Welcome to the IEEE Tri-Cities

Tech Conference

August 5, 2022, 8 am

Kennewick, Washington

Join us for a day of high-tech conference talks on cutting edge engineering technologies. Find out about potential energy storage for the grid, wind energy, Data Integration for the Power Grid, Autonomous Mill of the future, Portable Solar generators, Communications in Power systems, Big Data, Green Hydrogen, Energy Industry Solutions, Types of Batteries for Data Centers, Solar Powered Planes, and Electric Power Systems for renewable Energy.

IEEE

IEEE Tri-Cities Tech Conference | Mike Brisbois | 708.668.5488 | mike.brisbois@ieee.org

IEEE Tri-Cities Tech Conference

7:30 am PDT Network Breakfast and registration check-in

7:45 am PDT IEEE Announcements, introduction of the Tri-Cities Consultants, Our Speakers and special guest

8:00 am PDT Kick off the IEEE Tri-Cities Tech Conference by our Mayor

8:10 am PDT Keynote Speaker

8:35 am PDT 'Green Hydrogen', Dennis Walters, Stars

9:00 am PDT 'Wind Energy', Program Manager at Pacific Northwest National Laboratory, Alicia Mahon, Ph.D., PMP

9:25 am PDT 'Benchmark datasets to support decarbonization of buildings', Dr. Vikas Chandan, Scientist, PNNL

9:50 am PDT 'Communications in Power Systems: An Overview', Alka Singh

10:15 am PDT 'GridAPPS-D: data integration for the power grid', Alexander Anderson, PhD, PNNL Research Engineer

10:40 am PDT Portable Solar Vehicle, Paul Shmotoloka, CEO New Use Energy

11:05 am PDT 'Autonomous Mill of the Future', Brad Carlberg

11:30 am PDT 'Potential battery energy storage for the Grid', Research Scientist at PNNL, Dr. Minyuan 'Miller' Li

11:55 am PDT Special presentation from Olympic Gold Medalist Ollan Cassell and IEEE prize Pack give away - LUNCH

12:25 pm PDT Electric Power Systems Renewable Energy', PNNL Fernando Bereta dos Reis

12:50 pm PDT 'AMI Value Realization, Unlocking the Promise of AMI', Shaun Rogers, Trynzic

1:15 pm PDT 'Big Data', Marcelo Guerra Hahn, Engineering Director

1:40 pm PDT 'Types of Batteries for Data Centers', Jeff Bruce, Microsoft Engineer

2:05 pm PDT Solar Powered Planes

2:30 pm PDT Hydrogen Fuel Locomotives

2:55 pm PDT Ammonia Fuel Cells

3:20 pm PDT Smart Buildings

3:45 pm PDT Autonomous Vehicles

4:10 pm PDT Blue Origin Space Family Vacation

4:35 pm PDT Fire Protection, Thomas Kraft, Sr. Fire Protection

5:00 pm PDT Special Guest performance, Salute to our Speakers Consultants

5:10 pm PDT Roof Top Social - 1 drink coupon in registration pack

Register at:
https://events.vtools.ieee.org/m/317852

8:35 am PDT 'Green Hydrogen', Dennis Walters, Stars

Dennis Walters

Abstract: **Green Hydrogen**

The fundamental paradox of what comes first, the demand for hydrogen or the hydrogen infrastructure has been resolved. Low-cost, clean hydrogen can be produced where it is needed by using the natural gas grid and electrical grid. Now, natural gas and electrical utilities, fleet operators, wastewater treatment facilities, food waste digester installations, and others can reduce carbon intensity, and produce valuable hydrogen on site.

Bio

Dennis Walters is Chief of Staff, at STARS Technology, a startup company in Richland, WA that is commercializing microchannel based, steam methane reforming, hydrogen generator. He has over 40 years of electrical engineering, technical and organizational management experience. His background includes a broad spectrum of managerial and technical positions. Mr. Walters has applied his electrical engineering, project management, modeling, cost estimating and written communication skills to support a wide variety of projects.

