POWER 2024

ASME Power Division Conference

Responsible. Reliable. Power for All.

CONFERENCE
September 15–18, 2024

The Madison Hotel,
Washington, D.C.

Program

https://event.asme.org/POWER

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

Welcome

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EDP

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California State University, Sacramento

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Siemen

FROM THE CONFERENCE COMMITTEE & EXECUTIVE COMMITTEE

Dear Colleagues,

Welcome to the ASME Power Conference and NETL LEAP Workshop at the esteemed Madison Hotel in Washington, D.C.!

This year, we are thrilled to bring together the ASME Power Division, one of ASME's largest and most dynamic technical divisions, with the NETL LEAP Workshop. Our collaborative efforts have resulted in a robust program featuring peer-reviewed technical papers, enlightening keynotes, engaging plenaries, and thought-provoking panel discussions. The wide array of topics covered promises to provide valuable insights and foster innovation within our industry.

Beyond the technical paper presentations, we have curated an exciting lineup of activities for you to participate in and learn from. You will have the opportunity to attend expert technical presentations, workshops, panel sessions, and roundtables. Moreover, our event includes multiple ASME Power Division Technical Committee meetings. Make sure to visit our tabletop sponsors to explore the latest advancements and technologies in the power sector.

We extend our heartfelt gratitude to our dedicated volunteer leadership and track chairs who have invested countless hours into organizing this top-tier technical program. We also thank the ASME staff for their invaluable assistance and dedication, ensuring every detail is taken care of to make this conference a success. Additionally, we are immensely grateful to our sponsors and exhibitors for their continued support of ASME Power. Their contributions have been instrumental in making this event a success year after year.

Most importantly, we want to thank you, our attendees, for being part of this significant gathering. We look forward to engaging with you throughout the conference and hope you take advantage of the numerous networking opportunities available.

While you are here, we encourage you to explore the vibrant city of Washington, D.C. The Madison Hotel's central location provides easy access to the city's historical landmarks, museums, and cultural attractions. Take some time to enjoy the rich history and lively atmosphere of our nation's capital.

Have a fantastic conference and thank you once again for joining us at this year's ASME Power Conference and NETL LEAP Workshop!

Best regards,

Andre Teixeira
Conference Chair, ASME Power Division

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THANK YOU!

Thank you to our volunteers!

Without their dedication and time commitment, **Power** could not be a successful conference.

TOPIC CHAIRS

Topic 1.1: Fuels, Combustion, & Material Handling

Chair: Ashwani Gupta, *University of Maryland*

Co-Chair: Jeongmin Ahn, *Syracuse University*

Topic 1.2: Combustion Turbine Combined Cycles

Chair: Amanda Kilby, *Sargent Lundy*

Co-Chair: Jeffrey Cobb, *Sargent Lundy*

Topic 2.2: Power Plant Heat Exchangers & Cooling Technologies

Chair: Andrew Rister, *Duke Energy*

Topic 2.3: Steam Turbines, Generators, and Auxiliaries

Chair: Steve Radke, *Siemens Energy, Inc.*

Co-Chair: Davi Squaiella, *Black & Veatch*

Co-Chair: Mike Smiarowski, *Siemens Energy, Inc.*

Topic 3.2: Plant Construction, Supply Chain Management & Economics

Chair: Frank Michell, *Power Industry Consulting, LLC*

Topic 3.5: Experimental and Computational Fluid Dynamics and Thermal Hydraulics and Data Analytics

Chair: Donna Guillen, *Idaho National Lab*

Co-Chair: George Mesina, *Idaho National Lab*

Topic 4.1: Renewable Energy Systems

Chair: Gopal Singh, *Siemens Gamesa Renewable Energy/University of Central Florida*

Co-Chair: Anthony DiCarlo, *MITRE Corporation*

Co-Chair: Navid Goudarzi, *Cleveland State University*

Topic 4.2: Water Management, Beneficial Reuse, & Environmental Issues

Chair: Nick Siefert, *Department of Energy's National Energy Technology Laboratory*

Co-Chair: Heather Hunter, *National Energy Technology Laboratory*

Co-Chair: Jessica Mullen, *Department of Energy's National Energy Technology Laboratory*

Co-Chair: Joshua Brooks, *Georgia Institute of Technology*

Topic 4.3: Nuclear Forum

Chair: Jovica Riznic, *Canadian Nuclear Safety Commission*

Topic 4.4: Integrated Energy Systems & Micro-grids

Chair: Biao Zhang, *U.S. Department of Energy National Energy Technology Laboratory*

Topic 5.1: Advanced Tools for Cyber-Physical Systems and Digital Twins

Chair: Paolo Pezzini, *Ames Laboratory, Department of Energy*

Co-Chair: Biao Zhang, *U.S. Department of Energy National Energy Technology Laboratory*

Topic 6.1: Student Competition

Chair: Sarvenaz Sobhansarbandi, *California State University, Sacramento*

Co-Chair: André Teixeira, *EDP*

Co-Chair: Steven Greco, *Lectrodryer*

Registration Hours and Location

Registration will be located on the second level of the The Madison Hotel.

Sunday, September 15	**12:00PM–5:00PM**
Monday, September 16	**7:00AM–5:00PM**
Tuesday, September 17	**7:30AM–5:00PM**
Wednesday, September 18	**7:30AM–12:00PM**

REGISTRATION POLICIES

1. Conference registration fees include admission to all technical sessions, reception, keynote, plenary, refreshment breaks, plenary lunches and electronic access to technical presentations. **Tickets to the for guests are an additional fee.
2. All attendees, including member, non-members, authors, panelists, chairs, and co-chairs, must pay the appropriate registration fee.
3. One-day registration allows access to the conference activities only on that particular day.
4. No one will be allowed to attend the technical sessions or exhibits without first registering and obtaining the official **POWER 2024/NETL LEAP** Conference badge.

ASME COMPLIMENTARY MEMBERSHIP

Any attendee that pays a non-member conference registration fee will receive a 4-month ASME membership free of charge. ASME will activate this complimentary membership for qualified attendees approximately four weeks after the conclusion of the conference.

SWAPCARD APP

Download the **ASME Swapcard App** and hold the entire program in the palm of your hand!

The ASME Swapcard App allows you to easily look up sessions, search for papers or people, message with other attendees, and create your own schedule. Be sure to download the app for the latest information.

AUTHORS SPEAKERS' PRACTICE ROOM:

The speaker practice room is located in the Adams B meeting room in the hotel.

The room will be equipped with an LCD projector, computer, and screen, Sunday through Wednesday. Authors are encouraged to use this facility to meet with their co-authors and review presentations.

It will be available as follows:

Monday, September 16	**8:00AM–5:00PM**
Tuesday, September 17	**8:00AM–5:00PM**
Wednesday, September 18	**8:00AM–10:30AM**

SESSION ROOM EQUIPMENT

Each session room is equipped with a screen and LCD projector. There will be a laptop computer in each room. Speakers should have a copy of their presentation to load onto this computer on a memory stick. It is recommended that authors/speakers bring all visual aids with them.

CONFERENCE PAPERS ELECTRONIC ACCESS

All Full Conference Registrants will receive online access to papers and presentations made at the 2024 Power Conference & Nuclear Forum. Access will be granted using your registration email address. Papers that were not presented on site in Snowbird will not be published in the conference proceedings and cannot be cited or indexed.

LUNCH

Lunch will be served in the Dolley Madison on:

Monday, September 16	**11:30AM–12:15PM**
Tuesday, September 17	**12:15PM–1:00PM**

WI-FI

Free Wi-Fi access is provided to **POWER Conference** attendees throughout the Madison Hotel. Free Wi-Fi access is also provided in the hotel rooms at the Madison Hotel.

To access the Wi-Fi use these credentials.

Madison Hotel

Network: ASME
Password: Power2024

REFRESHMENT BREAKS

Morning Break - Montpelier A

Monday, September 16	**9:00AM–9:30AM**
Tuesday, September 17	**10:30AM–10:45AM**
Wednesday, September 18	**10:00AM–10:30AM**

Afternoon Break - Montpelier A

Sunday, September 15	**4:00PM–4:30PM *Coffee break in foyer**
Monday, September 16	**2:30PM–3:00PM**
Tuesday, September 17	**3:45PM–4:15PM**

NAME BADGES

Please wear your name badge at ALL times during the conference. Your name bade is required in order for you to attend the sessions and/or the exhibition. If you misplaced your badge, please go to the ASME registration desk and ask for a replacement.

OPENING RECEPTION

Monday, September 16 **5:00PM–7:00PM**

All registrants are invited to this special event to celebrate the opening of the exhibits. Come grab a drink and some food, meet this year's group of exhibitors, and learn about their products and services.

SPECIAL NEEDS & HANDICAPPED ATTENDEES

Whenever possible, we are pleased to make arrangements for special needs or handicapped registrants. Advance notice may be required for certain requests. For on-site assistance, please visit the ASME registration area at the hotel and ask to speak to a staff member.

