QAP/ 23-24/ E-05				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-1:1988 (Reaffirmed Year :2020) and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10
Acceptance Test											
13	LT Cable	Annealing test (for copper) * Tensile test (for aluminium) * Wrapping test (for aluminium) * Thickness of Insulation & Sheath (Inner & Outer) T.S. & Elongation at break for Insulation & Sheath Overall Diameter, Type of Cable, Dimensions of Armour, No. of Strands, Colors of Sheath, Diameter over Armour & Inner Sheath Insulation Resistance (Volume resistivity) High Voltage Test 3kV (AC) @ Room Temp. on full drum for 5 Min. Hot Set Test & Permanent Set for XLPE Insulation Conductor Resistance Test at ambient temperature Visual Check for Cable- Finish, Marking/ Printing, Top & Bottom Length Verification Visual Check on Drum Stenciling, Drum No., Quantity, Net & Gross Weight, Type & Size of Cable, Direction of Rotation	Mechanical Test Mechanical Test Mechanical Test Measurement Mechanical Visual & Mechanical Electrical Electrical Thermal Electrical Visual & Physical Visual & Physical	Sampling Plan as per IS 7098 Part 1/ IS 1554P-1	IS 7098 Part 1:1988: Reaffirmed Year :2020 / IS 1554P-1:1988 (Reaffirmed Year:2020)	IS 7098 Part 1:1988: Reaffirmed Year :2020 / IS 1554P-1:1988 (Reaffirmed Year:2020)	Inspection Test Report	P	W	W	
Type Test											
14	Cable	Overall Diameter	Measurement	One sample from each Size & Type per offered Lot	As per approved Drawing	As per approved Drawing	Type Test Report	P	R	R	
15	Test On Conductor	Annealing test (for copper) Tensile test (for aluminium) Wrapping test (for aluminium) Resistance test	Mechanical Test Mechanical Test Mechanical Test Electrical Test	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 8130:2013 (Reaffirmed Year 2018)	Type Test Report	P	R	R	
16	Tests for round steel wire/formed steel wire (strip) armour	Dimensions Tensile strength Elongation at break Torsion test for round wires Winding test for formed wires Uniformity of zinc coating Mass of zinc coating Resistivity	Measurement Mechanical Test Mechanical Test Mechanical Test Mechanical Test Chemical Test Chemical Test Electrical Test	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016) , IS 3975 & IS 4826	IS 7098 Part 1:1988: Reaffirmed Year :2020 / IS 1554P-1:1988 (Reaffirmed Year:2020)	Type Test Report	P	R	R	
17	Test for thickness of insulation and sheath	Thickness of Inner Sheath & Outer Sheath	Measurement				Type Test Report	P	R	R	
18	Physical tests for insulation	Tensile strength and elongation at break Ageing in air oven Hot set test Shrinkage test Water absorption (gravimetric)	Measurement Mechanical Test Mechanical Test Mechanical Test Electrical Test		IS 10810:1984 (Reaffirmed Year: 2016)		Type Test Report	P	R	R	

Desha
 Desha

STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: XLPE/ PVC Insulated Cable Upto and Including 1100V				Project :				
			QAP NO: Std QAP/ 23-24/ E-05				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ IS 7098 Part-1:1988 (Reaffirmed Year :2020) and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10
19	Physical tests for outer sheath	Tensile strength and elongation at break	Measurement	One sample from each Size & Type per offered Lot	IS 10810:1984 (Reaffirmed Year: 2016)	IS 5831:1984:(Reaffirmed Year:2016)	Type Test Report	P	R	R	
		Ageing in air oven	Mechanical Test								
		Loss of mass in air oven	Mechanical Test								
		Shrinkage test	Mechanical Test								
		Hot deformation	Thermal Test								
		Heat shock test	Thermal Test								
		Thermal stability	Thermal Test								
Flamability Test on Single Cable	Flame Test										
20	Insulation resistance (volume resistivity test)	Measurement of Insulation resistance	Electrical Test	IS 7098 Part 1:1988; Reaffirmed Year :2020) / IS 1554P-1:1988 (Reaffirmed Year:2020)	Type Test Report	P	R	R			
21	High voltage test	High voltage test - 3kV (AC) for 5 Min	Electrical Test		Type Test Report	P	R	R			
22	Flamability test	Burning Test	Flame Test		Type Test Report	P	R	R			
23	FR/FRLS Test on PVC Outer Sheath (If Applicable)	Oxygen & Temperature Index Test	Flame Test	One sample from each Size & Type per offered Lot	ASTM D 2863	29.0 % Min. at 2742°C & 250° Min.	Type Test Report	P	R	R	
		Smoke Density Rating	Flame Test		ASTM D 2863	60 % Max. Light Absorption					
		HCL Acid Gas Evolution Test	Chemical Test		IEC 60754-1	20 % Max. by weight					
		Flammability Test on Single Verticle Cable & Bunched Cable	Flame Test		IS 10810 Part-53	Un-affected Length from Top - 50 mm (Min.) & Burning less than 60 Sec after removal of Flame					
		Swedish Chimney Test (As applicable)	Flame Test		SS 424-14-75 Class F3	SS 424-14-75 Class F3					
		Anit-Rodent & Termite Repulsion Test	Chemical Test		Ammonium Acetate of PVC compound turns sodium sulphide solution Black	Presence of Lead in PVC					
P- Perform		R-Review of Documents		TPIA-Third Party Inspection Agency		W- Witness	OEM- Original Equipment Manufacturer				
Manufacturer / Vendor			Contractor			Client/ TPIA					
Signature:			Signature:			Signature:					
Name:			Name:			Name:					

