



DEPARTMENT OF
MECHANICAL ENGINEERING

The Sidney E. Fuchs Seminar Series

3:30-4:20pm, Friday, September 13, 2013
Frank H. Walk Design Presentation Room



Thermal Barrier Coatings

by **Shengmin Guo***

Associate Professor, Mechanical and Industrial Engineering, LSU

Gas turbines are typically subjected to significant temperature extremes and consequently severe degradation of the material properties. Currently the GE MS7001FA (200MW rating) gas turbine has a firing temperature of 2420 °F and the hot passage must be protected by thermal barrier coatings (TBCs). One measure of the substantial improvements to gas turbines over the past five decades is the increase in the maximum allowed surface temperature of engine hot section. The increase in working temperature has been facilitated mainly by three principal developments: 1) creep and oxidation resistant super-alloys; 2) advanced casting technology for the fabrication of both engine parts and the associated cooling configurations; and 3) new thermal barrier coatings. In this seminar, Dr Guo will introduce the development of thermal barrier coatings (TBCs) with a focus on hot corrosion behavior of the current and new TBCs.

* Dr. Guo received his D.Phil in 1998 from Oxford University, England. He is a faculty member at Louisiana State University, Department of Mechanical and Industrial Engineering since 2004. He is also a Louisiana registered professional engineer.

Dr. Guo's research activities are in the fields of fluid mechanics, heat transfer, instrumentation, turbomachinery, power generation, fuel cells, and high temperature materials (ceramic materials, thermal barrier coatings, and alloys). His research is funded by NASA, DOE, Air Force, NSF, LaSPACE, Louisiana Board of Regents, and industry.