

Programme Booklet



ICPS 2021

**9th International Conference on
Power Systems (ICPS) 2021**

December 16-18, 2021

**Developments towards Inclusive Growth for
Sustainable and Resilient Grid**

www.icps2021.iitkgp.ac.in



**Department of Electrical Engineering
and
School of Energy Science & Engineering
Indian Institute of Technology Kharagpur**

Content

About ICPS.....	4
About IIT Kharagpur.....	5
Message From Dignitaries.....	6
Chief Guest.....	6
Patron.....	7
Chairman, Core Steering Committee.....	8
General Chairs.....	9
Organizing Chair.....	10
Organization.....	11
Patron.....	11
Core Steering Committee.....	11
Advisory Committee.....	11
Local Organizing Committee.....	13
Organizing Secretaries.....	13
Program Schedule.....	14
Day 1: Thursday, 16th December 2021.....	14
Day 2: Friday, 17th December 2021.....	15
Day 3: Saturday, 18th December 2021.....	18
Guest of Honor.....	31
Invited Speaker.....	32
Tutorial Speakers.....	33
Keynote Speakers.....	36
Invited Paper Speakers.....	45
Panelists.....	51
Panel Session - I: Integrating Energy and Power in Engineering Education.....	51
Panel Session - II: Inclusive growth of Entrepreneurs in Smartgrid.....	54
Awards.....	58
LDC Excellence Awards.....	58
POSOCO Awards for Research Students.....	58
Best Contributory Paper Awards.....	58
List of Reviewers.....	59
List of Volunteers.....	66
Sponsors.....	67

About ICPS

The International Conference on Power Systems (ICPS) is a leading conference in the area of Power Engineering since its birth year 2004. It is a brainchild of academicians from India and Nepal. The 9th International Conference on Power Systems, 2021 (ICPS 2021) continues a series of the biennial conference and will be held at Indian Institute of Technology Kharagpur (IIT Kharagpur), Kharagpur, West Bengal India from 16th -18th December 2021.

With the theme "**Developments towards Inclusive growth for Sustainable and Resilient Grid**", ICPS 2021 will provide an opportunity to discuss various research activities and latest developments in the area of Smart Power System; and help us to generate a road map to move ahead with necessary pace. A large number of Eminent Professors, Technocrats, Scientists, Administrators and Students from various parts of the World are expected to participate in the ICPS 2021. The tutorials on the relevant topics, keynotes by eminent persons, panel discussion, paper & poster presentations, and opportunities for industry/trade exhibits, with separate events for industry sessions and student competitions, will be an integral part of the conference.

Accepted and presented papers in ICPS 2021 will be submitted for inclusion in the IEEE Xplore online digital library. Further, authors of selected presented papers in ICPS 2021 may be invited to submit extended versions of their manuscripts for consideration in the IEEE Transactions on Industry Applications.

About IIT Kharagpur

IIT Kharagpur is the first Indian Institute of Technology that started its journey in the old Hijli Detention Camp, where some of the country's great freedom fighters toiled and sacrificed their lives for India's independence. It was established in 1950 with the largest campus, the most departments and the highest student enrolment.

The motto of IIT Kharagpur is "Yogah Karmasu Kaushalam". This literally translates to "Excellence in action is Yoga", essentially implying that doing your work well is (true) yoga. This can be traced to Sri Krishna's discourse with Arjuna in the Bhagavad Gita. The quote, in the larger context of the Gita, urges man to acquire equanimity because a mind of equanimity allows a man to shed distracting thoughts of the effects of his deeds and concentrate on the task before him. Equanimity is the source of perfection in Karmic endeavours that leads to Salvation.

The "cultural capital of India", Kolkata, popularly known as "The city of joy", is the educational, commercial and cultural centre of the Eastern part of India. It is about 120 km from Kharagpur and well connected by Road and Rail transport.



Message From Chief Guest



AJAY MATHUR, Ph.D
Director General



Message

I am delighted that the 9th International Conference on Power Systems is being organized at IIT, Kharagpur, from the 16th to the 18th of December 2021. This Conference, the brainchild of academics from India and Nepal, has become a leading conference in the power engineering sector, and gained international repute in the years since 2004, when it was first organized.

Power systems are in a state of flux the world over; with intermittent renewables, electrical storage, and electrification of fossil fuel use applications seeming to become the future of the sector. This obviously has strong implications for grid management and resilience, and it is quite appropriate that ICPS-2021 is focusing on the theme of "Developments towards Inclusive Growth for Sustainable and Resilient Grid".

I look forward to a stimulating Conference, and wish it all the best.



(Ajay Mathur)

International Solar Alliance

National Institute of Solar Energy Campus, Gurugram - 122 003, India
www.isolaralliance.org | + 91 124 286 3090/30 | amathur@isolaralliance.org

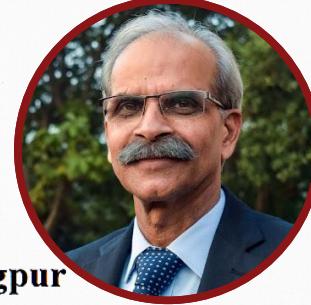
Message From Patron



भारतीय प्रौद्योगिकी संस्थान खड़गपुर
Indian Institute of Technology Kharagpur
खड़गपुर करागपुर – 721 302



प्रोफेसर वीरेन्द्र कुमार तिवारी
निदेशक
Professor Virendra Kumar Tewari
Director



Message from the Director, IIT Kharagpur

I am pleased to learn that the Department of Electrical Engineering and the School of Energy Science & Engineering, IIT Kharagpur, are jointly hosting the 9th edition of the esteemed International Conference on Power Systems (ICPS). This conference series has provided an outstanding forum for global experts from academia and industry constantly over the last two decades. The amazing efforts made by every individual of the organizing team during the prevalent epidemic situation to organize the ICPS 2021 in online mode are highly appreciating. This has retained the biennial nature of ICPS series and its conduct.

The theme of the ICPS2021 is of interest to most utilities, practicing engineers, and academics. It will encourage the participants to share the latest research developments and discuss the challenges in the field of Power Systems. ICPS 2021 will offer several Keynote Lectures on the chosen thematic areas with speakers from Industries such as GE digital, ABB Hitachi, POSOCO, Powergrid, OPAL-RT, GE Renewable and BSES Rajdhani and speakers from various academic Institutions such as, Washington State University and West Virginia University of USA, Curtin University and University of Queensland of Australia, University of Peradeniya of Sri Lanka, IIT Bombay etc.

This conference will provide an excellent opportunity to interact with experts and inspiring icons, through keynote sessions, panel discussions and contributory paper presentations on state of art in power system technologies and practices. I am confident that it will motivate the young scientists, researchers and practitioners, also the conference proceedings will be helpful to set roadmaps for their future endeavours. I take this opportunity to appreciate the tireless efforts of faculty members, staff, and students to organize the 9th ICPS 2021. I wish you all a very productive and rewarding conference.

(Prof. V. K. Tewari)

Message from Chairman ICPS CORE STEERING COMMITTEE



**Prof (Retd.) Shrikrishna A. Khaparde
IIT Bombay**

I welcome all the participants, invited speakers, experts, and guests attending the 9th International Conference on Power Systems (ICPS), organized by the Indian Institute of Technology Kharagpur along with the members of the Core steering committee of ICPS. I appreciate the amazing efforts made by organizing team of ICPS 2021 during the prevailing COVID 19 pandemic to hold the conference in online mode to maintain its continuousness. I hope that, in its Online virtual mode, the ICPS 2021 will bring all the intellectual excitement and interactions among the participants. Starting from 2004, the ICPS, which is being organized every two years, has served as an important platform for power engineering professionals from academics, industry, utility, R&D organizations, regulatory bodies, and students community to deliberate the issues of recent concerns and bring out the future roadmap of the power sector. It is quite encouraging to observe that the ICPS is playing a catalytic role in strengthening interactions between industry-academia community.

The theme selected for the ICPS 2021 “Developments towards Inclusive growth for Sustainable and Resilient Grid” is very much appropriate in the present scenario. I am sure that the research papers being presented at the conference, along with the Tutorials, Keynote lectures, Invited papers, Panel discussions being delivered by the eminent international as well as national experts, will help in bringing out clear guidelines in shaping the future grids in the country.

I would like to congratulate and thank the team involved from IIT Kharagpur and its administration for all their efforts and support provided in organizing 9th ICPS and wish the conference a grand success.

Message from General Chairs



Professor N K Kishore



Professor Ashok K Pradhan

IIT Kharagpur

Electric Power is the third most important commodity today, next to only Air and Water. As things stand, Thermal and Hydro generation have been the primary conversion processes in use for the most of electric power generation. Of the two forms thermal generation depends primarily on Coal and Gas; fossil fuels. Most backup generation is through Diesel Generator, again a fossil fuel based resource. As things stand today, fossil fuel resources are depleting fast and there is a need to look at alternative resources. Alternative resources need to be renewable and sustainable. In order to ensure continuous Power supply Grid is developing into a smarter one with continuous Monitoring and Control. Keeping this in view, the theme of the conference is kept as "Developments towards Inclusive growth for Sustainable and Resilient Grid". Power Industry is one large setup that has been absorbing the technologies that keep developing in various spheres to effectively deliver power to ultimate users. With all these, new operating principles of Market Driven Deregulated Operation, Distributed Generation, Storage, Condition Monitoring through Information Communication Technology, Asset Management and Smart Grids are becoming popular.

The International Conference on Power Systems (ICPS) is organized every alternate year by an academic/research institution in the Indian subcontinent. The objective is to provide a forum for presentation of latest developments, ideas and their applications to the practice of electric power and energy systems engineering. Another major goal is to promote academic-industry interaction and foster collaboration.

The Department of Electrical Engineering and School of Energy Science & Engineering, Indian Institute of Technology (IIT) Kharagpur are hosting the Ninth International Conference on Power Systems (ICPS 2021). IIT Kharagpur was established in 1951 and is the forerunner of the IIT system of education in the country. The Department of Electrical Engineering started functioning right from inception engaging actively in teaching and research in all current areas of Electrical Engineering. Its alumni occupy key positions in science and technology, education and industry, within the country and abroad. In view of increased penetration of renewable and thrust for green energy production, the School of Energy Science and Engineering was set up at the IIT Kharagpur in 2013 where Interdisciplinary in all areas of Energy Science and Engineering from Materials to Systems are focused.

Organizers are wholeheartedly thankful to authors, reviewers, speakers, delegates and one and all, who have enabled in shaping up the conference very well. Authorities of Indian Institute of Technology Kharagpur and IEEE Kharagpur Section have been very supportive of this endeavor. Financial sponsorship from Power Sector agencies, from Government and Industry is gratefully acknowledged. Support of the large number of volunteers is hereby put on record.

Message from Organising Chair



Dr Prabodh Bajpai
IIT Kharagpur

It is my privilege to serve as the Organising Chair of the 9th International Conference on Power Systems (ICPS) 2021, with abundant support from members of all committees. This conference is jointly organized by Department of Electrical Engineering and School of Energy Science and Engineering, IIT Kharagpur and hosted by IEEE Kharagpur Section with IEEE joint PES & IAS Chapters, UP Section, as the technical sponsors. I appreciate the active support and participation in ICPS 2021 under unexpected circumstance caused by COVID-19 from all participants. The inspiration behind the ICPS 2021 is to encourage the researcher to disseminate their research for the larger benefit of society in the area of smart and sustainable energy and to gain, share and explore the knowledge in the field of power engineering under the theme of “Developments towards Inclusive growth for Sustainable and Resilient Grid”.

ICPS 2021 focuses on modern power systems, electricity markets, smart grid, renewable energy, distributed generation and system integrations. Out of 267 contributory papers received from various Government, Industry and Academic organizations, only 112 papers are selected after peer review for oral presentation in five parallel session tracks. The conference features four Tutorial sessions, sixteen Keynote talks, ten Invited paper talks, two industry-academia panel sessions, and 109 contributory paper presentations. The conference program will also provide opportunity for Industries for promotion and branding through virtual exhibition along with industrial presentation session.

We are extremely honoured to have Dr. Ajay Mathur, DG, International Solar Alliance as the chief guest in the Inaugural program. The financial sponsorship by PGCIL, POSOCO, OPAL-RT technologies, CESC Ltd, NPTI and CPRI Bangalore. I extend my gratitude to the keynote speakers for sharing their knowledge on various aspects of the wide domain of electric power system. I would like to thank all the authors for their interest and participation. I extend my sincere thanks to the Patron of ICPS 2021, Prof. V.K. Tiwari, Director, IIT Kharagpur. Finally, I thank to all faculty and staff colleagues, students and volunteers of Department of Electrical Engineering and School of Energy Science and Engineering, IIT Kharagpur for their valuable support in organising this conference.

Organising Committee

Patron

Prof. Virendra Kumar Tewari,
Director, IIT Kharagpur

Core Steering Committee: Chairs

S. A. Khaparde,
Retd. IIT Bombay

S. N. Singh,
IIT Kanpur

I. M. Tamrakar,
IoE, Nepal

Core Steering Committee: Members

Anjan Bose,
WSU, USA

A. K. Pradhan,
IIT Kharagpur, India

A. R. Abhyankar,
IIT Delhi, India

Arun Kumar Mishra,
Vice Chair ISGAN; Director NSGM-PMU

Celia Shahnaz,
BUET, Bangladesh

Dipti Srinivasan,
NUS, Singapore

Joydeep Mitra,
MSU, USA

K.V.S. Baba,
CMD, POSOCO

Nav Raj Karki,
IoE, Nepal

Prabodh Bajpai,
IIT Kharagpur, India

R. Sarathi,
IIT Madras, India

Reji Pillai,
President, ISGF & Chairman, GSEF

Rohit Bhakar,
MNIT Jaipur

S. A. Soman,
IIT Bombay, India

S. C. Srivastava,
IIT Kanpur, India

S. K. Soonee,
Advisor POSOCO

Subir Sen,
COO, PGCIL

Tapan Saha,
UQ, Australia

V. S. Nandakumar,
DG CPRI

Weerakorn Ongsakul,
AIT Bangkok, Thailand

Advisory Committee Chairs

Siddhartha Mukhopadhyay,
Head, Dept. of EE and School of ES & E, IIT Kharagpur

S. N. Singh,
IIT Kanpur, IEEE India Council, Chairman 2020

Industry Advisory Committee

Angana Guha Roy Chowdhury,
Director, BCCI

Devendra Gupta,
Co-Founder & CEO,
Ecozen Solution Pvt. Ltd.

