

Office of Electricity

Transformer Resilience and Advanced Components (TRAC) 2026 Peer Review Program Report

September 2026

Acknowledgements

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TRAC Peer Review participants celebrate the conclusion of the TRAC Peer Review 2026 by posing with hands in the shape of a "T" for transformers.

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List of Abbreviated Terms

A	A&M	Agricultural and Mechanical
	AC	Alternating Current
	AC-AC	Alternating Current - Alternating Current
	AC-DC	Alternating Current-Direct Current
	AI	Artificial Intelligence
	ARPA-E	Advanced Research Projects Agency-Energy
C	CEO	Chief Executive Officer
D	DC	Direct Current
	DOE	U.S. Department of Energy
E	EERC	Energy & Environmental Research Center
F	FY	Fiscal Year
G	GOES	Grain-Oriented Electrical Steel
H	HVDC	High-Voltage Direct Current
K	KETEP	Korea Institute of Energy Technology Evaluation and Planning
L	LLC	Limited Liability Company
	LPT	Large Power Transformer
M	MTDC	Multi-Terminal Direct Current
O	OE	Office of Electricity
	ORNL	Oak Ridge National Laboratory
P	PI	Principal Investigator
S	SF_6	Sulfur Hexafluoride
	SiC	Silicon Carbide
	SSPS	Solid State Power Substation
T	TRAC	Transformer Resilience and Advanced Components

Executive Summary

The DOE OE's TRAC Program conducted a Peer Review event on September 21-22, 2026. This Peer Review brought together 102 participants from across the electric power sector, including representatives of utilities, consulting firms, academic institutions, national laboratories, and government agencies. Peer reviewed presentations covering 25 projects within the TRAC portfolio were delivered by members of the respective research teams. Project evaluations conducted by peers were conducted by a panel of 14 peer reviewers, who provided formal feedback, scores, and recommendations.

Through the TRAC Program, the DOE OE supports research, development, and testing activities that advance grid modernization and long-term reliability. The program invests in advanced transformers, power electronics, transmission technologies, and other critical grid components to improve grid resilience, flexibility, and performance. TRAC-supported projects address key technology gaps, accelerate the development of next-generation grid hardware, and support the deployment of advanced transmission solutions. As electricity demand continues to grow, including from data centers and super intelligence-enabled technologies, these efforts help prepare the grid to meet future reliability and performance needs.

The program review enabled peer reviewers and attendees to assess the progress, relevance, and technical merit of ongoing TRAC activities. Feedback helped ensure that program investments remain aligned with high-impact research priorities and critical technology needs. Reviewer recommendations informed program planning and project improvement efforts, while the review also provided participants with insights into the TRAC Program's strategic direction and research portfolio.

Beyond project evaluations, the 2026 TRAC Peer Review served as an important forum for strengthening the community of researchers, engineers, manufacturers, and other stakeholders working to advance grid component technologies. The agenda included a keynote address from Dr. Isik Kizilyalli, CEO & Entrepreneur of Avalanche Thinking, highlighting his diverse career as the former Associate Director of Technology and Program Director at ARPA-E and Senior Director of Technology at Stanford University's School of Sustainability Accelerator. Dr. Kizilyalli underscored the critical role of advanced grid hardware in enabling reliable, efficient, and scalable power delivery for the next generation of data centers and computing infrastructure. Following the keynote address, 25 projects were presented over the two days of the TRAC Peer Review. Such forums are essential for promoting collaboration, sharing technical insights, and supporting the development and deployment of innovative grid hardware. Through these engagements, the TRAC Program helps build and sustain a multidisciplinary community that includes material scientists, system designers, equipment manufacturers, utility engineers, and other experts across the electric power sector.

The **Project Evaluations** section below provides the current status, scores, and DOE comments for each of the 25 projects presented at the review.

Introduction

The DOE OE TRAC Program supports research, development, and testing activities that advance grid modernization and strengthen the long-term reliability, resilience, and flexibility of the nation's electric grid. Recognizing that a modernized grid requires innovations in both digital technologies and physical infrastructure, the program invests in the development of advanced transformers, power electronics, transmission technologies, and other critical grid components. These efforts aim to extend the life and improve the performance of existing assets while accelerating the deployment of next-generation hardware capable of meeting evolving grid needs.

