Virtual Tour Script for Whisper Wind Turbine

Penn State Sustainability Experience Center

**Main Facts:**

* Installed during the early part of the Sustainability Institute’s existence, refurbished in 2009 so it could be used for Aerospace Engineering Department research
* Upwind, off-grid, 3 kW-rated machine
* Rick Auhl, Assistant Research Professor in Aerospace Engineering, is the manager of the turbine

**Information:**

Right now, we are in the Southeastern section of the Sustainability Experience Center (SEC), and this is the Whisper Wind Turbine. It was originally built and installed around the time that the Sustainability Institute was established, and it has been utilized on and off since then. At first, it was used to provide energy to this area of the SEC, which at that time included a yurt, a garden, and a small pond. The turbine was then unused for an extended number of years, but it was refurbished in 2009 so that the Aerospace Engineering Department could perform research on it. Professor James Kalsbeek, who teaches in the College of Arts and Architecture, also had some of his students build this small shed at the base of the turbine. The shed would primarily house technology and equipment needed to perform research and maintenance on the turbine. Once the yurt was deconstructed, the turbine was once again not used for several years. When it was revisited later, it was discovered that the generator had rusted and that the blades had been attached backwards.

 Specifically, the turbine itself is an upwind machine that can provide 3 kW of off-grid power. The fact that the turbine is upwind means that its rotor is positioned in front of the unit (1). Thus, it is designed similarly to an airplane with a propeller on its front face. Its rotor is 15 feet in diameter, and the tower is 51 feet tall. It can measure a variety of values, including wind speeds at two elevations, wind direction, and power output. In terms of research activities, the turbine has been studied for such projects as “Small Wind-Turbine Performance Evaluation Using Field Test Data and a Coupled Aero-Electro-Mechanical Model” by McLaughlin, “Health Monitoring Applications for Small Wind Turbines” by McLauglin and Reichard, and “Design of a Moderate Scale Axial Flux Generator” by Auhl.

 Overall, the Whisper Wind Turbine has been a very useful and educational tool for the Sustainability Institute in the past. It has helped professors and students in activities with their research activities, and it has also served to display the capabilities of wind energy to many visitors. In the spirit of the Sustainability Institute’s goal to lift the SEC to its highest potential, we are focused on exploring new opportunities associated with this machine.

Sources:

1. <http://www.power-talk.net/upwind-turbine.html>