

WINDLETTER

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SMALL TURBINE COLUMN: ANNUAL WIND SYSTEM INSPECTIONS

Wind turbines live in a horrendous environment. Besides rain, snow, sleet, hail, and hordes of locusts, turbines must survive radical temperature swings, UV rays from sunlight, and lightning. And then there's the wind. In addition, wind turbines are not readily available for inspections. People must go out of their way to examine a turbine atop a high tower. Trouble is, without regular inspections, a wind turbine can become a time bomb that may explode unexpectedly, maybe disastrously.

Wind systems should be thoroughly inspected at least annually, and twice-a-year inspections never hurt. Experience indicates that the life expectancy of a wind system is directly related to the owner's involvement with the system (or the owner's dedication to the system's upkeep by hiring a professional to attend to the annual inspections and maintenance).

Since the weather is turning warm, now is a good time to think about a "spring cleaning" for your wind system. So, you ask, what's involved in annual inspections and maintenance?

A Bottom-Up Approach. Inspections begin at the bottom of the tower and move up from there. It only makes sense to be sure the tower is in good shape before scaling it. If you have a guyed or tilt-up tower, check the anchors where the guy cables attach. Inspect the guy cables for fraying, rust, or any sort of damage. Check the cable hardware and turnbuckles to assure that they are secure and not rusted or damaged. (Since guy anchors are often overgrown with grass, moisture can degrade the hardware and cable ends over time.) Finally, make sure the guy cables are properly tensioned.

Shut the wind generator down so that the blades are not spinning. If the tower is a tilt-up, tilt the tower down to inspect the tower. If climbable, put on your climbing harness and tool bag, and get ready for a leisurely climb. Before starting, check the hardware and anchor points that the tower sits on. Again, overgrown grass can hide developing problems.

Slowly climb the tower, inspecting as you go. Check all welds for integrity. Inspect hardware for tightness, damage, or corrosion. Also check the tower wiring for any damage. Make sure tower wiring or conduit is secured to the tower.

The Devil's In The Details. Once the machine is on top of the tower, it's time to give the wind turbine a thorough going over. All fasteners must be checked for tightness and integrity. Bolts that were torqued should be re-torqued according to the manufacturer's specifications. Be sure

to note cracks in the paint and any indication of rust on metal components. Pay particular attention to welds, as any crack in a weld demands immediate attention.

If visible, check all bearing seals for integrity. Dirt and moisture will make short order of bearings. Check the slip rings and brushes for signs of arcing or corrosion. Examine wires for deterioration of the insulation.

Pay particular attention to the condition of the blades. Check the blade roots for cracks, which can be an indication of a potential failure. If the blade paint is chipped or cracked, make a note to repaint them soon. If the blades have a leading edge tape applied, check its condition. Replace any leading edge tape that is frayed or torn.

On the tower as well as on the ground, check all wiring connections for tightness. Loose connections and wire terminals are points of resistance that will heat and burn if not attended to. Make sure that insulating tape on wire connections is still in good shape. While you're at it, check the condition of any disconnect switches, fuse boxes, and lightning arrestors.

While the wind generator is operating over the course of the year, pay particular attention to how it sounds and looks. Any unusual noises emanating from the generator must be attended to immediately. If a bad bearing is ignored, the results could be catastrophic. A wagging tail could indicate unbalanced blades or an out-of-plane rotor.

Wind turbines are not blenders, appliances that are inexpensively replaced rather than fixed. Wind systems represent a considerable investment for most people. No one drives a car without attending to scheduled maintenance. Your wind system, a comparable investment, deserves no less.

-- Mick Sagillo, Sagrillo Power & Light Co.