

OEM-ELEVATOR MANUFACTURER LOGO	MANUFACTURER'S NAME & ADDRESS	MANUFACTURING QUALITY PLAN <b>(For indicative and information purpose)</b>		PROJECT:
		Item: ELEVATORS Sub-Subsystem: FGD	QP No.: Date:	Rev.No.: Page:

Sl	Components & Operation	Characteristic	Class	Type of Check	Quantum of Check		Reference document	Acceptance Norms	Format of Record		Inspection Agency			Remarks
					M	C/B			M	C	N			
1	2	3	4	5	6		7	8	9	D*	10			11
<b>A</b>	<b>Raw Material</b>													
A1	Structural: M.S.: Plates, Angle, & channel for Car platform Car frame, Chequered Plates, Sheet for control, Panel Box	Dimension	Major	Measure	100%		Approved Drg /Data sheet/Manufacturer Drg	IR	-	P	-	-		
		Chemical composition	Major	Chemical test	1 Sample/heat			Test Report	√	V	V	V		
		Mechanical properties	Major	Mechanical test	1 Sample/heat/ HT/Batch			Test Report	√	V	V	V		
A2	Casting-Sheave, Over speed governor, Wheel, Brake drum	Chemical composition	Major	Chemical test	1 Sample/heat		Approved Drg /Data sheet/ Manufacturer Drg	Test Report	√	V	V	V	In case of Cast Iron Chemical test is N/A	
		Mechanical properties	Major	Mechanical test	1 Sample/heat/ HT/Batch				√	V	V	V		
A3	SS Sheets	Chemical composition	Major	Chemical test	1 Sample/heat		Approved Drg /Data sheet/ Manufacturer Drg	Test Report	√	V	V	V	In absence of correlated TC check testing shall be done	
		Mechanical properties	Major	Mechanical test	1 Sample/heat/ HT/Batch				√	V	V	V		
		Sheet thickness	Major	Measure	100%	100%			√	P	V	V		
<b>B</b>	<b>Bought out Items</b>													
B1	T Guide rail	Chemical composition	Major	Chemical test	1 Sample/Lot		Approved Drg /Data sheet/ Manufacturer Standard	Test Report	√	V	V	V		
		Mechanical properties	Major	Mechanical test	1 Sample/Lot				√	V	V	V		
		Visual & dimensional	Major	Visual & Measure	Random 5% (Each Size)			IR		P	-	-		

**Elevator suppliers not having NTPC approved RQP/MQP shall submit their MQP in line with this Indicative MQP for BHEL and NTPC review and approval.**

		LEGENDS:	For NTPC Use		
OEM SUPPLIE	MAIN (BHEL)SUPPLIER				
SIGNATURE					

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B2	Wire ropes	Make, Identification, Dimension, Construction & Breaking strength	Major	Visual & TC review	100% (Each Batch)		IS 2365/Approved drawing/ data sheet	MTC	√	V	V	V	Refer Note 4	
B3	Gear Boxes	Make & review of MTC for backlash, Reduction ratio, No load run test (Noise level, Temp Rise & oil leakage)	Major	Visual & TC review	100%		Approved Drg /Data sheet/ Manufacturer Standard	MTC	√	V	V	V	Refer Note 4	
B4	Lift Buffers	Chemical composition	Major	Chemical test	1 Sample/heat		Approved Drg /Data sheet/ Manufacturer Standard	MTC/ Check Test report	√	V	V	V		
		Mechanical properties	Major	Mechanical test	1 Sample/heat				√	V	V	V		
		Buffer Stroke	Major	Measure	One No/size/Lot		IS 14665		√	V	V	V		
		Dimension	Major	Measure	100%	-	Manf drg	IR	-	P	-	-		
B5	Counter weight	Type, weight	Major	Visual	100%	-	Manf drg	-	-	V	-	-		
B6	Batteries, Limit switch, braking resistor, MCB, contactor, Aux Relay, Push button, Infra-red curtain, wires, cables, VVF drive control, Transformer	Make, Type, rating	Major	Visual	100%	100%	Approved Drg/Data sheet/Manuf drg/ Relevant standards	IR	√	P	V	V	Refer Note 4	
		Routine test	Major	test	100%	100%		MTC/CoC	√	V	V	V		
B7	Microprocessor card	Model, Functional check	Major	Visual	100%	-	Manufacturer Standard	CoC	√	V	V	V		
		Routine test	Major	Verification	100%	100%		IR	√	V	V	V		
B8	Motor	Make/Type/ rating	Major	Visual	100%	100%	refer Note-1	IR	-	P	V	V	Refer Note 4	
		Routine test	Major	Verification	100%	100%		IR/CoC	√	V	V	V		

