

WIND & SOLAR ENERGY EXPLOITATION IN
ANTARCTICA DURING SIXTH INDIAN SCIENTIFIC
EXPEDITION
(1986-1987)

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A twelve bladed horizontal axis wind electric generator was assembled, installed and the performance evaluated, in the vicinity of Maitri field camp in Antarctica. Testing was done from 26th January 1987 through 10 February 1987 and the preliminary results are presented in Table 1. The values correspond to the peak power generated at a particular time of the day. A maximum output of about 1.5 KW, at a wind speed of 28 knots from southeast direction, was recorded.

Two solar photovoltaic modules in series were installed on the north facing roof top of the hut in the Maitri camp. The connections were given to the battery bank (24V; 120Ah capacity) for charging purpose. It was found to be operative. The two solar photovoltaic modules left behind at Dakshin Gangotri station were monitored. The installation was observed to be quite intact and the performance of module, satisfactory. The modules were reconnected to give 24 volts output, though the peak output of 39W, at about 780 W/m^2 global insolation, was recorded.

Table 1

Date	Time	Wind speed (m/sec)	Wind direction	Armature voltage (VDC)	Load current (A DC)	Power (watts)	RPM	
26.1.87	0600	10.0	SE	95	4.5	427.5	950	
	0800	6.2	SE	55	2.6	143.0	530	
	0930	low wind speeds						
27.1.87	0000	8.00	SSE	60	2.8	168.0	620	
	0110	9.00	SEE	75	3.6	270.0	940	
	1010	11.00	SSE	95	4.5	427.5	940	
	1200	wind less than 4.5 m/sec.						
	2300	11.00	SE	95	6.3	819.0	1100	
28.1.87	0000	12.00	SE	105	6.3	819.0	1100	
	0100	12.00	SE	105	7.8	819.0	1100	
	0400	09.00	SE	70	5.0	350.0	700	
	0600	06.00	SSE	-	-	-	-	
	1200	04.50	SSE	-	-			
29.1.87	easterly winds and very low wind speeds							

6.2.87

0000	9.5							
0800	10.00							
1000	9.00		SE	55	7.0	385.0		650
1200	10.50		SE	80	7.0	560.0		1000
1400	12.00		SE	100	8.0	800.0		1100
1800	0.00		SE	55	7.0	385.0		650
2000	9.00		SE	55	7.0	385.0		650
2300	12.50		SE	90	10.5	945.0		650

Southerly winds, so no outputs
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7.2.87

0000	13.00		SE	90	11.0	990.0		1130
0600	12.50		SE	85	10.5	892.0		1330
1200	14.40		SE	100	15.0	1500.0		1230
1400	13.00		SE	90	11.0	990.0		1100
1600	11.50		SE	85	9.0	765.0		1000
1800	10.50		SE	80	7.0	560.0		1100
2200	11.50		SE	85	9.0	765.0		1100

8.2.87

0000	13.00		SE	90	11.0	990.0		1230
0600	13.50		SE	95	12.0	1140.0		1200
1200	8.0		SE	35	5.1	178.5		610
1800	6.0		SE		very low winds			

10.2.87

0000	6.0		SE		very low winds			
1000	10.0		SE	50	9.2	460.0		800
1200	12.5		SE	70	13.2	924.0		1100