Gautam Ray,
Executive Director,
HR & Administration, CESC Ltd

Girish Nanjundaiah,
MD, OPAL RT

Gyanesh Chaudhary,
MD, Vikram Solar

I. S. Jha,
Member CERC

Dr. Jyotirmoy Roy,
Founder & CEO, GreenEnco, London

K. V. S. Baba,
CMD, POSOCO

K. Balaraman,
DG, NIWE

Kanak Mukhopadhyay,
MD, Agni Power &
Electronics Pvt. Ltd.

Krishna Bandopadhyay,
GM , NVVN, NTPC

M. Ramamoorthy,
Former DG, CPRI

N. Sreekumar,
Prayas, Pune

Nagaraja Ramappa,
MD, PRDC, Bangalore

P. B. Salim,
CMD, WBDCL

P.K. Agarwal,
Former Director, POSOCO

Raghav Raj Kanoria,
MD, IPCL

Dr. Rajib Mishra,
BD, Director, PTC

Reji Kumar Pillai,
President, ISGF

S. K. Soonee,
Advisor, POSOCO

S.P. GonChoudhary,
NBIRT, Kolkata

S. Suraesh Kumar,
Chairman, WBSETCL

Saikat Roy Choudhury,
MD, Galileisolar India Pvt Ltd

Sanjay Patki,
Tata Power

V. S. Nandakumar,
DG, CPRI, Bangalore

Organising Committee

International Advisory Committee (Academia)

A. G. Phadke, Virginia Tech University, USA	A. M. Gole, University of Manitoba, Canada	Anil Pahwa, Kansas State University, USA	Anjan Bose, Washington State University, USA
Anurag Srivastava, West Virginia University, USA	Arindam Ghosh, Curtin University, Australia	Anuradha Annaswamy, MIT, USA	Akshey Rathore, Uni. of Concordia, Canada
Alberto Borghetti, Uni. of Bologna, Italy	Chanan Singh, Texas A&M University, USA	Janaka Ekanayake, University of Peradeniya, Sri Lanka	Jianzhong Wu, Cardiff University, UK
Josep Pou, Nanyang Technological University, Singapore	Jignesh Solanki, West Virginia University, USA	Joydeep Mitra, Michigan State University, USA	Kankar Bhattacharya, University of Waterloo, UK
Lalit Goel, Nanyang Technological University, Singapore	Mohan Kolhe, University of Agder, Norway	Ned Mohan, University of Minnesota, USA	Rambabu Adapa, EPRI, USA
Ramesh C. Bansal, University of Sharjah, UAE	Shaikh A. Fattah, BUET, Bangladesh	S S (Mani) Venkata, University of Washington, USA	Saifur Rahman, Virginia Tech, USA
Tapan Saha, University of Queensland, Australia	T. S. Sidhu, Univ. of Ontario Institute of Tech., Canada	Venkataramana Ajjarapu, Iowa State University, USA	Vahid Madani, PG&E, USA
Vladimir Terzija, University of Manchester, UK	Vijay Vittal, Arizona State University, USA	Yin Xu, Beijing Jiaotong University, China	

National Advisory Committee (Academia)

Anil Kulkarni, IIT Bombay	Ankush Sharma, IIT Kanpur	Ashwani Kumar, NIT Kurukshetra	Anoop Singh, IIT Kanpur
Arup Kumar Goswami, NIT Silchar	B. G. Fernandes, IIT Bombay	B. K. Panigrahi, IIT Delhi	B. S. Rajpurohit, IIT Mandi
B. Tyagi, IIT Roorkee	B. VenkatesaPerumal, NIT Surathkal	Bidyadhar Subudhi, IIT Goa	Bhim Singh, IIT Delhi
Biswarup Das, IIT Roorkee	C. Nagmani, NIT Trichy	D. Thukaram, IISc Bangalore	Gurunath Gurrala, IISc Bangalore
H. M. Suryawanshi, VNIT, Nagpur	H. R. Jariwala, SVNIT, Surat	Joy Thomas M, IISc Bangalore	K B Mohanty, NIT Rourkela
Kalyan Kumar B, IIT Madras	Mahesh Kumar, IIT Madras	Niranjan Kumar, NIT Jamshedpur	Nishchal K. Verma, IIT Kanpur
Nand Kishor, NIT Allahabad	Nilanjan Senroy, IIT Delhi	Naran M. Pindoriya, IIT Gandhinagar	N. P. Padhy, IIT Roorkee
Parthasarathi Sensarma, IIT Kanpur	Pradeep Kumar Yemula, IIT Hyderabad	Praveen Tripathy, IIT Guwahati	Rajesh Gupta, NIT Allahabad
Ranjan Kumar Behera, IIT Patna	Ranjana Sodhi, IIT Ropar	R. K. Pandey, IIT BHU	Rohit Bhakar, MNIT Jaipur

Organising Committee

S P Singh,
IIT BHU

Sukumar Mishra,
IIT Delhi

Saikat Chakrabarti,
IIT Kanpur

Suryanarayana Doola,
IIT Bombay

S. K. Parida,
IIT Patna

Sivaji Chakravorti,
Jadavpur University

Sanjay S. Damhare,
COEP

S. V. Kulkarni,
IIT Bombay

S. R. Samantaray,
IIT Bhubaneswar

S. A. Soman,
IIT Bombay

Trapti Jain,
IIT Indore

Vivek Shrivastava,
NIT Delhi

Tripta Thakur,
MANIT Bhopal

Local Organizing Committee

General Chairs

N. K. Kishore,
Ashok K. Pradhan

Organizing Chair

Prabodh Bajpai

Tutorial Committee Chairs

Debapriya Das,
Chandan Chakraborty

Technical Program Committee Chairs

Dheeman Chatterjee,
Debaprasad Kastha

Registration Committee Chairs

Saurav Pramanik,
Anirban Mukherjee,
Sourav Patra

Publication & Publicity Committee Chairs,

Ashish R. Hota,
SM Haque,
Chirodeep Bakli

Logistic Committee Chairs (Travel & Accommodation)

Sreeraj Puravankara,
Trilok Singh,
Debashis Mandal,
Alok Kanti Deb

Finance Committee Chairs

Aurobinda Routray,
Neeraj K. Goyal

Food & Cultural Committee Chairs

Dipankar Debnath,
Amit Ghosh,
Nirmalya Ghosh

Program Management Committee Chairs

Ashis Maity,
Shambhu Sau

Organizing Secretaries

Bonu Ramesh Naidu

Priyanka Mishra

Day I - Thursday, 16 December, 2021

TIME	SESSION	DETAILS	
09:10 AM – 10:45 AM	Inaugural Session and Keynote Talk	Chief Guest: Dr. Ajay Mathur, DG, International Solar Alliance, India Keynote Speaker: Mr. Manu Asthana, President & CEO, PJM Interconnection, USA	
		Venue- Hall 1/ Auditorium	
10:45 AM – 11:20 AM	LDC Excellence Award	Load Dispatch Center (LDC) Excellence Award Announcement and Winner Presentation	
		Venue- Hall 1/ Auditorium	
11:30AM – 01:00 PM	Panel Session I-Integrating Energy and Power in Engineering Education	Prof Anjan Bose , Washington State University, USA, (Moderator) Prof. D.P. Kothari , Honorary Adjunct Professor, VNIT, Nagpur Prof. R. Banerjee , Dept. of Energy Science and Engg, IIT Bombay Prof. Saikat Chakrabarti , Dept. of Electrical Engineering, IIT Kanpur Mr. Gautam Ray , Executive Director, HR & Administration, CESC Ltd Prof. Tripta Thakur , Department of EE, MANIT Bhopal, DG, NPTI S.Shyam Sundar , Joint Director & HoD, Information & Publicity Division, CPRI Bangalore Prof. S. Mukhopadhyay , Head, Dept. of Electrical Engg, School of Energy Science & Engg., IIT Kharagpur	
		Venue- Hall 1/ Auditorium	
01:00 PM –02:00 PM		Break	
02:00 PM-04:00 PM	Tutorial Session-I	Tutorial-I A RE Rich Microgrid: Operation and Control	Tutorial-I B Generation Capacity Addition and Dispatch Modelling
		Sukumar Mishra, Professor, IIT Delhi, India	Nhalur Sreekumar, Member, Energy group Prayas, Pune, India
		Venue- Hall 1/ Auditorium	Venue- Hall 2
04.10 PM – 05.10 PM	Award Session	POSOCO Power System Awards (PPSA 2021) to meritorious research students	
		Venue- Hall 1/ Auditorium	
05:20 PM–07:20 PM	Tutorial Session-II	Tutorial-II A Grid Resilience in the Presence of Renewable Generation	Tutorial-II B Practical Aspects for design & construction of High Voltage Semiconductor Power Modules
		Joydeep Mitra, Professor, Michigan State University, USA	Dipak Dutta, (Retired) AGM, Electronics Division, BHEL, Bangalore, India
		Venue- Hall 1/ Auditorium	Venue- Hall 2

Schedule

Day II - Friday, 17 December, 2021

TIME	SESSION	DETAILS				
09.00 AM - 09.55 AM	Keynotes Session-A	Keynote session A I Enabling Resilience for the DER-rich Power Distribution System	Keynote session A II Renewable energy generation and its integration: Challenges and Solutions	Keynote session A III Storage, the ultimate disruptor. Is there anything Storage cannot do?	Keynote session A IV Collaborative Online experiences in Indian Engineering Education	
		Anurag K Srivastava Raymond J. Lane Professor and Chairperson, West Virginia University, USA	Janaka Ekanayake, Professor, University of Peradeniya, Sri Lanka	Dr Mani Vadari, President, Modern Grid Solutions, USA	Dr. Anil K. Jampala, GE Renewable Energy, USA	
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	
10.15 AM - 11.15 AM	Contributory Paper Session 1	Contributory Paper 1A IDs- 178, 146, 182, 149	Contributory Paper 1B IDs- 9, 183, 177, 53	Contributory Paper 1C IDs- 40, 82, 73, 259	Contributory Paper 1D IDs-272, 115, 199, 221	Contributory Paper 1E IDs- 114, 90, 180, 39
		Track-1.1 (PSPR01)	Track-1.2 (MGDS01)	Track-1.3 (PSDS01)	Track-1.4 (LFDM01)	Track-1.5 (RIEV01)
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	Venue- Hall 5
11.30 AM - 12:25 PM	Keynotes Session-B	Keynote session B I Solar PV integrations into national grid: Challenges and Opportunities	Keynote session B II Governance aspects of Indian Power System	Keynote session B III Low-Inertia Very Large Grid Digital Twins using HYPERSIM EMT simulator for Dynamic Transient Performance Evaluation	Keynote session B IV What about Hydrogen?	
		Tapan Saha, Professor, University of Queensland, Australia	S K Soonee, Advisor, POSOCO, India	Jean Belanger, President & CTO Opal-RT Technologies, Canada	Arindam Ghosh, Professor, Curtin University, Australia	
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	
12:30 PM - 01:30 PM	Break					

Schedule

Day II - Friday, 17 December, 2021

TIME	SESSION	DETAILS				
01.30 PM — 01.50 PM	Invited paper Session 1	Invited Paper 1 A Renewable Integrated Multi-Area Smart optimization Framework for Distribution Network Operators	Invited Paper 1 B AMI Meter Data and Analytics can help to optimize Grid Operation	Invited Paper 1 C Implementation experience of Whole Sale Electricity Markets in the North American Context	Invited Paper 1 D Machine and Deep Learning Based Classification Approach for Power Quality Disturbances	Invited Paper 1 E Estimation of Ev's Daily Load Profile in Bangkok Metropolitan City under Different Policy Scenarios
		N P Padhi, Professor, IIT Roorkee, India	Dr. Raghu Pulakurthi, Director-Product Development, Oracle Utilities, Hyderabad, India	Venkata Sivaram, GE, Hyderabad, India	Celia Shahnaz, Professor, BUET, Bangladesh	Jai Govind Singh, Associate Professor, AIT Bangkok, Thailand
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	Venue- Hall 5
01.50 PM — 02.50 PM	Contributory Paper Session 2	Contributory Paper 2A IDs- 25, 12, 8, 110	Contributory Paper 2B IDs-238, 84, 243, 148	Contributory Paper 2C IDs-189, 205, 132, 282	Contributory Paper 2D IDs-49, 278, 281, 270	Contributory Paper 2E IDs- 128, 141, 20, 109
		Track-2.1 (PSPR02)	Track-2.2 (MGDS02)	Track-2.3 (PSSR01)	Track-2.4 (LFDM02)	Track-2.5 (RIEV02)
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	Venue- Hall 5
03.00 PM — 04.00 PM	Sponsors session	Industrial Sponsors Presentation				
		Venue- Hall 1/ Auditorium				
04:15 PM — 05.00 PM	Invited Talk	Mr. Kunal Kumar, Jt. Secretary & Mission Director (Smart Cities Mission), Ministry of Housing and Urban Affairs, Government of India				
		Smart Energy for Smart Cities				
		Venue- Hall 1/ Auditorium				

Day II - Friday, 17 December, 2021

TIME	SESSION	DETAILS				
05:10 PM – 05.30 PM	Invited paper Session 2	Invited Paper 2A Investment Decision-Making in Power Systems Employing Data Monitoring Technology	Invited Paper 2B Importance of Regional Technical Institutional Mechanism in South Asian electricity grid	Invited Paper 2C Success Story of India-Bangladesh Power System Operation	Invited Paper 2D Looking beyond 175 GW Renewable Energy Integration in India - Challenges and Remedial Measures	Invited Paper 2E Behind the Meter Energy Storage: Role for supporting demand response and renewable integration
		Fushuan Wen, Professor, Tallinn University of Technology, Estonia	V K Agrawal, Technical Director (SARI/EI)/ IRADe, India	Saif Rehman, Manager, POSOCO, India	Dr. Nagaraja Ramappa, MD, PRDC, Bangalore, India	Dr. Rahul Walawalkar, President, India Energy Storage Alliance (IESA) & President & MD, Customized Energy Solutions, India
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	Venue- Hall 5
05.30 PM -06:45 PM	Contributory Paper Session 3	Contributory Paper 3A IDs- 98, 223, 276, 129, 229	Contributory Paper 3B IDs-161, 175, 69, 118, 211	Contributory Paper 3C IDs-41, 260, 152, 233	Contributory Paper 3D IDs-239, 21, 147, 59, 173	Contributory Paper 3E IDs- 256, 236, 29, 279, 105
		Track-3.1 (PSPR03)	Track-3.2 (MGDS03)	Track-3.3 (PSOP01)	Track-3.4 (PSDS02)	Track-3.5 (RIEV03)
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	Venue- Hall 5