9:00 am PDT 'Wind Energy', Program Manager at Pacific Northwest National Laboratory, Alicia Mahon, Ph.D., PMP

Topic:

Dr. Alicia Mahon, PNNL's wind energy program manager, as she discusses PNNL's contributions to wind energy research. PNNL partners with DOE's Wind Energy Technologies Office to meet its twofold mission: enable the innovations needed to advance the nation's wind energy systems and address wind energy market and deployment barriers, including siting and environmental impacts for offshore and land-based wind power. To meet this mission, PNNL's research focuses on key areas including wind resource characterization, environmental monitoring and wind-wildlife impacts, grid integration and transmission, data management, and distributed wind.

Alicia Mahon, Ph D, PMP at PNNL

Alicia M. Mahon, Ph.D., PMP serves as the Laboratory's Wind Energy Program Manager and Offshore Wind and Ocean Dynamics Team Lead in the Coastal Sciences Division at Pacific Northwest National Laboratory. Dr. Mahon manages an offshore renewable energy portfolio of approximately $12M annually, which includes several complex, high-risk projects, international subcontracts, and significant stakeholder outreach and engagement efforts. Dr. Mahon serves as the program manager for the Department of Energy Lidar Buoy Program, overseeing the management and deployment of two lidar buoys for the collection of offshore wind resource characterization data to support the U.S. offshore wind industry. Dr. Mahon also leads several international efforts that facilitate knowledge sharing and access to the state of the science regarding the potential environmental impacts of offshore wind energy. Dr. Mahon is a certified Project Management Professional (PMP) with a proven track record of expert delivery that is supported by successfully managing and mitigating several risks, managing large, collaborative teams, and routinely engaging stakeholders for improved project performance. Dr. Mahon serves as the editor of the Marine Technology Society Journal.

https://www.linkedin.com/in/aliciamahon/

9:25 am PDT 'Benchmark datasets to support decarbonization of buildings', Dr. Vikas Chandan, Scientist, PNNL

Title: Benchmark datasets to support decarbonization of buildings

Abstract: The lack of well documented, high-resolution datasets from real buildings has been a major barrier in the field of building science. It limits capabilities to support the development of analysis and control frameworks to address goals such as decarbonization. Instrumentation efforts to address this gap are quite resource intensive. This talk presents an ongoing four National Lab collaborative effort funded by the U.S. Department of Energy called *Benchmark Datasets for Buildings* that seeks to address this need through collecting, curating, and making publicly available high-resolution data from a small number of buildings that have broad applicability to support several high-impact use cases, and developing a suite of data management tools to design, describe, and archive building data in a standardized manner for maximum impact.

Bio: Dr. Vikas Chandan is a Scientist and Team Leader in the Optimization and Control Group within the Energy and Environment Directorate at the U.S. Department of Energy's Pacific Northwest National Laboratory (PNNL) since 2016. His research specializes in the application of modeling, control, and optimization to the area of energy systems, in particular building systems. He is also actively involved in projects related to modeling and control of buildings to support grid interaction and transactive goals, Physics informed Machine Learning for Buildings, and demonstration of value provided by Machine Learning for buildings. Previously, he was a Scientist at IBM Research from 2013 to 2016. He received his M.S. and Ph.D. degrees from the University of Illinois at Urbana-Champaign in 2010 and 2013 respectively.

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9:50 am PDT 'Communications in Power Systems: An Overview', Alka Singh

Communications in Power Systems

The modern electrical grid is a complex and dynamic system that increasingly relies on data for functions such as, situational awareness, distributed energy resource management, and locating and isolating faults to maintain reliable and safe operation. Power system communications is an integral part of the operation of a modern electric grid. Often the data from distributed data sources needs to be delivered to value enabling applications within a framework of constraints. In this presentation, I will provide an overview of the field of power system communications throughout the value chain. This includes the delivered value, existing technologies, challenges, and opportunities. Further, I will provide examples of research at PNNL aimed at addressing these challenges.

Alka Singh

Bio

Power Systems Research Engineer at Pacific Northwest National Laboratory -PNNL. Alka Singh is a Power System Research Engineer in Distributed Systems Group at Pacific Northwest National Laboratory (PNNL). Her research includes Advanced Distribution Management Systems, grid resiliency, grid interoperability and power systems. She joined the lab in October 2018. She is an experienced professional, with 4 years of experience in the software and IT industry. She received her master's from Washington State University, Tri-Cities in Electrical Engineering and Bachelors in Electronics and Telecommunications Engineering. She is currently serving as Chair of IEEE Women in Engineering Chapter ,Richland section. She is actively involved in several STEM activities at the local, national, and international level.

