

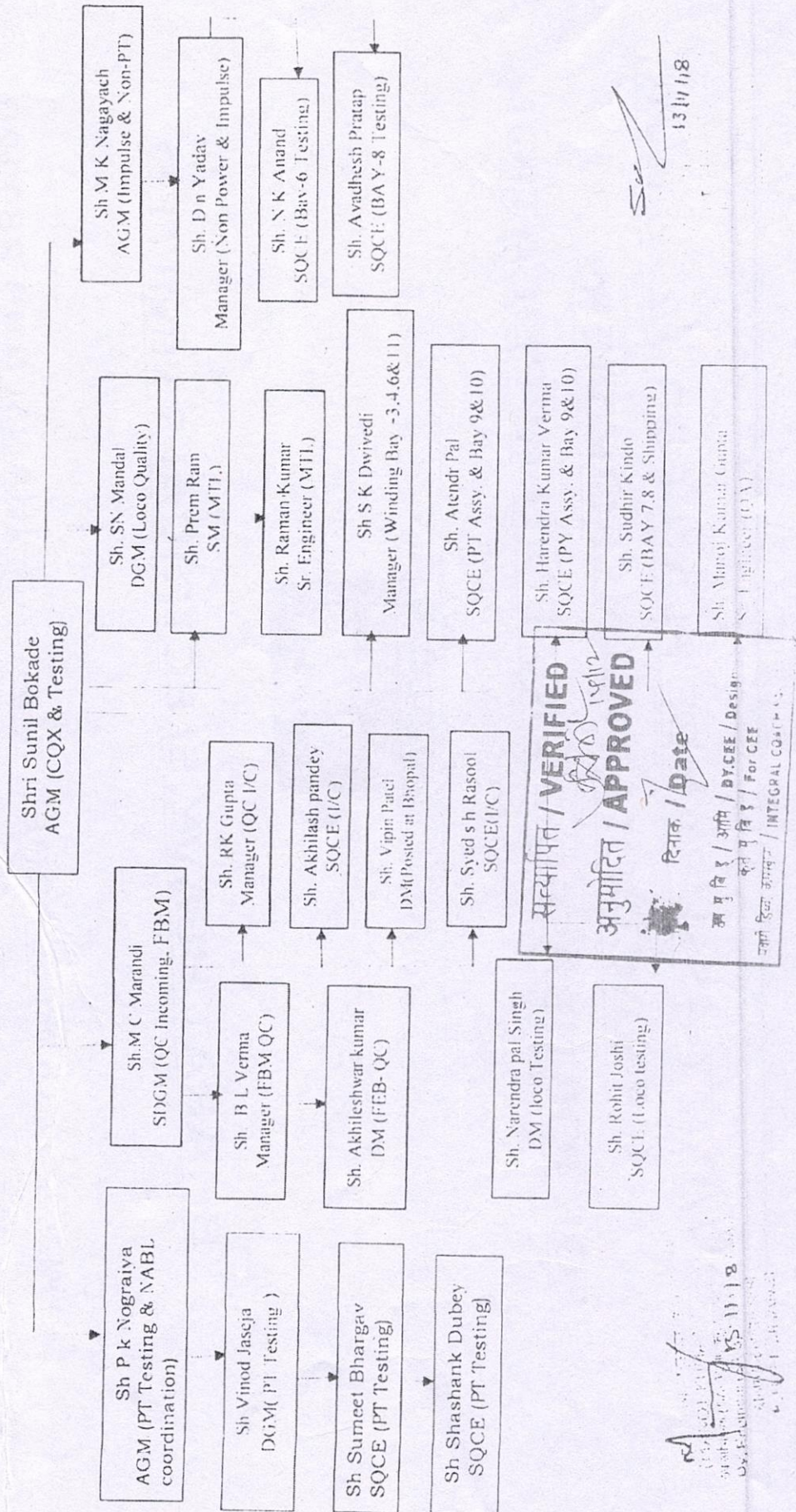
QUALITY ASSURANCE PLAN FOR 1276 KVA TRACTION TRANSFORMER FOR IGBT BASED 25 KV EMU APPLICATION

PAGE 01 OF 11

1.1 Quality Control Organization chart

Organizational Chart, clearly indicating the Quality Control Set-up, role and responsibilities of key personnel.