Schedule

Day III - Saturday, 18 December, 2021

TIME	SESSION	DETAILS			
09.00 AM - 9.55 AM	Keynotes Session-C	Keynote session C I Digital Twins for Digital Transformation	Keynote session C II Learnings from Global electricity Markets in Indian Context	Keynote session C III Power Systems on the Cusp of Energy and Digital Transformation	Keynote session C IV How Smart Distribution Systems and Microgrids Will Advance Energy Diversity and Equity
		Vinay Jammu, VP - Physical-Digital Technologies, GE Digital, India	S.S. Barpanda, Director, Market Operation, POSOCO, India	Akilur Rahman, Chief Technology Officer, ABB Hitachi, India	Noel Schulz, Professor, Washington State University, USA
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4
10.15 AM - 11.30 AM	Contributory Paper Session 4	Contributory Paper 4A IDs- 28, 253, 104, 139, 15	Contributory Paper 4B IDs-188, 158, 64, 164, 242	Contributory Paper 4C IDs-227, 36, 225, 224, 16	Contributory Paper 4D IDs-51, 216, 57, 248, 190
		Track-4.1 (PSPR04)	Track-4.2 (MGDS04)	Track-4.3 (PSOP02)	Track-4.4 (LFDM03)
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4
11.40 AM - 12:35 PM	Keynotes Session-D	Keynote session D I Power System Dynamic Phenomena: Correlating Theory with Real-life Measurements	Keynote session D II Role of Electric Mobility in Energy Transition	Keynote session D III Impact of Renewable Energy penetration on Power System Protection - Grid operator's perspective	Keynote session D IV Future Grid utilizing Smart Grid technologies for Sustainable Development
		A M Kulkarni, Professor, IIT Bombay, India	Abhishek Ranajan, VP, BSES Rajdhani, India	T. Muthukumar, DGM, SRLDC, POSOCO, India	Subir Sen, COO, PowerGrid, India
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4
12:35 PM - 01:30 PM		Break			

Day III - Saturday, 18 December, 2021

TIME	SESSION	DETAILS				
01.30 PM – 03.00 PM	Panel Session II- Inclusive growth of Entrepreneurs in Smartgrid	<p>Dr. S P GonChoudhury, NBIRT, Kolkata, India (Moderator) P.K. Agarwal, Former Director, Market Operations & CISO, POSOCO Shwetank Jain, Founder, CEO, P2Power, India Saikat Roy Chowdhury, MD, galileisolar India Pvt Ltd Vishal Pandya, REconnect, Bangalore Devendra Gupta, CEO/Co-Founder, Ecozen Solutions Pvt Lt, India Abhishek Mangalick, CEO, Ecosense Sustainable Solutions Pvt. Ltd Chandan Chakraborty, Professor, Associate Dean, SRIC, IIT Kharagpur, India</p>				
		Venue- Hall 1/ Auditorium				
03.15 PM – 04.15 PM	Contributory Paper Session 5	Contributory Paper 5A IDs- 195, 134, 160, 125	Contributory Paper 5B IDs-156, 171, 11, 62	Contributory Paper 5C IDs- 150, 122, 184, 56	Contributory Paper 5D IDs-274, 251, 197	Contributory Paper 5E IDs-208, 130, 7, 194
		Track-5.1 (AIML01)	Track-5.2 (MGDS05)	Track-5.3 (CMSC01)	Track-5.4 (LFDM04)	Track-5.5 (RIEV05)
		Venue- Hall 1/ Auditorium	Venue- Hall 2	Venue- Hall 3	Venue- Hall 4	Venue- Hall 5
04.30 PM – 05.30 PM	Award session	Announcement of Best Contributory paper award				
		Venue- Hall 1/ Auditorium				
05.30 PM – 06.15 PM	Valedictory Session	Report of ICPS 2021 Address by Guest of Honour - Prof. M. Ramamoorty, Former DG, CPRI Vote of Thanks				
		Venue- Hall 1/ Auditorium				

Contributory Paper Session 1 Friday, 17th December 2021, 10:15 AM - 11:15 AM

Track 1.1 (PSPR01): Power Systems Protection

Time	Paper ID	Title and Authors
10:15AM -10:30AM	178	Relay Coordination Algorithm with Limits on Minimum Operating Time of customized Time Inverse Relays Characteristics <i>Authors: Manohar Singh</i>
10:30AM -10:45AM	146	Fault Location During Power Swing Using Local Measurements <i>Authors: Neethu George, O.D. Naidu, Vedanta Pradhan</i>
10:45AM -11:00AM	182	Fast and Sensitive Time-Domain Protection of Shunt Capacitor Banks <i>Authors: Rabindra Mohanty, Ashok Kumar Pradhan</i>
11:00AM -11:15AM	149	A System Independent Setting Based Power Swing Blocking Technique for Transmission Lines <i>Authors: O.D. Naidu, Vedanta Pradhan</i>

Track 1.2 (MGDS01): Micro-Grid and Distribution System

Time	Paper ID	Title and Authors
10:15AM -10:30AM	9	Multiport AC-DC-AC Interfacing Converter for Microgrid Applications <i>Authors: Rajarshi Basu, Prof. Mahesh Kumar Mishra</i>
10:30AM -10:45AM	183	A Low Voltage High Power Bidirectional Multi- Port DC-DC Converter for DC Microgrids <i>Authors: Atanu Mondal, Debaprasad Kastha, Prabodh Bajpai</i>
10:45AM -11:00AM	177	A Coordinated Strategy for Optimal Operation of Unbalanced EDN via BESS, VVO and DSM <i>Authors: Vineeth Vijayan, Abheejit Mohapatra, S. N. Singh</i>
11:00AM -11:15AM	53	Application of Z-Source Circuit Breaker in a Solar PV based DC Microgrid with Battery Storage <i>Authors: Sharyu Chevale, Shubham Mahajan, Jaideep Bedarkar, Avinash Mathew, A VD Prasad, Arghya Mitra</i>

Track 1.3 (PSDS01): Power System Dynamics & Stability

Time	Paper ID	Title and Authors
10:15AM -10:30AM	40	Improving Frequency Regulation of Power System Using Primary and Secondary Reserves in Grid Integrated Wind Farms <i>Authors: Priyatosh Mahish, Sukumar Mishra</i>
10:30AM -10:45AM	82	Stability Analysis of Power system Connected to Wind Farm Using Eigenvalue sensitivity Approach <i>Authors: Balakrushna Sahu, Dr. Bibhu Prasad Padhy</i>
10:45AM -11:00AM	73	Impact of Different Penetration Level of Type-IV Renewable Energy Resources on Power System Dynamics <i>Authors: Gayathri K, Manas Kumar Jena, Akshaya Kumar Moharana</i>
11:00AM -11:15AM	259	A Direct Method for Calculation of Steady-state Operating Conditions of a Doubly Fed Induction Generator <i>Authors: D. R. Karthik, Shashidhara Mecha Kotian, Narayan Suresh Manjarekar</i>

Track 1.4 (LFDM01): Load Forecasting & Demand-side Management

Time	Paper ID	Title and Authors
10:15AM -10:30AM	272	Load Forecasting for Rare Events using LSTM <i>Authors: Shivanjali Yadav, Anjali Jain, Kailash Chand Sharma, Rohit Bhakar</i>
10:30AM -10:45AM	115	Load Forecast using ANN & VAR techniques for North Eastern Regional (NER) Grid of India <i>Nabarun Roy, Praveen Tripathy, Samar Chandra De, Sheikh Shadruddin, Bimal Swargiary, Authors: Subhash Kumar, Sangita Das, Namrata Pathak, Nishant Kumar Mishra</i>
10:45AM -11:00AM	199	An Ensemble Approach for Short-Term Load Forecasting for DISCOMS of Delhi Across the COVID-19 Scenario <i>Authors: Manish Uppal, Rumita Kumari, Saurabh Srivastava</i>
11:00AM -11:15AM	221	Cost Effective Operational Planning of a Retail Market with Distributed Generations <i>Authors: Shaziya Rasheed, Abhijit R. Abhyankar</i>

Track 1.5 (RIEV01): Renewable Integration & Electric Vehicle

Time	Paper ID	Title and Authors
10:15AM -10:30AM	114	Statistical Uncertainty Quantification of Wind Integrated Power System subjected to Random Injections <i>Authors: Suravi Thakur, Nilanjan Senroy</i>
10:30AM -10:45AM	90	DFIG Equivalence of a Wind Farm by Extended Kalman Filter based Parameters Estimation <i>Authors: Akhilesh Prakash Gupta, A. Mohapatra, S. N. Singh</i>
10:45AM -11:00AM	180	A Novel Power Converter Configuration for Open-Winding PMSG based High-Power Wind Energy Conversion Systems <i>Authors: Sayani Chatterjee, Debaprasad Kastha</i>
11:00AM -11:15AM	39	Smooth Synchronization Capability of Distributed Generation Based AC Microgrid <i>Authors: Farheen Chishti, Bhim Singh</i>

Contributory Paper Session 2 Friday, 17th December 2021, 1:50PM - 2:50PM

Track 2.1 (PSPR02): Power Systems Protection

Time	Paper ID	Title and Authors
01:50PM -02:05PM	25	An Extensive Review On Microgrid Protection Issues, Techniques And Solutions <i>Authors: Ekta Gairola, Mahiraj Singh Rawat</i>
02:05PM -02:20PM	12	An Intelligent Differential Protection Scheme for DC Microgrid <i>Authors: Nikhil Kumar Sharma, Abha Saxena, S. R. Samantaray.</i>
02:20PM -02:35PM	08	Adaptive Voltage Restrained Overcurrent Relaying for Protection of Distribution system with PV Plant <i>Authors: Priyanka Mishra, Ashok Kumar Pradhan, Prabodh Bajpai</i>
02:35PM -02:50PM	110	Line Protection Challenges and Its Mitigation in a New Grid Scenario <i>Authors: Jaisaikiran reddy Kurre, Subhadeep Paladhi, Ashok Kumar Pradhan</i>

Track 2.2 (MGDS02): Micro-Grid and Distribution System

Time	Paper ID	Title and Authors
01:50PM -02:05PM	238	Unscheduled Intentional Islanding in Microgrid using Trust Region based Sequential Linear Programming <i>Authors: Abhishek Mishra; Premalata Jena</i>
02:05PM -02:20PM	84	Synchrosqueezing Wavelet Transform based Identification of Transient Events in AC Microgrid <i>Authors: Ayushi Gupta; Seethalekshmi K..</i>
02:20PM -02:35PM	243	Stealth Attacks in Microgrids: Modeling Principles and Detection <i>Authors: Devakumar Annaram; Subham Sahoo; Sukumar Mishra</i>
02:35PM -02:50PM	148	Active Islanding Detection with Parallel Inverters in Microgrid <i>Authors: Sahil Gaurav; Prashant Agnihotri</i>

Track 2.3 (PSSR01): Power Systems Protection

Time	Paper ID	Title and Authors
01:50PM -02:05PM	189	Adequacy and Limitations of the Information Technology Act in Addressing Cyber-Security Issues of Indian Power Systems <i>Authors: Sarasij Das</i>
02:05PM -02:20PM	205	Major Blackouts of the Decade: Underlying Causes, Recommendations and Arising Challenges <i>Authors: Nirupma Sharma; Aparna Acharya; Irene Jacob; Sumanth Yamujala; Vikas Gupta; Rohit Bhakar</i>
02:20PM -02:35PM	132	Analysis of Single and Multiple Line Contingency in a 62 Bus Indian Practical Power System using Track Structure Algorithm Approach <i>Authors: Swasti Bachan Panda; Dr Sanjeeb Kumar Mohanty</i>
02:35PM -02:50PM	282	Optimal Location and Sizing of Multiple DGs to Improve Resiliency of Power System after an HILF event <i>Authors: Harsh Pachauri; ankit N Uniyal; Saumendra Sarangi</i>

Track 2.4 (LFDM02): Load Forecasting & Demand-side Management

Time	Paper ID	Title and Authors
01:50PM -02:05PM	49	A hybrid wind speed forecasting model using complete ensemble empirical decomposition with adaptive noise and convolutional support vector machine <i>Authors: Vishal Teja; Kiran Teeparthi; SANTHOSH M</i>
02:05PM -02:20PM	278	Short-term Wind Speed forecasting Using Multi-Source Multivariate RNN-LSTMs <i>Authors: Arun Kumar Nayak; Kailash Chand Sharma; Rohit Bhakar; Harpal Tiwari</i>
02:20PM -02:35pm	281	Wind Power Forecasting using Generalized Autoregressive Score Model <i>Authors: Yash Pal; Kailash Chand Sharma; Archee Gupta; Archita Vijayvargia; Rohit Bhakar</i>
02:35PM -02:50PM	270	Virtual Energy Storage Systems: Challenges and Opportunities <i>Authors: Chandra Prakash Barala; Parul Mathuria; Rohit Bhakar</i>

Track 2.5 (RIEV02): Renewable Integration & Electric Vehicle

Time	Paper ID	Title and Authors
01:50PM -02:05PM	128	Change in Power based P&O Algorithm for Maximum Power Extraction in Solar Energy Conversion System <i>Authors: Madhu G M; C Vyjayanthi; Modi Chirag Navinchandra</i>
02:05PM -02:20PM	141	A Novel High Gain Switched Capacitor Topology for Fuel Cell Vehicles with Wide Voltage Gain <i>Authors: Ishita Biswas; Debaprasad Kastha; Prabodh Bajpai</i>
02:20PM -02:35PM	20	Electric Vehicle Charging Station for Solar PV Based Grid Interactive System <i>Authors: Pavitra Shukla; Bhim Singh</i>
02:35PM -02:50PM	109	An Improved Crow Search Algorithm to Control MPPT Under Partial Shading Conditions <i>Authors: Swetha K.T; Abin Robinson</i>

Contributory Paper Session 3

Friday, 17th December 2021, 05:30PM - 06:45PM

Track 3.1 (PSPR03): Power Systems Protection

Time	Paper ID	Title and Authors
05:30PM-05:45PM	98	Wide Area Synchronous Disturbance Recording System <i>Authors: Sancho Simmy Louis, Faizan Feroz, Gopal Gajjar and A. M. Kulkarni</i>
05:45PM-06:00PM	223	Wide-Area Measurement Assisted Algorithm for Secure Backup Protection during Stressed Conditions <i>Authors:Shivaji Raskar, Prashant Gawande and Sanjay Dambhare</i>
06:00PM-06:15PM	276	Testing of WAMS-based Supervised Zone-3 Distance Relay Protection Scheme using a Real-Time Digital Simulator <i>Authors: K. K. Gajjar, A. M. Kulkarni, Gopal Gajjar, S. A. Soman, Rajeev Gajbhiye</i>
06:15PM-06:30PM	129	Application of synchrophasor angular difference as a grid monitoring tool and for assessment of Real time voltage Stability-Case Study <i>Authors: Alok Pratap Singh, Saibal Ghosh, Saurav Kumar Sahay, Chandan Kumar, Akash Modi, Saugato Mondal</i>
06:30pm-06:45PM	229	Communication Latency Calculation in Complex IEC 61850 Based Substation <i>Authors: Praveen. A. N, K. Shanti Swarup, Sachin Srivastava</i>