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10:15 am PDT 'GridAPPS-D: data integration for the power grid', Alexander Anderson, PhD, PNNL Research Engineer

GridAPPS-D: Data Integration for the Power Grid

The electric grid is being reshaped rapidly by decarbonization efforts, smart grid technology adoption, and projects to improve the reliability, resiliency, and robustness of both the bulk electric power system and distribution networks. Each year brings significant increases in the number of distributed energy resources, electric vehicles, controllable customer assets, power electronics, and intelligent grid-edge devices. Integration of these new devices and associated operational paradigms are driving the need for more streamlined data integration workflows and data exchange between advanced applications and between utilities. GridAPPS-D is an open-source platform developed by a team led by Pacific Northwest National Laboratory (PNNL) to accelerate the development and

Alexander Anderson, Ph D

deployment of portable applications for advanced distribution management systems. It is also the first platform for energy and distribution management systems that is designed with open standards for data integration.
This session will discuss some of the challenges data integration and how open-source tools based on accepted standards can accelerate the transition to a decarbonized future.

Bio
Dr. Alexander Anderson is a power systems research engineer in the Distributed Systems Group at PNNL. His research focuses on power systems operations, advanced power applications, next-generation energy management systems, defense against cyber-physical threats, microgrid optimization, and human factors in control room environments. Alexander has coordinated software integration, testing, and training for multiple power system simulators and applications. He is currently 2022 IEEE Region 6 Humanitarian Activities Chair and IEEE PES HAC Partnerships chair. Prior to that, he served for three years as chair of partner engagement for IEEE Smart Village which distributed nearly $2M of grant funding annually for creation of new electric utilities in Africa and SE Asia. Alexander holds a PhD in systems engineering from Colorado State University, professional science master's degree in power systems engineering from Washington State University, and a BS degree in Mechanical Engineering from Saint Martin's University.

Grid Architecture Team, Pacific Northwest National Laboratory
Partnerships Chair, IEEE PES Humanitarian Activities Committee
Events Chair, IEEE PES Entrepreneurship Committee
Past Chair, IEEE Smart Village Partner Engagement

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10:40 am PDT Portable Solar Vehicle, Paul Shmotoloka, CEO New Use Energy

Paul Shmotolokha

Progress of Highly Mobile Alternatives

This presentation will show the progress of highly mobile alternatives to using portable fossil fuel generators in disaster or humanitarian relief efforts to provide critical power when the grid is down or where it does not exist. First, I will examine the use cases and dynamics of where power is commonly needed citing disaster relief and medium-term support after Hurricane Ida. We will then examine humanitarian assistance examples in Ukraine supporting both internal and international refugees as well as communications, medical, municipal and relief organizations. From a technology perspective, it will focus on safe and energy dense Lithium-Ion batteries, generation options with a focus on lightweight solar, refrigeration, weatherization, power conversion, and ability to scale towards larger longer lasting microgrids. The difference between portability and mobility, Cost models, Speed of deployment, re-use and Logistics lessons will be covered.

Bio

Co-Founder of New Use Energy, Paul Shmotolokha currently serves as Chairman and CEO of the company which aims to replace fossil fuel portable generators with clean energy solutions. Paul led the international business of Power Solutions provider Alpha Technologies from 2003 through 2019, eventually holding the title of Senior Vice-President International Operations and Government Relations. During that time, Paul also served as Chairman of the Board of Cgates, the leading broadband operator in Lithuania. Paul also founded Coppervale Enterprises in 2008 which for over 10 years pioneered Sustainability and energy efficiency strategies in the Broadband industry. Prior to 2003, Paul held executive positions at Encore International in Beijing, China, and in Europe at Metromedia International Telecommunications and Multichoice. Paul currently serves on the US Chamber of Commerce Small Business Council and the Board of Directors of the US Philippines Society. Paul served as an officer for 13 years in the US Army Reserves and was nominated in 2019 by the President of the United States to serve as Vice-Chairman of the Export Import Bank of the United States. Paul graduated Magna Cum Laude with a Bachelor of Science in Foreign Service from Georgetown University. Additionally, Paul performed graduate work International Relations at the Institute for International Studies at the Universidad de Chile as well as executive business studies at London Business School and Dartmouth College. Paul speaks fluent Ukrainian, Russian and Spanish and is an avid tennis player having reached the national 50 and over tournament.