On September 21-22, 2026, the DOE OE TRAC Program conducted its fourth peer review. Established in fiscal year 2016 in response to opportunities identified in the 2015 Quadrennial Technology Review, the program was created to address critical research and development gaps in advanced grid components. Since its inception, TRAC has supported a diverse portfolio of projects spanning multiple technical focus areas. The 2026 Peer Review was conducted under the leadership of David Howard, DOE TRAC Program Manager.

The review convened 102 participants representing utilities, equipment manufacturers, engineering associations, consulting organizations, academic institutions, national laboratories, and government agencies. From across the TRAC portfolio, 25 projects were presented by members of the respective research teams. A panel of 14 peer reviewers evaluated the projects and provided formal feedback, with each reviewer assessing between three and 12 projects. Attendees also had opportunities to contribute comments and questions throughout the event. The feedback collected during the review informed both program-level and project-level assessments and is summarized in this report, along with a description of the review methodology and process.

A complete list of participants and the program agenda are provided in Appendices A and B, respectively.

Purpose

The TRAC Program manages a coordinated research portfolio designed to maximize the collective impact of investments in advanced grid components. While individual projects deliver value independently, a portfolio-based approach leverages synergies across technologies and research areas to accelerate progress toward program objectives. Peer Reviews are a key component of this strategy, providing an opportunity to assess project performance, technical merit, research management, and potential for impact. The resulting evaluations inform portfolio planning, support continuous program improvement, and help guide resources toward the most promising technology pathways.

In addition to supporting portfolio management, Peer Reviews provide a forum for stakeholders to exchange knowledge and engage with the program's strategic direction and research activities. The TRAC Program recognizes that advancing innovative grid technologies requires collaboration across a diverse community of researchers, system designers, equipment manufacturers, utilities, national laboratories, and other stakeholders. By fostering these connections, the program helps strengthen the broader ecosystem needed to advance and deploy next-generation grid technologies.

Program Review Process

Prior to the program review, a panel of peer reviewers were selected and trained to perform project and program evaluations. The project evaluations were based on presentations delivered by the project PIs or their designated representatives from the project team. Peer Reviewers attended the review to observe each project presentation and established a preliminary assessment. Based on the information captured, reviewers submitted a final evaluation against pre-established questions, along with supporting comments, within two weeks of the program review. The evaluation and feedback collected from Peer Reviewers will be used to improve the quality of the program and individual projects.

This section provides more details about the process.

Project Presentations

Before the review, PIs of projects were given presentation templates to ensure consistency. The PIs used the templates and criteria when developing their project presentations. During the review, the PI or a designated representative of the project team delivered the presentation to the peer review panel and other attendees who were present. After the conclusion of the review, DOE compiled the project evaluations for review and dissemination, and PIs used the feedback to improve their efforts.

Peer Reviewers

Preparing for the review involved identifying technical professionals with relevant experience and expertise to serve as reviewers for the selected projects. These reviewers were chosen based on their technical expertise in topics of relevance to the TRAC portfolio, their professional experience related to the management of technology projects, and the diversity in organizational perspectives. The final panel composition represented a broad spectrum of expertise and perspectives.

Each of the projects were evaluated by multiple peer reviewers, with assignments made to ensure diverse and balanced perspectives. Additionally, all assignments were investigated to ensure that no conflicts of interest existed between assigned peer reviewers and the projects that they evaluated.

Reviewers received training before the formal event to ensure complete understanding of the review objectives, consistent interpretation of the questions, and consistent application of scoring.

Below are the 14 individuals who were selected as peer reviewers, along with their professional affiliations.