Track 3.2 (MGDS03): Micro-Grid and Distribution System

Time	Paper ID	Title and Authors
05:30PM-05:45PM	161	Application of Piecewise-smooth System Theory in Droop Control <i>Authors: Sharwari Udaykumar Shah, Dande Chandra Sekhar Charan, Bhooshan Rajpathak</i>
05:45PM-06:00PM	175	Model Predictive Control Based Economic Operation of Grid-connected DC Microgrid System <i>Authors:Arghya Mallick, Dinesh Varma Tekumalla, Ashish R. Hota, Prabodh Bajpai</i>
06:00PM-06:15PM	69	Mitigation of Power Oscillations in DC Microgrid using Model Predictive Control <i>Authors: Chandrima Sahu, Rahul Sharma</i>
06:15PM-06:30PM	118	Comparative Fault Analysis in an Active Distribution Network <i>Authors: Diasa Bhattacharjee, Arkaprabha Roy, Bhaskar Saha, Avik Kumar Mukherjee, Syamasree Biswas Raha</i>
06:30pm-06:45PM	211	Modified VSG Scheme for Secondary Frequency Regulation in Islanded Microgrid <i>Authors: Muhammad Khalid Raza Khan, Pratim Kundu</i>

Track 3.3 (PSOP01): Power System Operation & Planning

Time	Paper ID	Title and Authors
05:30PM-05:45PM	41	A New Convex Relaxation based OPF for Mutually Coupled Unbalanced Active Distribution Network <i>Authors: Sanat Kumar Paul, Abheejeet Mohapatra, P. Naga Yasarvi</i>
05:45PM-06:00PM	260	Optimal Planning of a Distribution Network with P, PQV Buses by Jaya Algorithm <i>Authors: Sumanth Pemmada, Nita R. Patne, Ashwini D. Manchalwar, Ajay Kumar T</i>
06:00PM-06:15PM	152	Cost of Voltage Violation <i>Authors: Suresh Varwandkar, Jeremy Lin</i>
06:15PM-06:30PM	233	Envisioning Low-carbon Indian Power Grid Using Demand-side Flexibility <i>Authors: Ashok M. Jadhav, Shri Ram Vaishya, Abhijit R. Abhyankar</i>

Track 3.4 (PSDS02): Power System Dynamics & Stability

Time	Paper ID	Title and Authors
05:30PM-05:45PM	239	Critical Assessment and Comparative Study of PID and ADRC Approaches Applied to AGC in Multi-Source Single Area Power System <i>Authors: Nagendra Muppoori, Nagalakshmi Dasari, Yatendra G</i>
05:45PM-06:00PM	21	Load Frequency Control of Two Area Microgrid Using Reinforcement Learning Controller <i>Authors: Subal Beura, Deepak Kumar Soni, Dr. Bibhu Prasad Padhy</i>
06:00PM-06:15PM	147	PSS Tuning of Radially Connected Hydro Power Plant of Eastern India Using SMIB Model and Phase Compensation Technique <i>Authors: Saibal Ghosh</i>
06:15PM-06:30PM	59	Detailed Investigation of Mode Information based System Inertia Estimation using Synchrophasor Measurements <i>Authors: Adithya Surya Tarun Papa, Gayathri K, Manas Kumar Jena</i>
06:30pm-06:45PM	173	Back Stepping Optimal Scheme with Fractional Order Control for Power System Model <i>Authors: Vivek Kumar, Soumya R. Mohanty</i>

Schedule

Track 3.5 (RIEV03): Renewable Integration & Electric Vehicle

Time	Paper ID	Title and Authors
05:30PM-05:45PM	256	Market Based Congestion Management in the Distribution System Under Electric Vehicle Integration <i>Authors: Jitendra Kumar, Dr. Preerna Jain</i>
05:45PM-06:00PM	236	Study of Optimally Located Electric Vehicle Charging Stations for Frequency Control Service in Distribution Network <i>Authors: Syed Nafiz Hasan, Satish Kumar Singh, Naran M. Pindoriya</i>
06:00PM-06:15PM	29	Lyapunov Stability Analysis of Load Frequency Control Systems with Communication Network Induced Time-Delays and EV Aggregator <i>Authors: B. S. Sharini Rithigaa, Kalavagunta Vamshi, K. Ramakrishnan</i>
06:15PM-06:30PM	279	Electric Vehicle Charging Policies in Indian states: Key Learnings from International Experiences <i>Authors: Renu Banjarey, Irene Jacob, Shivanjali Yadav, Sumanth Yamujala, Ashok Kumar Agrawal, Rohit Bhakar</i>
06:30pm-06:45PM	105	Charging-Cost Minimization of Electric Vehicles and its Impact on the Distribution Network <i>Authors: Arjun Visakh, Selvan M P</i>

Contributory Paper Session 4

Saturday, 18th December 2021, 10:15 AM - 11:30 AM

Track 4.1 (PSPR04) : Power System Protection

Time	Paper ID	Title and Authors
10:15AM -10:30AM	28	A Time Varying Filter-EMD Based Intelligent Technique for Protecting UPFC Installed Transmission Line <i>Authors: Sauvik Biswas, Paresh Kumar Nayek, Gayadhar Pradhan</i>
10:30AM -10:45AM	253	An Efficient Travelling Wave based Fault Localization for MTDC transmission system <i>Authors: Mahitosh Banafer, Dr. Soumya R. Mohanty</i>
10:45AM -11:00AM	104	Positive Sequence Components based Fault Location Algorithm For Three Terminal Transmission Network with Non-Homogeneous Tapping <i>Authors: RAVIKUMAR BHIMASINGU, Ravikumar Bhimasingu</i>
11:00AM -11:15AM	139	Adaptive Distance Relay Based on Estimation And Update of Two-Port Equivalent Across Transmission Lines <i>Authors: Vedanta Pradhan, O. D. Naidu, Neethu George</i>
11:15 AM -11:30 AM	15	Transmission Network Protection using Line Current Phase Information <i>Authors: Pratim Kundu</i>

Track 4.2 (MGDS04) : Micro-Grid and Distribution System

Time	Paper ID	Title and Authors
10:15AM -10:30AM	188	Optimal Planning of DG and Shunt Capacitor in a Harmonic Distorted Distribution Network <i>Authors: Ram Prakash, S. Sivasubramani</i>
10:30AM -10:45AM	158	A Graph Theoretic Approach Based Capacitor Placement in Unbalanced Distribution System <i>Authors: Sourav Mondal, Mala De</i>
10:45AM -11:00AM	64	Local distribution network management through optimal flexibility scheduling: the Austrian pilot of the Horizon 2020 MERLON project <i>Authors: Da Huo, Neal Wade, David Greenwood, Philipp Novakovits, Joachim Hacker, Dimitrios Papadaskalopoulos, Nikolaos Chrysanthopoulos, Goran Strbac, Markus Resch, Uma Rajarathnam, Katerina Valalaki, Vasiliki Katsiki</i>
11:00AM -11:15AM	164	Frequency Stability Analysis of Microgrid interconnected Thermal Power Generating System with GWO tuned PID controller <i>Authors: K.Jagatheesan, Sourav Samanta, D.Boopathi, B.Anand</i>
11:15 AM -11:30 AM	242	Effect of Multiple PV and Battery Penetration on Stability of DC Microgrid with Single Bus Topology <i>Authors: Jithin K., Mayadevi N., Hari Kumar R., Mini V P.</i>

Track 4.3 (PSOP02) : Power System Operation & Planning

Time	Paper ID	Title and Authors
10:15AM -10:30AM	227	Solar Photovoltaic on Water Bodies in Rajasthan <i>Authors: Vijay Kumar, Kusum Lata, Rohit Bhakar, Parul Mathuria</i>
10:30AM -10:45AM	36	Proactive Operation Strategy to enhance resiliency of Indian Power System During Super Cyclone Amphan <i>Authors: Aman Gautam, G.Sudhakar, M.K.Gupta, Rahul Shukla, R.K. Porwal, Debasis De, S.R.Narasimhan</i>
10:45AM -11:00AM	225	Evolution and Institutional Building of Load Despatch Centres in India <i>Authors: Akhil Singhal, K.V.N. Pawan Kumar, Vivek Pandey, S.C. Saxena, Debasis De, S.R.Narasimhan, S.S. Barpanda, S.K. Soonee, K.V.S. Baba</i>
11:00AM -11:15AM	224	Applicability of VSAT Communication for Indian Power System <i>Authors: Nabarun Roy, M.K. Ramesh, Akhil Singhal, Tapobrata Paul, Ashutosh Kumar, Sakal Deep, Paominlal Doungel, Royal Sutnga</i>
11:15 AM -11:30 AM	16	Wireless Communication Technologies for Indian Smart Grid: Fitness Evaluation and Optimal Decision-making <i>Authors: Jignesh Bhatt, Omkar Jani, V.S.K.V. Harish</i>

Track 4.4 (LFDM03) : Load Forecasting & Demand-side Management

Time	Paper ID	Title and Authors
10:15AM -10:30AM	51	Coexistence of Day Ahead Market and Real Time Market in Indian power sector <i>Authors: Naresh Kumar Mhalas, Aditya Prasad Das, S. Usha</i>
10:30AM -10:45AM	216	Bhutan-India Interconnected Grid Operation and Electricity Market Transactions <i>Authors: Pinki Debnath, K V N Pawan Kumar, Subhendu Mukherjee, S C Saxena, G Chakraborty, Debasis De, S S Barpanda, KVS Baba</i>
10:45AM -11:00AM	57	Day-ahead Energy Market Framework Utilizing Transmission-Distribution Coordination <i>Authors: Megha Gupta, A. R. Abhyankar</i>
11:00AM -11:15AM	248	Peer-To-Peer Decentralised Local Energy Trading Markets Using Blockchain <i>Authors: Jayati Shrivastava, Srasti Sethi, Tanisha Sahu, Urjita Sharma, Gnana Lakshmi T C, Deep Kiran</i>
11:15AM -11:30AM	190	Blockchain-based Decentralized Hybrid P2P Energy Trading <i>Authors: Bhawana Solanki, Ayushi Agarwal, Raveena Meena, Nitika Mahiya, Divya Sharma, Priyanka Kushwaha, Parul Mathuria Rohit Bhakar</i>

Track 4.5 (RIEV04) : Renewable Integration & Electric Vehicle

Time	Paper ID	Title and Authors
10:15AM -10:30AM	179	Open-Source Active Distribution Grid Model with a large share of RES- features, and studies <i>Authors: Aeishwarya Baviskar, Anca D. Hansen, Kaushik Das</i>
10:30AM -10:45AM	284	Evolution of Integrated Multi-Energy Vector System and Innovation Opportunities <i>Authors: Arpit Mantri, Aaquib Firdous, Chandra Prakash Barala, Rohit Bhakar, Parul Mathuria</i>
10:45AM -11:00AM	226	Aerodynamic Energy Harvesting for Electric Vehicles <i>Authors: Ashishsingh Solanki</i>
11:00AM -11:15AM	165	Solar Powered EV Fast Charging Station to Support Distribution Grid <i>Authors: Harshita Arya, Dr. Moumita Das</i>
11:15AM -11:30AM	112	Modified Energy Management Strategy for HESS in Electric Vehicle <i>Authors: Alok Ranjan, Sanjay B. Bodkhe</i>

Contributory Paper Session 5 Saturday, 18th December 2021, 3:15PM - 4:15PM

Track 5.1 (AIML01): Artificial Intelligence & Machine Learning

Time	Paper ID	Title and Authors
03:15PM-03:30PM	195	The Adaptive Forecast Combiner <i>Authors: Yash Raizada, Rahul Kumar, Sanand Sule</i>
03:30PM-03:45PM	134	Impact of Renewable Energy Penetration on PMU Based Grid Event Detection Using Machine Learning Framework <i>Authors: Rajib Majumdar, Abhishek Rai, Dr. Paramita Chattopadhyay</i>
03:45PM-04:00PM	160	Alternative Regression Approach for Data-Driven Power Flow Linearization Methods <i>Authors: Gopal Jain, Suraj Sidar, Deep Kiran</i>
04:00PM-04:15PM	125	Estimation of Time drift in Interface energy meters <i>Authors: Mastanvali Shaik, Vivek Pandey, Sushrut Meshram Sunil Kumar Aharwal, Sachala Mishra, Velury Balaji</i>

Track 5.2 (MGDS05): Micro-Grid and Distribution System

Time	Paper ID	Title and Authors
03:15PM-03:30PM	156	Energy Storage Unit for Dynamic Voltage Support in Distribution Networks <i>Authors: Bonu Ramesh Naidu, Prabodh Bajpai, Chandan Chakraborty</i>
03:30PM-03:45PM	171	Comparative Study of Various Communication Technologies for Secondary Controllers in DC Microgrid <i>Authors: A B Shyam, Soumya Ranjan Sahoo, Sandeep Anand, Josep M. Guerrero</i>
03:45PM-04:00PM	11	Fractional-order Adaptive Sliding Mode Approach for Frequency Regulation in Power System <i>Authors: Vivek Patel, Dipayan Guha, Shubhi Purwar</i>
04:00PM-04:15PM	62	A Novel Hybrid Algorithm for Event Detection, Localisation and Classification <i>Authors: Arup Anshuman, Bijaya Ketan Panigrahi, Manas Kumar Jena</i>

Track 5.3 (CMSC01): Condition Monitoring & System Characterization

Time	Paper ID	Title and Authors
03:15PM-03:30PM	150	Impact of Defect Functionalization and Thickness Variation on EMI Shielding Efficiency of Epoxy- MWCNT Nanocomposites <i>Authors: Abhishek Sharma, Myneni Sukesh Babu, Asapu Vinaya Kumar, R. Sarathi, V. Subramanian</i>
03:30PM-03:45PM	122	Classification of Polluted Silicone Rubber Micro Nanocomposites Based on ESDD Using ANN <i>Authors: Pabbati Vinod, Myneni Sukesh Babu, Ramanujam Sarathi, Stefan Kornhuber</i>
03:45PM-04:00PM	184	Comparative Assessment of Spectral Analysis Methods for Characterizing Forced Oscillation <i>Authors: Priya Singh, Abhineet Prakash, Kundan Kumar, S. K. Parida</i>
04:00PM-04:15PM	56	Estimation of Inertia in Power Systems Using Law of Conservation of Energy <i>Authors: Lavanya L, K Shanti Swarup</i>