ASME POWER CONFERENCE

Schedule at a Glance

Schedule at a Glance

Eastern Time	Sunday, September 15	Room
12:00 PM – 5:00 PM	Registration Open	Dolley Madison Foyer
1:00 PM – 2:00 PM	LEAP Tutorial A: Integrated Energy Systems	Dolley Madison
1:00 PM – 2:00 PM	LEAP Tutorial B: Advanced Controls	Constitution A
2:00 PM – 2:30 PM	Stretch Break	
2:30 PM – 4:00 PM	LEAP Workshop 1: Introductory	Constitution A
4:00 PM – 4:30 PM	Refreshment Break	Foyer
4:30 PM – 6:30 PM	LEAP Workshop 2	Constitution A
Eastern Time	**Monday, September 16**	**Room**
7:00 AM – 5:00 PM	Registration Open	Dolley Madison Foyer
8:00 AM – 9:00 AM	Welcome & Opening Keynote	Dolley Madison
9:00 AM – 9:30 AM	Networking Break	Montpelier A
9:30 AM – 11:30 AM	1.2 Hydrogen - Solar Energy - Water Management, Beneficial Reuse, & Environmental Issues	Mount Vernon B
9:30 AM – 11:30 AM	1.3 Integrated Renewable Energy Systems - Nuclear Power	Mount Vernon A
9:30 AM – 11:30 AM	2.1 Advanced Tools for Cyber-physical systems and Digital Twins I	Adams A
9:30 AM – 11:30 AM	5.1 Boilers & Heat Recovery Steam Generators	Montpelier B
9:30 AM – 11:30 AM	6.1 Student Competition	Hamilton B
9:30 AM – 11:30 AM	LEAP Workshop 3: Identifying the needs from future advanced power systems	Constitution
11:30 AM – 12:45 PM	Lunch Keynote	Dolley Madison
1:00 PM – 2:30 PM	3.1 Fuels, Combustion & Material Handling I	Hamilton B
1:00 PM – 2:30 PM	4.1 Plant Performance and Operations I	Adams A
1:00 PM – 2:30 PM	5.3 Steam Turbines, Generators and Auxiliaries	Mount Vernon A
1:00 PM – 2:30 PM	6.2 Student Competition	Montpelier B
2:30 PM – 3:00 PM	Networking Break	Montpelier A
3:00 PM – 5:00 PM	Nuclear Panel	Mount Vernon A
3:00 PM – 5:00 PM	LEAP Workshop 4	Constitution
3:00PM – 5:00 PM	Branding and Networking Workshop	Montpelier B
5:00 PM – 7:00 PM	Opening Reception	Potomac

Schedule at a Glance

Eastern Time	Tuesday, September 17	Room
7:30 AM – 5:00 PM	Registration Open	Dolley Madison Foyer
8:00 AM – 8:50 AM	Keynote	Dolley Madison
9:00 AM – 10:30 AM	1.1 Energy Storage	Mount Vernon A
9:00 AM – 10:30 AM	3.2 Fuels, Combustion & Material Handling II	Adams A
9:00 AM – 10:30 AM	4.2 Experimental and Computational Fluid Dynamics and Thermal Hydraulics and Data Analytics	Montpelier B
9:00 AM – 10:30 AM	5.2 Power Plant Heat Exchangers & Cooling Technologies	Hamilton B
9:00 AM – 10:30 AM	6.3 Student Competition	Mount Vernon B
10:30 AM – 10:45 AM	Networking Break	Montpelier A
10:45 AM – 12:15 PM	Digital Twins Panel	Mount Vernon A
10:45 AM – 12:15 PM	LEAP Workshop 5	Constitution
12:15 PM – 2:00 PM	Lunch Keynote & Awards	Dolley Madison
2:15 PM – 3:45 PM	A Journey to Sustainability Panel	Mount Vernon A
2:15 PM – 3:45 PM	EPA Regulations Panel	Constitution
3:45 PM – 4:15 PM	Networking Break	Montpelier A
4:15 PM – 6:15 PM	Roundtables	Dolley Madison
4:15 PM – 6:15 PM	LEAP Workshop 6	Constitution
7:30 PM – 8:30 PM	LEAP Tutorial C: Cyber-Physical Simulation	Constitution

Eastern Time	Wednesday, September 18	Room
7:30 AM – 12:00 PM	Registration Open	Dolley Madison Foyer
8:00 AM – 10:00 AM	LEAP Workshop 7	Constitution
10:00 AM – 10:30 AM	Networking Break	Montpelier A
10:30 AM – 12:00 PM	1.4 Integrated Energy Systems & Micro-grids	Adams A
10:30 AM – 12:00 PM	2.2 Advanced Tools for Cyber-physical systems and Digital Twins II	Mount Vernon B
10:30 AM – 12:00 PM	3.3 Combustion Turbine Combined Cycles	Montpelier B
10:30 AM – 12:00 PM	4.3 Plant Performance and Operations II - Risk Management, Cyber Security and Safety	Hamilton B
12:00 PM – 1:00 PM	Break	Montpelier A
1:00 PM – 3:00 PM	LEAP Workshop 9 & Closing Remarks	Constitution

KEYNOTE

Monday, September 16
8:00AM–9:00AM

Geraldine (Geri) Richmond
Under Secretary for Science and Innovation
U.S. Department of Energy

Dr. Geraldine (Geri) Richmond is currently serving as the Undersecretary for Science and Innovation at the Department of Energy (DOE). In this role she oversees the DOE's Office of Science, the largest federal sponsor of basic research in the physical sciences in the U.S., DOE's applied R&D offices of Energy Efficiency and Renewable Energy, Fossil Energy and Carbon Management, Nuclear Energy, and Electricity as well as 13 of DOE's national laboratories. She is on leave from the University of Oregon where she holds the Presidential Chair in Science and Professor of Chemistry. Her research focuses on laser-based and computational methods to understand the structure and dynamics at liquid surfaces with relevance to environmental and technological interests. She is a member of the U.S. National Academy of Sciences and has received numerous awards including the National Medal of Science. A career-long advocate for underrepresented groups in STEM fields, she is the founding director of a grass-roots organization called COACh that has helped over 25,000 women scientists and engineers in career advancement in the U.S. and in dozens of developing countries around the world. A native of Kansas, Richmond received her B.S. in chemistry from Kansas State University and her Ph.D. in physical chemistry at the University of California, Berkeley.

WELCOME REMARKS

Andre Teixeira, EDP
Power Conference Chair

Thomas Costabile, P.E., FASME
ASME Executive Director/CEO

KEYNOTE

Monday, September 16

11:30AM–12:45PM (lunch served 11:30AM–12:15PM)

Cedric F. Green
Senior Vice President – Generation
Dominion Energy Virginia

Dr. Cedric F. Green is senior vice president–Generation, Dominion Energy Virginia. He is responsible for the operations, engineering, and maintenance of Dominion Energy's fossil, hydro, and renewable generating facilities and its energy storage portfolio, as well as solar generating facilities housed at Contracted Energy. Prior to the merger with Dominion Energy, Green started his career at SCANA in 1994 as an intern. For the next 25 years, he held several leadership roles in electric and gas operations, in both North and South Carolina. He was named the Southeast Energy Group's vice president–Gas Services in 2019, and later that year became vice president–Gas Transmission & Storage Technical Services. In 2020, he was named vice president–Technical Services for Dominion Energy Virginia. He assumed his current position in 2022.

Green serves on the Board of Directors for the University of Virginia's College at Wise. He also has served on the Board of Directors for the Charleston Metro Chamber of Commerce and served as Chairman of the Leadership South Carolina Board of Trustees. In 2021, he joined the boards of the Virginia Foundation for Community College Education, Thrive Birth to Five for the Richmond region, and the Henrico Education Foundation. Green is a graduate of University of South Carolina, where he earned all his degrees: B.S. Mechanical Engineering, MBA, M.E. Mechanical Engineering, and Ph.D. Mechanical Engineering. He is a Licensed Professional Engineer in the state of South Carolina. Green completed the Institute of Nuclear Power Operations' Reactor Technology Course for Utility Executives at the Massachusetts Institute of Technology in 2024.

KEYNOTE

Tuesday, September 17
8:00AM–8:50AM

Mark Ackiewicz
Deputy Assistant Secretary for the Office of Carbon Management
U.S. Department of Energy

Mark Ackiewicz is the Deputy Assistant Secretary for the Office of Carbon Management Technologies, leading the Office's research, development, demonstration, and deployment (RDD&D) portfolio, and collaborating domestically and internationally with a wide range of stakeholders. Before joining DOE in 2007, he worked in the private sector as a consultant, and in various industrial research and engineering positions, where he was responsible for process development and scale-up activities. Mark is a 2016–2017 White House Leadership Development Fellow alumnus. He has a B.S. in Chemical Engineering from Johns Hopkins University, and a Master's in Engineering Management from George Washington University.

Tuesday, September 17
12:15PM–2:00PM (lunch served 12:15PM–1:00PM)

Scott Parent
VP & Field CTO
Energy | Aerospace |Industrials
ANSYS

Scott is currently VP & Field CTO at ANSYS, connecting globally with customers to understand their digital engineering development needs and aligning methodologies ANSYS has to support their transitions. Scott had a number of preceding CTO/COO roles with GE, bp, and Baker Hughes. Scott has a broad leadership background in technology from multi-physics simulation to robotics, analytics, sensors development, asset health monitoring, AI/ML, additive, computer vision, edge analytics, and other associated 4-IR technologies. Scott has a bachelor's degree in mechanical engineering from the University of Maine and a master's degree in aerospace engineering from Pennsylvania State University.

PANELS

Monday, September 16
3:00PM–5:00PM
Room: Mount Vernon A

Frank Michell
Independent Consultant
Moderator

The Nuclear Role in Decarbonization of Electricity and Power Generation and Its Use – Current Activity and Future Trends

This panel will look at two topics of the nuclear industry – current activity on operating plants and future trends.

For currently operating nuclear plants, financial incentives, as part of the Inflation Reduction Act, served as a catalyst for many nuclear plants to extend their operating licenses and support continued operation. Reversals of nuclear plant closures on units at Diablo Canyon and Palisades are some recent examples of a turn-around in the industry with unprecedented investment in North American nuclear plants that is challenging the supply chain.

Significant engineering and manufacturing resources are needed to support the existing nuclear fleet. Active support includes thermal uprates and engineering studies to maximize the operating unit output, potential equipment upgrades to support continued operation and increased steam productions, and the on-going manufacturing and logistical challenges and mitigations being used to support these nuclear plants.

George Mesina
INNL
Panelist

For future trends, a recent study by DOE found that hundreds of coal power plant sites across the country could be repurposed to nuclear power plant sites. This would dramatically increase the supply of reliable, dispatchable, clean electricity to the grid and deliver huge gains to the nation's goal of net-zero emissions by 2050.

