

Transporting wind turbines brings business opportunities and risk management challenges. Kevin Cunningham discusses both



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Turbine transport

It is a common sight these days to see oversized transport loads hauling turbine parts all over the country. Moving wind turbine components from factory floor to the project site is not easy.

The risk management elements involved with handling highly-sensitive, technological and very valuable components that weigh several tons and extend well over 100 feet in length are extensive. In addition to the risk management elements requiring detailed planning and precise execution, the attention by everyday road travelers drawn to these massive move projects sometimes generates serious frustrations and even "road rage" caused by inevitable traffic delays.

While the focus on renewable energy may be good for certain business economies and the environment as a whole, the risk management demands present significant real life challenges for all parties involved.

Business growth opportunities

According to the American and Wind Energy Association (AWEA), in 2008 alone, the wind turbine industry installed approximately 8,300 megawatts, which equated to over 5,000 turbines, resulting in an estimated 40,000 specialized transport hauls. For a specialized transport operator, a single turbine can require up to eight hauls (one nacelle, one hub, three blades, and three tower sections).

"For an entire project of 150 megawatts, transportation requirements have been as much as 689 truckloads, 140 railcars, and eight ships to the United States," explains Tom Vinson, environmental legislative manager of AWEA. Many projects today are much larger than 150 megawatts. Currently, the largest operating project in the US is 736 megawatts, but projects of more than 4,000 megawatts, which are now in the planning phases, are to follow.

Other than purely urban areas where space is prohibitive, there seems to be little geographic limitations for the business segment of specialized transport and crane/rigging operators.

The US Department of Energy (DOE) released a feasibility report in 2008 stating that 20 percent of the US electricity from wind energy can be achieved by 2030. While the DOE concluded that this level is attainable, it would require ramping up installation to 7,000 turbines by 2018. This level would generate approximately 50,000 annual shipments of turbine components. Therefore, significant growth opportunities exist for specialized transport operators that serve the wind energy industry. In addition to specialized transport, all modes of transportation (road, rail and water) can be used to deliver turbine components from the factory to the project site. The economics of using a particular mode will depend on the specific factory and project location. Multiple modes are projected to be used for future projects.

Global railroads

CN and CN Specialized Services (CNSS) recently completed the first-ever rail move of twin-pack wind turbine blades from German manufacturer Enercon GmbH and Salco Energy Services Inc. of Calgary. Fifty-one sets of twin pack blades are now being installed in Dawson Creek, British Columbia as a result of the partnership between CNSS, Enercon GmbH and Salco Energy Services Inc.

The wind turbine blades, which are 135 feet (41 meters) in length, were transported by sea aboard three vessels from the Port of Emden, Germany, with the first ship arriving at the Port of Thunder Bay, Ontario, in early May 2009. CNSS, which arranged for rail car modifications for the move, also



coordinated the unloading of the blades from the vessel and the loading of the blades and support equipment onto rail cars.

Six trains were required to transport the equipment from Thunder Bay to Dawson Creek over CN's network. At destination, CNSS provided services for unloading the equipment for transportation to the wind farm.

Growth in Minnesota/Midwest

St. Cloud, MN is on a main route for wind turbine components travelling from the Port of Duluth to destinations across the Midwest, where the demand for wind energy is soaring.

The turbine components generally arrive via ship at the Port of Duluth and head to destinations in Iowa and the upper Midwest states. Many of the parts are manufactured overseas, including Germany, Spain and The Netherlands, by companies that include General Electric, Siemens and others. The port in Duluth became a major hub for wind turbine transport in part due to a major accident in Northern Wisconsin in 2008 that involved a large load semi-trailer carrying wind parts that dropped its cargo causing major traffic back up and public affairs mess. As a result, the state of Wisconsin tightened its permit requirements for oversized loads. In return, GE and other turbine

manufacturers rerouted its shipments to Duluth.

In addition, there are manufacturing facilities making turbine parts in Fargo, South Dakota and northern Iowa, resulting in transport operators being forced to zigzag across Minnesota on state highways and even country roads, taking them



through both small towns and urban areas such as St. Cloud. Minnesota Department of Transportation (MnDOT) would prefer that the loads stay on interstates, but due to the low overpasses and the height of the turbine loads, this is not always possible.

According to MnDOT permit supervisor, Ted Coulianos, the Minnesota DOT issued more than 2,400 permits for oversized wind loads, including 332 in a single week in late 2008 after the Wisconsin accident. "We have seen some very, very strange routing, which caused a lot of headshaking and problems," Coulianos said.

Risk management concerns

In late 2008, a woman was killed and her husband seriously injured when their mini-van was struck by an oversized load carrying wind turbine cargo. The midday crash occurred near St. Cloud. Although the truck driver was not at fault, the MnDOT is working to keep wind loads out of metro areas even if this means drivers must take circuitous routes.

In Idaho and Texas, oversized loads laden with tall turbine parts have slammed into interstate overpasses, requiring several hundred thousand dollars in repairs, not to mention project delays and cargo claims.

Dropped loads or miscalculated turns have caused significant property damage and have caused serious traffic tie-ups in New York, California, and Wisconsin.

Plenty can go wrong despite months of planning. The cost and hassle of transporting huge, heavy turbines has led to interest in manufacturing turbine parts across the US. Last year 24 states opened, expanded or announced turbine manufacturing plants, according to the AWEA. By value, approximately 50 percent of turbine parts used in the US are now manufactured here.

But even if more turbine parts are manufactured in the US, experts say that transportation logistics are starting to limit how large – and as a result, how powerful, wind turbines can get. Some blades are already more than 50 yards long and those are reaching the limits of what can be shipped on interstate highways and rail cars.

With significant opportunity comes growing challenges. One lesson this writer has learned over the past 15 years of working closely with specialized transport and crane/rigging operators is that if anybody can figure it out, our industry can. **act**

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