Track 5.4 (LFDM04): Load Forecasting & Demand-side Management

Time	Paper ID	Title and Authors
03:15PM-03:30PM	274	P2P Energy Trading in Local Energy Market considering Network Fees and Losses <i>Authors: Divya Sharma, Rohit Vijay, Parul Mathuria, Rohit Bhakar</i>
03:30PM-03:45PM	251	Multi-objective Optimization based Automated Demand Response Model in Smart Distribution Grid <i>Authors: Priyanka Sharma, Abhishek Tiwari, Naran M. Pindoriya</i>
03:45PM-04:00PM	197	Automated Demand Response for Residential Prosumer with Electric Vehicle and Battery Energy Storage System <i>Authors: Abhishek Tiwari, Naran M. Pindoriya</i>

Track 5.5 (RIEV05): Renewable Integration & Electric Vehicle

Time	Paper ID	Title and Authors
03:15PM-03:30PM	208	Implementation of Active and Reactive Power Control in a Novel Solar Power Plant Controller Solution <i>Authors: Ashutosh Kumar Tiwari, Anamika Dubey, Prabakaran Selvaraj, Soumya Kanta Panda</i>
03:30PM-03:45PM	130	Phase Shifting Strategy for Mitigation of Local Voltage Rise in Highly PV Penetrated Distribution Network <i>Authors: Dhaval Y. Raval, Dr. Saurabh N. Pandya</i>
03:45PM-04:00PM	7	Design and Optimization of Mini-grid PV System for Developing Country <i>Authors: Ashwini V. Chaware, S.S. Dambhare, Vasim Pathan, Gaurav Mistry</i>
04:00PM-04:15PM	194	Simulation And Analysis Of Solar Based Water Pump System Using Separately Excited DC Motor With Different Converter Topologies <i>Authors: Kalyan Singh Malviya, Savita Nema, Suresh Kumar Gawre</i>



M. Ramamoorty

Former Director General, CPRI Bangalore

Dr. Ramamoorty obtained his BE degree from Andhra University in 1956 and ME degree from the Indian Institute of Science (IISC), Bangalore in 1958. He obtained his MSc and PhD degree from Toronto University in 1965 and 1967, respectively. He was a Commonwealth scholar at Toronto University from 1963 to 1967. In this duration, he was a lecturer at Indian Institute of Technology Madras from 1959 to 1963. He worked as Asst/Asso/Professor at Indian Institute of Technology Kanpur from 1967 to 1977, chief of research at ABB India Baroda from 1977 to 1983, Director General of CPRI Bangalore from 1983 to 1995, Director of ERDA Vadodara from 1995 to 2007, R&D advisor of Crompton Greeves Bombay from 2009 to 2012 and chancellor of KL University from 2014 to 2017. He had been visiting Professor at many universities abroad and authored 5 Books and 7 patents. He is the recipient of many national awards by professional bodies which include CBIP, IE (I), NPSC, VASVIK, BHU, IITR, IEEMA, IISC. He is Life Fellow of IEEE, Fellow of Indian National Academy of Engineering (INAE) and Fellow of National Academy of Engineering (NAE), USA. He is presently a chairman of Project Monitoring Committee for UIASSIST Project, DST and honorary R&D advisor of VNR VJIET since 2009.



**Kunal Kumar, IAS,
Jt. Secretary & Mission Director (Smart Cities
Mission), Ministry of Housing and Urban Affairs,
Government of India**

Shri. Kunal Kumar, IAS presently holds the position of Joint Secretary & Mission Director (Smart Cities Mission), Ministry of Housing and Urban Affairs, Government of India since May 2018. Earlier, he was Municipal Commissioner at Pune Municipal Corporation, Maharashtra for close to 4 years. He has been working in the State of Maharashtra since 1999 and has served across various cities of Maharashtra.

Shri. Kunal Kumar has worked as District Collector in three districts of Bhandara, Jalgaon and Aurangabad and has also worked as Municipal Commissioner in Kolhapur Municipal Corporation. Besides travelling, he has an avid interest in reading and follows sports across the world.

Shri. Kunal Kumar is an Electrical Engineering graduate from IIT Roorkee, and has successfully completed his Masters in Public Management from National University of Singapore jointly conducted with Harvard Kennedy School, Cambridge, USA. Shri. Kunal Kumar was awarded by the Prime Minister of India for excellence in AADHAR Governance award during his stint as District Collector of Aurangabad.

Sukumar Mishra, Professor, IIT Delhi, India



Topic: RE Rich Microgrid: Operation and Control

Brief Biodata:

Dr. Sukumar Mishra (Senior Member, IEEE) received his M.Tech and Phd in Electrical Engineering from National Institute of Technology, Rourkela in 1992 and 2000 respectively. Presently, Dr. Mishra is a Professor at the Indian Institute of Technology Delhi and has been its part for the past 18 years.

Prof. Mishra has won many accolades such as Young Scientist award (1999) by Orissa Bigyan Academy, INSA medal for young scientist (2002), INAE young engineer award (2002), INAE silver jubilee young engineer award (2012), The Samanta Chandra Shekhar award (2016), Bimal Bose award (2019) and NASI-Reliance Platinum Jubilee award (2019), National Mission Innovation Championship award (2019) and INAE Outstanding Teachers award (2021).

He has been granted fellowship from academies like NASI (India), INAE (India) and professional societies like IET (U.K.), IETE (India), IE (India). He has also been recognized as the INAE Industry Academic Distinguished Professor. Prof. Mishra is currently acting as ABB Chair professor and has previously delegated as the NTPC, INAE and Power Grid Chair professor. He has also served as an Independent Director of the Cross Border Power Transmission Company Ltd. and the River Engineering Pvt. Ltd. Prof. Mishra has also carried out many important industrial consultations with TATA Power, Microtek and others. He is the founder of SILOV SOLUTIONS PRIVATE LIMITED under the Companies Act, 2013. The company specifically deals in products related to renewable energy sources utilizable at household scale as well as at commercial setups for example bidirectional electric vehicle supply equipment, AC based EV charger, DC based EV charger, grid connected solar inverters, smart DC home management systems, online UPS etc.

Prof. Mishra's research expertise lies in the field of Power Systems, Power Quality Studies, Renewable Energy and Smart Grid. Also, he has been functioning as Associate Dean R&D of IIT Delhi from March, 2020. Prof. Mishra has so far authored more than 75 IEEE Transactions/Journals, 30 IET Journals and 30 other international journal papers. He has supervised 31 Phd students (18 ongoing), 38 Masters students (2 Ongoing). Prof. Mishra has also authored 5 book chapters so far and has 16 patents to his credit. Prof. Mishra has been working in close association with IEEE Delhi Section Executive Committee for past few years and is currently serving as an Editor for the IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, Current Science and was an Area Editor for the IET Generation, Transmission & Distribution journal.

Topic: Generation Capacity Addition and Dispatch Modelling

Sreekumar Nhalur, Member, Energy group Prayas, Pune, India



Brief Biodata:

Sreekumar has been working in the power sector in the areas of policy analysis and Information Technology applications from 1984. After 14 years of work in the industry, in 2000 he joined Prayas, a voluntary organisation based at Pune, India, and is currently Member - Prayas (Energy Group). The Energy Group works on policy analysis, governance and civil society capacity building in the energy sector. Sreekumar is a member of government committees and is associated with several voluntary organisations. He is an author of many articles, papers, booklets, including a Citizens' Primer on the electricity sector and a book on electricity sector reforms. Sreekumar received his Bachelor's degree in Electrical Engineering from IIT - Bombay in 1984 and Master's degree in Power Systems Engineering from IIT- Kharagpur. He is a Senior Member of IEEE.

Srihari Dukkipati , Member, Energy group Prayas, Pune, India



Brief Biodata:

Srihari worked in embedded software development in the mobile communications sector for 14 years before joining Prayas in 2011. At Prayas, he focuses on energy data and modelling related activities. He has been part of various committees set up with central government energy data agencies to improve energy data management in the country. He works on power sector and energy systems modelling activities to inform power procurement planning and wider energy policy. Srihari has Bachelor's and Master's degrees in Computer Science and Engineering.

Joydeep Mitra, FIEEE, Professor, Electrical Engineering, MSU, USA



Topic: Grid Resilience in the Presence of Renewable Generation

Brief Biodata:

Joydeep Mitra (Ph.D., FIEEE) is MSU Foundation Professor of Electrical Engineering at Michigan State University, East Lansing, Director of the Energy Reliability & Security (ERiSe) Laboratory, and Senior Faculty Associate at the Institute of Public Utilities. He received a Ph.D. in Electrical Engineering from Texas A&M University, College Station, and a B.Tech.(Hons.) in Electrical Engineering from Indian Institute of Technology, Kharagpur. Prof. Mitra is known for his contributions to power system reliability analysis and reliability-based planning. He has over 200 publications and patents in the power systems area; he is co-author of the book, "Electric Power Grid Reliability Evaluation: Models and Methods," and of IEEE Standard 762, a standard on reliability reporting. He is recipient of the 2019 IEEE-PES Roy Billinton Power System Reliability Award and the 2020 PMAPS Merit Award. Prof. Mitra serves as an Associate Editor for the IEEE Transactions on Power Systems and Power Engineering Letters, and for the IEEE Transactions on Industry Applications. In the past he has served as Chair of the IEEE-PES Analytic Methods for Power Systems Committee, Chair of several IEEE-PES Subcommittees, and as an Editor for the IEEE Transactions on Smart Grid. Prof. Mitra is a Fellow of the IEEE and an IEEE-PES Distinguished Lecturer.

Dipak Dutta, AGM, Electronics Division, BHEL, Bangalore, India



Topic: Practical Aspects for design & construction of High Voltage Semiconductor Power Modules

Brief Biodata:

Dipak Dutta has Retired as AGM from Electronics Division, Bharat Heavy Electricals Limited, Bangalore. He was graduated in 1983 with BE degree in Electrical Engineering from Bengal Engineering College (now IEST), Calcutta University. In his service of 37+ years in Bharat Heavy Electricals Limited from 1983 to 2021, he got experience of design, development & commissioning of high voltage high power Semiconductor modules/stacks and associated water & air cooling systems for Transmission & Transportation applications. His major activities were in the areas of FACTS, HVDC and Railways Traction products and also did some developmental work done in the area of water cooled propulsion converter for eBus. He was involved in various other activities like Setting up of two manufacturing facilities for Saturable Reactors and Thyristor Modules for HVDC application, Member of National Steering Committee on Power Electronics and 4 other project review committees under the Ministry of Electronics & Information Technology (MeITY), Represented BHEL as Member of Electro Technical committee ETD-31 of Bureau of Indian Standard (BIS) till recent retirement. His major achievements include 7 granted patents as co-inventor, 1 copyright and 2 IEEE papers as co-author.

Manu Asthana, President & CEO at PJM Interconnection, USA



Topic: PJM: Leading reliable operations, competitive markets and the energy transition

Brief Biodata:

Asthana has extensive leadership experience across the electricity industry, including power generation operations, optimization and dispatch, competitive retail electricity, electricity and natural gas trading, and risk management, which he acquired across more than 21 years in the industry. Most recently, he served as President of Direct Energy Home in North America, where he led a team of over 2,600 to combine the company's retail electricity and home-services businesses, creating a leading energy and home-services provider serving over 3.4 million customers. He previously led power generation operations at Direct Energy, energy trading at both Direct Energy and at the TXU group of companies, as well as generation optimization and dispatch at TXU. In addition, Asthana also served as Chief Risk Officer of TXU Corporation, where he helped senior management and the Board quantify and manage risk in TXU's businesses. Asthana earned a Bachelor of Science in economics from The Wharton School at the University of Pennsylvania, where he was a Benjamin Franklin Scholar and a Joseph Wharton Scholar. He is active in the community, serving on the Board of Directors for The Chamber of Commerce for Greater Philadelphia, the Texas Children's Hospital Board of Trustees and as a board member of the Houston Food Bank and Child Advocates, Inc.

Keynote Session A I

Friday, 17 December 2021, 09:00 AM - 09:55 AM

Anurag K. Srivastava, Professor, WVU, USA



Topic: Enabling Resilience for the DER-rich Power Distribution System

Brief Biodata:

Anurag K. Srivastava is a Raymond J. Lane Professor and Chairperson of the Computer Science and Electrical Engineering Department at the West Virginia University. He is also an adjunct professor at the Washington State University and senior scientist at the Pacific Northwest National Lab. He received his Ph.D. degree in electrical engineering from the Illinois Institute of Technology in 2005. His research interest includes data-driven algorithms for power system operation and control including resiliency analysis. In past years, he has worked in a different capacity at the Réseau de transport d'électricité in France; RWTH Aachen University in Germany; PEAK Reliability Coordinator, Idaho National Laboratory, PJM Interconnection, Schweitzer Engineering Lab (SEL), GE Grid Solutions, Massachusetts Institute of Technology and Mississippi State University in USA; Indian Institute of Technology Kanpur in India; as well as at Asian Institute of Technology in Thailand. He is serving as chair of the IEEE Power & Energy Society's (PES) PEEC committee, co-chair of the microgrid working group, vice-chair of power system operation SC, chair of PES voltage stability working group, chair of PES synchrophasors applications working group, co-chair of distributed optimization application in power grid, vice-chair of tools for power grid resilience TF, and member of CIGRE C4C2-58 Voltage Stability, C4.47/ C2.25 Resilience WG. Dr. Srivastava is serving or served as an editor of the IEEE Transactions on Smart Grid, IEEE Transactions on Power Systems, IEEE Transactions on Industry Applications, and Elsevier Sustainable Computing and guest or past editor for numbers of other IEEE Transactions and IET Journal. He is the author of more than 300 technical publications including a book on power system security and 4 patents.

