

	A	B	C	D	E	F	G	H	I	J
1	Wind Tunnel Turbine Testing- with Electrical Load									
2										
3	Coil Resistance R_G			(repeat this even if it was done before)						
4	Test Lead resistance, R_{TL}			(short end of test leads together, approx. 1.5 ohms)						
5	Coil+ Leads Res, R_T			(leads connect to turbine)						
6	Load Resistor - R_L		varied							
7										
8	Test Procedure									
9	1 Measure all resistances except R_G and R_{TL}									
10	2 Place the wind turbine in the tunnel and secure the turbine base									
11	3 Connect the test leads to wind turbine and measure R_T									
12	4 Adjust the wind tunnel speed to the LOW setting									
13	5 Record the actual wind speed, frequency and turbine voltage									
14	6 Vary the load resistance and record frequency and voltage									
15	7 Repeat for MEDIUM speed settings									
16	8 Repeat for HIGH speed settings									
17	9 Create an Excel spreadsheet and calculated the voltage and power									
18										
19	Generator Resistance R_G					Formulas				
20						eq-1				
21						$P_T = (V_L^2 / R_L) (1 + R_G / R_L)$				
22						eq-2				
23						$RPM = F * 30$				
24						FOR 4-POLE GENERATOR				
25						eq-3				
26						$V_{L-Cal} = V_{NL} (R_L) / (R_L + R_G)$				
27										
28		Nominal wind speed (MPH)	Actual Speed (MPH)	RL	Freq. (Hz) F_L	RPM Calculated	Voltage (V-rms) V_L	P_T Actual Using V_L	Calculated V_{L-Cal}	Calculated Power using V_{L-Cal} P_{T-Cal}
29	SPEED									
30	LOW	10		4700						
31		10		27.30						
32		10		15.00						
33		10		10.00						
34		10		5.00						
35		10		1.00						
36										
37	MEDIUM	13		4700						
38		13		27.30						
39		13		15.00						
40		13		10.00						
41		13		5.00						
42		13		1.00						
43										
44	HIGH	16		4700						
45		16		27.30						
46		16		15.00						
47		16		10.00						
48		16		5.00						
49		16		1.00						