https://www.linkedin.com/in/paul-shmotolokha-615130/

11:05 am PDT 'Autonomous Mill of the Future', Brad Carlberg

Brad Carlberg

Autonomous Mill of the Future

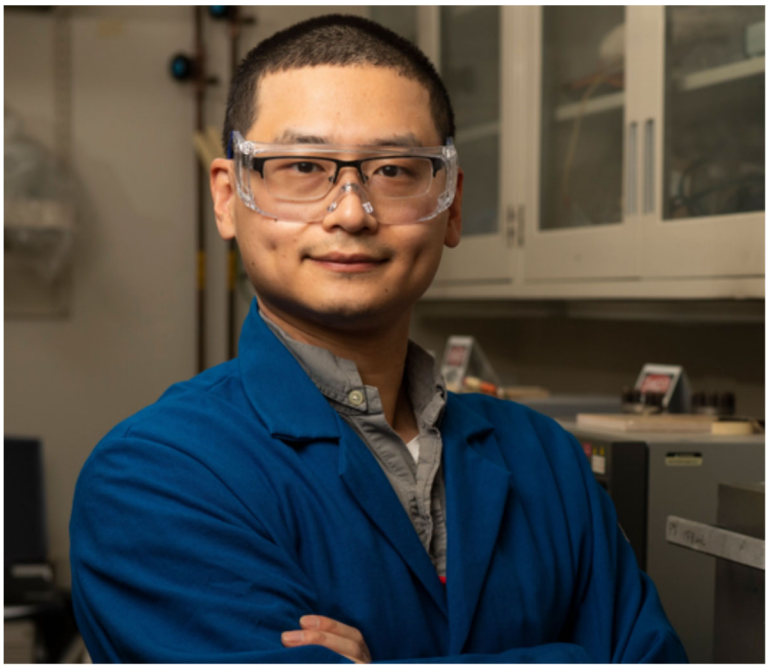
As a mill that benefits from the use of Digital Twins utilizing a Process Model coupled with a Control Model of the real-time Control System to allow the Autonomous Mill to "run itself" with little or no human intervention. This talk will then give an overview of the unit operations and equipment common to pulp and paper mills and conclude with several examples of specific opportunities where control systems optimization through Advanced Process Control (APC) and Model-Based Predictive Control (MPC) can increase production; reduce costs, and autonomously operate the mill of the future. The pulp and paper mill are often divided into six main "islands" of automation: raw material receiving and preparation (the woodyard), the pulp mill, the powerhouse, the paper mill, converting and finishing, and effluent treatment. Each of these islands presents their own, unique set of unit operations; but perhaps not surprisingly, you can see similar unit operations in various industries besides pulp and paper. For example, the powerhouse equipment, besides the main difference being that the fuel is "black liquor", the equipment can be found in any other industrial power plant. In the paper machine "island", the use of cascaded variable-speed drives to control the paper sheet tension is also seen in the draw line of a steel, textile, or fiber mill. And, as a final example, the effluent treatment facility of the paper mill has many of the same equipment you will find in a municipal water/wastewater plant. Several examples of specific control systems optimization included for each of these "islands" include chemical savings in the lime kiln and causticizing, pulping, screening and refining, washing, and bleaching processes of the pulp mill; energy savings in recovery boiler soot blowing and the lime kiln, pulp stock preparation including cleaning and refining and the paper pressing and drying sections of the paper mill; and the environmental savings involved in effluent treatment and recycling water. Lessons learned: 1. What is an Autonomous Mill? 2. What is a Digital Twin? 3. Understand the equipment and the processes in a pulp and paper mill 4. Understand the similarities to other industries 5. Understand specific areas where control system optimization can decrease costs and/or increase production as to how they see autonomous or some autonomous industrial facilities in general.

