



**Wind Turbine Generator System  
Acoustic Noise Test Report**

for the

**NW 100 Wind Turbine**

in

**Golden, Colorado**

by

**National Wind Technology Center  
National Renewable Energy Laboratory  
1617 Cole Boulevard  
Golden, Colorado 80401**

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for

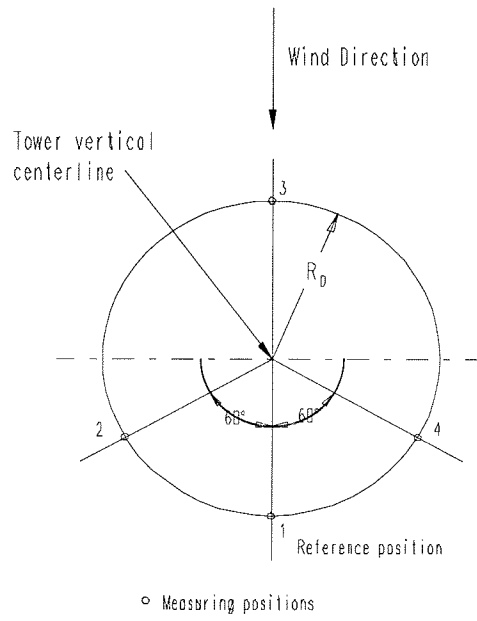
**Northern Power Systems  
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Waitsfield, VT. 05673-0999**

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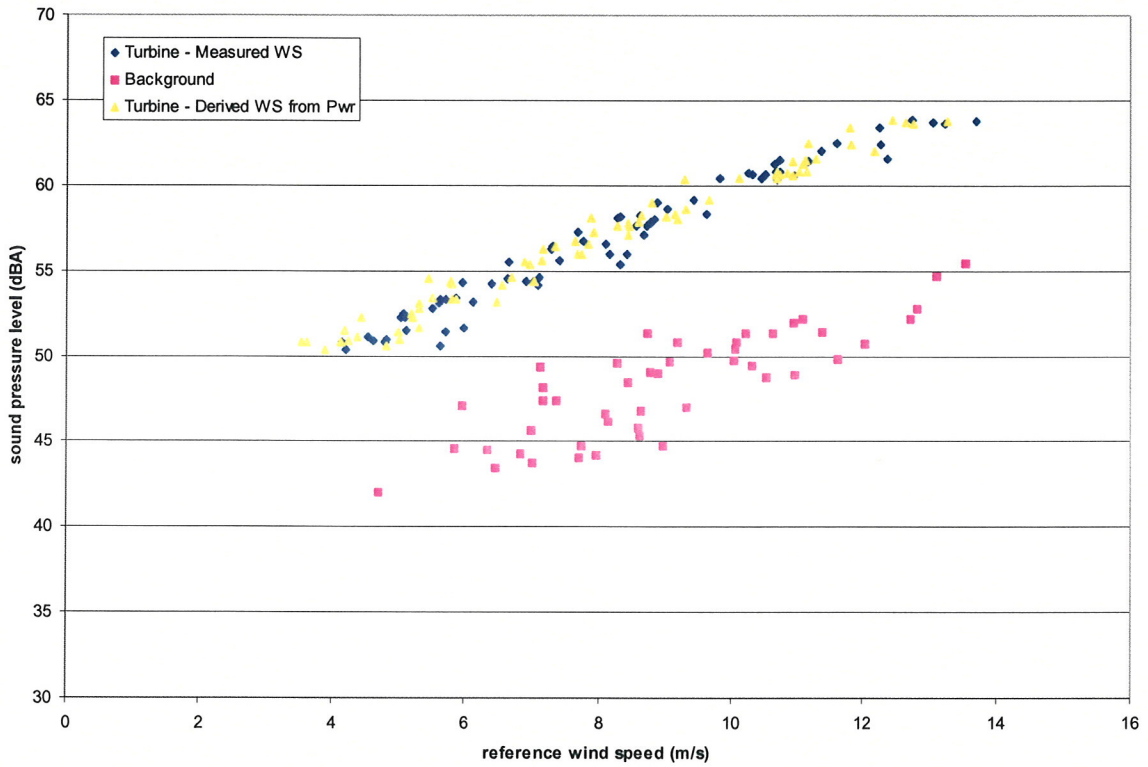
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**Figure 4. Microphone positions**



**Figure 1. Turbine Plus Background and Background Data for Microphone Position 1 (Reference)**

## 5.2 Wind Speed Sensitivity

In determining the wind speed dependence the wind speed was derived from the measured power. 60 pairs of turbine plus background and 46 pairs of background data were used. The results are shown in Table 9 and Figure 5. The wind speed range for the turbine data pairs was 5.4 to 9.2 m/s and background data pairs was 4.8 to 8.4 m/s.

**Table 9. Wind Speed Dependence**

Bin m/s	Wind Speed Average m/s	Position 1 dBA	Uncertainty* dBA
6	6.0	52.2	1.3
7	7.1	54.4	1.3
8	8.1	56.4	1.2
9	8.9	57.7	1.2
10	10.1	59.8	1.0
11	10.9	60.6	1.1
12	12.0	62.1	1.3
13	12.9	63.3	0.8

\* The uncertainty reported is the worst case.

## 5.3 Directivity

In calculating the directivity, the measurements from the four microphone positions were measured simultaneously. The directivity was calculated for positions 2, 3, and 4 in reference to position 1 at a wind speed of 8 m/s. The results are shown in Table 10.

**Table 10. Directivity at 8 m/s**

Position	Units	2	3	4
Directivity	dB	*	-0.8	-2.7
Uncertainty**	dB	--	1.4	1.9

\* - The directivity cannot be reported because the sound power level cannot be reported for position 2.

\*\* - The uncertainty reported is the worst case.