

To: Jersey Electricity
 The Powerhouse
 Planning Department
 PO Box 45, Queens Road
 St. Helier, Jersey, JE4 8NY



The Powerhouse, PO Box 45, Queens Road, St. Helier, Jersey, JE4 8NY

or to email: ese@jec.co.uk

G59-3 PARALLEL GENERATOR COMMISSIONING TESTS FORM

NON-TYPE TESTED GENERATING UNIT IN ADDITION TO THOSE REQUIRED IN APPENDIX 13.2

OVER AND UNDER VOLTAGE PROTECTION TESTS LV

Calibration and Accuracy Tests

Phase	Setting	Time Delay	Pickup Voltage				Time Delay Setting plus or minus 4V				
Stage 1 Over Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - N	262.2V 230V system	1.0s	258.75		265.65	Pass/Fail	266.2	1.0s		1.1s	Pass/Fail
L2 - N				Pass/Fail		Pass/Fail					
L3 - N				Pass/Fail		Pass/Fail					
Stage 2 Over Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - N	273.7V 230V system	0.5s	270.25		277.15	Pass/Fail	277.7	0.5s		0.6s	Pass/Fail
L2 - N				Pass/Fail		Pass/Fail					
L3 - N				Pass/Fail		Pass/Fail					
Stage 1 Under Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - N	200.1V 230V system	2.5s	196.65		203.55	Pass/Fail	196.1	2.5s		2.6s	Pass/Fail
L2 - N				Pass/Fail		Pass/Fail					
L3 - N				Pass/Fail		Pass/Fail					
Stage 2 Under Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - N	184.0V 230V system	0.5s	180.55		187.45	Pass/Fail	180	0.5s		0.6s	Pass/Fail
L2 - N				Pass/Fail		Pass/Fail					
L3 - N				Pass/Fail		Pass/Fail					

Stability Tests

Test Description	Setting	Time Delay	Test Condition (3-Phase Value)	Test Voltage all phases ph-n	Test Duration	Confirm No Trip	Result
Inside Normal band	-----	-----	< OV Stage 1	258.2V	5.00s		Pass/Fail
Stage 1 Over Voltage	262.2V	1.0s	> OV Stage 1	269.7V	0.95s		Pass/Fail
Stage 2 Over Voltage	273.7V	0.5s	> OV Stage 2	277.7V	0.45s		Pass/Fail
Inside Normal band	-----	-----	> UV Stage 1	204.1V	5.00s		Pass/Fail
Stage 1 Under Voltage	200.1V	2.5s	< UV Stage 1	188V	2.45s		Pass/Fail
Stage 2 Under Voltage	184.0V	0.5s	< UV Stage 2	180V	0.45s		Pass/Fail

Additional Comments / Observations:

OVER AND UNDER VOLTAGE PROTECTION TESTS HV REFERENCED TO 110V PH-PH VT OUTPUT

Calibration and Accuracy Tests

Phase	Setting	Time Delay	Pickup Voltage				Time Delay measured value plus or minus 2V				
Stage 1 Over Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - L2	121V 110V VT secondary	1.0s	119.35		122.65	Pass/Fail	Measured value plus 2V	1.0s		1.1s	Pass/Fail
L2 - L3				Pass/Fail		Pass/Fail					
L3 - L1				Pass/Fail		Pass/Fail					
Stage 2 Over Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - L2	124.3V 110V VT secondary	0.5s	122.65		125.95	Pass/Fail	Measured value plus 2V	0.5s		0.6s	Pass/Fail
L2 - L3				Pass/Fail		Pass/Fail					
L3 - L1				Pass/Fail		Pass/Fail					
Stage 1 Under Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - L2	95.70V 110V VT secondary	2.5s	94.05		97.35	Pass/Fail	Measured value minus 2V	2.5s		2.6s	Pass/Fail
L2 - L3				Pass/Fail		Pass/Fail					
L3 - L1				Pass/Fail		Pass/Fail					
Stage 2 Under Voltage			Lower Limit	Measured Value	Upper Limit	Result	Test Value	Lower Limit	Measured Value	Upper Limit	Result
L1 - L2	88.00V 110V VT secondary	0.5s	86.35		89.65	Pass/Fail	Measured value minus 2V	0.5s		0.6s	Pass/Fail
L2 - L3				Pass/Fail		Pass/Fail					
L3 - L1				Pass/Fail		Pass/Fail					

Stability Tests

Test Description	Setting	Time Delay	Test Condition (3-Phase Value)	Test Voltage all phases ph-n	Test Duration	Confirm No Trip	Result
Inside Normal band	-----	-----	< OV Stage 1	119V	5.00s		Pass/Fail
Stage 1 Over Voltage	121V	1.0s	> OV Stage 1	122.3V	0.95s		Pass/Fail
Stage 2 Over Voltage	124.3V	0.5s	> OV Stage 2	126.3V	0.45s		Pass/Fail
Inside Normal band	-----	-----	> UV Stage 1	97.7V	5.00s		Pass/Fail
Stage 1 Under Voltage	95.7V	2.5s	< UV Stage 1	90V	2.45s		Pass/Fail
Stage 2 Under Voltage	88V	0.5s	< UV Stage 2	86V	0.45s		Pass/Fail

Additional Comments / Observations:

