AMSC’s Windtec Solutions include wind turbine designs that enable our partners to launch best-in-class wind turbines quickly, effectively and profitably. Providing a path to significantly lower the cost of offshore wind power, AMSC is developing the SeaTitan wind turbine to maximize “power per tower.” With the ability to produce 10 MW of power or more, the SeaTitan model promises to be the world’s most powerful turbine. It is based on a lighter weight and highly reliable direct drive design, ensuring a perfect fit for the harsh offshore operational conditions.

**Superconductor generator eliminates tolerance and deformation issues**

The SeaTitan wind turbine design employs a high temperature superconductor (HTS) generator, which is significantly smaller and lighter than a generator using conventional technologies. The superconductor generator has a large air gap to eliminate issues with tolerance, deformation and rare earth material availability. The generator is integrated as part of the turbine and decoupled from the load-carrying components. Generator torque is transferred directly from the stator to the mainframe.

**Amperium® wire is key to low cost and light weight**

AMSC’s Amperium wire is used for the HTS rotors instead of copper wire. These wires can carry over 100 times more power than copper wires of the same dimensions. Therefore, the generator is much smaller, lighter and more efficient than conventional large-scale wind turbine generators and produces the highest known power-to-weight ratio. This reduces the costs associated with the supporting mast structure, foundations, floatation systems and installation.

**Direct drive lowers maintenance need**

The direct drive model does not use a gearbox, which is one of the most maintenance-intensive wind turbine components and extremely costly with breakdowns at sea. In addition, no couplings are needed with the direct drive.

**High efficiency for offshore generation**

The SeaTitan turbine connects the superconductor generator to the grid with a full-scale converter. The IGBT-based converter with advanced power electronics ensures that the generator works with high efficiency over the entire speed range.

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**AMSC® intends to license SeaTitan wind turbines and generators to qualified manufacturers around the world.**
The SeaTitan turbine uses an advanced electrical individual pitch control system design. It is available in 50 Hz or 60 Hz.

**Compliance with international grid codes**

The SeaTitan turbine fulfills the most demanding international grid code requirements and has low voltage ride-through (LVRT) capability.

**Real-time information with continuous monitoring and alarm handling**

AMSC’s advanced wtCMS condition monitoring system provides continuous monitoring of the key system components. This gives operators real-time information about the turbine status as well as detailed and comprehensive analysis tools to optimize maintenance activities. The fully integrated system allows intelligent measurement, turbine control interaction, and the analysis of monitoring and performance data. In addition, wtSCADA remote operation and wtDataCenter analyzing packages are available to provide a harmonized control system with supervisory control and data acquisition to actively monitor, analyze and operate entire wind farms.