

		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:						
		PROJECT ENGINEERING & SYSTEMS DIVISION, BHEL, RC PURAM, HYD-502032			PRODUCT: Emergency DG Set BHEL Spec: PY55281			REV NO:		DATE:				
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SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY				REMARKS
										P	W	V		
1.0	ENGINE/ALTERNATOR ASSEMBLY													
1.1	ENGINE	Appl. Code, BHP, Model No	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1		
		All routine tests & manual analysis of Engine as per relevant std.	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1		
		Static & dynamic balance tests of all rotating parts	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1		
1.2	ALTERNATOR	kVA, Rating, Phase	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1		
		All routine test & manual analysis of Alternator as per relevant std.	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1		
		Static & dynamic balance tests of all rotating parts	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1		
1.3	ASSEMBLY	a) Torque to coupling bolts, b) Torque to AV Mountings c) End Play	MA	Torque Wrench/ Dial gauge	100%	Torque chart/End play chart	Torque chart/End play chart	Test Certi.		2	-	1		
2.0	BASE FRAME													

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										P	W	V	
2.1	Overall dimensions	Length, Breadth, Height, thickness, size,	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
2.2	Engine/Alternator /Radiator mounting support	Dimensions	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
2.3	Channels	size	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
2.4	Welding	Welding quality, continuous, free from splitting	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
2.5	Painting of base frame	Finishing of painting	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	
3.0	Fuel Tank												
3.1	Size of tank	Length, Breadth, Height, thickness, size,	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	
3.2	Sheet specifications	Thickness	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	

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										P	W	V	
3.3	Welding	Welding quality, continuous, free from spatter & burrs	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
3.4	Fuel tank leakage test	Leakage of fuel tank by air pressure	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	
3.5	Fuel Filling/Drain mountings	Visual	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
4.0	BATTERY												
4.1	Battery	Physical verification of battery	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Manufacturer's Test Certi.		2	-	1	
5.0	ACCOUSTIC ENCLOSURE												
5.1	Sheet CRCA	Thickness	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	
5.2	Punching	Dimensions	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	
5.3	Bending	Dimensions, angularity	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Report		2	-	1	

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										P	W	V	
5.4	Welding	Spatter, uniformity	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
5.5	Pre-treatment	Surface free from oil, rust & should be clean	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
5.6	Powder Coating	DFT, finishing,scratch test, impact test	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
5.7	Stuffing of components/panels	Rockwool & Foam Density, fixing of perforated sheet by riveting	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
6.0	SILENCER												
6.1	Silencer model & Size	No. punched on the silencer & dimensions	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
6.2	Exhaust pipe	Welding quality, continuous, free from splitting	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
6.3	Exhaust bellow	Straightness, Perpendicular to Exhaust manifold	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	

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6.4	Sound level at the time of testing	Sound level	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
7.0	DG SET CONTROLLER												
7.1	DG Set Controller panel & AMF panel	All routine tests as per relevant code & standards	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
7.2		Digital display of Engine & Alternator parameters during running of the DG Set	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
8.0	TESTING OF DG SET												
8.1	All Routine & acceptance tests for DG set	As per relevant standards	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
8.1	Performance Load tests	At different loads 25%,50%,100%,110 %	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
8.2	Safety Tests	HWT, LLOP, Emergency Stop, Over speed	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
8.3	Sound level test	Sound level < 75 dB at one meter	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	

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8.4	Vibration	Checking of vibration	MA	Measurement	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
8.5	Dimensional check, Painting thickness, finish quality & workmanship	Physical	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
8.6	Type tests	*All type tests as per relevant IS/IEC	MA	Test	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	*Type test reports not older than 5 years.
9.0	BOM VERIFICATION	Verification of approved BOM	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	1	-	
10.0	LABELLING & PACKING												
10.1	Labels	Instructions, Do & Do not labels at right place	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	
10.2	Packing	Wrapping of canopy by stretch plastic film	MA	Visual	100%	BHEL Specification/ Datasheet/ Drawing	BHEL Specification/ Datasheet/ Drawing	Test Certi.		2	-	1	

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									D	P	W	V		

Notes:

1. This typical MQP should be read along with specification (latest revision), approved drawings & approved data sheet.
2. Drawing/Data sheet shall prevail over Quality Plan for contradiction if any between quality plan and drawing/specification.
3. All test certificates/type test reports reviewed and certified by TPI/BHEL shall be submitted to BHEL as documentation package.
4. All type test reports submitted shall not be older than 5 yrs from the date of purchase order. If type test reports not available, same shall be conducted by vendor at his own cost in any recognized laboratory.
5. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.

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