Also, the recent surge in small modular reactor (SMR) development offers a game-changing solution for our energy future. SMRs hold promise not only for clean electricity generation but also for providing heat and power to remote areas, resource extraction sites, and heavy industries. Additionally, they can play a crucial role in enabling a clean hydrogen economy.

This panel will explore how the nuclear industry, through operational excellence of the current fleet, advancements like SMRs and other novel concepts, can accelerate the transition to a net-zero emissions economy.

Michael Smiarowski
Siemens Energy, Inc.

Donna Williams
US NRC
Panelist

Caleb Tomlin
Electric Power Research Institute
Panelist

PANELIST

Tuesday, September 17
10:45AM–12:15PM
Room: Mount Vernon A

Digital Twin for Energy System Performance Monitoring and Controls

This panel session will discuss the development of digital twin systems used to monitor dynamic performance operation of existing power plants. The fundamental change of operating existing power plants due to the penetration of non-dispatchable resources exposed traditional power assets to follow aggressive ramps to guarantee electric load operations. Real time models and digital twin environments are becoming powerful tools used to monitor performance of existing power plants that can also support the development of new control strategies to achieve near-zero emission targets. Regarding the monitoring of existing power plants, digital twin model supports the prompt detection of abnormal operations and the optimization of scheduled maintenance and repair services of operators, which will avoid costly forced shutdowns, thereby increasing plant availability. Regarding the development of control strategies for new energy systems, digital twin can reduce the risk of failures and facilitate the integration of new low/zero carbon technologies. The panelists in this session will cover the state-of-the-art of digital twin systems and their application in the energy field.

PANELIST

Paolo Pezzini
EPRI
Moderator

Giancarlo Lenci
Metroscope
Panelist

Steve Seachman
EPRI
Panelist

Del A. Nargy
EPRI
Panelist

EPA REGULATIONS PANEL

Tuesday, September 17
2:15PM–3:45PM
Room: Mount Vernon A

Investor-owned and public power utilities share related concerns to environmental compliance and timing issues with the GreenHouse Gas (GHG) Rules, Good Neighbor Plan, Mercury and Air Toxics Standards (MATS), Coal and Oil-Fired Electric Utility Steam Generating Units (ELGs), and Coal Combustion Residuals (CCR). This panel will address how EGUs are planning for this suite of rules. All these rules have been challenged or will be challenged in the courts. The panel will look at how they plan to integrate more non-baseload resources, reliability, and supply chain issues during this time of great uncertainty.

JOURNEY TO SUSTAINABILITY PANEL

Tuesday, September 17
2:15PM–3:45PM
Room: Constitution

The "Journey to Sustainability" panel brings together experts, innovators, and leaders from various sectors to explore the path towards a more sustainable future. The panel focuses on innovative solutions and technologies that engineers are developing to address pressing environmental challenges. From renewable energy systems and sustainable materials to strategies for reducing carbon footprints, this panel highlights how engineering principles are being reconceptualized to create a more sustainable world. Attendees will gain insights into the integration of sustainability into engineering practices, the challenges faced, and the opportunities for future advancements. The session will also feature case studies and real-world examples showcasing successful sustainable research projects, illustrating the path forward in our collective journey to a more sustainable and resilient future.

ROUNDTABLE

Tuesday, September 17
4:15PM–6:15PM
Room: Dolley Madison

The Power conference will offer several informal discussions on topics important to the power industry led by a Moderator/Leader. Each Roundtable will be organized into two 30-minute discussions during the scheduled hour, which will provide the audience the opportunity to participate in a couple of different discussions. You are encouraged to spend time with multiple topics. The Roundtable topics include:

a. Diversity in Power – An open discussion on how to develop, encourage, and support personnel diversity within the power industry, including some voices from successful women working in the industry.

b. Early Career Development – An open discussion on available career pathways within power, resources ASME can provide, education and licensing options, and how best to position yourself to move along your chosen path and attain your professional goals.

ASME POWER CONFERENCE

2024 Low Emission Advanced Power (LEAP) Workshop

2024 Low Emission Advanced Power (LEAP) Workshop

Preliminary Technical Agenda*

TUTORIALS

Sunday afternoon, September 15, 2024

Session A – Integrated Energy Systems

Session B – System Controls

Session C – Cyber-physical modeling

Introductory Sessions – Hybrids and Technology Development

Sunday afternoon, September 15, 2024

Session 1 – Technology Development Current Paradigm and New Tools

Starting with a review of the current paradigm for power systems technology development, this session will provide discussion from technical leaders regarding development tools such as dynamic models, digital twins, hardware-in-the-loop simulations, and cyber-physical modeling to mitigate risk in developing new power technologies.

Session 2 – Penetration of Intermittent Renewable Resources with Electric Integration and Storage

This session will involve discussion focused on the most recent advances in renewable energy systems with electric energy storage and green hydrogen production/utilization and with an emphasis on challenges in implementation and needs from dispatchable power assets in the transition.

Integrated Energy Systems and Carbon Management

Monday & Tuesday, September 16–17, 2024

Session 3 – Identify Needs for Future Advanced Power Systems

This session will involve discussion from international leaders regarding economic and environmental drivers for new technologies, identifying technology needs from socioeconomic and social justice point of view. Also, given the leading role governments are playing to help transition their countries to renewable energy, this session also needs to provide a viable pathway that supports a transition from a dominant fossil energy society to a renewable energy society. Example: what critical role is needed from fossil energy resources to allow a speedy transition to reliable renewable energy? And how far into the future is it needed?

Session 4 – Identify Transition Impacts, Costs, and Opportunities for Early Adoption of Integrated Energy Systems

This session will involve discussion from power industry leaders (grid operators, generators, retail utilities) with an emphasis on current and anticipated transition impacts and associated costs, including cost of mitigation strategies. Resistance/bottlenecks toward a speedy transition are discussed along with their solutions. This session will also focus on recent integrated energy systems commercialization efforts with discussion on fee structures needed by industry to support investment in hybrid power systems which will enable a speedy transition to renewable energy.

Session 5 – Integrated Energy Systems: Cycles and Integration

Coupling components with disparate time scales and process sensitivities represents a significant challenge. This session will include discussion focused on matching components for thermal, chemical, and carbon management in integrated hybrid power systems capable of meeting the demands of transitioning to a net-zero carbon energy sector. Focus on challenges associated with integrating components into a single system with thermal, chemical, and electric interactions and coupling. What component coupling brings about nonlinearities? What is the extent of new states brought about by coupling components? What methods can be used to maintain stability when transitioning control states?

Session 6 – Integrated Energy Systems: Dynamics, Performance Optimization, and Controls

This session will involve identifying challenges for highly coupled hybrid systems with non-linear process interactions and potential control issues, especially under part-load or dynamic load conditions. This session will focus on the control needs for highly coupled novel cycles with an emphasis on the coordination of high-speed dynamics with performance optimization at the dispatch level.

Technology Development for Integrated Energy Systems

Tuesday & Wednesday, September 17–18, 2024

Session 7 – Digital Twins, Hardware-In-The-Loop, and Cyber-Physical Systems in Technology Development

This session will focus on using digital twins and cyber-physical systems to develop cyber-physical models capable of reconfigurability such that several cycle geometries and integration strategies could be evaluated for performance metrics using a single platform.

Session 8 – Codesign and Intelligent Systems

This session will focus efforts by technical leaders to use cyber-physical modeling and hardware-in-the-loop simulations to simultaneously design the components, system integration, and controls of an integrated energy system to achieve an intelligent or cyber-physical system capable of meeting the complicated performance needs of the future energy sector. As an example, using the Hyper facility to design the mini-Hyper components, integration, and controls simultaneously.

Technology Development for Integrated Energy Systems

Wednesday afternoon, September 18, 2024

Session 9 – Summary and Next Steps

The final session will provide a venue for open discussion regarding the insights gained from the previous sessions and the papers presented at the ASME 2024 Power conference.

Some key questions for consideration:

1. **Are hybrid systems likely to provide meaningful support to the energy transition? If so, how/why?**
2. **What specific forms of hybrid systems (e.g., component integrations) will be needed? Prioritize them.**
3. **What is a viable roadmap (steps needed) to develop viable hybrid technical solution(s)?**
4. **Identifying current barriers to commercial implementation of hybrid systems.**

** Subject to change.*

*** Subject to change and requires security approval.*

The Power Division is proud to present the James N. Landis Medal to James Wieters

James Wieters, EPRI

James is Principal Technical Leader in the Steam Turbine program at Electric Power Research Institute since 2014, where his responsibilities include new technologies research and applications supporting the EPRI membership. James manages the EPRI TGUG Turbine Generator User Group and provides two weekly conferences each year.

James completed 35 year career representing the utility owner in plant engineering, procurement, construction, operations, maintenance, and modifications. His focus has been the steam turbine and project outage management inspections, refurbishments, and upgrades for both nuclear and thermal fleet steam turbine and generators.

James is a Mechanical Engineer, BS from Clemson University (South Carolina, USA)

James is a member of the American Society of Mechanical Engineers (ASME) and active in the Power Division. He served as past chairman of the ASME Power Executive Committee and membership in the Turbine, Generator, and Auxiliaries Committee and the Turbine Water Damage Prevention Committee. He has authored and co-authored numerous technical reports on the subject of steam turbine modernizations, operations, and maintenance topics.

James N. Landis Medal

The James N. Landis Medal is presented for outstanding personal performance in the design, construction, or management of major steam-electric stations using nuclear or fossil fuels. The candidate must also demonstrate personal leadership in humanitarian pursuits, which may include committee activity, Section leadership, or the broad non-technical professional activity of the individual's engineering society.

The award was established in 1977 in honor of James N. Landis, President of ASME in 1958.