OVER AND UNDER FREQUENCY PROTECTION TESTS

Calibration and Accuracy Tests

Setting		Time Delay		Pickup Frequency				Time Delay			
Stage 1 Over Frequency		Lower Limit	Measured Value	Upper Limit	Result	Freq step	Lower Limit	Measured Value	Upper Limit	Result	
51.5Hz	90s	51.40		51.60	Pass/Fail	51.2-51.8Hz	90.0s		90.9s	Pass/Fail	
Stage 2 Over Frequency		Lower Limit	Measured Value	Upper Limit	Result	Freq step	Lower Limit	Measured Value	Upper Limit	Result	
52Hz	0.5s	51.90		52.10	51.2-51.8Hz	51.7-52.3Hz	0.50s		0.60s	Pass/Fail	
Stage 1 Under Frequency		Lower Limit	Measured Value	Upper Limit	Result	Freq step	Lower Limit	Measured Value	Upper Limit	Result	
47.5Hz	20s	47.40		47.60	51.2-51.8Hz	47.8-47.2Hz	20.0s		20.2s	Pass/Fail	
Stage 2 Under Frequency		Lower Limit	Measured Value	Upper Limit	Result	Freq step	Lower Limit	Measured Value	Upper Limit	Result	
47Hz	0.5s	46.90		47.1	51.2-51.8Hz	47.3-46.7Hz	0.50s		0.60s	Pass/Fail	

Stability Tests

Test Description	Setting	Time Delay	Test Condition	Test Frequency	Test Duration	Confirm No Trip	Result
Inside Normal band	-----	-----	< OF Stage 1	51.3Hz	120s		Pass/Fail
Stage 1 Over Frequency	51.5Hz	90s	> OF Stage 1	51.7Hz	89.0s		Pass/Fail
Stage 2 Over Frequency	52Hz	0.5s	> OF Stage 2	52.2Hz	0.45s		Pass/Fail
Inside Normal band	-----	-----	> UF Stage 1	47.7Hz	30s		Pass/Fail
Stage 1 Under Frequency	47.5Hz	20s	< UF Stage 1	47.3Hz	19.5s		Pass/Fail
Stage 2 Under Frequency	47Hz	0.5s	< UF Stage 2	46.8Hz	0.45s		Pass/Fail

Additional Comments / Observations:

LOSS-OF-MAINS (LOM) PROTECTION TESTS - ROCOF								
Calibration and Accuracy Tests								
Ramp in range 49.5-50.5Hz	Pickup (+ / -0.005Hzs ⁻¹)				Time Delay RoCoF = +0.05Hz/s above setting			
Setting = 0.125 / 0.20 Hzs ⁻¹	Lower Limit	Measured Value	Upper Limit	Result	Test Condition	Measured Value	Upper Limit	Result
Increasing Frequency	0.120 0.195		0.130 0.205	Pass/Fail	0.175 Hzs ⁻¹ 0.25 Hzs ⁻¹		<0.5s	Pass/Fail
Reducing Frequency	0.120 0.195		0.130 0.205	Pass/Fail	0.175 Hzs ⁻¹ 0.25 Hzs ⁻¹		<0.5s	Pass/Fail
Stability Tests								
Ramp in range 49.5-50.5Hz	Test Condition	Test frequency ramp		Test Duration	Confirm No Trip		Result	
Inside Normal band	< RoCoF (increasing f)	Higher of 0.12 Hzs ⁻¹ or ROCOF - 0.01 Hzs ⁻¹		5.0s			Pass/Fail	
Inside Normal band	< RoCoF (reducing f)	= _____		5.0s			Pass/Fail	
Additional Comments / Observations:								

LOSS-OF-MAINS (LOM) PROTECTION TESTS - VECTOR SHIFT								
Calibration and Accuracy Tests								
Vector Shift	Pickup (± 0.5 degree)				Time Delay Vector shift = 2 deg above setting			
Setting = 6 / 12 degrees	Lower Limit	Measured Value	Upper Limit	Result	Test Condition	Measured Value	Upper Limit	Result
Vector Shift : Lagging Angle	5.5 11.5		6.5 12.5	Pass/Fail	8 deg 14 deg		<0.5s	Pass/Fail
Vector Shift : Leading Angle	5.5 11.5		6.5 12.5	Pass/Fail	8 deg 14 deg		<0.5s	Pass/Fail
Stability Tests								
Test Description	Test Condition	Test vector shift		Test Duration	Confirm No Trip		Result	
Inside Normal band	< Vector Shift (Lagging f)	Higher of 5 degrees or vector shift -1 degree					Pass/Fail	
Inside Normal band	< Vector Shift (Leading f)	= _____					Pass/Fail	
Additional Comments / Observations:								

Insert here any additional tests which have been carried out

DECLARATION – TO BE COMPLETED BY GENERATOR OR GENERATORS APPOINTED TECHNICAL REPRESENTATIVE

I declare that the **Generating Unit** and the installation comply with the requirements of G59/3 and the additional commissioning checks noted above have been successfully completed in addition to those required for all **Generating Unit** installations (see Appendix 13.2)

Signature	Date
Position	

DECLARATION – TO BE COMPLETED BY DNO WITNESSING REPRESENTATIVE

I confirm that I have witnessed the tests in this document on behalf of _____ and that the results are an accurate record of the tests

Signature	Date
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