Keynote Speakers

Keynote Session A II
Friday, 17 December 2021, 09:00 AM - 09:55 AM

Janaka Ekanayake, FIEEE, Professor, Department of Electrical & Electronic Engineering, University of Peradeniya, Sri Lanka



Topic: Renewable energy generation and its integration: Challenges and Solutions

Brief Biodata:

Janaka Ekanayake is attached to the Department of Electrical and Electronic Engineering, University of Peradeniya, Sri Lanka as a Professor since April 2013. He is also a visiting professor at the Institute of Energy at Cardiff University, UK and an honorary professor of the School of Electrical, Computer and Telecommunication Engineering, University of Wollongong, Australia. Prof. Ekanayake is a Fellow of IEEE (USA), IET (UK), and IESL, Sri Lanka. He was also recognised as an IEEE PES distinguished lecturer (DLP). He has been a Royal Society and Commonwealth Fellow at the University of Manchester Institute of Science and Technology, the UK in 1997 and 2001. He is also a Chartered Engineer of the UK and Sri Lanka. His main research interests include renewable energy generation and its integration and Smart Grids. He has published more than 80 papers in refereed journals, more than 100 papers in conferences and co-authored 7 books. He is a member of the IET Journal of Renewable Power Generation and Wind Engineering journal. He served as an Editorial Board member of IEEE Transaction on Energy Conversion from 2007 to 2017. He was the Organising Vice Chairperson of the First IEEE PES conference of Innovative Smart Grid Technologies, Asia (2012). He served as a consultant to a number of organisations such as Asian Development Bank; International Copper Association; National Microelectronic Institute, UK; Utility Partners Limited, UK; and Gamesa, Spain.

Keynote Session A III

Friday, 17 December 2021, 09:00 AM - 09:55 AM

Mani Vadari, President of Modern Grid Solutions, Seattle, USA



Topic: Storage, the ultimate disrupter. Is there anything Storage cannot do?

Brief Biodata:

Dr. Mani Vadari leads a team of experts to deliver complex and innovative technology, business, regulatory, and finance solutions to electric utilities, suppliers, regulators, corporate boards, and policymakers worldwide. Mani brings over 35 years of experience delivering business and technical solutions for transmission, distribution, and generation operations, wholesale markets, Smart Grid, Cyber security/threat assessment, and Smart Cities. Mani is also an Affiliate Professor at the University of Washington. Mani has published two popular books, "Smart Grid Redefined: Transformation of the Electric Utility" and "Electric System Operations – Evolving to the Modern Grid, 2nd edition", and has authored over 100 industry papers, articles, and blogs.

Keynote Speakers

Keynote Session A IV
Friday, 17 December 2021, 09:00 AM - 09:55 AM

Anil K. Jampala, FIEEE, Senior Staff Software Engineer, GE Renewable Energy



Topic: Collaborative Online experiences in Indian Engineering Education

Brief Biodata:

Anil Jampala, Ph. D, Fellow IEEE – has over 24+ years of experience in EMS, DTS and WAMS areas. He also worked in the Indian Information Technology area for 13 years. He was a key leader in setting up integrated emergency management system 108 (9-1-1 type) system in India. He holds several US and international patents. He holds a P.E. license in the state of Washington. He has been a Managing Committee of HYSEA for over 2 decades.

Keynote Session B I

Friday, 17 December 2021, 11:30 AM - 12:25 PM

Tapan Saha, FIEEE, Professor, School of Information Technology and Electrical Engineering, UQ, Australia



Topic: Solar PV integrations into national grid: Challenges and Opportunities

Brief Biodata:

Tapan Saha received his PhD from the University of Queensland (UQ), Brisbane, Australia in 1994. Previously, Tapan obtained a B. Sc in Electrical & Electronic Engineering from Bangladesh University of Engineering and Technology (BUET), Dhaka in 1982 and a Master of Technology in Electrical Engineering from Indian Institute of Technology, New Delhi in 1985. He has been with the University of Queensland since 1996, where he has been a Professor of Electrical Engineering since 2005. Currently he is the Discipline Leader of Power, Energy & Control Engineering at UQ, founding Director of Australasian Transformer Innovation Centre & Leader of UQ Solar and UQ industry 4.0 Energy TestLab. He is a Fellow of IEEE and a Fellow and CPEng of Institution of Engineers Australia. He is an IEEE Power & Energy Society Distinguished Lecturer. Tapan has successfully supervised 50 PhD students as the principal supervisor. He has received extensive funding from Australian competitive agencies, state and federal governments and the electricity industry. He has published more than 600 papers in IEEE, IET & Elsevier Journals and peer reviewed conferences.

Keynote Speakers

Keynote Session B II
Friday, 17 December 2021, 11:30 AM - 12:25 PM

S. K. Soonee, FIEEE, Advisor, POSOCO, India



Topic: Governance aspects of Indian Power System

Brief Biodata:

Mr. Sushil, the former and Founder Chief Executive Officer (CEO) of Power System Operation Corporation Ltd (POSOCO), is presently serving as Advisor to the POSOCO. He has first-hand more than four decades of experience in Power System Operation of various Regional Grids of India and has worked extensively towards Integration of State Grids to form Regional Grids, and subsequent integration of Regional Grids leading to the formation of the National Grid and now SAARC Grid. He specializes in Power System Operation, Planning, Commercial, Settlement, Restoration, and the entire gamut of Power Pooling and Governance. Other areas of interest include Electricity Markets, Open Access, Regulatory affairs, besides expertise in Load Despatch Technology, integration of Renewable Energy, including REC Mechanism, Transmission Pricing, and the development of Ancillary Services. He is a Life Fellow of Institution of Engineers (India), Fellow of IEEE, Fellow INAE, Distinguished Alumnus IIT Kharagpur, Distinguished Member CIGRE, Foreign Member NAE USA. He has represented India on the CIGRE Study Committee C2 on Power System Operation and currently represents India on the CIGRE Study Committee C5 on Electricity Markets and Regulation.

Keynote Session B III

Friday, 17 December 2021, 11:30 AM - 12:25 PM

Jean Belanger, President & CTO, Opal-RT Technologies, Canada



Topic: Low-Inertia Very Large Grid Digital Twins using HYPERSIM EMT simulator for Dynamic Transient Performance Evaluation

Brief Biodata:

Jean Bélanger is the co-founder, CEO and CTO of OPAL-RT TECHNOLOGIES. Founded in 1997, OPAL-RT develops and commercializes one of fastest and most advanced digital real-time simulators for system design and electronic controller testing. Jean Bélanger received his Electrical Engineering degree in 1971 at Laval University, in Quebec City, and his Master's degree from the École Polytechnique in Montreal. Under his direction and technological leadership, OPAL-RT has become a well-known developer of state-of-the-art real-time simulators capable of simulating all types of mechanical and electrical systems, including the fastest power electronic converters used in a wide range of industries - from hybrid vehicles to entirely electrical-driven aircraft, and from micro-grids to very large AC/DC power systems. Jean Bélanger began his career at Hydro-Quebec's System Planning Division for the design of several aspects of the James Bay 735-kV transmission systems. He also worked at the IREQ where he contributed to the design and construction of Hydro-Quebec real-time simulators. Today, Jean Bélanger foresees that high-end real-time simulators will soon be available to all engineers, scientists and students by taking full advantage of off-the-shelf PCs. This is the driving challenge that Jean Bélanger and the OPAL-RT team have taken as their primary goal.

Keynote Speakers

Keynote Session B IV
Friday, 17 December 2021, 11:30 AM - 12:25 PM

Arindam Ghosh, Professor, Curtin University, Australia



Topic: What about Hydrogen?

Brief Biodata:

Arindam Ghosh is a Professor (Research Academic) at Curtin University. Prior to joining Curtin University in November 2013, he was a Research Capacity Building Professor in Power Engineering at Queensland University of Technology, Brisbane, where he joined in May 2006. Before that, he was Professor of Electrical Engineering from 1991 till 2006 and an Assistant Professor from 1985 and 1991 at Indian Institute of Technology Kanpur. He has obtained his Ph.D. from University of Calgary, Canada in 1983. He was a Fulbright Scholar, is a Fellow of IEEE, Indian National Academy of Engineering, and is an IEEE PES Distinguished Lecturer. He was awarded IEEE PES Nari Hingorani Custom Power Award in 2019.

Keynote Session C I

Saturday, 18 December 2021, 09:00 AM - 09:55 AM

Vinay Jammu, VP, Physical-Digital Technologies, GE Digital, India



Topic: Digital Twins for Digital Transformation

Brief Biodata:

Vinay Jammu is the VP-Physical-Digital Technologies at GE Digital based at the John F Welch Technology Organization, Bangalore. He is responsible for strategy and execution of domain-based analytics and software to differentiate GE's Industrial Internet Solutions. Before this role, Vinay was Technology Director for Software and Analytics in GE Research where he spent 23 years driving physical-digital technologies. Vinay obtained his doctoral degree from University of Massachusetts, Amherst in 1996 in Mechanical Engineering with specialization in applications of Artificial Intelligence (AI) for machine prognosis. After a brief stint at Mechanical Technology Inc, NY, he joined GE Global Research, Schenectady, NY in 1997 as Diagnostics Engineer where he focused on developing predictive analytics for failure and life prediction of industrial assets. Vinay relocated to Bangalore in 2002 and held multiple roles as Lab Manager, Technology Leader and Technology Director for Aero-Thermal and Mechanical Systems as well as Software and Analytics organizations in GE Global Research. Vinay is a certified master black belt, has 40 patents applications, and 60+ internal and external publications.

Sudhansu Sekhar Barpanda, Director, Market Operation, POSOCO, India



Topic: Learnings from Global electricity Markets in Indian Context

Brief Biodata:

Mr. Sudhansu Sekhar Barpanda (DIN: 08775878) is the Director (Market Operation) of Power System Operation Corporation Limited (POSOCO). Before his appointment, he was holding the charge of Executive Director, NRLDC, POSOCO. He is a Graduate Electrical Engineer from University College of Engineering, Burla, Odisha. He has more than three decades of experience in power system / power market operation. Mr. Barpanda was responsible for diverse areas like non-discriminatory Open Access including Power Exchange Operations, scheduling, pool settlement, transmission pricing, regulatory affairs, etc. Mr. Barpanda played a vital role in implementation of a number of power sector reforms such as Transmission Pricing (POC mechanism), Grid Integration of Renewables, Renewable Energy Certificate mechanism, Ancillary Services, Revenue Stream for System Operators, Capacity Building and Certification of System Operators, System Operation norms and benchmarking, Electricity Market Design issues etc. He played a major role in synchronous inter-connection of all regional grids. As member of joint committees with neighbouring countries, he worked for enhancing bilateral cooperation in power sector. He has visited number of countries as Expert, for meetings / workshops and authored/ presented a number of papers in national / international conferences. He joined our Board in July, 2020.

Keynote Session C III Saturday, 18 December 2021, 09:00 AM - 09:55 AM

Akilur Rahman, Chief Technology Officer, Hitachi ABB Power Grids India



Topic: Power Systems on the Cusp of Energy and Digital Transformation

Brief Biodata:

Akilur Rahman, CTO - Hitachi ABB Power GridsIndia, is leading technology, digitalization and innovation towards the market. Has more than 32years of experience in research, R&D, technology management, engineering, business and product development in power and automation technologies.

With master's degree in Electrical Engineering from IIT Kharagpur, Akilur has held various international and global roles in India, Germany and Switzerland including head of global collaborative production management, engineering, and cyber security in process/industrial automation. Was responsible for building up ABB's global automation software product and system R&D in India. Led ABB corporate research center and technology in India with focus on power, automation, robotics, analytics, AI-ML, Industry 4.0, Industrial IoT and digitalization. Previously held the role of CTO - ABB India. In the current CTO role, Akilur has been leading core, automation and digital technologies for power, energy and asset performance management in utilities, industries, infrastructure, and transport sectors. Co-creating the concepts and applications of smart electric grid, energy internet, smart cities, sustainable electric mobility, smart factories, digital enterprise and carbon neutral future. Akilur has been a speaker and panelist at various international and national conferences.

Keynote Speakers

Keynote Session C IV
Saturday, 18 December 2021, 09:00 AM - 09:55 AM

Noel Schulz, FIEEE, Professor, School of Electrical Engineering and Computer Science, WSU, USA



Topic: How Smart Distribution Systems and Microgrids Will Advance Energy Diversity and Equity

Brief Biodata:

Noel Schulz received her B.S.E.E. (1988) and M.S.E.E. (1990) degrees from Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg, Virginia, USA. She received her Ph.D. in EE (1995) from the University of Minnesota in Minneapolis, Minnesota, USA. Before moving to Washington State in the summer of 2016, Noel spent seven years on Kansas State University faculty in 2009 in the Department of Electrical and Computer Engineering. From August, 2012 through May, 2016, she served as the Associate Dean for Engineering Research and Graduate Programs. Noel has been active for over 24 years in teaching, research, and service at six U.S. universities. She teaches electrical engineering and power engineering topics. In research and graduate studies, she has graduated 45 MS and 13 PhD students; published 175 papers and 2 book chapters; and brought in over \$40M in external research through individual and collaborative projects including a U.S. National Science Foundation CAREER award. Dr. Schulz is a Fellow of IEEE and the American Society of Engineering Education (ASEE). Her research interests are in power system design, analysis and operations including rural electrification, smart grid, renewable energy, shipboard power systems, and intelligent system applications. As Associate Dean for Research and Graduate Programs at Kansas State, she advanced faculty development and research team activities and worked to cultivate the graduate student program and environment in the College of Engineering. Her other leadership interest areas are increasing the number of women and under-represented minorities in STEM as well as international engineering solutions.

Noel has been active in the IEEE Power & Energy Society (PES) serving on the PES Governing Boards for 12 years from 2004-2015. She served as Secretary (2004-2007), Treasurer (2008-2009), President-Elect (2010-2011), President (2012-2013) and Immediate Past President (2014-2015). In 2014 she received the IEEE HP Harriet B. Rigas Award. She is a member of Eta Kappa Nu (Electrical Engineering Honorary Society), Tau Beta Pi (Engineering Honor Society), the Society of Women Engineers, and the National Society of Black Engineers. She served on the Board of Directors for ASEE from 2008 to 2010. In addition to her role on the faculty, she will serve as the Washington State First Lady. Noel and her husband Kirk have two grown sons, Tim and Andrew.

Keynote Session D I
Saturday, 18 December 2021, 11:40 AM - 12:25 PM

A M Kulkarni, Professor, Department of Electrical Engineering, IIT Bombay, India



Topic: Power System Dynamic Phenomena: Correlating Theory with Real-life Measurements

Brief Biodata:

A.M.Kulkarni a Professor in the Electrical Engineering Department, IIT Bombay India. He obtained his BE degree in Electrical Engineering from the University of Roorkee, India in 1992, and his ME and PhD degrees in 1994 and 1998 respectively, from the Indian Institute of Science, Bangalore. His broad areas of interest are in Power System Dynamics, HVDC and FACTS. Recently, he has focused on Wide Area Measurement Systems (WAMS). He has worked closely with utilities in India on several projects, including the PSS tuning exercise in the Eastern and Western regional grids, Sub-synchronous resonance studies and disturbance diagnostics. His current focus is on the use of WAMS for protection and control.

