

2023

Entity: Renewable System Integration Coordination Committee

Chair: YC Zhang

Co-Vice-Chair: Miaolei Shao/Aidan Tuohy

Technical Committee Program Chair: Aidan Tuohy

Liaison Coordinator: Sudipta Dutta

Secretary and Award Rep: Junbo Zhao

Webmaster: Rui Yang

The role of RSICC is to serve as a focal point within the Power and Energy Society (PES) for the identification of challenges associated with the integration of renewable energy resources, related energy carriers (storage, fuels, heat) and related electrification applications (transportation, buildings, industry.)

1. Significant Accomplishments:

At the 2023 IEEE PES general meeting, RSICC, in collaboration with other partners, organized two panel sessions and contributed to other panel sessions dedicated to addressing the emerging challenges stemming from the integration of renewable energy sources. These sessions covered important topics, ranging from 'National Transmission Planning', 'Grid Forming inverters', 'Resource adequacy' to 'Impact of climate change'. All panel sessions have received great attentions and participations. Panelists representing diverse sectors including industry, academia, government, and other relevant entities, shared their insights and perspectives on the technological requirements for managing power systems with substantial renewable energy integration and simultaneous electrification of various sectors. During these sessions, participants have also identified challenges and outlined future directions.

RSICC is also leading the development of the PES Road Map chapter one on renewable integration. To support such an effort, bi-weekly meetings were organized serving as a platform for the contributors, involving experts from utilities, ISOs, standards-making organizations, electrical and electronic manufacturing industry, national labs, and universities, to discuss the chapter structure, assign tasks, and track the progress of the project. As of the annual meeting, an initial draft version of the chapter is ready for review and feedback. It consists of six sections, covering the topics of climate change, deep carbonization, sustainable transition, current and future states of the renewable integration worldwide, advantages and disadvantages of various types of renewables, as well as challenges and solutions of the renewable integration.

2. Benefits to Industry and PES Members from the Committee Work:

The RSICC 2023 annual meeting took place on July 20th in conjunction with the 2023 IEEE PES general meeting. It gathers representatives from other IEEE PES committees and external organizations to share updates on ongoing initiatives related to the integration of renewable energy and aims to facilitate future collaborations. The meeting kicked off with an introduction to RSICC. The RSICC chair extended a welcoming message followed by attendees' introductions. And the main part of the meeting covers a series of presentations summarizing each committee's 2023 efforts in following sequences:

RSICC: RSICC chair, Dr. Yingchen Zhang, summarized the RSICC achievements made in 2023, including panel organization at the PES general meeting, PES road map contribution as well as proposed collaboration with CIGRE for a white paper on renewable integration.



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PSOPE: On behalf of PSOPE, Dr. Xin Fang from Mississippi State University summarized the significant accomplishments made by PSOPE relevant to renewable integration (RI). In total 3 tutorials have been organized centering around RI. More than half of the papers sponsored by PSOPE subcommittees are relevant to RI. 10 out of 17 working groups and 4 out of 14 task force discussed the topics are relevant to RI.

AMPS: Dr. Kwok W. Cheung from GE digital provided an introduction to AMPS, which serves as a standards developing committee in analytic and computational methods for electric power and energy. There are in total 6 subcommittees, 24 and 25 working groups and task forces organized by the committee and subcommittees. In this year's general meeting, AMPS has organized in total 40 panels. In addition to that, AMPS recently published standard IEEE P762-2023 which standardizes terminology and indexes for reporting electric generating unit reliability, availability, and productivity performance measures. Three technical reports, focusing on cloud computing, spatio-temporal data-driven and machine learning algorithms and power system reliability have been published as well.

ESSB: Mr. Curtis Ashton from American Power Systems provided an update on ESSB's efforts relevant to renewable integration mostly on standards developments. In total 25 standards have been identified covering topics of installation, maintenance, sizing, optimizing and testing performance of stand-alone PV, batteries, and hybrid systems.

Smart Buildings-Loads-Customer Systems Committee (SBLC): Dr. Junbo Zhao from University of Connecticut provided an update on the office transition, new working group and task forces and technical report relevant to RSICC. He also updated SBLC the office transition and ongoing activities at RSICC.

PSRC: Dr. Kamal Garg from Schweitzer Engineering Laboratories (Sel) introduced inverter-based resources relevant workshops/panel discussions organized by different PSRC subcommittees: administrative subcommittee, system protection subcommittee, line protection subcommittee, and rotating machinery subcommittee.

PES T&D: Mr. Eriks Surmanis from Power Delivery Consultants provided an update on the scope, organization, and leadership team of the PES T&D.

PSDP: Dr. Edgar Casale, representing S&C Electric Company, provided a comprehensive overview of the initiatives undertaken by PSDP in 2023. This encompassed various activities, such as working groups, tutorials, and panel sessions. He also offered a glimpse into the anticipated panel discussions planned for GM 2024.

RSICC: Dr. Liangzong Yao from Wuhan University introduced the China satellite committee and highlighted their 2023 meeting hosted in Beijing in April 2023. In total, the membership of the China satellite committee has reached 1200 with 450 female members and 520 young members.

3. Benefits to Volunteer Participants from the Committee Work:

As a coordinating committee, RSICC does not write standards or conduct technical work. Rather, it coordinates wind and solar activities among PES Technical Committees. RSICC is a resource for members who want to get more involved with wind and solar. RSICC can help direct members who are seeking deeper involvement in specific technical areas. The following participant has presented their committee work at the RSICC meeting and the presentations are attached.

- PSOPE, Xin Fang
- AMPS, Dr. Kwok W. Cheung
- ESSB: Mr. Curtis Ashton
- Smart Buildings-Loads-Customer Systems Committee (SBLC): Dr. Junbo Zhao
- PSRC: Dr. Kamal Garg



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- PES T&D: Mr. Eriks Surmanis
- PES T&D: Mr. Eriks Surmanis
- PSDP: Dr. Edgar Casale
- RSICC: Dr. Liangzong Yao

4. **Coordination with Other Entities (PES Committees, CIGRE, standards, etc.):**

RSICC established and extended list of liaisons from other IEEE committees and external organizations who works on renewable systems integration. RSICC has established liaisons with the following organization or groups to bring awareness of their efforts in renewable systems integration to IEEE PES for other committees to digest and utilize

- IEEE Transportation Electrification Community (TEC)
- UNIFI consortium
- G-PST
- ESIG
- CIGRE

RSICC is continuing the identification and tracking of the activities of our liaison groups, both inside and outside of IEEE.

5. **New Technologies of Interest to the Committee:**

The RSICC is focusing on coordinating road, system level issues related to the grid of the future and technologies such as storage, buildings, and other systems that are coupled with renewable integration. We are focusing on coordinate activities related to all forms of renewable energy as we work towards a clean power grid. We're also planning on staying very involved and helping to coordinate discussions related to storage and hybrid plants which could be considered "firmed" renewable resources. We're interested in helping to broadly coordinate as much as we can to help all involved parties and technologies without encroaching on any technical committee's scope.

6. **Significant Plans for the Next Period:**

We expect to establish enhanced liaison relationships with focused group of relevant organizations, and we plan to issue an white paper in collaboration with CIGRE to summarize and share relevant renewable system integration efforts.

7. **Problems and Concerns:**

At this time, there are no problems or concerns to mention.

Submitted by: Yingchen (YC) Zhang, Chair, RSICC

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