ORGANISATION CHART (CQX & Testing)





BHARAT HEAVY ELECTRICAL LIMITED, JHANSI

Quality plan for IGBT EMU Transformer
1276 KVA

QP/Traction./EMU.-IGBT/1245 /
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SL No	Name	Designation	Technical qualification	Experience	Brief Scope of Responsibilities
1	Shri Sunil Bokade	AGM	BE	32 yrs	HOD Quality control & Testing
2	Shri MC Marandi	Sr. DGM	B. Tech	32 yrs	Quality Control Incoming & Fab.
3	Shri SN Mandal	DGM	B.Tech.	30 yrs	Quality Control Loco
4	Shri Prem Ram	Sr. Manager	D.E.	35 yrs	I/C NDT (material laboratory)
5	Shri B.L.Verma	Manager	D.E.	32 yrs	Quality Control Fabrication
6	Shri S.K.Dwivedi	Manager	D.E.	32yrs	Q.C. Traction & Power winding
7	Shri Akhileshwar	Dy. Manager	B. Tech	11 yrs	Quality Control Fabrication
8	Shri Dhiraj Kumar	Dy. Manager	B. Tech	11 Yrs	Quality Control Loco
9	Shri Sudhir kindo	Sr.Engineer	B. Tech	10 Yrs	Quality Control Shipping & DTT
10	Shri Atendra Pal	Sr.Engineer	B. Tech	8 Yrs	Quality Control Power Transformer
11	Shri Akhilesh Pandey	Sr.Engineer	B. Tech	8 Yrs	Quality Control incoming
12	Shri Raman Kumar	Sr.Engineer	B. Tech	8 Yrs	Quality Control NDT Lab
13	Shri Harendra Verma	Sr.Engineer	B.Tech.	7 yrs	Quality control Power Transformer
14	Shri Syed S H Rasool	Sr. Engineer		7yrs	Quality Control incoming

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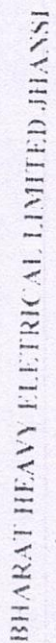
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FOR CEE / INTEGRAL PRODUCTION

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13/11/18

Signature

Dr. Engineer (Quality Control)
Dr. Engineer (Quality Control)
Dr. Engineer (Quality Control)
Dr. Engineer (Quality Control)
Dr. Engineer (Quality Control)



Quality plan for IGBT EMC Transformer
1276 KVA

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1.1 BHEL- CQX /TRACTION TRANSFORMER ORGANISATION CHART

Group Head

Mr. Sunil Bokade, AGM (Quality & Testing)

Section Head

Mr. S. K. DWIVEDI Manager
(QC-Traction & Power winding)

QC - Inspector

Mr. U. C. UPADHYAY,
Asstt. Engineer

QC - Inspector

Mr. MANOJ AGRAWAL
Dy. Engineer

11.18

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1276 KVA

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IGBT EMU TRANSFORMER

1.2 Availability of Machinery & Plant

Sl. No.	Name of M&P	Make	Machine No	Range /Capacity
1	Heating oven	Storing Engineering	ME-1-7-2453 ME-1/3/2126 ME-1/4/2526	30 to 130C°
2	Oil Treatment Plant	VPI Pune	ME-1-7-2320 ME/1/5/2639	6 KL.
3	EOT Crane	ACME Khandehval	1758 01C/1	15 Tons. 5 Tons.
4	VPI	Phinko Seiki Co	318690 ME-1/4/2278	800L
5	Winding Machine	IIMT / BHEL make	1093 / 1092 1546 / 1547 1343 / 1342	5 ton
6	CRGO	RED MAN	1195	0-200 mm width of CRGO

Prepared by

(Manoj Kumar Agrawal)

(Dy. Engineer)

(Signature of Manoj Kumar Agrawal)
Manoj Kumar Agrawal
Dy. Engineer (QA/QC) (T.M. Assy.)