- Alex J. Hanson, University of Texas, Austin
- Alireza Khaligh, University of Maryland
- Babu Chalamala, University of Texas, Dallas
- Fang Luo, Stony Brook University

- Feng Guo, University of Wisconsin, Milwaukee
- Harish S. Krishnamoorthy, University of Houston
- Isik Kizilyalli, CEO and Entrepreneur, Former ARPA-E
- Mack W. Knobbe, Southern California Edison
- Olga Lavrova, New Mexico State University
- Prasad Enjeti, Texas A&M University
- Shuo Wang, University of Florida
- Sudip K. Mazumder, University of Illinois Chicago
- Yue Cao, Oregon State University
- Zhicheng Guo, Arizona State University

Project Evaluation Criteria

The reviewers evaluated each project against eight questions, developed to capture the information needed for the review's purpose. These questions included the project's relevance to DOE and OE missions, impacts on industry, accomplishments, and management. In each evaluation question, reviewers were asked to provide a numerical score for each project, according to the following scale:

1	2	3	4	5
Not adequate	Fair	Good	Very good	Excellent

In addition, reviewers were asked to provide comments/findings, recommended actions, and any considerations the PI should evaluate. The questions which the peer reviewers responded to, are listed below.

1. How clearly are the objectives, methodology, and results reported? Any suggestions for presentation style or content?
2. Technically speaking, how would you evaluate the researcher's hypothesis, testing, results, analysis, and/or overall methodology?
3. Describe the metrics/milestones the presenter(s) used to identify the results of the project?
4. How did the project achieve its stated objectives?
5. How well does the researcher appear to build upon previous work in the field?
6. Utilizing the scale provided previously, how well does the researcher highlight the overall impact of the project?
7. Utilizing the scale provided previously, how innovative is the work? Is there a clear direction the researcher is taking the project in for the future?
8. Additional comments or suggestions?

Project Evaluations

Project Information

Research projects within the TRAC Peer Review were organized into five activity areas: Advanced Transformers, Transformer Materials, Direct Current Breakers, Advanced Power Electronics, and Advanced Conductors, Busbars, and Dielectric Materials. This section summarizes the results from the peer evaluations of the 25 presentations conducted.

Advanced Transformers Projects

Advanced grid integration technologies enable grid hardware to be adaptive, flexible, self-healing, resilient, reliable, and cost effective. During the Peer Review, the following advanced grid integration technologies projects were evaluated:

- *Optimal Three Port AC-AC Module for Flexible and Scalable Solid-State Transformers*
    - Jacob Mueller, Sandia National Laboratories
- *Novel Resonance Frequency Bushing Decoupler for Improved Seismic Resilience of LPTs*
    - Bjorn Vaagensmith, Idaho National Laboratory
- *Developing Nuclear Magnetic Resonance Sensor (NMRSense) for Real-Time Monitoring of Transformer Health*
    - Todd Monson, Sandia National Laboratory
- *MV Converter Based on Coreless High-Frequency Transformers*
    - Rajendra Prasad Kandula, Oak Ridge National Laboratory
- *Characterization of Solid-State Transformers*
    - Feng Qui, Argonne National Laboratory
- *Voltage Transforming Batteries as a New Class of Advanced Power Transformers*
    - Eric Dufek, Idaho National Laboratory

Below are summarized results from the reviews of these projects out of a total possible score of 5.

	Average Score	3.2
	Score Range	2.8 - 3.7

Transformers Materials Projects

Innovative transformer materials improve transformer performance and lifespan while enabling more efficient, reliable, and resilient grid operations. During the Peer Review, the following transformer materials projects were evaluated:

- *Multiphysics Optimization of Iron Nitride Based Transformers*
  - Todd Monson, Sandia National Labs
- *GOES Alternative Electrical Steels for Transformers (GOAST)*
  - Chins Chinnasamy, Oak Ridge National Laboratory
- *Manufacturing Near Net Shape High Flux Density Amorphous Magnets*
  - Hrishikesh Das, Pacific Northwest National Laboratory
- *Minnealloy: Critical Material Free High-Power High- Frequency Transformers*
  - Steve Glover, Sandia National Laboratory
- *Next Generation Ultra-Conductors for High Efficiency Transformers*
  - Keerti S. Kappagantula, Pacific Northwest National Laboratory

Below are summarized results from the reviews of these projects out of a total possible score of 5.

