Advanced Sensors and Instrumentation

Meeting Agenda

Advanced Sensors and Instrumentation (ASI)
FY23 Annual Program Review meeting

Monday, October 30, 2023

Session 1: **Introduction** ***Moderators: Daniel Nichols (DOE)/Pattrick Calderoni (INL)***

10:00 am	Welcome, Opening Remarks, and ASI Program Overview	Suibel Schuppner/Daniel Nichols, DOE
10:40 am	ASI Program Roadmap	Pattrick Calderoni, INL
11:00 am	NRC Research Status Update	Chris Cook, NRC

Session 2 (part 1): **Sensors for Advanced Reactors** ***Moderator: Chris Petrie, ORNL***

11:20 am	Neutron Flux – INL	Kevin Tsai, INL
11:40 am	Neutron Flux – ORNL	Tony Birri/Pat Mulligan, ORNL
12:00 pm	[SBIR] Commercialization of the Micro Pocket Fission Detector (MPFD)	Taylor Ochs, Radiation Detection Technologies, Inc.
12:20 pm	---------- ***Break*** ----------	
12:50 pm	Optical Fiber – INL	Austin Fleming, INL
1:10 pm	Optical Fiber – ORNL	Chris Petrie, ORNL
1:30 pm	Non-Contact Strain and Displacement Monitoring via Single Crystal Sapphire Based Interferometry	Daniel Homa, Virgina Tech
1:50 pm	[NSUF] Irradiation of Optical Components of In-Situ Laser Spectroscopic Sensors	Igor Jovanovic, University of Michigan
2:10 pm	---------- ***Lunch*** ----------	
2:40 pm	[NSUF] High Fluence Active Irradiation and Combined Effects Testing of Sapphire Optical Fiber Distributed Temperature Sensors	Kelly McCary/Josh Daw, INL
3:00 pm	[SBIR] Fiber-optic Sensor System for Multi-Point Pressure and Temperature Measurement	Qiwen Sheng, Nusenics, LLC
3:10 pm	[SBIR] Scaled Reduced Mode Sapphire Fiber Production Towards High Temperature Radiation Resilient Sensors	Derek Rountree, Luna Innovations, Inc.
3:30 pm	[SBIR] Fiber-Embedded Wireless Sensors	Joseph Pegna, Free Form Fibers
3:40 pm	[SBIR] Optical Fiber Based Distributed Radiation Detection	Chris Westcott, Luna Innovations, Inc.
3:50 pm	[SBIR] Fiber-Optic Multifunctional Sensor for Crack Monitoring in Harsh Environments	George Boggs, Luna Innovations, Inc.
4:10 pm	---------- ***Wrap Up*** ----------	

*All Times are Eastern Daylight Time (UTC - 04:00)

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Tuesday, October 31, 2023

Session 2 (part 2): **Sensors for Advanced Reactors** ***Moderator: Chris Petrie, ORNL***

10:30 am	Nuclear Thermocouples – INL	Richard Skifton, INL
10:50 am	Acoustic Sensors – INL	Josh Daw, INL
11:10 am	[NEUP] Development of Microwave Resonant Cavity Transducer for Flow Sensing in Advanced Reactor High Temperature Fluids	Alexander Heifetz, ANL
11:30 am	[NSUF] Irradiation of Sensors and Adhesive Couplants for Application in LWR Primary Loop Piping and Components	James Wall, EPRI
11:50 am	[SBIR] Advanced Laser Ultrasonic Sensor for Fuel Rod Characterization	Brad Bobbs, Intelligent Optical Systems, Inc
12:10 pm	***Break***	
12:50 pm	[SBIR] Ultrasonic Sensors for Nuclear Reactor Applications	Dan Xiang, X-wave Innovations, Inc.

