Wind Turbine Certifications
Q I have heard that UL has developed requirements for wind turbines and is able to perform listing evaluations and field evaluations on this type of equipment. We have had a number of these turbines installed in our area and would like to require listing on the entire assembly. When will that be possible?

A UL has developed a classification program for wind turbines and wind turbine related equipment. The program is based on requirements in the Subject 6140 series of documents, titled UL Outline of Investigation for Wind Turbine Generating Systems.

UL has created several new product categories to evaluate the major components of these systems as well as the overall system themselves. The evaluations are limited to risk of fire and electric shock and do not include the tower or structural evaluations of the turbine. The electrical equipment systems covered under these categories are intended for installation in accordance with Article 705, of ANSI/NFPA 70, National Electrical Code (NEC).

Below is a list of the product categories and a brief description of what they cover.

The Wind Turbine Inverters and Converters (ZGFA) category covers permanently connected inverters and converters for use in wind generated electrical power systems. This category covers stand alone, utility interconnected and multiple mode converters.

The Wind Turbine Safety Related Control Systems (ZGCP) category covers wind turbine safety related control systems equipment for large and small wind turbine generation systems.

The Small Wind Turbine Generating Systems (ZGEN) category covers small (16 meter rotor diameter or less and output of 600 V or less) wind turbine generation systems evaluated for risk of fire and electric shock, including safety related control system electrical performance and utility (grid) interconnect performance for utility interactive models.

The Large Wind Turbine Assemblies Evaluated for Construction (ZGBP) category covers large wind turbine generating assemblies; these turbines have a rotor larger than 16 meters in diameter. They are evaluated for compliance of internal and external electrical hardware to the applicable component standards, and interconnection of the electrical hardware to the applicable standards or codes. Large Wind Turbine Assemblies consist of various electrical hardware components and subassemblies constructed and interconnected in accordance with electrical safety requirements to create a complete wind turbine. These systems are most often assembled on-site in multiple sections.

The Large Wind Turbine Generating Systems (ZGEA) category covers construction and performance of complete systems. This category covers Large Wind Turbine Generating Systems (WTGS) evaluated for risk of fire and electric shock, including safety related control system electrical performance and grid interconnection performance. The ZGEA category includes the construction evaluation as defined by the ZGBP category and also includes the overall safety related performance evaluation at the system level for the interconnected electrical components and systems.

Large WTGS are defined as wind turbines with a rotor swept area larger than 16 meters in rotor diameter. Large WTGS consist of various electrical hardware subassemblies and safety related control systems constructed and interconnected in accordance with electrical safety requirements to create a complete wind turbine. These systems are typically assembled on-site in multiple sections.

Safety related control system performance is defined as the electrical hardware and software operation of the controls and protection functions up to the electromechanical interface of the associated power and control circuits. The ability of the mechanical systems to perform control and protection functions has not been evaluated under this certification.

Electric utility grid interconnection performance is evaluated to limits defined by the manufacturer for synchronization, overvoltage, under-voltage, over-frequency, under-frequency, clearing times, reconnect time, power factor, DC injection, harmonic distortion, unintentional islanding, power range and low voltage ride-through (if provided).

Until manufacturers of these systems redesign their products to comply with these new requirements, it may be some time before entire classified systems under the (ZGEA) category will be commercially available. However, the construction only category (ZGBP) should be available in short order and field evaluations for construction only are presently available. To obtain information on UL Field Evaluations of wind turbines, please contact UL’s Customer Service at (877) UL HELPS (854-3577) or www.ul.com/fequote.

These product categories were developed after the 2009 White Book went to publication and do not appear in the 2009 White Book. However, they currently appear on UL’s Online Certification Directory at www.ul.com/database by entering the 4 letter category code in the category code search field. These categories will be included in the 2010 UL White Book.