	Average Score	4.0
	Score Range	3.6 - 4.3

Direct Current Breakers

Direct current breakers provide the fast and reliable fault protection needed to safely integrate advanced transformers and other next-generation technologies into emerging DC grid architectures. During the Peer Review, the following direct current breakers projects were evaluated:

- *Multi-Vendor Multiterminal HVDC Interoperability-Enhancing Scalable Solid-State Circuit Breaker (MTDC-Breaker)*
  - Gab-Su Seo, National Laboratory of the Rockies
- *Medium Voltage DC Solid-State Circuit Breaker Based on a Cascaded Switch Topology*
  - Luciano Garcia Rodriguez, Sandia National Laboratories
- *Hybrid Breakers*

- Rajendra Prasad Kandula, Oak Ridge National Laboratory

Below are summarized results from the reviews of these projects out of a total possible score of 5.

	Average Score	3.5
	Score Range	3.46 – 3.5

Advanced Power Electronics

Advanced power electronics provide the power conversion, control, and protection capabilities that enable advanced transformers, direct current systems, and other next-generation grid technologies to operate efficiently, reliably, and flexibly. During the Peer Review, the following advanced materials-based components projects were evaluated:

- *3-D Double-Sided Isolated 10 kV/300 A SiC MOSFET Power Module with Embedded Active Gate Driver and Jet Impingement Cooling*
  - Faisal Khan, National Laboratory of the Rockies
- *Solid State Power Substation (SSPS) Demonstration*
  - Madhu Chinthavali, Oak Ridge National Laboratory
- *Medium-voltage AC-to-DC Versatile Energy Router with Integrated Conversion (MAVERIC)*
  - Ian Webb, Savannah River National Laboratory
- *Advanced Submodule Designs for Cost-Effective and Miniaturized High-Performance Data Center Converters (ASCEND-DC)*
  - Yashodhan Agalgaonkar, National Laboratory of the Rockies
- *Demonstration of Modular 5-kV Class Solid State Power Substation*
  - Jack Flicker, Sandia National Laboratories
- *A Scalable and Flexible Co-Model and Monitoring System for Advanced Transformer Considering Interactions with Power Electronics Assets*
  - Meng Yue, Brookhaven National Laboratory

Below are summarized results from the reviews of these projects out of a total possible score of 5.

	Average Score	3.6

	Score Range	3.2 - 3.9

Advanced Conductors, Busbars, and Dielectric Materials

Advanced conductors, busbars, and dielectric materials enable higher-performance grid hardware by improving power transfer, electrical insulation, efficiency, reliability, and system resilience. During the Peer Review, the following advanced materials-based components projects were evaluated:

- *Advanced Copper-MXene Composites for Enhanced Grid Efficiency and Resilience*
  - Jianlin Li, Argonne National Laboratory
- *Novel three-in-one high-temperature-superconducting DC cables for grid revolution*
  - Doan Nguyen, Los Alamos National Laboratory
- *Hybrid Low Copper Busbars*
  - Md. Reza-E-Rabby, Pacific Northwest National Laboratory
- *Dielectric Replacement Gas Testing for SF_6 in Substation Equipment*
  - Ram Kumar, Idaho National Laboratory
- *High Dielectric Breakdown Strength Ceramic-Polymer Composites*
  - Beihai Ma, Argonne National Laboratory

Below are summarized results from the reviews of these projects out of a total possible score of 5.

	Average Score	3.5
	Score Range	3.1 - 3.7

Conclusion

The 2026 TRAC Peer Review provided a structured assessment of 25 research projects spanning Advanced Transformers, Transformer Materials, Direct Current Breakers, Advanced Power Electronics, and Advanced Conductors, Busbars, and Dielectric Materials. Based on the reported activity-area averages, the portfolio received an overall weighted average score of approximately 3.6 out of 5, placing it between “good” and “very good” on the review scale. Results varied across the five areas, reflecting the diversity of project maturity, technical approaches, and research objectives within the portfolio.

Looking ahead, opportunities exist to elevate portfolio performance and move more projects into the “very good” range of the review scale. Future PIs can support stronger evaluations by clearly articulating project objectives, demonstrating how research activities align with those objectives, and providing quantitative evidence of progress against established metrics and milestones. Researchers can further strengthen presentations by clearly communicating the novelty of their approach, explaining how the work builds on prior research, and demonstrating the relevance of the results to DOE OE and industry. Additionally, reviewers may be better positioned to assess project impact when presenters more explicitly connect technical accomplishments to potential deployment pathways, operational benefits, and long-term contributions to grid reliability, resilience, and performance.