Session 3 (part 1): **Sensors for Irradiation Experiments** ***Moderator: Austin Fleming, INL***

1:20 pm	LVDT – INL	Kurt Davis, INL
1:40 pm	Boise State University – Supporting Activities	Brian Jaques, Boise State University
2:00 pm	***Lunch***	
2:30 pm	Passive Monitors – INL	Malwina Wilding, INL
2:50 pm	Material Properties – INL	Mike McMurtrey, INL
3:10 pm	[NSUF] Deployment and In-Reactor Test of an Instrument for Real-Time Monitoring Thermal Conductivity Evolution of Nuclear Fuels	Zilong Hua, INL
3:30 pm	[NEUP] An Innovative Monitoring Technology for the Reactor Vessel of Micro-HTGR	Lesley Wright, Texas A&M
3:50 pm	[SBIR] Printed Sensors for Monitoring Reactor Health	Richard Fink, Applied Nanotech, Inc.
4:10 pm	***Wrap Up***	

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Wednesday, November 1, 2023

Session 4: **Sensor Integration** ***Moderator: Craig Primer, INL***

10:30 am	Advance Controls – ANL	Rick Vilim, ANL
10:50 am	Advanced Controls / Digital Twin – INL	Ahmad Al Rashdan, INL
11:10 am	Communication – Develop Multi-Band Wireless	Vivek Agarwal, INL
11:30 am	[NEUP] Design and Prototyping of Advanced Reactor Operating in the Future Electric Grid	Roberto Ponciroli, ANL
11:50 am	[NEUP] Advanced Online Monitoring and Diagnostic Technologies for Nuclear Plant Management, Operation, and Maintenance	Daniel Cole, University of Pittsburgh
12:10 pm	----------***Break***----------	
12:40 pm	[IFOA] Machine Learning for Enhanced Diagnostic and Prognostic Capabilities of NPP Assets	Tom Gruenwald, Bluewave
1:00 pm	Radiation-Hardened Electronics – ORNL	Callie Goetz, ORNL
1:20 pm	[NEUP] Gallium Nitride-based 100-Mrad Electronics Technology for Advanced Nuclear Reactor Wireless Communications	Kyle Reed, ORNL
1:40 pm	[NSUF] Understanding Irradiation Behaviors of Ultrawide Bandgap Ga203 High Temperature Sensor Materials for Advanced Nuclear Reactor Systems	Ge Yang, North Carolina State University
2:00 pm	---------- ***Lunch***----------	
2:30 pm	[SBIR] Video Camera for Harsh Environments in Nuclear	Esen Salcin, Alphacore, Inc.
2:50 pm	[SBIR] Advanced Process Instrumentation System for Next-Generation Nuclear Reactors	Ryan O'Hagan, Analysis & Measurement Services Corp.
3:10 pm	----------***Wrap-Up***----------	

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Meeting Agenda

Advanced Sensors and Instrumentation (ASI)
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Thursday, November 2, 2023

Session 3 (part 2): **Sensors for Irradiation Experiments** ***Moderator: Austin Fleming, INL***

10:30 am	Nuclear Energy Sensor Database – PNNL	Shan Osborn/Jeanne Morgan, PNNL
10:50 am	Irradiation Test – INL	Austin Fleming, INL
11:10 am	Irradiation Test – ORNL (Gamma Thermometer)	Tony Birri, ORNL

Session 5: **Program Synergies & Irradiation Facilities** ***Moderators: Daniel Nichols (DOE)/Pattrick Calderoni (INL)***

11:30 am	ARPA-E Projects with ASI Synergies	Jen Shafer, ARPA-E
11:50 am	----------***Break***----------	
12:20 pm	FRP Projects with ASI Synergies	Chris Grandy, Fast Reactor Program
12:40 pm	MSR Projects with ASI Synergies	Janelle Eddins, Molten Salt Program
1:00 pm	MRP Projects with ASI Synergies	John Jackson, Micro Reactor Program
1:20 pm	NSUF Utilization for Sensor Testing and Validation	J. Keith Jewell, INL
1:40 pm	Capabilities of the INL Irradiation Facilities	Troy Unruh, INL
2:00 pm	----------***Lunch***----------	
2:30 pm	Capabilities of the ORNL Irradiation Facilities	Dianne Ezell, ORNL
2:50 pm	Capabilities of the MITR Irradiation Facilities	Gordon Khose, MITR
3:10 pm	Capabilities of the OSURR Irradiation Facilities	Andrew Kauffman, OSURR
3:30 pm	Capabilities of the PULSTAR Irradiation Facilities	Nina Colby Fleming, PULSTAR
3:50 pm	----------***Wrap-Up***----------	

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