Keynote Speakers

Keynote Session D II
Saturday, 18 December 2021, 11:40 AM - 12:25 PM

Abishek Ranajan, VP, BSES Rajdhani, India



Topic: Role of Electric Mobility in Energy Transition

Brief Biodata:

Abhishek has over two decades of experience in Power and Information Technology sectors in India. He started his career with Infosys Technologies Limited, an IT company based in India, where he worked on development of enterprise applications for a major US utility and a technology MNC. In his earlier assignments, Abhishek has worked on Detailed Project Reports covering power project economics & financing/techno-commercial aspects, Power potential study, tariff analysis and financial closure of Hydro renewable projects in Indian Himalayan states of Arunachal Pradesh, Himachal Pradesh and Uttarakhand. He has Undertaken several Energy conservation and efficiency programs for consumers including Efficient cooling and lighting solutions, solar powered energy efficient pumps (grid connected), non-wired alternatives for meeting peak demand e.g. grid level battery storage in license area and faster roll out of EV charging infrastructure for public fleet as well as private owners of EV. He is currently leading a team in the areas of Energy Efficiency & Demand Side Management, Renewable Integration and Rooftop Solar, grid level Energy Storage solutions, EV charging infrastructure, Power scheduling & demand forecasting and Energy Analytics at BSES Rajdhani Power Limited (BRPL), New Delhi. Abhishek is a Bachelor of Electrical Engineering from National Institute of Technology, Bhopal and PGDM(GM) from XLRI Jamshedpur.

Keynote Session D III

Saturday, 18 December 2021, 11:40 AM - 12:25 PM

T. Muthukumar, DGM, SRLDC, POSOCO, India



Topic: Impact of Renewable Energy penetration on Power System Protection - Grid operator perspective

Brief Biodata:

Shri T. Muthu Kumar is DGM at SRLDC, POSOCO and currently heading Shift Operation. He has a formal degree in Electrical & Electronics engineering. He has 15 years of experience and has worked with grid operation and Protection wing at POSOCO. His area of expertise includes analysis of grid events and protection audits of grid stations. During his tenure with POWERGRID he has worked in Substation Commissioning, Operation & Maintenance and relay testing. He has been regularly conducting sessions on power system protection and other topic related to grid operation for various prestigious organisations. He has published papers in IEEE, CIGRE and Power system protection conferences. His areas of interest include Power System Protection and Grid operation.

Keynote Speakers

Keynote Session D IV

Saturday, 18 December 2021, 11:40 AM - 12:25 PM

Subir Sen, COO, Powergrid, India



Topic: Future Grid utilizing Smart Grid technologies for Sustainable Development

Brief Biodata:

Dr. Subir Sen currently working as Executive Director (Technology Development & Smart Grid) in Power Grid Corporation of India Ltd. Dr. Sen has more than three decades of professional experience in the field of Power System spanning over planning & development of National Grid comprising 400kV/765kV and HVDC technology, Green Energy Corridors for integration of renewable energy sources, open access. He also facilitates application of advanced technologies towards bringing efficiency such as FACTS, series reactors, forecasting of renewable generation, dynamic compensation, GIS/Hybrid substation, re-conductoring of lines, synchrophasor technology for real time dynamic state measurement and control, energy storage system, deployment of smart grid integrated with intelligent sensors, monitoring, IT & communication technology, big data analytics, EV charging infrastructure etc. He is also working on technology development and digitalization of power system as well as cyber-physical security related to power system to improve reliability and resilience in power supply system. Published more than 100 technical papers in various international and national journals/conferences. Guided research students and Co-authored three books in the field of Renewable Energy Technology and Smart Grid. Applied 4 patents in the field of Smart Grid.

Invited Paper Speakers

Invited Paper 1A
Friday, 17 December 2021, 1:30 PM - 1:50 PM

**Narayana Prasad Padhy, Professor, Department of Electrical Engineering,
IIT Roorkee, India**



Topic: Smart Optimization Framework to Distribution Network Operators for Serving Multiple Renewable Penetrated Areas: A Comprehensive Study

Brief Biodata:

Narayana Prasad Padhy (SM'09) received the Ph.D. degree in power systems engineering from Anna University, Chennai, India, in 1997. He is working as Professor (HAG) and 92 Batch Chair Professor with the Department of Electrical Engineering, Indian Institute of Technology (IIT) Roorkee, Roorkee, India. Earlier he has served as Dean of Academic Affairs, Institute and NEEPCO Chair Professor at IIT Roorkee. He is the National lead of many national and international projects such as DSIDES, ID-EDGE, and HEAPD. He is also part of other international projects, namely Indo-US UI-ASSIST and Indo UK ZED-I. His research interests include Power System Engineering and AC-DC Smart Grids. Dr. Padhy is also a Fellow of the Indian National Academy of Engineers (INAE), Fellow Institution of Electronics and Telecommunication Engineers, India, Fellow Institution of Engineering and Technology and Fellow of Institution of Engineers and India. He was the recipient of the IEEE PES Outstanding Engineers Award 2018, Boycast Fellowship and the Humboldt Experienced research Fellowship in the year 2005 and 2009, respectively.

Invited Paper 1B

Friday 17 December 2021, 1:30 PM - 1:50 PM

Raghavendra R Pulakurthi, Sr. Director, Data and Analytics, Flex Technologies Ltd.



Topic: How AMI meter data can help to optimize grid operation: Real cases/stories from a US Utility Smart Grid implementation experience employing Data Analytics.

Brief Biodata:

Raghu leads product development teams at Oracle Utilities Global Business Unit, Hyderabad, India. Prior to this Raghu worked for Flex International, world's third largest Electronics manufacturing company, as Director of Application Development. Raghu worked in the US until July 2013. In the US, he has worked for Baltimore Gas and Electric (BGE) and was a key member of its USD 500M+ Smart Grid implementation project. At BGE, he has contributed in Systems Integration, Application Development, Project and Program Management. Raghu also worked as Application development manager for EDS. While with EDS, he has worked for several State and Local Government projects in the US.

Raghu obtained his degree in Mechanical Engineering from G Pulla Reddy Engineering College, Kurnool, AP. He earned his MBA degree from Carey Business School, Johns Hopkins University, Baltimore, MD. Raghu lives with his wife, son and daughter in Hyderabad, India. He is a meditation practitioner and a trainer.

Invited Paper Speakers

Invited Paper 1C

Friday, 17 December 2021, 1:30 PM - 1:50 PM

**Venkata Sivaram Vaddamanu, Sr. Manager, Software Engineering, GE,
Hyderabad, India**



Topic: Implementation experience of WholeSale Electricity Markets in the North American Context

Brief Biodata:

Mr. Venkata Sivaram Vaddamanu completed his Bachelors in Electrical and Electronics Engineering from JNTU College of Engineering, Anantapur in 1990. He completed his masters in Electrical Engineering from Indian Institute of Science, Bangalore in 1992. After spending his initial years at CMC Limited, Mr. Venkata worked in US for about 12.5 years before returning to India. In US, he worked with pretty much all leading EMS Vendors such as GE, ABB, Siemens etc. He has a very rich experience in the area of deregulation and wholesale electricity markets, having worked at Electric Reliability Commission of Texas (ERCOT) and played an instrumental role in the transition to nodal markets. After returning to India, he served as an R&D Leader at Crompton Greaves Limited. Currently, he is based out of Hyderabad, working for GE in the domain of electricity markets.

Invited Paper 1D

Friday, 17 December 2021, 1:30 PM - 1:50 PM

**Celia Shahnaz, Professor, Department of EEE, Bangladesh University of
Engineering & Technology, Bangladesh**



Topic : Machine and Deep Learning Based Classification Approach for Power Quality Disturbances

Brief Biodata:

Celia Shahnaz, SMIEEE, Fellow IEB, received her Ph.D. degree from Concordia University, Canada and is currently a Professor at the Department of Electrical & Electronic Engineering, Bangladesh University of Engineering and Technology.

She has more than 20 years of experience (20 years as an IEEE volunteer) in leading impactful Technical, Professional, Educational, Industrial, Women Empowerment and Humanitarian Technology, Power and Energy-related Projects at national/international levels. She has published more than 150 international journal/conference papers. Her research interests include the areas of signal processing for speech analysis and speech enhancement, audio-visual recognition for biometric security, control system, robotics, pattern recognition, machine learning and deep learning for audio, video, biomedical, power signals, multimodal emotion recognition, and humanitarian technology.

She has been elected as 2022 IEEE WIE Chair-Elect. She has been appointed as 2021-23 Chair, IEEE SPS Women in Signal Processing, 2021-23 Liaison between IEEE SPS and IEEE WIE. She has served as an Editorial board member, IET Signal Processing From 2018 to date and 2018-20 Member, Technical Committee, Image, Video, and Multimedia (IVM), Asia Pacific Signal and Information Processing Association (APSIPA).

Invited Paper Speakers

Invited Paper 1E
Friday, 17 December 2021, 1:30 PM - 1:50PM

Jai Govind Singh, Associate Professor, Department of Energy, Environment and Climate Change, AIT Bangkok, Thailand



Topic: Estimation of EV's Daily Load Profile in Bangkok Metropolitan City under Different Policy Scenarios

Brief Biodata:

Dr. Jai Govind Singh is an Associate Professor and Head of the Department of Energy, Environment, and Climate, School of Environment, Resources and Development, Asian Institute of Technology, Thailand. His educational background includes Ph.D. in 2008, in Power and Control, from Indian Institute of Technology, Kanpur, India, M.Tech. in 2003, in Power System, from Indian Institute of Technology, Roorkee, India and B.E. in 2001, in Electrical Engineering, from Motilal Nehru National Institute of Technology, Allahabad, India. His teaching and research interests include Smart Grid and Microgrid; Electric vehicles and battery storage; power system planning, operation and control; deregulation; solar and wind integration. Dr. Singh has supervised 6 doctoral dissertations and 59 master theses besides involved as a committee member of more than 150 other master/doctoral thesis works completed so far. He has published more than 85 articles in different international journals (28), international conference proceedings (57). He has been involved in several research and development projects (22) sponsored by different international donors/agencies. He has delivered several invited talks in conferences and training programs.

Invited Paper 2A

Friday, 17 December 2021, 5:10 PM - 5:30 PM

Fushuan Wen, Professor in Energy Systems, Department of Electrical Power Engineering and Mechatronics, Tallinn University of Technology (TalTech), Estonia



Topic: Investment Decision-Making in Power Systems Employing Data Monitoring Technology

Brief Biodata:

Professor Fushuan Wen received the B.E. and M.E. degrees from Tianjin University, Tianjin, China, in 1985 and 1988, respectively, and the Ph.D. degree from Zhejiang University, Hangzhou, China, in 1991, all in electrical engineering. He joined the faculty of Zhejiang University in 1991, and has been a full professor and the director of the Institute of Power Economics and Information since 1997, and the director of Zhejiang University-Insigma Joint Research Center for Smart Grids since 2010. He is a Professor in Energy Systems at Tallinn University of Technology.

His research interests include: 1) power economics and electricity markets; 2) power system investment, planning and operation optimization; 3) smart grids and electric vehicles; 4) power system alarm processing, fault diagnosis and system restoration; 5) artificial intelligence applications in power and integrated energy systems. He has published 200+ SCI-indexed papers, 650+ EI-indexed papers, and 720+ Scopus-indexed papers. His publications have been cited for 16000+ times. He has completed and is undertaking more than 170 grants and projects from governmental organizations and industry.

Prof Wen received many awards both at the national level and provincial level, including the most prestigious National Natural Science Award of China. He has been listed in "Most Cited Chinese Researchers" in six consecutive years since 2015 by Elsevier, and is the author of one of the China's 100 Most Influential Domestic Academic Papers in 2016. Prof Wen was elected to IEEE Fellow for contributions to fault diagnosis in power grids in November, 2020.

Prof Wen is the editor-in-chief of Energy Conversion and Economics (IET, Wiley), the deputy editor-in-chief of Journal of Automation of Electric Power Systems, an editor of IEEE Transactions on Power Systems and IEEE Power Engineering Letters, a subject editor in power system economics of IET Generation, Transmission and Distribution, an associate editor of Journal of Energy Engineering and Journal of Modern Power Systems and Clean Energy. He is also on the editorial boards of more than 10 journals.

Invited Paper Speakers

Invited Paper 2B

Friday, 17 December 2021, 5:10 PM - 5:30 PM

Vinod Kumar Agrawal, Technical Director (SARI/EI) / IRADe & Former Executive Director, POSOCO, India



Topic: Importance of Regional Technical Institutional Mechanism in South Asian electricity grid

Brief Biodata:

Mr. Vinod Kumar Agrawal is the Technical Director at Integrated Research and action for Development (IRADe), a leading think tank and research institute and is responsible for steering the technical functions under the USAID initiated program SARI/EI (South Asia Regional Initiative for Energy Integration), intended towards enhancement of the Cross-Border Energy Trade in South Asia region. Mr. Agrawal has more than 4 decades of experience in the power sector and before joining IRADe he was Executive Director in POSOCO (Power System Operation Corporation) and has worked extensively towards operation and control of regional and national grid in India and its synchronisation with the neighbouring countries in South Asia region. He has rich experience in the area of power system operation and its safety and security, integration of renewables with the grid and entire gamut of power market operations and governance. He has graduated from Delhi College of Engineering and M. Tech in the area of Power System and Apparatus (PAS) from I.I.T, Delhi. He has represented India on the CIGRE Standing Committee - C2, on 'Power System Operation and Control' and is a Senior Member of IEEE. He has authored a number of technical papers in the area of Power System and associated subjects and is also co-editor of the book titled 'Grid Security and Management' published in the year 2009.

Invited Paper 2C

Friday, 17 December 2021, 5:10 PM - 5:30 PM

Saif Rehman, Manager, POSOCO, India



Topic: Success Story of India-Bangladesh Power System Operation

Brief Biodata:

Saif Rehman works as Manager (System Operation) at National Load Dispatch Centre, New Delhi, where he has been working for the last 9 years. He is one of the lead implementers of Security Constrained Economic Dispatch and Reserve Regulation Ancillary Services in the Indian Power System. His other areas of work are Cross-border coordination, Power System Modeling, Scheduling, Development of Power Atlas and Data Analysis & Visualization.

Invited Paper Speakers

Invited Paper 2D
Friday, 17 December 2021, 5:10 PM - 5:30 PM

Topic: Looking beyond 175 GW Renewable Energy Integration in India - Challenges and Remedial Measures

R. Nagaraja, MD, PRDC, Bangalore, India



Brief Biodata:

Nagaraja R has done his electrical engineering degree from University of Mysore in 1986 and did his masters (M.E) and doctoral (PhD) degrees from Indian Institute of Science, Bangalore, India. He is Promoter and Managing Director of Power Research Development Consultants Pvt. Ltd., Bengaluru, INDIA. He is specialized in design, implementation and project management of power system analysis, power plant training simulators, design simulators, SCADA and Energy Management Systems. He has provided consultancy services to a large number of utilities and industries across the world. He is the brain and key architect behind the power system analysis software MiPower. R. Nagaraja is senior member IEEE and has served IEEE PES in various capacities.