ASME POWER CONFERENCE

Technical Program

MONDAY, 9/16/2024

2.1 Advanced Tools for Cyber-Physical Systems and Digital Twins I

9/16/2024
9:30AM–11:30AM - Adams A

Chair: ***Luca Mantelli - University of Genoa***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Surrogate-Based Optimization of a Proton-Exchange Membrane Fuel Cell for Hybrid Propulsion

Technical Paper Publication: POWER2024-137636

Hao Chen *- Mälardalen University*

Valentina Zaccaria *- Mälardalen University*

Konstantinos Kyprianidis *- Mälardalen University*

Spatio-Temporal Graph Convolutional Network for Steam Heating Network Simulation Considering Dynamic Characteristics

Technical Paper Publication: POWER2024-138361

Chongshuo Yuan *- Zhejiang University*

Jiale Wang *- Zhejiang University*

Xiaojie Lin *- Zhejiang University*

Advanced Digital Techniques for Monitoring Dynamic Compressor Instabilities Through Non-Intrusive Approaches

Technical Paper Publication: POWER2024-138467

Maurizio Ratto *- Università degli Studi di Genova*

Paolo Silvestri *- Università degli Studi di Genova*

Federico Reggio *- Università degli Studi di Genova*

Alberto Traverso *- Università degli Studi di Genova*

Matteo Pascenti *- SIT Technologies Srl*

William T. Cousins *- Aerodynamic Technology Consulting LLC*

Integrated CFD-VR Visualization of Indoor Displacement Ventilation

Technical Paper Publication: POWER2024-138902

Ashish Alfred *- Cleveland State University*

Navid Goudarzi *- Cleveland State University*

Elijah Gulley *- Cleveland State University*

Apostolos Kalatzis *- Cleveland State University*

Impacts of Carbon Capture Within Power Plants Panel Discussion

Technical Presentation Only: POWER2024-149075

Steven Radke *- Siemens Energy*

5.1 Boilers & Heat Recovery Steam Generators

9/16/2024
9:30AM–11:30AM - Montpelier B

Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***F. David Fitzgerald - Retired***

A Rapid Wet-Dry State Conversion Method of the Ultra-Supercritical Coal-Fired Power Plant by Optimizing the Recirculation Water Control Strategy

Technical Paper Publication: POWER2024-137401

Zefeng Liu *- Xi'an Jiaotong University*

Chaoyang Wang *- Xi'an Jiaotong University*

Ming Liu *- Xi'an Jiaotong University*

Junjie Yan *- Xi'an Jiaotong University*

Thermal-Hydraulic Analysis of the Cooling Wall in Ultra Supercritical Coal-Fired Generation Plants During Deep Peaking

Technical Paper Publication: POWER2024-137426

Dengliang Wang - *Xi'an Jiaotong University*

Yongliang Zhao - *Xi'an Jiaotong University*

Weixiong Chen - *Xi'an Jiaotong University*

Chaoyang Wang - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

The Flexibility Enhancement of Subcritical Coal-Fired Power Plants: Control Strategy Optimization for Live and Reheat Steam Temperature

Technical Paper Publication: POWER2024-137463

Chen Chen - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Chaoyang Wang - *Xi'an Jiaotong University*

Yongliang Zhao - *Xi'an Jiaotong University*

Hui Yan - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Dynamic Characteristics and Control Strategy Optimization of a 1000 MW Lignite-Fired Power Unit Integrated With Primary Air Heater

Technical Paper Publication: POWER2024-137471

Mengjie Li - *Xi'an Jiaotong University*

Maoliang Li - *Dongfang Electric Group Dongfang Boiler Co. Ltd.*

Chaoqiang Yin - *Dongfang Electric Group Dongfang Boiler Co. Ltd.*

Ming Liu - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Effect of Blending Straw Powder Into Coal Gangue on Loading-Up Characteristics of the Circulating Fluidized Bed Generator Unit

Technical Paper Publication: POWER2024-137765

Chenyu Zhao - *Xi'an Jiaotong University*

Chaoyang Wang - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Jiping Liu - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Effect of Operating Parameters on Boilers Tube Skin Temperature Measurement Accuracy & Development of New Improved Tube Skin Thermocouple

Technical Presentation Only: POWER2024-137267

Ravi Jethra - *WIKA*

6.1 Student Competition

9/16/2024
9:30AM–11:30AM - Hamilton B

Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Investigation of Electric Grid Decarbonization for Arizona With Solar Photovoltaic

Technical Paper Publication: POWER2024-134717

Haider Nadeem - *Arizona State University*

Ryan J. Milcarek - *Arizona State University*

Ellen B. Stechel - *Arizona State University*

Clark Miller - *Arizona State University*

The Experimental Integration of Photovoltaic Systems With Aeration Tanks in Wastewater Treatment

Technical Paper Publication: POWER2024-137201

Hamza Al Nawafah - *University of Wisconsin-Milwaukee*

Cheikh Kada - *University of Wisconsin-Milwaukee*

Omar Habash - *University of Wisconsin-Milwaukee*

Ahmad Abdel Hadi - *University of Wisconsin-Milwaukee*

Ryoichi S. Amano - *University of Wisconsin-Milwaukee*

Enhanced Thermal Performance in Evacuated Tube Solar Collectors Using Titanium Oxide Nanoparticle: A Computational Fluid Dynamics (CFD) Investigation

Technical Paper Publication: POWER2024-137203

Qais Al Nawafah - *University of Wisconsin-Milwaukee*

Hamza Al Nawafah - *University of Wisconsin-Milwaukee*

Ryoichi S. Amano - *University of Wisconsin-Milwaukee*

Mohamed Abousabae - *University of Wisconsin-Milwaukee*

Dielectric Nanofluid Jet-Impingement Cooling of Laptop CPU Package

Technical Paper Publication: POWER2024-137510

Erkin Yucel - *California State University Sacramento*

Sabina Pilipovich - *California State University Sacramento*

Nate Matos - *California State University Sacramento*

Sarvenaz Sobhansarbandi - *California State University Sacramento*

1.3 Integrated Renewable Energy Systems – Nuclear Power

9/16/2024
9:30AM–11:30AM - Mount Vernon A

Chair: ***Gopal Singh - Siemens Gamesa***

Co-Chair: ***Aanya Singh - Council on Energy, Environment and Water***

Underground Piping Systems for Geothermal Applications

Technical Presentation Only: POWER2024-137262

John Versnel - *Fervo Energy*

Colton Sheets - *Stress Engineering Inc.*

Energy Transition: Past, Present, & Future

Technical Presentation Only: POWER2024-146616

John Dulude - *J.S. Held LLC*

Nuclear Fusion Proposal Using the Explosive Power of Magnesium

Technical Paper Publication: POWER2024-137116

Haruo Morishige - *Kitamura Co., Ltd.*

Yasufumi Kitamura - *Kitamura Co., Ltd.*

Isolation Systems in Turbine Building & Their Performance in Seismic Assessment

Technical Presentation Only: POWER2024-137395

Abbas Mokhtar-Zadeh *- Westinghouse Electric Company LLC*

Koji Watanabe *- Toshiba*

Peter Nawrotzki *- GERB Schwingungsisolierungen GmbH & Co.KG*

Daniel Siepe *- GERB Schwingungsisolierungen GmbH & Co.KG*

Paul V. Powers *- Westinghouse Electric Company*

Selected Nuclear Power Projects From Idaho National Laboratory

Technical Presentation Only: POWER2024-149181

George Mesina *- Idaho National Laboratory*

Are Self-Sustainable Communities Economically Viable: A Financial Analysis of Self-Sustainable Communities

Technical Paper Publication: POWER2024-138907

Pranava Manthena *- Middleton High School*

Gopal Singh *- Siemens Gamesa*

1.2 Hydrogen - Solar Energy - Water Management, Beneficial Reuse, & Environmental Issues

9/16/2024
9:30AM–11:30AM - Mount Vernon B

Chair: ***Anthony DiCarlo, MITRE Corporation***

Co-Chair: ***Rishi Roy - Sandia National Laboratories***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Nicholas Siefert - U.S. Department of Energy, National Energy Technology Laboratory***

Environmental Assessment of Centralized and Decentralized Scenarios of Green Hydrogen Implementation in the Transportation Sector

Technical Paper Publication: POWER2024-137530

Luis D. Cortez *- Escuela Superior Politécnica del Litoral*

C.V. Tapia-Bastidas *- The University of Queensland*

Carlos G. Helguero *- Escuela Superior Politécnica del Litoral*

Fausto A. Maldonado *- Escuela Superior Politécnica del Litoral*

Eduardo Alava *- Escuela Superior Politécnica del Litoral*

José Hidalgo-Crespo *- Université Grenoble Alpes*

Jorge L. Amaya-Rivas *- Escuela Superior Politécnica del Litoral*

Impact of the Availability of Critical Minerals on Energy From Hydrogen

Technical Paper Publication: POWER2024-137813

Magali Itzai Soto Crisanto *- Business Modelling Applications*

Aanya Singh *- Council on Energy, Environment and Water*

Luis Angel Resendiz Facio *- Business Modelling Applications*

Imerson Joao *- Chevron*

Batool Mohsin *- University of Cambridge*

Design of Flat Photovoltaic-Thermal (PVT) Collectors With Perforations

Technical Presentation Only: POWER2024-138038

Kim Haseong *- Korea Institute of Industrial Technology*

Kim Hyun Seok *- Korea Institute of Industrial Technology*

Dilip Badadhe Jaya *- Korea Institute of Industrial Technology*

Kim Young Won *- Korea Institute of Industrial Technology*

Techno-Economic Analysis of an Integrated Green Hydrogen Production Into a Combined Cooling, Heating, and Power (CCHP) System for a University Campus

Technical Presentation Only: POWER2024-149215

Matheus Strobel *- The University of Alabama*

Mustafa Erguvan *- The University of Alabama*

Ramon Peruchi Pacheco Da Silva *- The University of Alabama*

Shahriar Amini *- The University of Alabama*

National Energy Water Treatment & Speciation (NEWTS): A Water & Critical Minerals Database and Dashboard

Technical Presentation Only: POWER2024-138099

Nicholas Siefert *- U.S. Department of Energy, National Energy Technology Laboratory*

Madison Wenzlick *- U.S. Department of Energy National Energy Technology Laboratory*

