U.S. DEPARTMENT OF ENERGY

DOE OE PEER REVIEW

# DOE OE ENERGY STORAGE PEER REVIEW POSTER SESSIONS

## Tuesday | September 24, 2019 | Poster Session I

### Reliability

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| Multi-scale Thermal Stability Study of Lithium-ion Batteries as a Function of Chemistry and State of Charge | Yuliya Preger, Sandia National Laboratories |
| Durability and Reliability of Commercial Lithium-Ion Cells as a Function of Chemistry and Cycling Conditions | Yuliya Preger, Sandia National Laboratories |
| Heat Release from Thermal Decomposition of Layered Metal Oxide Cathodes in Lithium-Ion Batteries | Randy Shurtz, Sandia National Laboratories |
| Energy Storage Models for Risk Optimization | David Rosewater, Sandia National Laboratories |
| Battery Management System Standards | David Rosewater, Sandia National Laboratories |
| Reliability Testing of Li-ion Batteries for Stationary Applications | Daiwon Choi, Pacific Northwest National Laboratory |
| Reliability Test Laboratory Update | David Reed, Pacific Northwest National Laboratory |
| In-situ Reliability Studies of Vanadium Redox Flow Batteries: High Voltage Stressors | Rajankumar Patel, Pacific Northwest National Laboratory |

### Analytics

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| A Model Predictive Frequency Control of Low Inertia Microgrids with Energy Storage Systems | Reinaldo Tonkoski, South Dakota State University |
| Distributed Controls Using Energy Storage for Improved Grid Stability and Resilience | Roghieh Biroon, Clemson University |
| Energy Storage Planning for Clean Energy Target | Tu Nguyen, Sandia National Laboratories |
| Utilization of Existing Generation Fleet Using Large Scale Energy Storage Systems | Tu Nguyen, Sandia National Laboratories |
| Opportunities for energy storage plus solar in CAISO | Raymond Byrne, Sandia National Laboratories |
| Siting Energy Storage for Resilient Distribution Systems | Randy Brost, Sandia National Laboratories |
| Continuous-time Look-Ahead Scheduling of Energy Storage in Real-time Markets | Bosong Li, University of Utah<br>Masood Parvania, University of Utah |

## Materials II

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| Advanced Membranes for Flow Batteries: Anion Exchange Membranes | Cy Fujimoto, Sandia National Laboratories |
| Electrochemical Energy Storage through Ligand-Based Charge Manipulation | Mitchell Anstey, Davidson College |
| Next Generation Cell design and Material Optimization for Sodium Batteries | Stephen Percival Sandia National Laboratories |
| Solid State Separator Development for Sodium-Based Batteries | Amanda Peretti, Sandia National Laboratories |
| Radialene Radicals for Aqueous Redox Flow Batteries | Christopher Beiger, The University of North Carolina at Charlotte |
| Materials and Membranes for High Energy Density Non-Aqueous Redox Flow Batteries | Ethan Self, Oak Ridge National Laboratory |
| Elucidating Molecular Transport through Membranes in Flow Batteries | Leo Small, Sandia National Laboratories |
| Materials and Membranes for High Energy Density Non-Aqueous Redox Flow Batteries | Jagjit Nanda, Oak Ridge National Laboratory |
| Lithium-Pretreated Hard Carbon as High-Performance Sodium-ion Battery Anodes | Biwei Xiao, Pacific Northwest National Laboratory |
| Development of Sulfide based solid state Electrolytes for Na-ion Batteries | Donghai Wang, Pacific Northwest National Laboratory |
| Monitoring the State-of-Charge of a Vanadium Redox Flow Battery with the Acoustic Attenuation Coefficient: An In Operando Noninvasive Method | Xiaoqin Zang, Pacific Northwest National Laboratory |
| Regenerated hydrogen-iron flow cell for low-cost distributed long-duration energy storage | Litao Yan, Pacific Norhtwest National Laboratory |

## Power Electronics

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| Extreme Solar: Towards 24-7 Renewable Energy | Valerio De Angelis, Urban Electric Power<br>Satish Ranade, New Mexico State University |
| Connecting Alaska Remote Villages using Medium Voltage Intertie System | Mariko Shirazi, University of Alaska Fairbanks |
| Advanced Power Electronics for Grid Storage | Satish Ranade, New Mexico State University |
| Advanced Capacitors for Future Power Conversion System | Bruce Gnade, Southern Methodist University |
| X7R Ceramic Capacitor Lifetime for Pseudo-DC-Link Topologies | Jon Bock, Sandia National Laboratories |
| Advanced Gate Dialectrics for Wide-Bandgap Devices | Peter Dickens, Sandia National Laboratories |
| Wide Bandgap Power Electronics Reliability | Oleksiy Slobodyan, Sandia National Laboratories<br>Bob Kaplar, Sandia National Laboratories |
| Advanced Power Conversion Systems featuring SiC MOSFETs with In-Situ Restoration Capabilities | Ranbir Singh, GeneSiC Semiconductor |

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| Development of a Battery Chemistry Agnostic Secondary Use Energy Storage System | Madhu Chinthavali, Oak Ridge National Laboratory |
| Residential Deployment of a Secondary Use Energy Storage System | Michael Starke, Oak Ridge National Laboratory |
| Engineering Routes Towards Synthesis and Performance of Layered Oxide Cathode Materials for Sodium-ion Batteries | David Wood III, Oak Ridge National Laboratory |
| Design and Fabrication of High-Temperature Optocoupler For High-Density Power Module | Zhong Chen, University of Arkansas |
| Medium-voltage Power Electronics for Grid-tied Energy Storage | Kristen Booth, The Ohio State University |
| Smart GaN-based Inverters for Grid-tied Energy Storage Systems | Medhi Ferdowsi, Innocit |
| Predicting Reliability, Improving Safety and Resiliency in Grid Connected Battery Energy Storage Systems | Harish Sarma Krishnamoorthy, University of Houston |
| GLIDES: Delivering Efficient, Flexible Energy Storage | Ayyoub Momen, Oak Ridge National Laboratory |