12.11.18

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JHANSI / INTEGRAL CO. LTD.

Approved by

(Signature of S. K. Dwivedi)

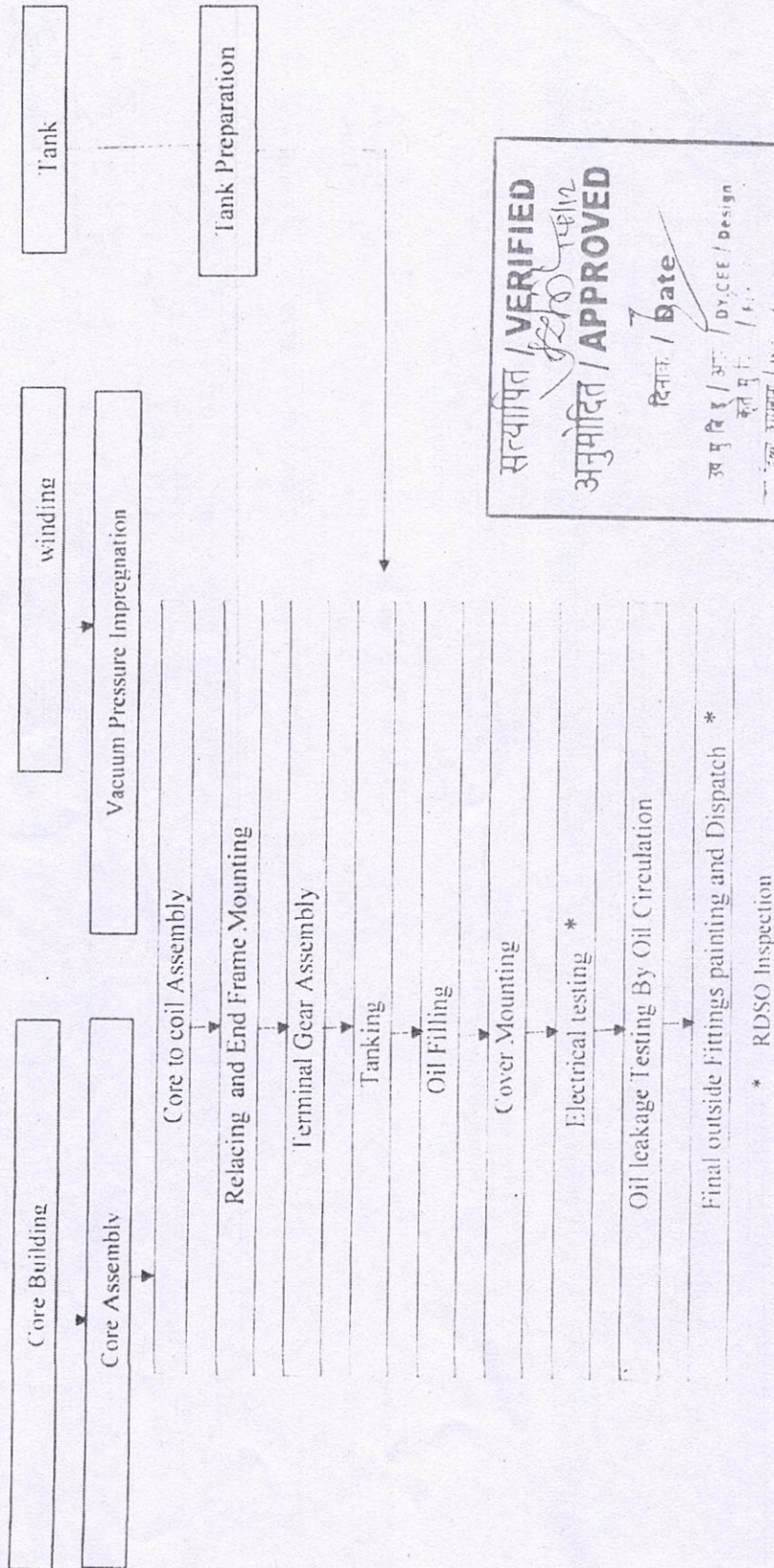
S. K. Dwivedi
Manager (Traction & Power wdg) 12/11/18