National Energy Water Treatment & Speciation (NEWTS): A Water & Critical Minerals Database and Dashboard

Technical Presentation Only: POWER2024-149317

Nicholas Siefert *– U.S. Department of Energy, National Energy Technology Laboratory*

3.1 Fuels, Combustion, & Material Handling I

9/16/2024
1:00PM–2:30PM - Hamilton B

Chair: ***Ashwani Gupta - University of Maryland***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Jeongmin Ahn - Syracuse University***

Extension of Solid Particle Erosion Models for the Calculation of Erosion of Pneumatic Equipment Due to Pulverized Coal

Technical Paper Publication: POWER2024-137646

Lawrence D. Berg *- RJM-International*

Peyman Baghernejad *- University of Tulsa*

Ann Grue *- RJM Corporation (USA), Inc.*

Anura Perera *- RJM-International*

Thiana A. Sedrez *- Universtiy of Tulsa*

Siamack A. Shirazi *- University of Tulsa*

Soroor Karimi *- University of Tulsa*

Investigation of Liquid Film Behavior on the Surface of an Airfoil in a High-Speed Flow and Subsequent Atomization From the Trailing Edge – Effect of Airfoil Shape

Technical Paper Publication: POWER2024-137651

Safiullah Safiullah - *University of California, Irvine*

Brandon Esquivias - *University of California, Irvine*

Brendan Hickey - *University of California, Irvine*

Vincent McDonell - *University of California, Irvine*

Soichiro Tabata - *Mitsubishi Heavy Industries*

Shigeki Senoo - *Mitsubishi Heavy Industries*

Performance Evaluation of Tangentially Fired Boiler Utilizing Hydrogen Enriched Natural Gas Fuel

Technical Paper Publication: POWER2024-137937

Sharad Pachpute - *Babcock Power APAC Pvt. Ltd.*

Jason Lee - *Babcock Power APAC Pvt. Ltd.*

Modeling and Control of a High Voltage Battery Pack Cell for Electric Vehicles

Technical Paper Publication: POWER2024-137947

Jesus Villalobos - *General Motors*

Taylor R. Garrick - *General Motors*

Rohollah Moghadam - *California State University, Sacramento*

4.1 Plant Performance and Operations I

9/16/2024
1:00PM–2:30PM - Adams A

Chair: ***Edward Dundon - Dominion Energy - Millstone Power Station***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Brian Wodka - RMF Engineering***

The Impact of Wind Exposure on Power Plant Cold Weather Readiness in Winter Storm Elliot

Technical Paper Publication: POWER2024-136925

David Moelling - *Tetra Engineering Group, Inc.*

Early Femiana - *Tetra Engineering Group, Inc.*

Stanley Zheng - *Tetra Engineering Group Inc.*

Control Strategy Optimization for Electrostatic Precipitator System of Coal-Fired Power Plant Integrated With the Waste Heat Recovery System During Load Cycling Dynamic Processes

Technical Paper Publication: POWER2024-137324

Wei Gao - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Yongliang Zhao - *Xi'an Jiaotong University*

Chaoyang Wang - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Research on Multi-Parameter Collaborative Operation Optimization of Bypass Flue Gas Waste Heat Recovery System of 1000MW Coal-Fired Unit

Technical Paper Publication: POWER2024-137798

Xun Chen - *State Grid Hunan Electric Power Co., Ltd. Research Institute*

Youlin Feng - *Xi'an Thermal Power Research Institute Co., Ltd.*

Ke Zhou - *Xi'an Thermal Power Research Institute Co., Ltd.*

Guangming Zhu - *State Grid Hunan Electric Power Co., Ltd. Research Institute*

Ming Liu - *Xi'an Jiaotong University*

Shu Xu - *Hunan Xiangdian Experimental Research Institute Co., Ltd.*

Mengjie Li - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Performance Assessment of Waste Coal and Torrefied Pine Biomass Co-Fired Power Plants With Carbon Capture and Storage Technologies

Technical Paper Publication: POWER2024-137895

Prakash Bhoi - *Georgia Southern University*

Olanrewaju Gbadamosi-Olatunde - *Georgia Southern University*

Surja Sarkar - *Georgia Southern University*

Root Cause Analysis of the Catastrophic Failure of a Propylene Recycle Compressor

Technical Paper Publication: POWER2024-138379

Kamorudeen Abidogun - *Saudi Aramco*

5.3 Steam Turbines, Generators, and Auxiliaries

9/16/2024
1:00PM–2:30PM - Mount Vernon A

Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Davi Jose Ferreira Squaiella - Black & Veatch***

Operational Flexibility and Thermodynamic Performances of a Combined Heat and Power Plant Integrated With Carbon Capture System

Technical Paper Publication: POWER2024-137330

Xingyan Liu - *Xi'an Jiaotong University*

Yue Fu - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Zhu Wang - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

A Comprehensive Introduction of the World First Elevated and Conventional Turbine-Generators Layout Design Double-Reheat Coal-Fired Power Unit

Technical Paper Publication: POWER2024-137768

Weizhong Feng - *Shanghai Shenergy Power Technology Co., Ltd.*

Li Li - *Shanghai Shenergy Power Technology Co., Ltd.*

Jiancheng Zhang - *Shanghai Shenergy Power Technology Co., Ltd.*

Yan Cao - *Shanghai Shenergy Power Technology Co., Ltd.*

Dynamic Modeling and Frequency Regulation Performance Evaluation of a Combined Heat and Power Unit Supplying Industrial Steam

Technical Paper Publication: POWER2024-138406

Yongsheng Xiong *- Xi'an Jiaotong University*

Na Wang *- Shaangu Group*

Ming Liu *- Xi'an Jiaotong University*

Junjie Yan *- Xi'an Jiaotong University*

Steam Turbine Modernization Options for Combined Cycle Power Plants-Addressing Industry Challenges

Technical Paper Publication: POWER2024-138887

Michael Smiarowski *- Siemens Energy Inc.*

6.2 Student Competition

9/16/2024
1:00PM–2:30PM - Montpelier B

Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Investigation of Propane Micro-Scale Thermal Partial Oxidation for Syngas Production

Technical Paper Publication: POWER2024-137738

Guthrie Demers *- Arizona State University*

Ryan Milcarek *- Arizona State University*

Modeling of a Novel Elastohydrodynamic Seal for sCO2 Power Cycles With Experimental Verification

Technical Paper Publication: POWER2024-138553

Cole Hayne *- Georgia Southern University*

Ali Akbor Topu *- Georgia Southern University*

Mohammad Fuad Hassan *- Georgia Southern University*

George Sercer *- Georgia Southern University*

Hanping Xu *- Ultool, LLC*

Sevki Cesmeci *- Georgia Southern University*

Assessment of the Feasibility of District Heating Networks Crossing Multiple Cost Areas Using Profitability Maps

Technical Paper Publication: POWER2024-138792

Claudia F. Balan *- Mälardalens University*

Valentina Zaccaria *- Mälardalens University*

Konstantinos Kyprianidis *- Mälardalens University*

Amir Vadiee *- Mälardalens University*

Posters

9/16/2024
5:00PM–7:00PM - Potomac

Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Efficient Water Recovery From Humid Flue Gases: Innovative Approaches and Technologies

Poster Presentation: POWER2024-137996

Eydhah Almatrafi *- King Abdulaziz University*

Improving Campus Sustainability Through Employing Hybrid Renewable Energy

Poster Presentation: POWER2024-149230

Navid Goudarzi *- Cleveland State University*

Are Self-Sustainable Communities Economically Viable? A Financial Analysis of Self-Sustainable Communities

Poster Presentation: POWER2024-151039

Pranava Manthena *- Middleton*

Gopal Singh *- Siemens Gamesa*

Aluminum-Air Batteries: Pioneering a New Frontier in Combating Global Energy Poverty

Poster Presentation: POWER2024-151040

Siddharth Mohan *- Middleton*

Pranava Manthena *- Middleton*

Poojitha Palaniswamy *- Middleton*

Sahasra Beerala *- Middleton*

Advik Aditya *- Middleton*

Gopal Singh *- Siemens Gamesa*

TUESDAY, 9/17/2024

3.2 Fuels, Combustion, and Material Handling II

9/17/2024
9:00AM–10:30AM - Adams A

Chair: ***Jeffrey Cobb – Sargent & Lundy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Amanda Kilby - Sargent & Lundy***

Temperature and Positioning Effects of Spent Fluid Catalytic Cracking Catalyst in the Reactor on Pyrolysis of Polyethylene Terephthalate

Technical Paper Publication: POWER2024-138163

Fatih Aktaş *- Gazi University*

Kiran G. Burra *- University of Maryland*

Athi-enkosi Mavukwana *- University of South Africa*

Ashwani K. Gupta *- University of Maryland*

Polyethylene Terephthalate Gasification Using CO2: Impact of SFCC Catalyst Contact Mode and Amount

Technical Paper Publication: POWER2024-138167

Fatih Aktaş *- Gazi University*

Kiran G. Burra *- University of Maryland*

Ashwani K. Gupta *- University of Maryland*

Investigation of NOx Generation and Ammonia Fuel Utilization in a Solid Oxide Fuel Cell

Technical Paper Publication: POWER2024-138521

Cole Wilhelm *- Syracuse University*

Aliza Willsey *- Syracuse University*

Jeongmin Ahn *- Syracuse University*

Comparison of Ceramic Electrolyte Materials in Solid Oxide Fuel Cells for Emission Reduction

Technical Paper Publication: POWER2024-138529

Aliza M. Willsey - *Syracuse University*

Thomas S. Welles - *Syracuse University*

Jeongmin Ahn - *Syracuse University*

4.2 Experimental and Computational Fluid Dynamics and Thermal Hydraulics and Data Analytics

9/17/2024
9:00AM–10:30AM - Montpelier B

Chair: ***Donna Post Guillen - Idaho National Laboratory***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***George Mesina - Idaho National Laboratory***