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		Item: ELEVATORS Sub-Subsystem: FGD	QP No.:	Rev.No.:	PACKAGE:
			Date:	Page:	CONTRACT NO:
					MAIN CONTRACTOR: BHEL RANIPET

Sl	Components & Operation	Characteristic	Class	Type of Check	Quantum of Check		Reference document	Acceptance Norms	Format of Record		Inspection Agency			Remarks
					M	C/B			M	C	N			
1	2	3	4	5	6		7	8	9	D*	10			11
<b>C</b>	<b>In-Process Inspection</b>													
C1	Sheaves, Over speed Governor wheel after machining	Visual & dimensional	Major	Visual & Measure	100%	-	Manufacturer drawing	IR	-	P	-	-		
C2	Car Panel - After Forming	Visual & dimensional	Major	Visual & Measure	Random	-	Manufacturer drawing	IR	-	P	-	-		
C3	Welding operation in structural	WPS, PQR & WPQ	Major	Verification	100%	100%	Appd WPS, ASME Sec IX	ASME Sec IX	QW-182-184	√	P	V	V	Refer Note 2
		Marking & Cutting	Major	Visual & Measure	100%	-	Manufacturer drawing		IR	-	P	-	-	
		Edge preparation	Major	Visual & Measure	100%	-	Manufacturer drawing/ Approved WPS		IR	-	P	-	-	
		Weld joint size/ Location/ Welder No. Correlation	Major	Marking, Verification	100%	-	Manufacturer drawing/ Approved WPS		-	-	P	-	-	
		DP test on weld	Major	NDT	100%	10%	ASTM E-165	No defect	DPT report	√	P	V	V	
		Dimensional check after final fabrication & Machining	Major	Measure	100%	100%	Manufacturer drawing		IR	-	P	-	-	
C4	Brakes-EM (Coil) function test before and after burn test	Make	Major	Verification	100%	-	Manufacturer Standard		IR	-	P	V	V	Refer Note 4
		IR, HV	Major	Measure	100%	100%			IR	-	P	V	V	
C5	Burn in Test of Control panel	Functional test before and after Burn in test	Major	Test	100%	100%	As per Test Procedure to be submitted		IR	-	P	V	V	
		Temp Rise in the Cubicle	Major	Measure	100%	100%	As per Test Procedure to be submitted			-	P	V	V	
C6	Control panel fabrication	Dimension	Major	Measure	100%	-	Manufacturer drg		IR	-	P	-	-	

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SI	Components & Operation	Characteristic	Class	Type of Check	Quantum of Check		Reference document	Acceptance Norms	Format of Record		Inspection Agency			Remarks
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1	2	3	4	5	6		7	8	9	D*	10		11	
<b>D</b>	<b>Final Inspection</b>													
D1	Assembled machinery unit (Motor & Gear)	No load run test for 30 min-check for vibration, Oil leakage, Brake function	Major	Test & Measure	100%	1 No/ Capacity (kg)/ Offered Lot	As per Test Procedure to be submitted	IR	√	P	W	W		
D2	Car door operator assembly	Dimensions (Clear opening)	Major	Test & Measure	100%	1 No/ Capacity (kg)/ Offered Lot	Approved drawing/ data sheet	IR	√	P	W	W		
		Function	Major	Test & Visual	100%		As per Test Procedure to be submitted	IR	√	P	W	W		
D3	Assembled car	Dimension (Depth, Width, Height)	Major	Measure	100%	1 No/ Capacity (kg)/ Offered Lot	Approved drawing/ data sheet	IR	√	P	W	W		
D4	Over speed governor	Calibration	Major	Measure	100%		IS 14665	IR	√	P	W	W		
D5	Control Panel	Panel mounted instrument & wiring check	Major	Visual & Measure	100%	1 No/ Capacity (kg)/ Offered Lot	proper ferruling, termination etc. Only agreed makes to be used	-	√	P	W	W		
		Dimension	Major	Measure	100%		Approved Drawing & Data sheet	IR	√	P	W	W		
		Paint shade, Paint thk, & adhesion test	Major	Visual & Measure	100%	1 No/ Capacity (kg)/ Offered Lot	Approved Drawing & Data sheet	IR	√	P	W	W		
		Degree of protection by paper insertion	Major	Visual	100%		When door is closed, paper should not pass (A4 paper approx. 115μ)	IR	√	P	W	W		
		Functional check	Major	Measure	100%		As per Test Procedure to be submitted	IR	√	P	W	W		
D6	Packing	Proper packing	Major	Verification	100%	-	Manufacturer packing list	Packing list	√	P	-	-		

