



Applied Research Center Lecture Series
featuring

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Research Specialist

“Thermal Measurement and Modeling of Nuclear Waste in the Double Shell Tanks at Hanford Nuclear Waste Site Using Miniature Sensors”

September 27, 2016 | 3:00 PM | FIU Engineering Campus | Room 2186

This event is open to the public.

Double Shell Tanks (DST's) at the Hanford Site in Washington store nuclear waste and their structural integrity is a primary concern. Depending on the chemical composition and pH of the waste, certain temperature requirements are specified especially for corrosion control. DST's are complex tanks and the methods used to acquire the temperature data, chemical composition, and other parameters provide results that are often uncertain. Temperature measurements are usually recorded more than 10 feet away from the walls primarily because of technical and accessibility constraints which are further integrated with basic simulation models to provide an estimate of the wall conditions. Hence, there exists a need to accurately measure and model the wall and inside temperatures. To resolve the issue, research is being conducted on the use of miniature pyrometers (Infrared (IR) temperature sensors) to be deployed into the annulus of the DST's. The IR sensors can be mounted on annulus inspection cameras or ultrasonic testing crawlers for temperature measurement of the inner wall for the DSTs. Further, advanced heat transfer based thermal models are developed for accurate prediction of the nuclear waste conditions in the tanks. Successful implementation of the pilot scale testing would result in the deployment of the technology for testing the nuclear waste storage tanks at the Hanford Site in Washington.

Dr. Aravelli is a Research Specialist at Applied Research Center (ARC) and an Adjunct Professor in the Department of Mechanical and Materials Engineering (MME) at Florida International University. She received her Ph.D. in Mechanical Engineering from the University of Miami. Her M.S. and B.S. degrees in Mechanical Engineering are from West Virginia University and Andhra University (India) respectively. Her research and industrial experience span the broad area of mechanical engineering varying from Engines and Emissions Research to Design and Optimization of Engineering Systems. Dr. Aravelli holds a patent in the optimization of Heating Ventilating and Air Conditioning (HVAC) control systems and has authored several peer-reviewed journal publications and attended conferences. She has published a book entitled “Real-time measurement of oxides of nitrogen from heavy-duty diesel engines”. Her industrial experience covers biomedical and HVAC industries.