The review demonstrated the value of independent technical evaluation in supporting continuous improvement across the TRAC portfolio. The feedback, scores, and recommendations collected through the review will help DOE and project teams assess technical progress, strengthen project execution, and inform future program planning. The event also promoted knowledge exchange among researchers, utilities, manufacturers, national laboratories, academic institutions, government agencies, and other stakeholders working to advance critical grid technologies.

The 2026 TRAC Peer Review reaffirmed the importance of the program's investments in advanced grid components and highlighted a portfolio that is making measurable progress toward addressing emerging electric grid challenges. As electricity demand continues to grow and grid architectures evolve, the continued advancement of transformers, power electronics, direct current technologies, advanced materials, and related hardware will remain critical to maintaining a reliable, resilient, and flexible energy system. Through ongoing research, collaboration, and incorporation of peer-review feedback, the TRAC Program is well positioned to continue advancing innovative technologies that support the future of the nation's electric grid.

Appendix A. List of Participants

A	Adel Nasiri, University of South Carolina
	Alan Sbravati, Hitachi Energy
	Alex Hanson, University of Texas at Austin
	Alexander Rentschler, Siemens Energy Global
	Alireza Khaligh, University of Maryland
	Andrew Hines, SenSanna Incorporated
	Andrew Padgett, Sandia National Laboratories
	Anthony Popovski, Hepburn and Sons, LLC
	Armando Montoya, Sandia National Laboratories
	Arvind Tiwari, GE Vernova Advanced Research
B	Babu Chalamala, The University of Texas at Dallas
	Beihai Ma, Argonne National Laboratory
	Beth Hofstad, Pacific Northwest National Laboratory
	Bjorn Vaagensmith, Idaho National Laboratory
	Bradley Ydens, Hepburn and Sons LLC
	Brandon Grainger, University of Pittsburgh
	Brian Rowden, Oak Ridge National Laboratory
C	Caitlin Callaghan, Department of Energy
	Charles Cho, HICO
	Chins Chinnasamy, Oak Ridge National Laboratory
D	David Howard, Department of Energy
	Doan Nguyen, Los Alamos National Laboratory
	Dong Dong, Virginia Tech
	Dylan Poindexter, Sandia National Laboratories
E	Edson Perez, PeraWatt
	Emmanuel Taylor, PowerAmerica Institute
	Eric Dufek, Idaho National Laboratory
	Eric Hsieh, Department of Energy
	Eric Theisen, EERC
F	Fahmid Sadeque, Pacific Northwest National Laboratory
	Faisal Khan, National Laboratory of the Rockies

	Fang Luo, Stony Brook University
	Felipe Palacios II, Sandia National Laboratories
	Feng Guo, University of Wisconsin-Milwaukee
	Feng Qiu, Argonne National Laboratory
G	Gab-Su Seo, National Laboratory of The Rockies
	Giovanni Ponce, Sandia National Laboratories
H	Harish Krishnamoorthy, University of Houston
	Henry Huang, Argonne National Laboratory
	Hrishikesh Das, Pacific Northwest National Laboratory
	Hunter Gray, Hepburn and Sons LLC
I	Ian Webb, Savannah River National Laboratory
	Irving Derin, Sandia National Laboratories
	Isik Kizilyalli, Avalanche Thinking
J	Jack Flicker, Sandia National Laboratories
	Jacqueline Hines, SenSanna Incorporated
	Jake Mueller, Sandia National Laboratories
	Jaydip Das, Proterial America
	Jianlin Li, Argonne National Laboratory
	Joao Onofre Pereira Pinto, ORNL
	Julia De la Cruz, Deloitte
K	Karthikeyan Ramasamy, Los Alamos National Laboratory
	Keerti Kappagantula, Pacific Northwest National Laboratory
	Kevin Schneider, Pacific Northwest National Laboratory
	Kew Chan Youn, Hyosung
L	LEA MANGLICMOT, Sandia National Laboratories
	Lize Balmaceda, Sandia National Laboratories
	Luciano Garcia Rodriguez, Sandia National Laboratories
	Lucy Wu, PeraWatt
M	Mack Knobbe, Knobbe Consulting
	Madhu Chinthavali, Oak Ridge National Laboratory
	Marcio L Magri Kimpara, Oak Ridge National Laboratory
	MD Reza E Rabby, Pacific Northwest National Laboratory