Regression Orthogonal Analysis of Underground Coal Gasification Products

Technical Paper Publication: POWER2024-134767

Shuxia Yuan - *Xi'an Shiyou University*

Yi Wang - *Xi'an Shiyou University*

Jiafeng Zhang - *Xi'an Shiyou University*

Song Wu - *Xi'an Shiyou University*

Experimental Investigation of Leakage From Cracked Thin-Walled Tubes

Technical Paper Publication: POWER2024-137746

Jovica Riznic - *Canadian Nuclear Safety Commission*

On the Numerical Efficacy Evaluation of Industrial Droplet Separators

Technical Paper Publication: POWER2024-138858

Jan Dudaško - *Technische Universität Wien*

Bernhard Semlitsch - *Technische Universität Wien*

Characterization of Rising Bubbles in Silicone Oil: Validating CFD With Experiments

Technical Presentation Only: POWER2024-137678

Donna Guillen - *Idaho National Laboratory*

Carson Noack - *Idaho National Laboratory*

Jeremy Sharapov - *Idaho National Laboratory*

Emily Nienhuis - *Pacific Northwest National Laboratory*

Tongan Jin - *Pacific Northwest National Laboratory*

5.2 Power Plant Heat Exchangers & Cooling Technologies

9/17/2024
9:00AM–10:30AM - Hamilton B

Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Identification of Control State Changes in a Power Plant Desuperheater System via Transfer Functions and Gaussian Process Modeling

Technical Paper Publication: POWER2024-138094

Claudemi Nascimento - *West Virginia University*

Victor Alves - *West Virginia University*

Nor Farida Harun - *U.S. Department of Energy*

Nana Zhou - *U.S. Department of Energy*

Kenneth M. Bryden - *Ames Laboratory*

Lawrence J. Shadle - *U.S. Department of Energy*

David Tucker - *U.S. Department of Energy*

Fernando V. Lima - *West Virginia University*

Root Cause Analysis of the Catastrophic Failure of a Propylene Recycle Compressor

Technical Paper Publication: POWER2024-138379

Kamorudeen Abidogun - *Saudi Aramco*

Risk Assessment of Fukushima Daiichi Unit 1 Reactor Collapse

Technical Presentation Only: POWER2024-139456

Haruo Morishige - *Fukushima Nuclear Accident Countermeasures Review Group*

5.3 Steam Turbines, Generators, and Auxiliaries

9/16/2024
1:00PM–2:30PM - Mount Vernon A

Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Davi Jose Ferreira Squaiella - Black & Veatch***

Operational Flexibility and Thermodynamic Performances of a Combined Heat and Power Plant Integrated With Carbon Capture System

Technical Paper Publication: POWER2024-137330

Xingyan Liu - *Xi'an Jiaotong University*

Yue Fu - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Zhu Wang - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

A Comprehensive Introduction of the World First Elevated and Conventional Turbine-Generators Layout Design Double-Reheat Coal-Fired Power Unit

Technical Paper Publication: POWER2024-137768

Weizhong Feng - *Shanghai Shenergy Power Technology Co., Ltd.*

Li Li - *Shanghai Shenergy Power Technology Co., Ltd.*

Jiancheng Zhang - *Shanghai Shenergy Power Technology Co., Ltd.*

Yan Cao - *Shanghai Shenergy Power Technology Co., Ltd.*

Root Cause Analysis of the Catastrophic Failure of a Propylene Recycle Compressor

Technical Paper Publication: POWER2024-138379

Kamorudeen Abidogun - *Saudi Aramco*

5.3 Steam Turbines, Generators, and Auxiliaries

9/16/2024
1:00PM–2:30PM - Mount Vernon A

Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Davi Jose Ferreira Squaiella - Black & Veatch***

Operational Flexibility and Thermodynamic Performances of a Combined Heat and Power Plant Integrated With Carbon Capture System

Technical Paper Publication: POWER2024-137330

Xingyan Liu - *Xi'an Jiaotong University*

Yue Fu - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Zhu Wang - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

A Comprehensive Introduction of the World First Elevated and Conventional Turbine-Generators Layout Design Double-Reheat Coal-Fired Power Unit

Technical Paper Publication: POWER2024-137768

Weizhong Feng - *Shanghai Shenergy Power Technology Co., Ltd.*

Li Li - *Shanghai Shenergy Power Technology Co., Ltd.*

Jiancheng Zhang - *Shanghai Shenergy Power Technology Co., Ltd.*

Yan Cao - *Shanghai Shenergy Power Technology Co., Ltd.*

Dynamic Modeling and Frequency Regulation Performance Evaluation of a Combined Heat and Power Unit Supplying Industrial Steam

Technical Paper Publication: POWER2024-138406

Yongsheng Xiong *- Xi'an Jiaotong University*

Na Wang *- Shaangu Group*

Ming Liu *- Xi'an Jiaotong University*

Junjie Yan *- Xi'an Jiaotong University*

Steam Turbine Modernization Options for Combined Cycle Power Plants-Addressing Industry Challenges

Technical Paper Publication: POWER2024-138887

Michael Smiarowski *- Siemens Energy Inc.*

6.2 Student Competition

9/16/2024
1:00PM–2:30PM - Montpelier B

Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Investigation of Propane Micro-Scale Thermal Partial Oxidation for Syngas Production

Technical Paper Publication: POWER2024-137738

Guthrie Demers *- Arizona State University*

Ryan Milcarek *- Arizona State University*

Modeling of a Novel Elastohydrodynamic Seal for sCO2 Power Cycles With Experimental Verification

Technical Paper Publication: POWER2024-138553

Cole Hayne *- Georgia Southern University*

Ali Akbor Topu *- Georgia Southern University*

Mohammad Fuad Hassan *- Georgia Southern University*

George Sercer *- Georgia Southern University*

Hanping Xu *- Ultool, LLC*

Sevki Cesmeci *- Georgia Southern University*

Assessment of the Feasibility of District Heating Networks Crossing Multiple Cost Areas Using Profitability Maps

Technical Paper Publication: POWER2024-138792

Claudia F. Balan *- Mälardalens University*

Valentina Zaccaria *- Mälardalens University*

Konstantinos Kyprianidis *- Mälardalens University*

Amir Vadiee *- Mälardalens University*

Posters

9/16/2024
5:00PM–7:00PM - Potomac

Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Efficient Water Recovery From Humid Flue Gases: Innovative Approaches and Technologies

Poster Presentation: POWER2024-137996

Eydhah Almatrafi *- King Abdulaziz University*

Improving Campus Sustainability Through Employing Hybrid Renewable Energy

Poster Presentation: POWER2024-149230

Navid Goudarzi *- Cleveland State University*

Are Self-Sustainable Communities Economically Viable? A Financial Analysis of Self-Sustainable Communities

Poster Presentation: POWER2024-151039

Pranava Manthena *- Middleton*

Gopal Singh *- Siemens Gamesa*

Aluminum-Air Batteries: Pioneering a New Frontier in Combating Global Energy Poverty

Poster Presentation: POWER2024-151040

Siddharth Mohan *- Middleton*

Pranava Manthena *- Middleton*

Poojitha Palaniswamy *- Middleton*

Sahasra Beerala *- Middleton*

Advik Aditya *- Middleton*

Gopal Singh *- Siemens Gamesa*

TUESDAY, 9/17/2024

3.2 Fuels, Combustion, and Material Handling II

9/17/2024
9:00AM–10:30AM - Adams A

Chair: ***Jeffrey Cobb – Sargent & Lundy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Amanda Kilby - Sargent & Lundy***

Temperature and Positioning Effects of Spent Fluid Catalytic Cracking Catalyst in the Reactor on Pyrolysis of Polyethylene Terephthalate

Technical Paper Publication: POWER2024-138163

Fatih Aktaş *- Gazi University*

Kiran G. Burra *- University of Maryland*

Athi-enkosi Mavukwana *- University of South Africa*

Ashwani K. Gupta *- University of Maryland*

Polyethylene Terephthalate Gasification Using CO2: Impact of SFCC Catalyst Contact Mode and Amount

Technical Paper Publication: POWER2024-138167

Fatih Aktaş *- Gazi University*

Kiran G. Burra *- University of Maryland*

Ashwani K. Gupta *- University of Maryland*

Investigation of NOx Generation and Ammonia Fuel Utilization in a Solid Oxide Fuel Cell

Technical Paper Publication: POWER2024-138521

Cole Wilhelm *- Syracuse University*

Aliza Willsey *- Syracuse University*

Jeongmin Ahn *- Syracuse University*

Comparison of Ceramic Electrolyte Materials in Solid Oxide Fuel Cells for Emission Reduction

Technical Paper Publication: POWER2024-138529

Aliza M. Willsey - *Syracuse University*

Thomas S. Welles - *Syracuse University*

Jeongmin Ahn - *Syracuse University*

4.2 Experimental and Computational Fluid Dynamics and Thermal Hydraulics and Data Analytics

9/17/2024
9:00AM–10:30AM - Montpelier B

Chair: ***Donna Post Guillen - Idaho National Laboratory***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***George Mesina - Idaho National Laboratory***

Regression Orthogonal Analysis of Underground Coal Gasification Products

Technical Paper Publication: POWER2024-134767

Shuxia Yuan - *Xi'an Shiyou University*

Yi Wang - *Xi'an Shiyou University*

Jiafeng Zhang - *Xi'an Shiyou University*

Song Wu - *Xi'an Shiyou University*

Experimental Investigation of Leakage From Cracked Thin-Walled Tubes

Technical Paper Publication: POWER2024-137746

Jovica Riznic - *Canadian Nuclear Safety Commission*

On the Numerical Efficacy Evaluation of Industrial Droplet Separators

Technical Paper Publication: POWER2024-138858

Jan Dudaško - *Technische Universität Wien*

Bernhard Semlitsch - *Technische Universität Wien*

Characterization of Rising Bubbles in Silicone Oil: Validating CFD With Experiments

