



West Virginia University

Department of Mechanical and Aerospace Engineering

## **MAE GRADUATE SEMINAR**

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**Director, Solid Oxide Fuel Cell Program**  
**University of South Carolina, Columbia, SC**  
**October 15, 2008 @ 11:00 PM, Room G83 ESB**

### ***Multiphysics Concepts and Foundations for Durability of Solid Oxide Fuel Cells***

**Abstract:** As energy conversion devices, solid oxide fuel cells and electrolyzers have capabilities that cannot be matched by any other technology. They can convert chemical energy (in many forms, including bio-renewable derivatives) into electrical energy, convert liquid fuels to gaseous form (e.g. hydrogen and oxygen from water), or convert various gaseous combinations to liquid fuels (e.g. CO<sub>2</sub> and steam to liquid fuels). But these (and other) capabilities require an array of material and system combinations, engineered for specific functions and tasks. Moreover, engineering, and the science that supports it, must include performance over time, i.e., we must be able to design for specific durability and sustained performance. The present lecture will outline some of these issues and offer some approaches to SOFC and SOEC cells, stacks, and systems.

**Short Bio:** Dr. Reifsnider's research and interests include durability, damage tolerance and strength-life relationships in material systems; performance of life prognosis, aging, material state changes, long term behavior; fuel cell science and engineering. He received his Ph.D. in 1968 from The Johns Hopkins University