NATIONAL ENERGY TECHNOLOGY LABORATORY

2020 SENSORS AND CONTROLS PROJECT REVIEW MEETING
Virtual Agenda
Wednesday, August 26, 2020

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Advanced Sensors and Controls for FE Power Generation

Moderator Jessica Mullen

8:00 AM **Advanced Sensors and Controls FWP**
Ben Chorpening; Dustin McIntyre; Michael Buric; Dave Tucker, NETL

9:30 AM **Advanced Tool for Cyber Physical Systems and Digital Twins**
Paolo Pezzini, Ames National Laboratory

10:00 AM **BREAK**

Artificial Intelligence for Improved Plant Operation and Performance

Moderator Robie Lewis

10:30 AM **Generation Plant Cost of Operations and Cycling Optimization Model**
Anantha Narayanan, National Rural Electric Cooperative Association (NRECA)

11:00 AM **Hybrid Analytics Solution to Improve Coal Power Plant Operations**
Randall Lee Bickford, Expert Microsystems, Inc.

11:30 AM **Deep Analysis Net with Casual Embedding for Coal Fired Power Plant Fault Detection and Diagnosis**
Dr. Feng Xue, General Electric (GE) Company

12:00 PM **Boiler Health Monitoring Using a Hybrid First Principles-Artificial Intelligence Model**
Debangsu Bhattacharyya, West Virginia University Research Corporation

12:30 PM **BREAK**

Monitoring and Diagnostics for Gas Turbine Application

Moderator Mark Render

1:00 PM **Novel Temperature Sensors and Wireless Telemetry for Active Condition Monitoring of Advanced Gas Turbines**
Anand Kulkarni, Siemens Corporation

1:30 PM **Embedded Multiplexed Fiber-Optic Sensing for Turbine Control and PHM**
William Price, Intelligent Fiber Optic Systems Corporation

2:00 PM **In-Situ Optical Monitoring of Operating Gas Turbine Blade Coatings Under Extreme Environments**
Quentin Fouliard, University of Central Florida

2:30 PM **BREAK**

Embedded Sensor Technologies

Moderator Jason Hissam

3:00 PM **Additive Manufacturing of Circumferentially Embedded Optical Sensor Modules for In-Situ Monitoring of Coal-Fueled Steam Turbines**
Hai Xiao, Clemson University

3:30 PM **Embedded Sensors Integrated into Critical Components for In-Situ Health Monitoring of Steam Turbines**
Anand Kulkarni, Siemens Corporation

4:00 PM **Advanced Manufacturing of Ceramic Anchors with Embedded Sensors for Process and Health Monitoring of Coal Boilers**
Ed Sabolsky, West Virginia University

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Thursday, August 27, 2020

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Cybersecurity (Session I)

Moderator Robie Lewis

8:00 AM **Cyber Security Risk Reduction Framework for Generation I&C Technology**
Jeremy Lawrence, Electric Power Research Institute, Inc.

8:30 AM **Operational Technology Behavioral Analytics**
Patrick Crossley, Southern Company Services, Inc.

9:00 AM **Cyber Secure Sensor Network for Fossil Fuel Power Generation Assets Monitoring**
Dr. Benjamin Justus, Siemens Corporation

9:30 AM **Physical Domain Approaches to Reduce Cybersecurity Risks Associated with Control Systems**
Daniel Holzhauer, General Electric (GE) Corporation

10:00 AM **BREAK**

Cybersecurity (Session II)

Moderator Jason Hissam

10:30 AM **Metaphortress: A Situational Awareness Platform**
Scott Brunza, Sonalysts, Inc.

11:00 AM **Blockchain Empowered Provenance Framework for Sensor Identity Management and Data Flow Security in Fossil-Based Power Plants**
Sachin Shetty, Eranga Herath, and Roland New, Old Dominion University; Deepak Tosh and Abel Gomez, University of Texas at El Paso

11:30 AM **A Novel Access Control Blockchain Paradigm to Realize a Cybersecure Sensor Infrastructure in Fossil Power Generation Systems**
Rahul Panat, Carnegie Mellon University (CMU)

12:00 PM **Incorporating Blockchain/P2p Technology into an Sdn-Enabled Cybersecurity System to Safeguard Fossil Fuel Power Generation Systems**
Jun Liu, University of North Dakota Energy and Environmental Research Center (UNDEERC)

12:30 PM **Secure Data Logging and Processing with Blockchain and Machine Learning**
Dr. Leonel Lagos, Florida International University

1:00 PM **BREAK**

Robotics for Non-Destructive Evaluation and Repair

Moderator Maria Reidpath

1:30 PM **Development of a Pipe Crawler Inspection Tool for Fossil Energy Power Plants**
Dwayne McDaniel, Florida International University

2:00 PM **A Robotics Enabled Eddy Current Testing System for Autonomous Inspection of Heat Exchanger Tubes**
Jian Lin, University of Missouri

2:30 PM **A Lizard-Inspired Tube Inspector (LTI) Robot**
Ehsan Dehghan-Niri, New Mexico State University

3:00 PM **AI Enabled Robots for Automated Nondestructive Evaluation and Repair of Power Plant Boilers**
Hao Zhang, Colorado School of Mines

3:30 PM **Autonomous Aerial Power Plant Inspection in GPS-Denied Environments**
Angel Flores, Abad, University of Texas at El Paso

4:00 PM **BREAK**

Coal Fly Ash Speciation Analysis

Moderator Adam Payne

4:30 PM **Characterization of Arsenic and Selenium in Coal Fly Ash to Improve Evaluations for Disposal and Reuse Potential**
Heileen Hsu-Kim, Duke University

5:00 PM **Elucidating Arsenic and Selenium Speciation in Coal Fly Ashes**
Yuanzhi Tang, Georgia Tech Research Corporation