Julian Bell
Signal Energy Constructors

Wind energy development in Southeastern states faces unique challenges, requiring proper preparation and planning.

THIS YEAR, the American Wind Energy Association (AWEA) held its annual WINDPOWER conference in Atlanta. One of the main emphases of the conference was the future of wind project development and construction in the southeastern United States. As contractors look to the future of the wind industry construction, they will be well served by preparing for some of the challenges that they will face as wind projects become more common in the southeastern U.S.

To date, only 29MW of utility-scale wind energy (Buffalo Ridge Wind Project-Anderson County, TN) have been constructed in the 11 states comprising the Southeast. Until recently, the conventional wisdom was that there will be little wind energy production in these states due to low wind speeds at the traditional hub height of 80 meters. However, in recent months there have been numerous announcements concerning major wind developers proposing wind projects in several Southeastern states (Invenergy in TN and SC; Iberdrola in GA and NC; Wind Capital Group in NC and FL).

The amount of geographic area in the Southeast that can support utility-scale wind projects is relatively small when based upon wind speeds at 80 meters. This area increases dramatically when it is calculated based upon wind speeds at 100-meter hub heights. With hub heights of 100 meters becoming more common in the U.S., and with the advent of 110-140-meter hub heights, the prospects for increased development and construction of wind projects in the Southeast are much brighter.

In preparing for the construction of wind projects in the Southeast, contractors should be well-versed in a number of key areas:

1. Challenging environmental conditions — The challenge for wind developers in this area of the country remains finding higher wind speeds. Contractors must be able to deal with the challenges of construction in the traditional high-wind areas of the Southeast — coastal areas and high terrain. In coastal areas, contractors must be able to handle high water tables, salt water/corrosion issues, enhanced environmental compliance issues, and hazardous weather.
2. Construction in high terrain — In order to reach winds capable of supporting an economically viable wind project in the Southeast, projects likely will be placed on ridge-top or mountaintop locations. These areas come with their own set of challenges:
   a. Civil infrastructure — Access roads for ridge-top projects present unusual challenges for wind turbine component transportation. Contractors must design these roads with specific hauling equipment in mind, and must carefully plan all site logistics. In many cases, traffic heading up and down the ridge must be controlled, as the road will not allow motorists to pass.
   b. Limited work areas — Ridge-top projects typically lack the luxury of large areas available at each foundation location for the laydown of turbine components and assembly of rotors. Contractors must make sure that each foundation location has planned laydown areas. Contractors must also be prepared to employ innovative laydown techniques for blades in smaller areas.
   c. Logistics — Space at the foundation locations may be so restricted on some projects that just-in-time delivery of turbine components is necessary. Such projects will require a central laydown area for short-term storage of components and subsequent double-handling of components.
   d. Specialized transport — By employing specialized transport vehicles from a central laydown area, turbine components can be transported on roads that have steeper grades and tighter turns than normal. Contractors should be familiar with the use of such vehicles, as well as become innovative in assisting transport vehicles on steeper grades.
   e. Single-blade erection — When space prevents rotors from being assembled at the foundation, single-blade assembly is required. Using a single-blade erection process, the contractor installs the blades on the erected rotor one at a time.
3. Taller Towers — Another way that developers will find the higher wind speeds is to place turbines at higher hub heights. Installing taller towers requires the use of specialized erection cranes. Currently, the tallest utility-scale wind turbines in North America are on 105-meter steel towers. Concrete towers are capable of reaching hub heights of 130-140 meters. Concrete towers have been deployed in a number of locations in the United States and utility-scale use is likely in the not-too-distant future. While there are a variety of concrete tower types, all will involve the use of extremely large main erection cranes. However, erecting turbines at heights of up to 140 meters requires cranes that are much harder to find. As taller towers become more prevalent, procurement of the main erection crane will become a project-critical issue. In addition, contractors must be adept at handling the logistics issues inherent in either (a) on-site manufacturing of concrete tower sections, or (b) transportation of large numbers of individual tower section components for assembly on-site.

Julian Bell is the director of preconstruction for Signal Energy Constructors. For more information, visit www.signalenergy.com.