



		LARSEN & TOUBRO LIMITED - POWER			QUALITY MANAGEMENT SYSTEM							
				Balance of Turbine Island Package of RAPP 7&8			Doc No. : RAPP7&8/BOTIP/ELECT/WP-40							
				Nuclear Power Corporation Limited			Rev No: 00							
INSPECTION TEST PLAN - FIELD QUALITY PLAN							SYSTEM:	ISOLATE PHASE BUSDUCT Supplied by BHEL,CFP,Rudrapur						
Sl.	Component /			Method of	Quantum /	Reference	Limits	Format of	Responsibility				Remarks	
No.	Process		Nature of	Check	Frequency of	Document		Record	L&T		NPCIL			
			Check / Test		check by BHEL				Erection	Quality	Erection	FQA		
A	CHECKS ON ARRIVAL AT SITE												Page No: 5	
1	Unloading with use of strap belt		C	V	100%	Erection Manual	---	---	---	---	---	---		Approved Drawings and Approved data sheet will be available with site to kick start erection activities.
2	Check for damages (puncture, bend, scratch etc)		C	V	100%	Erection Manual	---	Site register / Site MDR/SCAR	---	---	---	---		
B	CHECKS DURING STORAGE													
1	Ensure that busduct should not be laid directly on ground		C	V	100%	Erection Manual	---	---	---	---	---	---		
2	Ensure that BOIs, hardware, copper, electrical items etc are stored in concealed areas		C	V	100%	Erection Manual	---	---	---	---	---	---		
C	CHECKS DURING ERECTION & COMMISSIONING													
1	Dimensional checking of foundation (Tape)		B	M	100%	Drawing	Drawing	Handing over protocols from Civil	100%	---	100%	---	---	
2	Layout of Bus Ducts (Tape)		B	M	100%	Drawing	Drawing							
3	Check the equipment for their physical condition and cleanliness		C	V	100%	---	---	---	---	---	---	---	---	
4	Verticality of structure (plumb bob)		B	M	100%	Drawing	Drawing	---	Random	---	Random	---	---	
5	Ensure that eye-bolts are used for lifting of cubicles & generator adopters		C	V	During Erection	Erection Manual	---	---	During Erection	---	---	---	---	
6	Ensure enclosures/ cubicles are properly aligned.		B	V	During erection	Drawing	Drawing	---	During erection	---	---	---	---	
7	Check physically insulators after fixing busbars in the Adopter box.		C	V	100%	Crack free clear insulator surface	IS 9431	---	5%	---	5%	---	---	
8	Continuity of Bus bars after welding (Multimeter)		A	T	100%	Drawing	---		Once	Once	Once	Once	One time after erection in every route	
9	Clearance between phase conductor and enclosure before welding (Tape)		B	M	100%	Drawing	Drawing		5%	---	5%	---	% age of joints for each run of IPBD	
10	Welding and NDT: DPT 100% to be done for conductor & enclosure butt weld joints. (a) Root Welding (b) Final welding  For conductors, both (a) and (b) will be applicable For enclosures, only (b) will be applicable (DP Test kit)		A	T	100%	Welding Manual	Welding Manual	Site Register/ Welding Protocols	5%	5%	5%	5%	% age of joints for each run of IPBD Test results for 100% welded joints shall be submitted in protocols. RAPP will witness 5% DPT on randomly selected welded joints. For this, inspection call shall be given by BHEL before carrying out DPT/Final welding.	
11	Positioning of Shunts and welding		C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
12	Dimensional and alignment checking of wall frames		C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
13	Polarity and ratio tests of CTs and their placement		A	T	100%	Layout Drawing/Testing Procedure	IS 2705	Site Register/ CT Testing protocol	---	100%	---	100%	---	
14	Check CTs secondaries are kept shorted until connected to respective instrument /relays.		B	V	100%	Drawing	Drawing	---	100%	---	100%	---	---	
15	Secondary wiring & clamping of CTs		B	V	100%	CT wiring diag.	CT wiring diag.	---	Once	---	Once	---	---	

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<b>INSPECTION TEST PLAN - FIELD QUALITY PLAN</b>												SYSTEM: ISOLATE PHASE BUSDUCT Supplied by BHEL,CFP,Rudrapur	
Sl. No.	Component / Process	Nature of Check / Test	Method of Check	Quantum / Frequency of check by BHEL	Reference Document	Limits	Format of Record	Responsibility				Remarks	
								L&T		NPCIL			
								Erection	Quality	Erection	FQA		
Page No: 6													
16	Crimping, ferrule numbering and check of wiring (as per wiring diagram) inside CT Terminal box	C	V	100%	CT wiring diag.	CT wiring diag.	---	---	---	---	---	---	
17	Positioning of rubber bellows	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
18	Checks that all wiring is done as per wiring diagram	B	V	100%	Wiring diag.	Wiring diag.	---	Once	---	Once	---	---	
19	Earthing of busducts, structure, NG cubicles & shunt	B	V	100%	Erection manual	Erection manual	---	Once	---	Once	---	---	
20	IR value of each bus conductor before erection (5 KV Insulation Tester)	A	T	100%	IS 8084	IS 8084	Site register / IR Protocol	10%	---	10%	---	---	
21	Specified size of Gaskets being used	C	V	Once	Drawing	Drawing	---	---	---	---	---	---	
22	Setting of thermostats	C	M	100%	Erection manual	---	---	---	---	---	---	---	
23	Air Tightness test subsequent to completion of installation	C	V	Once	Erection manual	Drawing	---	Once	---	Once	---	---	
24	Functional Test on Air Pressurization Equipment / Hot Air Blowing Equipment	C	V	Once	Drawing	Drawing	---	Once	---	Once	---	---	
<b>D COMMISSIONING TESTS</b>													
1	Resistance check ( by CRM kit) of welded and bolted joints of bus bar	A	T	100%	Erection manual	Erection manual	Site Register/ Testing Protocol	Once	Once	Once	Once	Once for each route after erection	
2	High Voltage testing of Busduct at specified voltage for each route (HV Test kit)	A	T	Once	Erection manual	IS 8084	Site Register/ Testing Protocol	Once	Once	Once	Once		
<b>E CHECKS FOR NEUTRAL GROUNDING CUBICLE</b>													
1	Bus bar connections to NG Transformer & NGR	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
2	Function of heaters	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
3	Free movement of panel doors	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
4	Check for earthing connections of Neutral Grounding Cubicles and Busduct / associated equipment	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
5	Checking IR value of NGT (Insulation tester)	B	T	100%	Erection manual	Erection manual	---	Once	Once	Once	Once	---	
<b>F CHECKS FOR LAVT CUBICLE</b>													
1	Wiring and continuity check	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
2	Movement of trolleys	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
3	Check of proper shrouding and size of bolts	C	V	100%	Drawing	Drawing	---	---	---	---	---	---	
4	Limit switch operation	B	V	100%	Drawing	Drawing	---	Once	---	Once	---	---	
<b>LEGEND :</b>													
Legend to be used: Class # : A = Critical, B=Major, C=Minor;													
*A* shall be witnessed by RAPP FQA.													
*B* shall be witnessed by RAPP Erection/Construction deptt.													
*C* shall be witnessed by MAIN SUPPLIER (A & B check shall be RAPP Erection, Testing & Commissioning stage).													
V=Visual													
M=Measurement													
T=Testing													
Description		Prepared by		Reviewed by			Approved by L&T			Approved by NPCIL			
Signature													
Date		15-10-2015		15-10-2015									
Name		Sanjay Meena		Ajit Sahay									
Designation		Sr. Engineer(FES)		Manager(FES & PPC)									