	Meng Yue, Brookhaven National Laboratory
	Michael Maroney, S&C Electric Co.
	Michael Starke, Oak Ridge National Laboratory
	Moinuddin Ahmed, Argonne National Laboratory
	Monica Neukomm, Argonne National Laboratory
	Murali Baggu, National Laboratory of The Rockies
O	Olga Lavrova, New Mexico State University
	Oyelayo Ajayi, Argonne National Laboratory
P	Paul Ohodnicki, University of Pittsburgh
	Prasad Enjeti, Texas A&M University
R	Rachel Beery, Deloitte
	Rajendra Prasad Kandula, Oak Ridge National Laboratory
	Ram Kumar, Idaho National Laboratory
	Raymond Byrne, Sandia National Laboratories
S	Sabrina Helbig, University of Pittsburgh
	Sai Kiran Hota, Advanced Cooling Technologies
	Sharon Ruiz, Sandia National Laboratories
	Shiba Adhikari, Argonne National Laboratory
	SHUO WANG, University of Florida
	Sixbert Muhoza, Argonne National Laboratory
	Sonya Mahler, Sandia National Laboratories
	Sophia Peters, Deloitte
	Sreenivasa Jaldanki, Oak Ridge National Laboratory
	Steven Glover, Sandia National Laboratories
	Sudip Mazumder, University of Illinois Chicago
	Sunglook Sue, KETEP
T	Todd Marzec, University of Pittsburgh
	Todd Monson, Sandia National Laboratories
V	Valerio De Angelis, Sandia National Laboratories
W	Wayne Austad, Idaho National Laboratory
	Wenhua Yu, Argonne National Laboratory
	Will McNamara, Sandia National Laboratories

X	Xiaonan Lu, Purdue University
	Xin Zan, University of Maryland, College Park
Y	Yash Agalgaonkar, National Laboratory of the Rockies
	Yiqiao Song, Harvard University
	Yue Cao, Oregon State University
Z	Zhicheng Guo, Arizona State University
	Zifeng Lu, Zifeng Lu

Appendix B. Program Review Agenda



DAY 1 – MONDAY, SEPTEMBER 21, 2026

Time	Agenda
9:00 – 9:30 am	**Welcome & Opening Remarks** • Valerio De Angelis, Manager, Power Electronics and Energy Conversion Systems, Sandia National Laboratories • David Howard, TRAC Program Manager, Office of Electricity, Department of Energy • Eric Hsieh, Deputy Assistant Secretary, Systems and StandardsAdvancement, Office of Electricity, Department of Energy
9:30 – 10:00 am	**Keynote Presentation** • Dr. Isik C. Kizilyalli, CEO & Entrepreneur *Commercializing Innovation in Grid Transformers and Advanced Components*
10:00 – 10:30 am	**BREAK**
10:30 – 11:00 am 11:00 – 11:30 am	**Session 1: Advanced Transformers** • Jacob Mueller, Sandia National Laboratories *Optimal Three Port AC-AC Module for Flexible and Scalable Solid-State Transformers*

11:30 – 12:00 pm	• Bjorn Vaagensmith, Idaho National Laboratory *Novel Resonance Frequency Bushing Decoupler for Improved Seismic Resilience of LPTs* • Todd Monson, Sandia National Laboratory *Developing Nuclear Magnetic Resonance Sensor (NMRSense) for Real-Time Monitoring of Transformer Health*
12:00 – 1:00 pm	**LUNCH**
	Session 1: Advanced Transformers
1:00 – 1:30 pm	• Rajendra Prasad Kandula, Oak Ridge National Laboratory *MV Converter Based on Coreless High-Frequency Transformers*
1:30 – 2:00 pm	• Feng Qiu, Argonne National Laboratory *Characterization of Solid-State Transformers*
2:00 – 2:30 pm	• Eric Dufek, Idaho National Laboratory *Voltage Transforming Batteries as a New Class of Advanced Power Transformers*
	Session 2: Transformer Materials
2:30 – 3:00 pm	• Todd Monson, Sandia National Laboratories *Multipysics Optimization of Iron Nitride Based Transformers*
3:00 – 3:30 pm	• Chins Chinnasamy, Oak Ridge National Laboratory *GOES Alternative Electrical Steels for Transformers (GOAST)*
3:30 – 4:00 pm	**BREAK**
4:00 – 4:30 pm	**Session 2: Transformer Materials**
4:30 – 5:00 pm	• Hrishikesh Das, Pacific Northwest National Laboratory *Manufacturing Near Net Shape High Flux Density Amorphous Magnets*
5:00 – 5:30 pm	• Steve Glover, Sandia National Laboratory *Minnealloy Critical Material Free High Power High Frequency Transformers* • Keerti Kappagantula, Pacific Northwest National Laboratory