Signature
 Date

STANDARD QUALITY ASSURANCE PLAN											
	MANUFACTURER/ VENDOR:		EQUIPMENT: DG Sets				Project :				
			QAP NO: Sld QAP/ 23-24/ E-06				Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT				
			REV.NO: 00				Consultant: SHAH TECHNICAL CONSULTANT (STC)				
			DATE:				Contractor:				
Specifications: Approved Drawings/ Project Specifications/ CPCB Norms/ BS 5514/ IS:10000:1980 and Latest amendments											
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10
1.0 RAW MATERIAL											
1.1	PUNCHED MATERIAL/ CRCA SHEET	Visual & Dimensions	Measurement	100%	Approved GTP/ Drawing Manufacturer's Spec.	Approved GTP/ Drawing Manufacturer's Spec.	Incoming Check Sheet	P	R	R	Supplier TC shall be provide for review
1.2	ENGINE	Engine Name Plate i.e Manufacturer Name Label with HP, RPM, S. No & Model	Visual	100%	Approved GTP/ Drawing BS 5514/ IS:10000:1980	Approved GTP/ Drawing BS 5514/ IS:10000:1980	Test Certificate	P	R	R	Engine Manufacturer's Routine Test Certificate shall be provided for review during inspection
1.3	ALTERNATOR	H.V. TEST, REGULATION TEST, STATOR AND ROTOR WINDING RESISTANCE AND INSULATION RESISTANCE TEST	Visual	100%	Approved GTP/ Drawing IS:4722/BS 2613/ IEC-34 Part 1 & IS 4880	Approved GTP/ Drawing IS:4722/BS 2613/ IEC-34 Part 1 & IS 4880	Test Certificate	P	R	R	Alternator's manufacturer's test certificate shall be provided for review during inspection
1.4	BASE FRAME	Dimensions & Mercury Level	Visual	100%	Approved GTP/ Drawing	Approved GTP/ Drawing	Incoming Check Sheet	P	R	R	
1.5	FUEL TANK	Capacity & Leakage	Measurement	100%			Incoming Check Sheet	P	R	R	
1.6	STUFFING MATERIAL	Foam/Rockwool- Thickness	Measurement	100%			Incoming Check Sheet	P	R	R	
1.7	BATTERY	Make & Rating	Visual	100%			warranty certificates	P	R	R	Battery warranty certificates to be submitted during inspection
1.8	CONTROL PANEL	Make, Visual, BOM, Rotine test	Measurement	100%			Panel routine TC	P	R	R	
2.0 In-Process											
2.1	BENDING	a. Check all the components of punching before bending b. Check the appropriate part for bending with respective Drawing Ref No. c. Check the bend angle & overall dimension of first piece of similar components d. Check the bended component for any bending gap,uneven bending etc	Measuring tape / Template/ Visual	100%	Approved GTP/ Drawing Manufacturer's Spec.	Approved GTP/ Drawing Manufacturer's Spec.	In-process Check Sheet	P	R	R	
2.2	FABRICATION	a. Check the components, frame,channels are welded as per specified dimension b. Check the welding gap, welding run, uniformity of welding joint c. Check for Burn through and Outer faces of welded joints are properly grinded	Measuring tape / Template/ Visual	100%	Approved GTP/ Drawing Manufacturer's Spec.	Approved GTP/ Drawing Manufacturer's Spec.	In-process Check Sheet	P	R	R	
2.3	Accessories fittings, Hose connection	Loose fittings & BOM completeness	Visual	100%							
2.4	Fuel, Water, Lub oil leakages	Fitment checked properly and ensure no any leakages	Visual	100%							
2.5	PAINTING	a. Cross cut Adhesion Test on powder coated finished component	Cross Cut cutter/ tape	2 times a day	GT=0/100	GT=0/100	Incoming Check Sheet	P	R	R	
		b. Dry Film Thickness of the power coated finished component	DFT meter		Plain Powder 60 -80 Micron Metre DFT	Plain Powder 60 -80 Micron Metre DFT	Incoming Check Sheet				