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D7	Mandatory spares	Verification of spares as per PO and correlation/check as per mother equipment	Major	Review of Internal Inspection reports MFR's TC	100%	100%	PO/Customer approved document	IR	v	P	V	V	
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Notes													
1	<p><b>Motor power rating less than 30 kW:</b> Acceptance is based on CoC of the manufacturer &amp; the contractor confirming as follows: "It is hereby confirmed that the above mentioned motor(s) was/were manufactured taking care of NTPC specific requirements regarding ambient temp., Voltage &amp; frequency variation, Hot starts pull out torque starting kVA/kW, Temp rise distance between centre of stud &amp; Gland plate &amp; is tested in accordance with approved drawing data sheets"</p> <p><b>Motor power rating more than 30 kW upto 50 kW:</b> Acceptance is based on NTPC review of routine test inspection report as per IS:325 witnessed by main contractor along with CoC of the manufacturer &amp; the contractor giving confirmation as for motor upto 30 kW.</p> <p><b>Motor power rating more than 50 kW:</b> Separate RQP/MQP shall be submitted for NTPC review</p>												
2	NTPC/BHEL/LLOYD/BVQI/TUV approved and qualified WPS shall be used for fabrication. Only NTPC/BHEL/ LLOYD/BVQI/TUV approved welders shall be engaged for welding												
3	HV test on control panels will be done isolating VVF drive and other electronic parts , HV test at 2 kV for power and 1.5 kV for control circuit												
4	List of makes for the bought out items like VVF drive, Trailing cable, Power cable, Control Cable, Battery, Motor, Contactor, Control transformer, MCB, Aux. relay, Infrared curtain, Limit switch, Braking resistor, Panel, Mounted instruments, Gear box, Steel wire ropes etc shall be submitted along with the QP.												

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Elevator Manufacturers shall conform to submit the following along with QP:-

1. Test Procedure for Burn In Test of Control Panel, Assembled Machinery (Motor & Gear), Car Door Operators, Control Panel Testing in the format given below.
2. List of Make for Bought Out Items for Ultimate Customer NTPC approval.

<b>Enq:</b>		This Procedure is Part of QAP Elevator	
Manufacturer Logo	Manufacturer Name & Address	<b>Control No</b>	
		<b>Issue No</b>	
		<b>Rev No</b>	
		<b>Issue Date</b>	

Test Procedure for BURN IN TEST CONTROL PANEL

- 1.
- 2.
- 3.

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Designation			
Stamp			

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		<b>Rev No</b>	
		<b>Issue Date</b>	

Test Procedure for ASSEMBLED MACHINERY UNITS (MOTOR and GEAR)

- 1.
- 2.
- 3.
- 4.

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#### Test Procedure for CAR DOOR OPERATORS

- 1.
- 2.
- 3.
- 4.

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**CONTROL PANEL TESTING**

SI	Parameter	Related Procedure	Acceptance Limit	Observation
1	Car Interlocks			
2	Landing Interlocks			
3	Normal / Inspection Mode			
4	Floor read Switches			
5	Final cut Safety Switch (Up & Down)			
6	RD (Home floor Arrival)			

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**CONTROL PANEL TESTING**

SI	Parameter	Related Procedure	Acceptance Limit	Observation
7	Car Calls			
8	Hall Calls (Landing)			
9	Call Register LED			
10	Auto / Wait man (Attendant mode)			
11	Up & Down Arrow			
12	Position Indicator			
13	Fire Man Application			
14	Auto Fan Functions			
15	Up & Down Drive			
16	Auto Door Signal			

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		Issue Date	

**CONTROL PANEL TESTING**

SI	Parameter	Related Procedure	Acceptance Limit	Observation
17	Brake supply – 110 volt DC			
18	Fan Supply			
19	Speech Processor			
20	ARD System			
21	Earthing Strip			
22	Wire for Earthing			
23	Drive			
24	Label provided			

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