## Wednesday | September 25, 2019

### Equitable Regulatory Environment

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| Planning Considerations for Energy Storage in Resilience Applications | Jeremy Twitchell, Pacific Northwest National Laboratory |

### Industry Acceptance

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| The BEAM Training Center at Santa Fe Community College | Stephen Gomez, Santa Fe Community College |
| The Nanogrid at Santa Fe Community College | Stephen Gomez, Santa Fe Community College |
| BESS Control of A Grid to Liberate Renewables | Clay Koplin, Cordova Electric Cooperative (CEC) |
| Global Energy Storage Database (GESDB) Updates | Sam Roberts, Sandia National Laboratories |
| CESA State Energy Storage Policy Initiatives | Todd Olinksy-Paul, Clean Energy States Alliance (CESA) |
| Eugene Water and Electric Board / Korean Consortium Energy Storage Project | Kendall Mongird, Pacific Northwest National Laboratory |
| Microgrid Evaluation Tool | Di Wu, Pacific Northwest National Laboratory |
| Washington Clean Energy Fund Economics | Patrick Balducci, Pacific Northwest National Laboratory |
| Modeling the Nantucket Energy Storage System | Kevin Blackman, Helix Power Coorporation |
| Battery State of Health Model | Howard Passell, Sandia National Laboratories |
| Energy Storage Control Capability Expansion at Portland General Electric's Salem Smart Power Center | Benjamin Schenkman, Sandia National Laboratories<br>Daniel Borneo, Sandia National Laboratories |

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| Energy Storage Analysis for Regional Demonstrations Projects | Vanshika Fotedar, Pacific Northwest National Laboratory<br>Xu Ma, Pacific Northwest National Laboratory |
| Safety considerations for BESS: Before, During and After Commissioning | Vish Viswanathan, Pacific Northwest National Laboratory<br>Alasdair Crawford, Pacific Northwest National Laboratory |
| Helix Power: Technical Challenges for Energy Storage in Metro Rail Applications | Jan Alam, Pacific Northwest National Laboratory |
| State Regulatory Commission Energy Storage Outreach and Education | Alexander Headley, Sandia National Laboratories |
| Sandia National Laboratories Demonstration Summary | Susan Schoenung, Longitude 122 West |

## Materials I

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| Effect of ZnO-Saturated Electrolyte on Rechargeable Alkaline Zinc Batteries at High Depth-of-Discharge | Matthew Lim, Sandia National Laboratories |
| Zincate-Blocking Polymeric Separators for Zn/MnO2 Batteries | Igor Kolesnichenko, Sandia National Laboratories |
| Rechargeable Zinc Manganese Dioxide Batteries: From Concept to Product | Jinchao Huang, Urban Electric Power |
| Real-Time Identification and Understanding of Zinc Compounds in Rechargeable Zinc Electrodes | Brendan Hawkins, City College of New York |
| Theoretical Studies of the Electrochemical Properties of Bi- and Cu-Modified d-MnO2 Electrodes in Rechargeable Zn/MnO2 Batteries | Birendra Ale Magar, New Mexico State University |
| Effects of Water-Soluble Binders on Electrochemical Performance of Manganese Dioxide Cathode in Mild Aqueous Zinc Batteries | Hee Jung Chang, Pacific Northwest National Laboratory |
| Development of Zinc-Based Anodes for Aqueous MnO2/Zn based Batteries | Matthew Fayette, Pacific Northwest National Laboratory |
| Enabling Natural Graphite in High Voltage Aqueous Zinc-Graphite Dual Ion Batteries | Ismael Rodriguez Perez, Pacific Northwest National Laboratory |
| Electrochemically Produced Zinc Oxide Electrode in Rechargeable Alkaline Batteries | Snehal Kolhekar, City College of New York |
| Rechargeable Solid-State Copper Sulfide Cathodes for Alkaline Batteries: Importance of the Copper Valence State | Jonathan Duay, Sandia National Laboratories |

## Safety Performance

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| Mechanisms and Materials Impact of Abused Li-ion Batteries | Loraine Torres-Castro, Sandia National Laboratories |
| Mitigation of Failure Propagation in Multi-Cell Lithium Ion Batteries | Loraine Torres-Castro, Sandia National Laboratories |
| Predicting and Mitigating Cascading Failure in Stacks of Lithium-Ion Cells | Andrew Kurzawski, Sandia National Laboratories |
| Thermal Runaway Testing and Database Development of Large-format Li-ion Cells at ORNL and SNL | June Stanley, Sandia National Laboratories |
| Internal Pressure Measurements during the Thermal Runaway of Cylindrical Lithium Ion Batteries | Frank Austin Mier, New Mexico Tech |

## Partnerships: Academia, Industry, Professional Organizations, Standards Boards

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| Energy Resilience for the Seminole Tribe | Frank Currie, Sandia National Laboratories |
| Rural Electricity Resilience on the Navajo Nation | Frank Currie, Sandia National Laboratories |
| Energy Storage Valuation at San Carlos Apache Tribe | Rodrigo Trevizan, Sandia National Laboratories |
| Energy Storage in the Future Puerto Rico Electric Grid | Frank Currie, Sandia National Laboratories |
| Update on the Natural Energy Laboratory of Hawaii Authority ESS and Microgrid Projects | Laurence Sombardier, Natural Energy Laboratory of Hawaii Authority (NELHA) |