Technical Presentation Only: POWER2024-137678

Donna Guillen - *Idaho National Laboratory*

Carson Noack - *Idaho National Laboratory*

Jeremy Sharapov - *Idaho National Laboratory*

Emily Nienhuis - *Pacific Northwest National Laboratory*

Tongan Jin - *Pacific Northwest National Laboratory*

5.2 Power Plant Heat Exchangers & Cooling Technologies

9/17/2024
9:00AM–10:30AM - Hamilton B

Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Identification of Control State Changes in a Power Plant Desuperheater System via Transfer Functions and Gaussian Process Modeling

Technical Paper Publication: POWER2024-138094

Claudemi Nascimento - *West Virginia University*

Victor Alves - *West Virginia University*

Nor Farida Harun - *U.S. Department of Energy*

Nana Zhou - *U.S. Department of Energy*

Kenneth M. Bryden - *Ames Laboratory*

Lawrence J. Shadle - *U.S. Department of Energy*

David Tucker - *U.S. Department of Energy*

Fernando V. Lima - *West Virginia University*

Variable Speed Drive Overheating on a 1.8mw Condensate Extraction Pump System – Case Study

Technical Presentation Only: POWER2024-139921

Gugulethu Ngcobo - *Eskom Holdings SOC Ltd.*

Stress Analysis and Life Assessment of the Steam Turbine Rotor During Peak Shaving Transient Processes

Technical Paper Publication: POWER2024-134617

Mengyang Fan - *Xi'an Jiaotong University*

Yongliang Zhao - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Chaoyang Wang - *Xi'an Jiaotong University*

Zhu Wang - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Energy Storage

9/17/2024

9:00AM–10:30AM - Mount Vernon A

Chair: ***Mustafa Erguvan - The University of Alabama***

Co-Chair: ***Daniel Moreno - Missouri State University***

Impact of Efficiency Calculation Methods on the Adoption of Energy Storage Technologies

Technical Paper Publication: POWER2024-129802

Aanya Singh - *Council on Energy, Environment and Water*

Nedunchezhian Swaminathan - *University of Cambridge*

Dynamic Modeling and Performance Evaluation of Thermal Storage Tank With Packed Bed of Phase Change Capsules During Charging Processes

Technical Paper Publication: POWER2024-137338

Chang Wang - *Xi'an Jiaotong University*

Can Xu - *Xi'an Jiaotong University*

Ming Liu - *Xi'an Jiaotong University*

Junjie Yan - *Xi'an Jiaotong University*

Connecting Physical and Circuit-Based Li-Ion Battery Models Under a Large Range of Temperature Conditions

Technical Presentation Only: POWER2024-149201

Daniel Moreno - *Missouri State University*

Emily Rapp - *Missouri State University*

Jared Shortt - *Missouri State University*

Toxic Gas Emissions From Lithium-Ion Battery Thermal Runaway and Fire

Technical Presentation Only: POWER2024-149216

Rishi Roy *- Sandia National Laboratories*

Aluminum Air Batteries: Pioneering a New Frontier in Combating Global Energy Poverty

Technical Paper Publication: POWER2024-138862

Siddharth Mohan *- Middleton High School*

Pranava Manthena *- Middleton High School*

Poojitha Palaniswamy *- Middleton High School*

Sahasra Beerala *- Middleton High School*

Advik Aditya *- Middleton High School*

Gopal Singh *- University of Central Florida*

6.3 Student Competition

9/17/2024

9:00AM–10:30AM - Mount Vernon B

Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Fluid-Structure Interaction Modelling of the Regular Water-Waves Impact on a Flexible Beam

Technical Paper Publication: POWER2024-138848

Wajiha Rehman *- University of Leeds*

Tim Bunnik *- Maritime Research Institute Netherlands*

Multi-Fidelity Machine Learning Analysis of Wind Patterns Around High-Rise Buildings

Technical Paper Publication: POWER2024-138891

Javad Mortazavian *- Cleveland State University*

Navid Goudarzi *- Cleveland State University*

Effect of Non-Isothermal Conditions on Wind Patterns Near Isolated High-Rise Buildings

Technical Paper Publication: POWER2024-138900

Maede Najian *- Cleveland State University*

Shivesh Sharma *- Cleveland State University*

Navid Goudarzi *- Cleveland State University*

WEDNESDAY, 9/18/2024

1.4 Integrated Energy Systems & Micro-grids

9/18/2024
10:30AM–12:00PM - Adams A

Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Characteristics Analysis of Cargo Ship Propulsion System Based on Solid Oxide Fuel Cell-Gas Turbine in Yangtze River

Technical Paper Publication: POWER2024-137819

Xiaojing Lv *- Shanghai Jiao Tong University*

Xicong Mi *- Shanghai Jiao Tong University*

Jiale Wen *- Shanghai Jiao Tong University*

Ruikang Yan *- Shanghai Jiao Tong University*

Catalina Spataru *- University College London*

Yiwu Weng *- Shanghai Jiao Tong University*

Different Approaches for Hybridization Between Solid Oxide Fuel Cells and Internal Combustion Engines

Technical Paper Publication: POWER2024-138460

Ahmed G. Elkafas *- University of Genoa*

Massimo Rivarolo *- University of Genoa*

Luca Mantelli *- University of Genoa*

Stefano Barberis *- University of Genoa*

José Colón Rodríguez *- West Virginia University*

Nana Zhou *- U.S. Department of Energy, National Energy Technology Laboratory*

David Tucker *- U.S. Department of Energy, National Energy Technology Laboratory*

Efficient Low-Fidelity Design Tool for Turbine-Integrated Wave Rotor Combustor

Technical Paper Publication: POWER2024-138815

Mohammad Jamshidnejad - *Purdue University Indianapolis*

M. Razi Nalim - *Purdue University Indianapolis*

The Concept PATMI: A Breakthrough in High-Efficient Low-Emissions Thermo-Mechanical Power Generation, Leading to the Rapid Decarbonization of the Energy Sector

Technical Paper Publication: POWER2024-138816

Kamal P. Fernando - *Kalindha Rashmi LLC*

Danylo B. Oryshchyn - *National Energy Technology Laboratory*

David Tucker - *National Energy Technology Laboratory*

Cyber-Physical Simulation of the Cold Startup of Solid Oxide Fuel Cell – Gas Turbine (SOFC-GT) Hybrid Systems

Technical Presentation Only: POWER2024-149218

Nana Zhou - *National Energy Technology Laboratory/Leidos*

Nor Farida Harun - *National Energy Technology Laboratory/Leidos*

Biao Zhang - *National Energy Technology Laboratory/Leidos*

David Tucker - *National Energy Technology Laboratory*

2.2 Advanced Tools for Cyber-Physical Systems and Digital Twins II

9/18/2024
10:30AM–12:00PM - Mount Vernon B

Chair: ***Luca Mantelli - University of Genoa***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Potential and Techno-Economic Perspectives of the Hybrid Solid Oxide Semi-Closed Co2 Cycle (SOS-Co2) for High Efficiency Ultra Low Carbon Power Generation

Technical Presentation Only: POWER2024-149446

Stefano Campanari - *Politecnico di Milano*

Matteo Martinelli - *Politecnico di Milano*

Alessandro Donazzi - *Politecnico di Milano*

Emanuele Martelli - *Politecnico di Milano*

Cyber-Physical Simulation of an Innovative Solid Oxide Electrolysis Cell – Gas Turbine (SOEC-GT) Hybrid Energy System

Technical Presentation Only: POWER2024-133152

Biao Zhang *- National Energy Technology Laboratory*

Nor Farida Harun *- National Energy Technology Laboratory*

Nana Zhou *- National Energy Technology Laboratory*

Danylo Oryshchyn *- National Energy Technology Laboratory*

David Tucker *- National Energy Technology Laboratory*

Samuel Bayham *- National Energy Technology Laboratory*

Analysis of 50% Power Turndown in SOFC/GT Hybrid Systems: Dynamic Characterization of Operational Control States Through Transfer Functions

Technical Presentation Only: POWER2024-138802

Nor Farida Harun *- National Energy Technology Laboratory/Leidos*

Biao Zhang *- National Energy Technology Laboratory/Leidos*

Bernardo Restrepo *- Polytechnic University of Puerto Rico – Orlando Campus*

Nana Zhou *- National Energy Technology Laboratory/Leidos*

Samuel Bayham *- National Energy Technology Laboratory*

David Tucker *- National Energy Technology Laboratory*

Cyber-Physical System Based on Machine Learning Model in Unity Environment for Group Operated Turbomachinery System

Technical Presentation Only: POWER2024-148777

Yongbok Lee *- Korea Institute of Science and Technology*

Yunseok Ha *- Korea Institute of Science and Technology*

Jongyeong Kim *- Korea Institute of Science and Technology*

Soyeon Lee *- Korea Institute of Science and Technology*

Metroscope Digital Twin Technology for Diagnosing Concurrent Plant Faults: Insights From 70+ Power Plant Units, Cybersecurity Measures, and Ongoing Developments

Technical Presentation Only: POWER2024-149210

Giancarlo Lenci *- Metroscope Inc.*

Eric Helm *- Metroscope Inc.*

4.3 Plant Performance and Operations II - Risk Management, Cyber Security, and Safety

9/18/2024
10:30AM–12:00PM - Hamilton B

Chair: ***Edward Dundon - Dominion Energy - Millstone Power Station***

Co-Chair: ***Brian Wodka - RMF Engineering***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Innovations & Best Practices for Monitoring Pressure in Thermal Power Stations

Technical Presentation Only: POWER2024-137266

Ravi Jethra - WIKA

Asset Reliability & Performance Management

Technical Presentation Only: POWER2024-141055

The Operational Stability and Energy Efficiency of Coal-Fired Power Plant Under Ultra-Low Power Load Ratio: Feedwater Preheating System Issues