Bio

Brad. S. Carlberg, P.E. received his Bachelor of Science in Mechanical Engineering in February, 1984 from Washington State University in Pullman, Washington and is a Registered, Professional Control Systems Engineer with over thirty - eight years' experience in Process Engineering and Process Control Engineering specifically with Distributed Control Systems and Programmable Logic Controllers combining extensive experience with both Hardware and Software Design, Programming, Implementation and Startup, including Advanced Continuous and Batch Control Programming; designing, implementing, and commissioning brownfield & greenfield DCS and Advanced Control (APC) automation projects throughout North America, Hong Kong, The UAE, and South Korea in twenty-five pulp and paper mills and twenty-two other Industrial facilities.

https://www.linkedin.com/in/brad-carlberg-b4bb31a/

11:30 am PDT 'Potential battery energy storage for the Grid', Research Scientist at PNNL, Dr. Minyuan 'Miller' Li



Dr. Minyuan 'Miller' Li

Advanced battery technologies for long duration energy storage applications potential battery energy storage for the grid

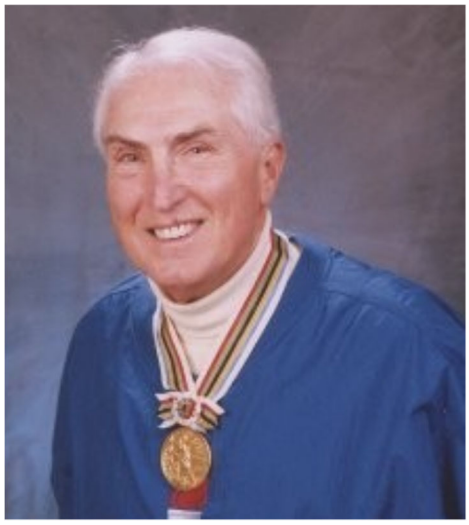
Energy storage system (ESS) with low-cost, long-duration capabilities is critical for growing renewable energy sources such as solar and wind. The cost of renewable energy generation has been steadily declining in recent years, and there is an urgent need for appropriate energy storage technologies to pair renewable energy sources to effectively replace traditional fossil energy generation. Although lithium-ion batteries (LIBs) have generally dominated transportation (EV), consumer electronics (portable devices) over the past few decades, the high inherent materials cost and fire-related safety concern of LIBs hinder its large-scale applications in ESS market. To achieve rapid decarbonization goal and reduce the impact of global climate change, there is a strong drive for battery research beyond current LIB chemistry. In this talk, advanced battery technologies that use earth-abundant low-cost materials and enable long-duration/long cycle life will be discussed.

Bio

Dr. Minyuan Miller Li is a postdoctoral associate in the Battery Materials & Systems Group at PNNL. His research interests include inorganic syntheses, nanomaterials, and electrochemistry. He is currently developing new battery systems for long-duration and seasonal energy storage applications to support grid resiliency.

https://www.linkedin.com/in/minyuanli/

11:55 am PDT Special presentation from Olympic Gold Medalist Ollan Cassell and IEEE prize pack give away LUNCH



USA Gold Medalist in the 4x400 relay 1964

Ollan Cassell

Bio

I served as Executive Director of AAU/USTF/TAC for 27 years after being AAU"s Track and Field Administer for 5 years, during this time, also, elected to IAAF council and Vice President for 23 years. Spear headed the change of Olympic and International Federations rule from pure amateurism to fully professionals to represent their country's Olympic Teams. Saw drug testing go from no testing to out of competition testing. Saw prize money go from under-the-table to the top of the table with trust funds. Responsible for negotiating 15 sports contracts, during the cold war , with Soviet Union. Established television, marketing and Gran Prix series of track and field event on a global basis. Have published a book with details of how these changes happened="INSIDE THE FIVE RING CIRCUS" . May be obtained directly from me for $15.00 including postage. Make contact by messenger platform.

