

DEPARTMENT OF MECHANICAL ENGINEERING

WILLIAM MAXWELL REED SEMINAR SERIES

“Aero-elastic Design Research for Large-scale Wind Energy Rotor Systems”

D. Todd Griffith, Ph.D.

University of Texas at Dallas

Abstract: Wind energy installations have shown strong growth in recent years. A dominant and persistent trend with wind energy technology over the past decades enabling this market growth is growth in the size of the rotor and associated cost reductions. Wind turbines are the largest rotating structures in the world (e.g., the GE Haliade X produces 12MW with 107 meter blades). However, continued growth in the size of the rotor is challenging given numerous competing design constraints that are technical, economic, and logistical in nature. Additional research remains to achieve even loftier goals for larger penetration in the market and the development of larger turbine sizes, including in the offshore environment. Addressing these challenges is the focus of our research, and this presentation will cover several recent and ongoing studies to advance large-scale rotor designs (100-meter to over 250-meter blade lengths) for traditional three-bladed designs at 13MW scale, novel two-bladed downwind designs for 50MW rotors, and large-scale floating offshore vertical axis wind turbine rotors. The presentation will highlight challenges and opportunities in design of these rotor systems with a focus on recent blade & system design and design & structural dynamic testing of sub-scale demonstrator blades.

Bio: Dr. D. Todd Griffith is an Associate Professor of Mechanical Engineering at the University of Texas at Dallas. His recent research has focused on renewable energy systems, in particular Wind Energy applications. His research contributions are in the areas of large wind turbine rotor technology development, new rotor concepts, aero-elasticity, and structural health monitoring & prognostics management methods. Prior to joining UT Dallas in Fall of 2017, Dr. Griffith was a researcher (Principal Member of the Technical Staff) at Sandia National Laboratories in the departments of Wind Energy, Water Power, and Structural Dynamics Research (from 2005-2017). He was the Technical Lead for Sandia’s Offshore Wind Energy Program, which focused on developing new technology for offshore wind systems for the US Department of Energy. Dr. Griffith has served as organizer and technical program chair for many international workshops and conferences including the 2016, 2018, and 2020 Science of Making Torque from Wind Conference and the 2014 and 2015 ASME Wind Energy Symposium. He currently chairs the ASME Wind Energy Technical Committee. He is an Associate Fellow of AIAA, recipient of an AIAA Distinguished Service award for leadership in wind energy conference development, and Guest Scholar of the Erasmus Mundus European Wind Energy Masters (EWEM) program at the Delft University of Technology. Prior to joining Sandia, he completed PhD work at Texas A&M University in Aerospace Engineering, MS and BS degrees from the University of Kentucky in Mechanical Engineering, and a BS degree in Physics from Morehead State University.

Date: Friday, Oct. 9th

Place: <https://uky.zoom.us/j/92940732923>

Time: 3:00PM EST

Contact: Dr. Alexandre Martin 257-4462

Meet the speaker and have refreshments
Attendance open to all interested persons