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Quality plan for IGBT EMU Transformer
1276 KVA

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Process Flow Chart / Description of Manufacturing Process



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ड. य. सी. ई. / Design

Prepared by

(Manoj Kumar Agrawal, 11/18)
(Dy. Engineer)

Approved by

S. K. Dwivedi
Manager (Traction & Power wdg)
13/11/18

Sl. No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT (DRG / SPEC)	ACCEPTANCE NORMS (DRG / SPEC)	FORMAT OF RECORD	AGENCY			REMARKS
									M	C	N	
1.	RAW MATERIAL											
1.1)	Copper Details											
	HV CPR											
	i) (12 X 50 X 1343) COPPER (NOMEX)	a) Dimension b) Resistivity/Conductivity c) Conductor Finish	A A A	I T V	ONE SAMPLE / SUPPLIES OF DIFFERENT SIZE	CPS-AA28128	CPS-AA28128	SUPPLIER TC	P P P	V V V	- - -	
	ii) LV CPR (7//20 X 9.2 X 107) CTC COPPER)	a) Dimension b) Resistivity/Conductivity c) Conductor Finish	A A A	I T V	ONE SAMPLE / SUPPLIES OF DIFFERENT SIZE	CPS-AA28129	CPS-AA28129	SUPPLIER TC	P P P	V V V	- - -	
1.2)	Lamination (Core CRGO Steel)											
		a) Dimensions b) Specific Loss c) Bend Test d) Surface Resistivity	A A A A	I T T T	ONE SAMPLE / SIZE / LOT	CPS-AA10905	CPS-AA10905	SUPPLIER TC	P P P P	V V V V	- - - -	
1.3)	END FRAME											
		a) Dimension b) Physical condition & Cleanliness c) Surface Finish	B B B	I V V	100 % 100 % 100 %	DRG 24664050063 24664050064 24664050065 24664050066	DRG 24664050063 24664050064 24664050065 24664050066	SUPPLIER TC	P P P P	V V V V	- - - -	

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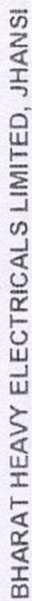
(Manoj Kumar Agrawal)
(Dy. Engineer)

दिनांक / Date

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सु मु वि ड / For CEE
INTEGRAL COLLEGE

Approved by

(सुबोध द्विवेदी)
S. K. Dwivedi
Reaction & Polymerization Division
Manager (CQX)
वीएचआईएल, औसी
B.H.E.L., BHANSI



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इंजिनियरिंग / INTEGRAL ENGINEERING

(Manoj Kumar Agrawal)
(Dy. Engineer)

S. K. Dwivedi
Manager (Traction & Power)

(सुबोध द्विवेक)
(SUBODH DWIVEDI)
प्रबन्धक (गुणता)
Manager (CQX)
बीएचईएलन, क्रांती
B.H.E. HANSI