12:25 pm PDT Electric Power Systems Renewable Energy', PNNL Fernando Bereta dos Reis

Fernando Bereta dos Reis

Power System Resilience

Designing a resilient power system has become imperative in the face of the increasing intensity and frequency of intense weather conditions and extreme events. Every element of the power system, such as transmission and distribution support structures, transmission and distribution conductors, substations equipment, centralized and distributed generators of all types, and loads are affected by the local climate conditions. There are two main impacts on the power system assets under strenuous climate conditions. 1) Quantifying the change in operational capabilities, and 2) probability of permanent damage (i.e., probability of failure). They must be seen differently given one performs a temporary change to power system equipment while the other requires access to needed components and a specialized maintenance crew to perform the repairs. Discusses examples in the transmission systems, wind turbines, and building standers. Importance of quantifying the probability of failure of transmission towers. Presenting the published work on "Methodology to Calibrate Fragility Curves Using Limited Real-World Data".

Bio:
Fernando Bereta dos Reis has been a Research Electrical Engineer with Pacific Northwest National Laboratory since 2019. Fernando is currently the vice-chair for IEEE Young Professionals. Fernando completed his Ph.D. work at South Dakota State University in 2020, M.S. work at the Federal University of Santa Catarina in 2016, and B.S. at Pontifical Catholic University of Rio Grande do Sul. Fernando is interested in power system modeling & analysis (e.g., load, transmission & distribution systems, asset fragility, grid resilience, markets, and batteries), transactive energy systems, large-scale simulations, multi-agent systems, and state estimation.

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12:50 pm PDT 'AMI Value Realization, Unlocking the Promise of AMI', Shaun Rogers, Trynzic

Shaun T. Rogers

AMI Value Realization, Unlocking the Promise of AMI

The lack of real-time, high-fidelity observability in the low voltage grid has been the consequence of technology limits of the age, leaving hard and soft value on the table for distribution utilities. The introduction of Advanced Metering Infrastructure (AMI) opened the way towards capturing this value for stakeholders. AMI is a large, high-profile investment, and the path to implementation is often through an application process rooted in a rate case, an AMI Proposal, or a portion of a broader Grid Modernization proposal. This initiative has proven to have low success rates of transformation, as low as 30% adoption per leading research firms. There is a purposeful way in unlocking this value through digital transformation efforts that are rooted in higher success rates through Trynzic's Sense, Triage, and Act model via the GridOps platform. This value realization chain will be shared within a short presentation of Trynzic's next gen solution starting from the As-Is mindset to the future state of Utility Grid Operations.

Bio

Shaun Rogers has led an impressive career as a sales and operation professional in his 15 years working within the technology space in numerous verticals such as fintech, construction, utilities and as a business owner. Serving as the Regional Director at Trynzic, Shaun plays a major role in the go-to-market strategy of Trynzic's flagship product, GridOps. Through his commitment to this role, he continues to help Trynzic reach a broader audience by introducing the awesome power of AMI data and educating the utilities space in how to leverage the technology to their benefit. He has a Bachelor of Science, Business Administration & Healthcare Management from Colorado State University. In his spare time, he is an avid outdoorsman in Colorado, and travels the world with his wife and two dogs.

https://www.linkedin.com/in/shauntyler/

1:15 pm PDT ‘Big Data’, Marcelo Guerra Hahn, Engineering Director

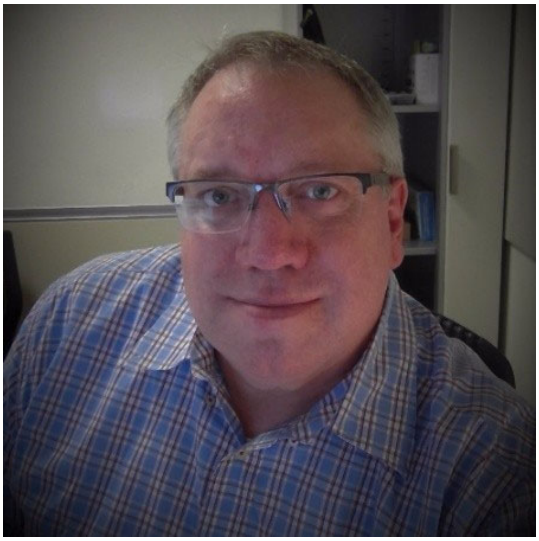
Big Data

Marcelo Guerra Hahn

Bio
Helping people see and understand their data, students enjoy Computer/Data Science, and leaving this world a little better than I found it.

https://www.linkedin.com/in/marceloguerrahahn/

1:40 pm PDT 'Types of Batteries for Data Centers', Jeff Bruce, Microsoft Engineer



Data Center Batteries. Which type is the best for the application?

