SAND2013-7238P

Fabrication of AMI Demonstration Blade Begun

The Advanced Manufacturing Initiative (AMI) is a multiple-year, 3-way collaboration among TPI Composites, Iowa State University, and Sandia National Laboratories. The goal of this collaboration is to improve the viability of U.S.-based wind turbine blade manufacturing through improvements in labor productivity and cycle time. As the AMI effort nears completion, the "capstone" effort is the fabrication of a full utility-scale blade which incorporates many of the material and manufacturing technologies generated by AMI. This demonstrator blade will undergo full scale testing and the resulting validation of these technologies will have a significant impact on the cost of future rotors and the ability to fabricate these rotors in the U.S.

Spool of RodPack spar cap material.

Layers of RodPack before spar cap infusion.

As part of this blade build, the AMI team completed the Pressure Side Surface BASF Epoxy/RodPack spar cap. This accomplishment demonstrated the manufacturing approach needed to combine BASF latent curing epoxy and NEPTCO glass fiber RodPack to rapidly layup, infuse and cure a multiple-megawatt-scale spar cap in less than 8 hours (as compared to over a 22 hour cycle with conventional materials, labor productivity improvement statistics are still being compiled). The component is void free, wave/wrinkle free and weighs 177 kg less that the current design (a total weight savings of 350kg, approximately 4.3% reduction in mass).

Additionally, both root preforms were fabricated. These preforms use a new fiberglass material and the BASF epoxy resin. Infusion time was reduced by 10 minutes and the cure was accelerated by 30 minutes. Fabrication of the pressure side and suction side trailing edge preforms and the BASF epoxy resulted in reduced cure times as well.

The complete blade fabrication and assembly was completed by July 25.

Exceptional Service in the National Interest