BHARAT HEAVY ELECTRICALS LIMITED, JHANSI

STANDARD MANUFACTURING QUALITY PLAN FOR SUBMISSION TO CUSTOMER			QUALITY PLAN FOR IGBT 1276 KVA EMU TRANSFORMER			MATERIAL INSPECTION / IN-PROCESS INSPECTION / FINAL INSPECTION			SUB VENDORS / VENDORS / CONTRACTORS WORKS			QP/Traction/EMU-IGBT/1245/ Rev 00 Page 08 of 11		
Sl. No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT DRG / SPEC	ACCEPTANCE NORMS DRG / SPEC	FORMAT OF RECORD	AGENCY			REMARKS		
									M	C	N			
2.	<u>COMPONENTS</u>													
2.1	BUSHING 750 S1(HV)	} Manufacturer Test Certificate shall be submitted for review						SUPPLIER TC	P	V	--			
2.2	CIRCULATING PUMP							SUPPLIER TC	P	V	--			
2.3	PRV							SUPPLIER TC	P	V	--			
2.4	S S VALVE							SUPPLIER TC	P	V	--			
2.5	BUTTERFLY VALVE							SUPPLIER TC	P	V	--			
2.6	COOLER WITH MOTOR							SUPPLIER TC	P	V	--			
2.7	OIL FLOW SWITCH							SUPPLIER TC	P	V	--			
2.8	RTD PT-100							SUPPLIER TC	P	V	--			

Prepared by
(Manoj Kumar Agrawal)
(Dy. Engineer)

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महोदय / महोदय / INTEGRAL

Approved by
(S. K. Dwivedi)
S. K. DWIVEDI (DWIVEDI)
Manager (Traction)
Manager (COX)
वीएचईएल, झांसी
B.H.E.L., JHANSI

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BHARAT HEAVY ELECTRICALS LIMITED, JHANSI												
STANDARD MANUFACTURING QUALITY PLAN FOR SUBMISSION TO CUSTOMER			QUALITY PLAN FOR IGBT 1276 KVA EMU TRANSFORMER			MATERIAL INSPECTION / IN- PROCESS INSPECTION / FINAL INSPECTION		SUB VENDORS / VENDORS / CONTRACTORS WORKS		Qp/Traction/EMU- IGBT/1245/ Rev 00 Page 09 of 11		
Sl No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									M	C	N	
3.	INPROCESS INSPECTION STAGE INSPECTION											
3.1	TANK	a) Dimension b) Finishing c) Air Pressure Test	A A B	I I T	100 %	DRG 04661550037	DRG 04661550037	SUPPLIER TC	P P P	V V V	-- -- --	
3.2	CORE	a) Dimension b) HV Test	B B	I T	100 % 100 %	DRG 14664050024	DRG 14664050024	Check list No. CQX/341	P P	V V	-- --	
3.3	COIL ASSY. WDG ASSY - 1 WDG ASSY - 2	a) Dimensions/ Visual	B	I	100 %	DRG 14666150042 14666150043	DRG 14664150042 14666150043	Check list No. CQX/351	P P	V V	-- --	
3.4)	COILS PROCESSING	Vacuum Pressure Impregnation (VPI)	I	I	100 %	JS 0672099	JS 0672099	As per process specification	P	V	--	

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३१ मृ वि १ / INTEGRAL

Prepared by
(Manoj Kumar Agrawal)
(Dy. Engineer)

Approved by
S. K. Dwivedi
Manager (Traction & Substation) (VERIFIED)
प्रबन्धक (जोताता)
Manager (CQX)
बी.ए.ई. लि., जहानाबाद
B.H.E.L., JHANSI