Dev Shrivastava

STANDARD QUALITY ASSURANCE PLAN													
		MANUFACTURER/ VENDOR:		EQUIPMENT: DG Sets			Project :						
				QAP NO: Sid QAP/ 23-24/ E-06			Client: RAJASTHAN URBAN INFRASTRUCTURE DEVELOPMENT PROJECT						
				REV.NO: 00			Consultant: SHAH TECHNICAL CONSULTANT (STC)						
				DATE:			Contractor:						
Specifications: Approved Drawings/ Project Specifications/ CPCB Norms/ BS 5514/ IS:10000:1980 and Latest amendments													
S.No	Item/ Component & Operation	Characteristics	Type of Check	Quantum of Check	Reference Document/ Standards	Acceptance Norms	Format of Records	Inspecting Agency			Remarks		
1	2	3	4	5	6	7	8	Vendor/ Sub Vendor	Contractor	Client / TPI	10		
		c. Check the Impact Test for powder coated test panel	Impact Testor		100 Kg- Cm impact, (No peel off & Crack to Powder coating Film)	100 Kg- Cm impact (No peel off & Crack to Powder coating Film)	Incoming Check Sheet						
3.0 FINAL INSPECTION													
3.1	TEST ON ASSEMBLED DG SET	Verification of Engine, Alternator & Battery - Make, Model & Rating	Physical	100%	Approved GTP/ Drawing/ Manufacturer's Standard/ CPCB Norms	Approved GTP/ Drawing/ Manufacturer's Standard/ CPCB Norms	Inspection Report	P	W	W			
		DG set is run for 10 min. to verify leakages and any abnormal sound	Physical	100%			Inspection Report	P	W	W			
		Load Test On DG Set: Starting the DG Set and putting the load after speed reaches to 1500 RPM & 415 Volts 25% Load - 10 Minute 50% Load - 10 Minute 75% Load - 15 Minute 100% Load - 30 Minute 110% Load - 10 Minute	Electrical	100%			Inspection Report	P	W	W	DG SET PERFORMANCE PARAMETERS LIKE VOLTAGE, HZ, AMP., KW, PF, COOLANT TEMP., LUB. OIL PRESSURE., ETC. SHALL BE RECORDED DURING TRIAL RUN.		
		Voltage regulation & Governing	Electrical	100%			Inspection Report	P	R	R	Test Certificate Review		
		Vibration Test on & below AVM Pads at No Load & 100% load	Measurement	100%			Inspection Report	P	W	W			
		Noise Level at 100% Load & Emission	Measurement	100%			Inspection Report	P	R	R	Test Certificate from Designated Nodal Agency shall be provided.		
		Fuel Consumption at 75% & 100% Load	Measurement	100%			Inspection Report	P	W	W	By Crude Oil Method or Differential Level Method		
		Paint shade Verification	Physical	Random sample			Approved Drawings	Approved Drawings	Inspection Report	P	W	W	
		Paint thickness	Visual/ Measurment	Random sample	Approved Drawings	Approved Drawings	Inspection Report	P	W	W			
		Dimension and BOM For DG Set	Visual/ Measurment	One Sample/Rating	Approved Drawings/BOM	Approved Drawings/BOM	Inspection Report	P	W	W			
		3.2	Control Panel	Control Panel- Visual, Dimesion, BOM, IP Certification, Operation & Functional Check during DG set test run.	Electrical	100%	Approved GTP/ Drawing/ Manufacturer's	Approved GTP/ Drawing/ Manufacturer's	Inspection Report	P	W	W	Test Certificate Review
		P- Perform			R-Review of Documents		TPIA-Third Party Inspection Agency		W- Witness		OEM- Original Equipment Manufacturer		
Manufacturer / Vendor					Contractor				Client/ TPIA				
Signature:					Signature:				Signature:				
Name:					Name:				Name:				

End
 Ruidp