	ShAPE – Next Generation Ultra-Conductors for High Efficiency Transformers
5:30 – 7:00 pm	**Technical Poster Session**

DAY 2 – TUESDAY, SEPTEMBER 22, 2026

Time	Agenda
8:00 – 8:15 am	**Welcome Remarks** • David Howard, TRAC Program Manager, Office of Electricity, U.S. Department of Energy
8:15 – 8:45 am 8:45 – 9:15 am 9:15 – 9:45 am	**Session 3: Direct Current Breakers** • Gab-Su Seo, National Laboratory of the Rockies *Multi-Vendor Multiterminal Direct Interoperability-Enhancing Scalable Solid-State Circuit Break (MTDC-Breaker)* • Luciano Garcia Rodriguez, Sandia National Laboratories *Medium Voltage DC Solid-State Circuit Breaker Based on a Cascaded Switch Topology* • Rajendra Prasad Kandula, Oak Ridge National Laboratory *Hybrid Breakers*
9:45 – 10:15 am	**BREAK**
10:15 – 10:45 am 10:45 – 11:15 am 11:15 – 11:45 am 11:45 – 12:15 pm	**Session 4: Advanced Power Electronics** • Faisal Khan, National Laboratory of the Rockies *3-D Double-Sided Isolated 10 kV/300 A SiC MOSFET Power Module with Embedded Active Gate Driver Cooling* • Madhu Chinthavali, Oak Ridge National Laboratory *Solid State Power Substation (SSPS) Demonstration* • Ian Webb, Savannah River National Laboratory *Medium-Voltage AC-to-DC Versatile Energy Router with Integrated Conversion (MAVERIC)* • Yashodhan Agalgaonkar, National Laboratory of the Rockies *Advanced Submodule Designs for Cost-Effective and Miniaturized High-Performance Data Center Converters (ASCEND-DC)*

12:15 – 1:00 pm	**LUNCH**
	Session 4: Advanced Power Electronics
1:00 – 1:30 pm	• Jack Flicker, Sandia National Laboratories *Demonstration of Modular 5-kV Class Solid State Power Substation*
1:30 – 2:00 pm	• Meng Yue, Brookhaven National Laboratory *A Scalable and Flexible Co-Model and Monitoring System for Advanced Transformers Considering Interactions with Power Electronics Assets*
	Session 5: Advanced Conductors, Busbars, and Dielectric Materials
2:00 – 2:30 pm	• Jianlin Li, Argonne National Laboratory *Advanced Copper-Mxene Composites for Enhancing Grid Efficiency and Resilience*
2:30 – 3:00 pm	**BREAK**
	Session 5: Advanced Conductors, Busbars, and Dielectric Materials
3:00 – 3:30 pm	• Doan Nguyen, Los Alamos National Laboratory *Novel Three-In-One High-Temperature-Superconducting DC Cables for Grid Revolution*
3:30 – 4:00 pm	• Md. Reza-E-Rabby, Pacific Northwest National Laboratory *Hybrid Low Copper Busbars*
4:00 – 4:30 pm	• Ram Kumar, Idaho National Laboratory *Dielectric Replacement Gas Testing for SF6 in Substation Equipment*
4:30 – 5:00 pm	• Beihai Ma, Argonne National Laboratory *High Dielectric Breakdown Strength Ceramic-Polymer Composites*
	Closing Remarks
5:00 – 5:15 pm	• David Howard, TRAC Program Manager, Office of Electricity, U.S. Department of Energy