BHARAT HEAVY ELECTRICALS LIMITED, JHANSI



STANDARD MANUFACTURING
QUALITY PLAN FOR
SUBMISSION TO CUSTOMER

QUALITY PLAN FOR IGBT 1276 KVA EMU
TRANSFORMER

MATERIAL INSPECTION / IN-
PROCESS INSPECTION / FINAL
INSPECTION

SUB VENDORS / VENDORS /
CONTRACTORS WORKS

QP/Traction/EMU-
IGBT/1245 Rev 00
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Sl. No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									M	C	N	
3.5)	BEFORE TANKING CORE & COIL ASSEMBLY & TG	a) RATIO TEST b) MAG CURRENT c) 2 KV TEST d) CHECK FOR PROPER CLEANLINESS	A	T	100 %	Test Schedule TRE/ 72067T/TS	Test Schedule < 15 mA @ 230 V 2 KV with stand for 1 min.	Stage Tag NO. 327	P	V	--	
3.6)	TANK PREPARATION	As per checklist	A	I	100 %	CHECK LIST NO. COX / 342	CHECK LIST NO. COX / 342	CHECK LIST NO. COX / 342	P	V	--	
3.7)	TANKING BEFORE COVER MOUNTING	As per checklist	A	I	100 %	CHECK LIST NO. COX / 343	CHECK LIST NO. COX / 343	CHECK LIST NO. COX / 343	P	V	--	
3.8)	OIL FILLING	FILLING & CIRCULATION	A	T	100 %	---	IR > 500 MΩ HV - Earth LV - Earth AUX - Earth HV - LV HV - AUX	---	P	V	--	
3.9)	TIGHTENING OF HARDWARE OF ALL SUB-ASSEMBLIES	TORQUE	B	I	100 %	TR15013T / DRG	TR15013T / DRG	CHECK LIST NO. COX / 349	P	V	--	

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अप प्र वि ३ / For CEE

--- / INTEGRAL CO. JHANSI

Prepared by

(Manoj Kumar Agrewal)
(Dy. Engineer)

Approved by

S. K. Dwivedi
Manager (Traction & Substation)
प्रवर्तक (प्रेषण)
Manager (COX)
धीरेंद्रकुमार, जीसी
S.H.F.L., JHANSI

STANDARD MANUFACTURING QUALITY PLAN FOR SUBMISSION TO CUSTOMER		QUALITY PLAN FOR IGBT 1276 KVA EMU TRANSFORMER		MATERIAL INSPECTION / IN-PROCESS INSPECTION / FINAL INSPECTION		SUB VENDORS / VENDORS / CONTRACTORS WORKS		QPTraction/EMU-IGBT/1245/ Rev 00 Page 11 of 11	
SI No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	REMARKS
4.0)	FINAL INSPECTION	a) Electrical test	A	T	100 %	Test schedule TRE/ 72067T/TS	Test schedule TRE/ 72067T/TS	Test certificate	CHP
		b) Oil Leakage Test	A	T	100 %	Checklist No. 272A	Checklist No. 272A	Checklist No. 272A	
		c) Dimension msmd	A	I	100%	As per OGA drg	Check list CQX/ 355	Check list CQX/ 355	
		d) Appearance & Cleanliness	A	I	100 %	CHECK LIST NO. CQX 349	CHECK LIST NO. CQX 349	CHECK LIST NO. CQX 349	CHP
		d) Inspection of Loose items	A	V/I	100 %	PACKING LIST	PACKING LIST	PACKING LIST	CHP

LEGEND:

CLASS
A : CRITICAL
B : MAJOR
C : MINOR

TYPE OF CHECK
V : VISUAL
I : MEASUREMENT
T : TEST

AGENCY
M : MANUFACTURER / SUB CONTRACTOR
C : CONT/NOMINATED INSPECTION AGENCY
N : CUSTOMER

SCOPE OF AGENCY
P : PERFORMER
V : VERIFICATION

W : WITNESS
CHP : CUSTOMER HOLD POINT

FORMAT OF RECORD

TC : TEST CERTIFICATE
OS : OBSERVATION SHEET

DRG : DRAWING
CHECK LIST : CHECK LIST

AA/JS/PS/ : BHEL PURCHASE SPECIFICATION

NOTES: 1) ALL DRG / SPECS MENTIONED IN ABOVE QAP IS LATEST.
2) ALL MEASURING / TEST INSTRUMENTS SHALL HAVE VALID CALIBRATION CERTIFICATE ON DATE OF TESTING AND CAN BE VERIFIED, IF REQUIRED.

Prepared by

(Manoj Kumar Agrawal)
(Dy Engineer)

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Approved by (Signature)
S K DWIVEDI (Sub-Manager (CQX))
Manager (Traction & Power) BHEL, Jhansi
BHEL, Jhansi