Technical Paper Publication: POWER2024-137432

Zeyu Du - Xi'an Jiaotong University

Ming Liu - Xi'an Jiaotong University

Junjie Yan - Xi'an Jiaotong University

3.3 Combustion Turbine Combined Cycles

9/18/2024
10:30AM–12:00PM - Montpelier B

Chair: ***Jeffrey Cobb – Sargent & Lundy***

Co-Chair: ***Andre Teixeira - EDP***

Co-Chair: ***Sarvenaz Sobhansarbandi - California State University, Sacramento***

Co-Chair: ***Michael Smiarowski - Siemens Energy Inc.***

Co-Chair: ***Biao Zhang - National Energy Technology Laboratory***

Co-Chair: ***Steve Radke - Siemens Energy***

Co-Chair: ***Farzan Kazemifar - San Jose State University***

Co-Chair: ***Andrew Rister - Duke Energy***

Co-Chair: ***Amanda Kilby - Sargent & Lundy***

Development of a Novel Thermodynamic Analytical Method for the Direct-Fired Supercritical Carbon Dioxide Cycle: Process Splitting Method

Technical Paper Publication: POWER2024-137870

Tuantuan Xin *- North China Electric Power University*

Wei Yang *- North China Electric Power University*

Yifei Zhang *- North China Electric Power University*

Hongyu Xu *- North China Electric Power University*

Cheng Xu *- North China Electric Power University*

Ammonia Cracking As Auxiliary System for Gas Turbine: Preliminary Studies

Technical Paper Publication: POWER2024-137878

Christian Romano *- Baker Hughes*

Daria Bellotti *- Università degli Studi di Genova*

Egidio Pucci *- Baker Hughes*

Ever Fadlun *- Baker Hughes*

Michele Roma *- Baker Hughes*

Sergio Ghezzi *- Baker Hughes*

Geremia Manferino *- Baker Hughes*

Chiara Anfosso *- Università degli studi di Genova*

Chiara Monacchini *- Università degli studi di Genova*

Experimental Study of Instabilities in Hydrogen-Air Fueled Rotating Detonation Combustion

Technical Paper Publication: POWER2024-138549

Justin M. Weber *- National Energy Technology Laboratory*

Kristyn B. Johnson May *- National Energy Technology Laboratory*

Don H. Ferguson *- National Energy Technology Laboratory*

Clint R. Bedick *- National Energy Technology Laboratory*

Peter A. Strakey *- National Energy Technology Laboratory*

Todd G. Sidwell *- National Energy Technology Laboratory*

Simulation and Analysis of the Semi-Closed Solid Oxide Co2 Cycle (SOSCo2) for High Efficiency Ultra Low Carbon Power Generation

Technical Paper Publication: POWER2024-140084

Matteo Martinelli *- Politecnico di Milano*

Stefano Campanari *- Politecnico di Milano*

Dario Montinaro *- SOLYDERA SpA*

Emanuele Martelli *- Politecnico di Milano*

EXHIBITS/SPONSORS

Visit the exhibits to discover new products and services from some of the industry's leading organizations. Coffee and tea will be served amongst the exhibits during the coffee breaks.

Dates & Times – Montpelier A

Monday, September 16 **9:00AM–5:00PM**

5:00PM–7:00PM ****At the opening reception**

Tuesday, September 17 **9:00AM–5:00PM**

Wednesday, September 18 **9:00AM–12:00PM**

Dominion Energy

More than 4.5 million customers in 13 states energize their homes and businesses with electricity or natural gas from Dominion Energy (NYSE: D), headquartered in Richmond, Va. The company is committed to providing reliable, affordable, and increasingly clean energy every day and to achieving Net Zero emissions by 2050.

Flyability

Flyability is a Swiss drone manufacturer with one goal in mind: no more humans doing dangerous jobs. Their drones are built to operate indoors, in complex and confined spaces. Our latest drone, the Elios 3, was launched in 2023 with 3 payloads: a radiation detection payload, a surveying payload, and the new UT payload.

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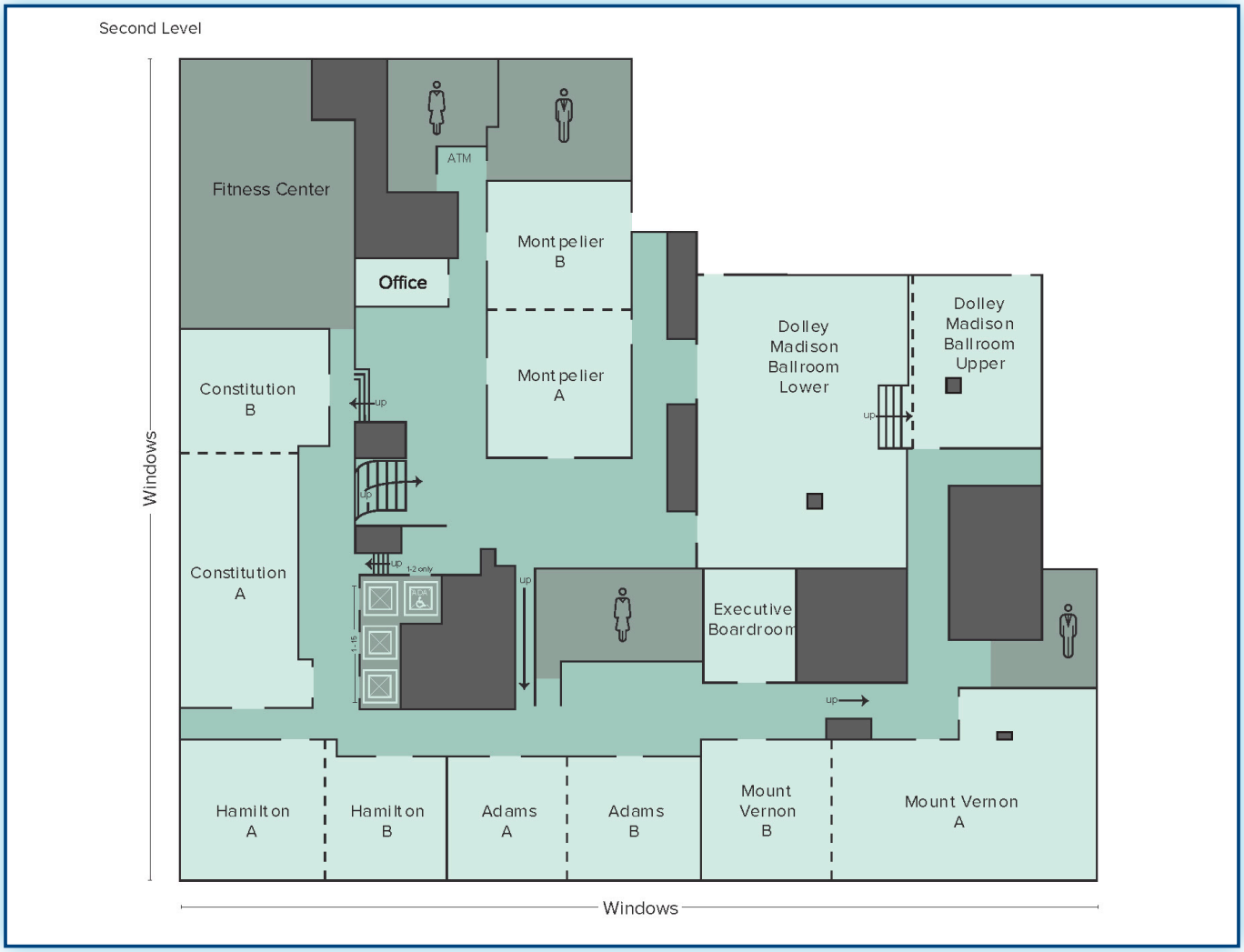
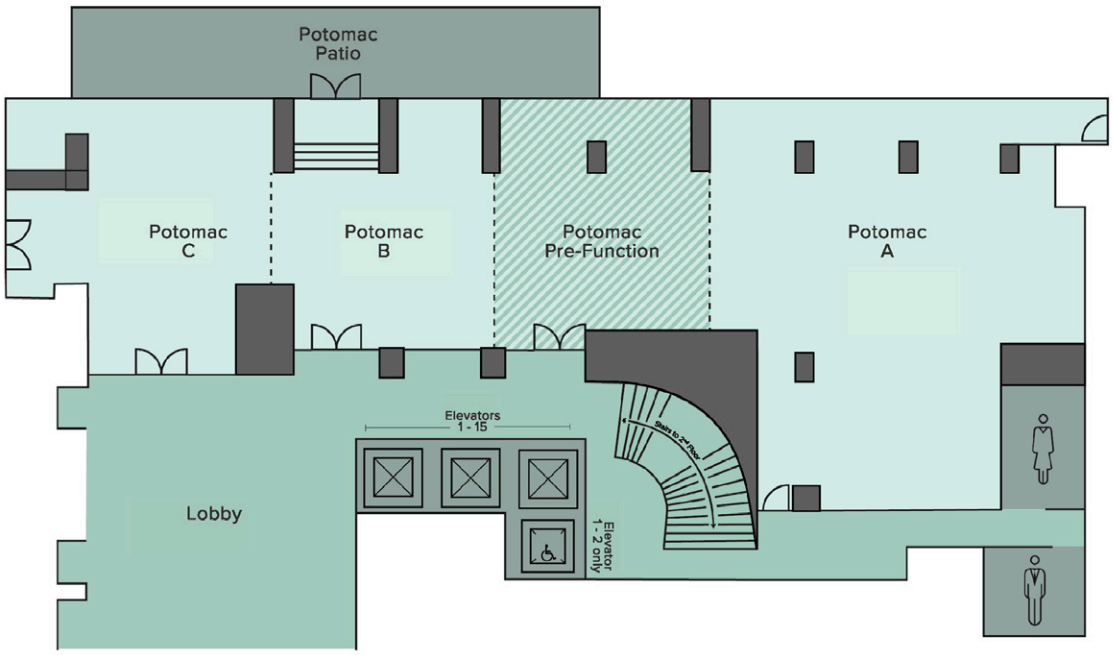


THE MADISON

POTOMAC



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September 2025

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