Jeff Bruce

Director Battery Technologies

Microsoft

Jeff is the Director of Battery Technologies at Microsoft. He is responsible for battery development in Microsoft's varied product lines. Prior to joining Microsoft Jeff worked in various battery manufacturers and Energy Storage System Integrators. Jeff has worked with almost every electro-chemical storage medium available today. From the many faces of Lithium Ion, Lead Acid, Molten Salts, and Aqueous Alkaline and Halide salts. Jeff holds a BSEE from Washington State University, MSEE from University of Idaho. He has published numerous papers in journals and conferences and holds over 45+ patents.

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Host and Moderator

Bio

Mr. Brisbois is an Electrical Engineer with design experience, project management and leadership skills. He has worked in the building, space, and technology sectors. He has hosted and presented at many technical sessions and conferences. He is a technical competent leader and able to get things done. Mr. Brisbois has his Professional Engineering license in the State of Washington, Texas, Illinois, California, and Missouri. His focus is on leading sustainable energy projects. He is a board member on several technical organizations.

https://www.linkedin.com/in/mike-brisbois-pe-2b79207/

We salute all our consultants:

- Michael Brisbois
- Brian Galonek
- Wendi Walsh
- Blaine Millet
- Sayonsom Chanda
- Kirill Gritsenko
- Sean Zhou
- Bob Ke
- Bruce Yee
- Thomas Coughlin
- Tam Tran, PE
- Bob Williams
- Laith Oasir
- David Brighton
- Alex Gamble
- Wally Adamchik
- Kirshanmurthy Raghunandan
- Phillip Serna
- Dan Velando
- Shirly Shemesh
- Mark Mcgee Pasceri
- Marley Smith
- John Black
- Pamela Hamblin
- Dennis Garrett
- Joe Weiss
- Jerry Huber

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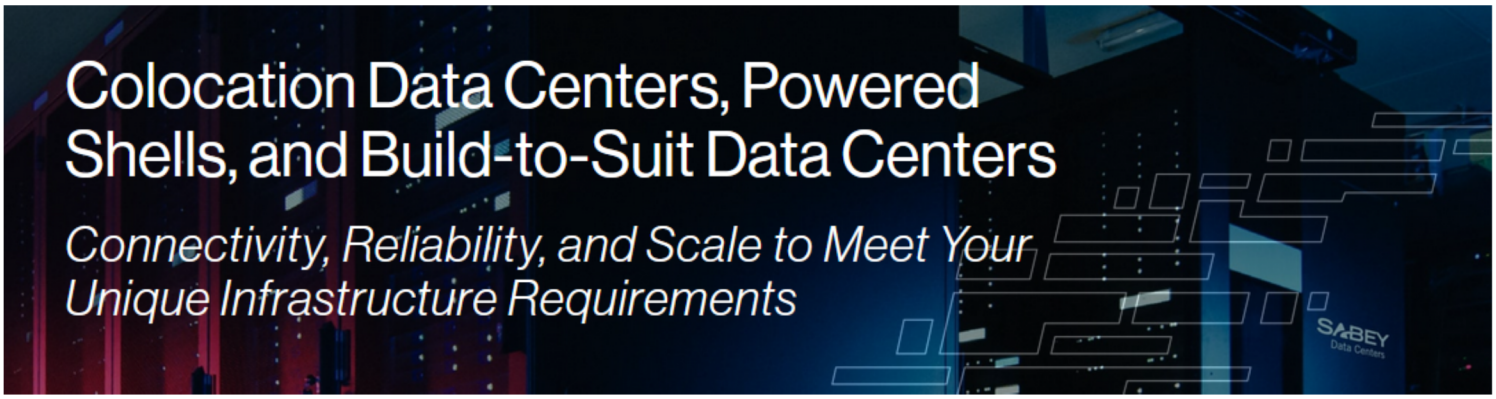

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