Chandrasekhar Reddy Atla



Brief Biodata:

Chandrasekhar Reddy Atla (S'10, M'13, SM' 20) received his B.Tech degree in Electrical Engineering from Sri Venkateswara University, Tirupati, INDIA, in 2003. He received his M.Tech degree in Power & Energy Systems from National Institute of Technology-Karnataka, INDIA, in 2008. He received PhD in Power System Reliability from Visvesvaraya Technological University, INDIA, in 2017 and is currently working with PRDC, Bengaluru, INDIA. He has published more than 25 papers in international conferences and journals. His areas of interest are Battery Storage System, Electric Vehicles, power system operation, energy management system, power system reliability, generation and transmission planning, renewable integration and forecasting etc.

Invited Paper Speakers

Invited Paper 2E
Friday, 17 December 2021, 5:10 PM - 5:30 PM

Dr. Rahul Walawalkar, President, India Energy Storage Alliance (IESA) & President & MD, Customized Energy Solutions, India



Topic: Behind the Meter Energy Storage: role for supporting demand response and renewable integration

Brief Biodata:

Dr. Rahul Walawalkar is President & MD of Customized Energy Solutions India Pvt. Ltd. He leads the Emerging Technologies domain for Customized Energy Solutions globally, which under his leadership has emerged as a thought leader in the areas of energy storage, renewables, demand response, electric vehicles, and smart grid technologies.

Under Rahul's leadership, Customized Energy Solutions' has received numerous awards including IPPAI Power Innovation Award for creation of India Energy Storage Alliance in 2016-17, Brad Roberts Award for outstanding industry contribution by Energy Storage Association (USA) in 2016, USAID's PACEsetter Fund Award for MICRO initiative in 2016 & 2019 and CII Innovative Energy Services Award for Tata Power Demand Response program in 2012.

A strong votary of improving energy storage and e-mobility in India, Rahul founded the India Energy Storage Alliance in 2012 and continues to serve as its President. He served as board member for Energy Storage Association, USA during 2009-15 and as the Chair for Global Energy Storage Alliance during 2018-20.

In 2020, Rahul received the 'Global Young Entrepreneur Excellence Award' for his valuable contribution & leadership in the field of energy storage and renewable energy at the World Renewable Energy Technology Congress. In 2018, he was also recognized with India Smart Grid Forum (ISGF) President's Award for outstanding contribution to growth of smart grids in India. He is the recipient of Energy Storage Crusader Award in 2017, Institution of Engineers (India) Energy Award in 2014 and Computer Society of India's Young IT Professional Award for 2000 & 2001.

Rahul holds a Ph.D. in Engineering and Public Policy from Carnegie Mellon University and Master's degree in Energy Management from NYIT, United States and B.E. from Walchand College of Engineering, India.

Integrating Energy and Power in Engineering Education

Anjan Bose, FIEEE, Professor, School of Electrical Engineering and Computer Science, WSU, USA



Brief Biodata:

Dr. Anjan Bose has over forty years of experience in industry and academia, as an engineer, educator, and administrator. He is well known as a technical leader in the power grid control industry, a researcher in electric power engineering, an educator in engineering, and an administrator in higher education. He is a Regents Professor in the School of Electrical Engineering and Computer Science, at Washington State University (WSU), where he also served as the Dean of Engineering and Architecture (1998-2005) and in 2012-13 served as a Senior Advisor to the US Department of Energy (DOE) in the Obama administration. Dr. Bose is a Member of the US National Academy of Engineering (2003) and has served on many National Academy Committees. He is a founding Member of the Washington State Academy of Sciences and has been elected as its President. He is also a Foreign Fellow of the Indian National Academy of Engineering. He is a Fellow of the IEEE and is active in several international professional societies. He was the recipient of the Outstanding Power Engineering Educator Award (1994), the Third Millennium Medal (2000) and the Herman Halperin Electric Transmission & Distribution Award (2006), from the IEEE. He has been recognized as a distinguished alumnus of the Indian Institute of Technology, Kharagpur (2005) and the College of Engineering at Iowa State University (1993). He has served on several editorial boards of IEEE publications and the McGraw-Hill Encyclopedia of Science & Technology. He has also served, some as chair, on several international technical committees and conference organizations. He was appointed by the governor to the board of the Washington Technology Center (served as Vice-Chair for three years), and by the US Secretary of Energy on the committees to study the 1999 and 2003 power blackouts. He has consulted for the electric power industry throughout the world and has been an advisor to several governments on grid related issues.

D. P. Kothari, FIEEE, Honorary Adjunct Professor, VNIT, Nagpur, India



Brief Biodata:

D.P. Kothari received his B.E. (Electrical), M.E. (Power Systems) and doctoral degree in Electrical Engineering from the Birla Institute of Technology & Science, Pilani. His activities include Optimal Hydro-thermal Scheduling, Unit Commitment, Maintenance Scheduling, Energy Conservation (loss minimization and voltage control), and Power Quality and Energy Systems Planning and Modelling. He has guided 16 Ph. D. scholars and has contributed extensively in these areas as evidenced by the 335 research papers published by him in various national and international journals. Prof. Kothari has also authored 12 books in Power Systems.

He was visiting professor at Royal Melbourne Institute of Technology, Melbourne, Australia in 1982 and 1989. He was NSF Fellow at Purdue University in 1992. He has visited and delivered several invited talks, keynote addresses at both national and international conferences on Electric Energy Systems. He has received several best paper awards and gold medals for his work. He has been Principal (1997-98), Visvesvaraya Regional Engineering College, Nagpur. D. P. Kothari has served as Advisor to the Chancellor at VIT University, Vellore, and prior to that he was Head, Centre for Energy Studies[4] at IIT Delhi (1995-97) and Principal, Visvesvaraya Regional Engineering College, Nagpur (1997-98).[5] He has also been Director i/c, IIT Delhi (2005) and Deputy Director (Administration), IIT Delhi (2003-06). D. P. Kothari is most popularly known for his contributions to the advancement of engineering education in India. His research interest includes Optimal Hydro-thermal Scheduling, Unit Commitment, Maintenance Scheduling, Energy Conservation (loss minimization and voltage control), Power Quality and Energy Systems Planning and Modelling

Rangan Banerjee, Professor, Former Head of Department of Energy Science and Engineering, IIT Bombay, India



Brief Biodata:

Rangan Banerjee is the Forbes Marshall Chair Professor in the Department of Energy Science and Engineering at IIT Bombay - a Department that he helped start in 2007. His areas of interest include energy management, modelling of energy systems, energy planning and policy, hydrogen energy and fuel cells.

He has been involved in setting up a Megawattsolar Thermal Power Testing, Simulation, Research Facility sponsored by the Ministry of New and Renewable Energy and was the faculty advisor of Team Shunya – India's first team to participate in the Solar Decathlon Europe in 2014, Solar Decathlon China 2018 and US Solar Decathlon Design Challenge in 2021. . He has been involved in advising the Niti Aayog, Planning Commission, MNRE city, state regulatory commission and energy agency, on energy issues. He is a Fellow of the Indian National Academy of Engineering and the World Sustainable Society for Energy Technologies. He is also an Adjunct faculty (Honorary) in the Dept of Engineering and Public Policy at Carnegie Mellon University.

Saikat Chakrabarti, Professor, Department of Electrical Engineering, IIT Kanpur, India



Brief Biodata:

Dr. S. Chakrabarti completed his PhD in Electrical Engineering from Memorial University of Newfoundland, Canada in 2006. Before completing PhD, he worked in Asea Brown Boveri (ABB) Limited, India, and Bhabha Atomic Research Centre, India. After completing PhD, he worked as a Special Scientist in University of Cyprus, Cyprus, and first as a Research Associate and then as a Lecturer in Queensland University of Technology, Brisbane, Australia. Since 2009, he has been working in the Department of Electrical Engineering, Indian Institute of Technology,

Kanpur, India, where he is currently a Chair Professor. His research interests are in the areas of power system state estimation, power system dynamics and stability, modelling of power system loads, smart grid, and microgrid. He is a Fellow of the Indian National Academy of Engineering and a Fellow of the Institution of Engineers (India). He is an Editor of IEEE Transactions on Power Systems, Editor of IEEE Power Engineering Letters, Associate Editor of International Journal of Electrical Power & Energy Systems, and Associate Editor of IET Generation, Transmission & Distribution.

Gautam Ray, Executive Director, HR & Administration, CESC Ltd, India



Brief Biodata:

Gautam Ray is Executive Director, HR & Administration, in CESC Ltd since 2017. In his past career Mr. Ray was Vice President-Human Resources at CESC Ltd. CESC Limited is a flagship company of RPG Enterprises, one of India's leading industrial houses. CESC Ltd is India's first fully integrated electrical utility, generating and distributing electrical power in Kolkata and Howrah since 1897. CESC is the sole distributor of electricity within an area of 567 sq km of Kolkata and Howrah serving 2.3 million consumers which includes domestic, industrial and commercial users. CESC also own and operate four thermal power plants: Budge Budge Generating Station (750 MW), Southern Generating Station (135 MW), Titagarh Generating Station (240 MW) and New Cossipore Generating Station (100 MW). More than 50% of the coal requirement is sourced from captive mines.

S. Mukhopadhyay, Professor and Head, Department of Electrical Engineering & School of Energy Science & Engineering, IIT Kharagpur



Brief Biodata:

Siddhartha Mukhopadhyay received his B.Tech. (Hons.), M.Tech. and Ph.D, all from IIT Kharagpur, in 1985, 1987 and 1991 respectively. Currently he is a Professor and Head, Department of Electrical Engg. and Head, School of Energy Science and Engineering at IIT Kharagpur. His current research interests are in Electric Mobility, Integrated Vehicle Health Management, Aerospace Tracking and Guidance, Industrial Automation and Cyber-Physical Systems.

He has been interacting, collaborating, consulting and reviewing with several national and international industry over the last two decades in several R&D contexts. He is currently building an indigenous Plug-in Hybrid Electric Vehicle under the Uchchatar Avishkar Yojana Programme of Government of India jointly with Tata Motors Limited.

He has been leading the Revision of UG and PG curricula as well as implementation of the NEP 2020 features in the academic programmes of IIT Kharagpur.

Tripta Thakur, Professor, MANIT Bhopal, Director-General, National Power Training Institute, India



Brief Biodata:

Tripta Thakur is Director General, National Power Training Institute (NPTI), apex body of Ministry of Power, Government of India. She was earlier Head and Professor, Electrical Engineering Department at the National Institute of Technology, MANIT-Bhopal, India. She is a graduate in Electrical Engineering with Master's degree in Power Electronics from IIT-Kanpur, and has a PhD from IIT-Delhi. She has been recipient of several awards such as Commonwealth Research Scholar at University of Dundee (2005-2008), UK, Commonwealth Academic fellow at Durham University Business School (2014), UK, COFUND Senior researcher at Durham University Business School (2016), Visiting Faculty at Asian Institute of Technology, Bangkok (2010), technical member for International Electrotechnical Commission (IEC), SEG4 Group, ISGF (MoP) working group member etc. She has teaching and research experience of 28 years, and has nearly 100 publications to her credit. She has also been a Consultant for evolving a possible Common South Asian Electricity Markets. She has done various consultancies for Distribution companies in India.

Inclusive growth of Entrepreneurs in Smartgrid

S.P. Gon Choudhury, Chairman, NBIRT, Kolkata, India



Brief Biodata:

S.P.Gon Chaudhuri an Electrical Engineer from Jadavpur University is an International Expert in the field of Renewable Energy. He served Govt of Tripura. Govt of West Bengal and North Eastern Council for promotion of Renewable Energy. He was Director, WBREDA ,Govt of West Bengal and also Special Secretary (Energy) to the Govt of West Bengal. He did pioneering work in the field of Solar Photovoltaic .His work in Sundarbans received worldwide recognition. He received National Science Academy Award, Ashden Award from UK and Euro Solar Award from Germany for his outstanding contribution in providing energy access to millions people in this planet. He worked throughout the world including different states of India to provide electricity in the unserved areas. The Mini grid concept was introduced by him. India's first

2 MW grid connected Solar Power Plant in Asansol was introduced by him. He designed the first Floating Solar Power plant of India and commissioned in 2014. He is at present and Chairman of State Solar Power Committee, Govt of Tripura. He is also Visiting Professor of IEST, Shibpur . A fellow of Institute of Engineers, India. Dr. Gon Chaudhuri travelled extensively throughout the world to realize his dream Energy for all. He has written four books on Renewable Energy. He is the Member in the Energy Expert Committee of Govt. of India. He is also the Chairman, International Solar Innovation Council,Helsinki. He was conferred with D.Sc by University of Calcutta and received "Shera Bangali" Award from a leading TV Channel. He has invented Micro Solar Dome which has become a National Programme now and helping thousands of slum dwellers of India.

RECENT CONTRIBUTION:

- Asia's First Solar Pumped storage scheme is being set up under his leadership.
- Micro Solar Dome developed by Dr.S.P.Gon Chaudhuri has become a National Programme. He received appreciation from Prime Minister of India.
- Solar Water Purifier developed by Dr.Gon Chaudhuri received country wide recognition.
- Mission Innovation Champion ,he is the first person from India who achieve this prestigious award from Canada in 2019.

Vishal Pandya, Cofounder, REconnect, Bangalore, India



Brief Biodata:

Vishal is co-founder of REConnect Energy - India's largest Digital Energy Platform scaleup. Vishal has about 12 years of experience in energy markets with expertise in renewable energy policies, predictive analytics, restructured power markets and energy trading. His current role at REConnect Energy involves strategic business development, utility scale projects management, team building, growth hacking and everything else required to keep his organisation growing! Vishal is an electrical engineer (specialisation in Power Systems) from IIT Bombay and a Chevening Fellow (St. Cross College, Oxford) with passion for clean energy markets.

P. K. Agarwal, Former, Director, Market Operations and Chief Information Security Officer, POSOCO, India



Brief Biodata:

Former Director and Chief Information Security Officer of Power System Operation Corporation Ltd. An accomplished power system professional with 40+ yrs. of experience in diverse areas of power sector. Now working as advisor and expert trainer on electricity market design, digitalization strategy, large SCADA integration, and OT cyber security.

- Advising on Smart Grid Development in Central Asia as senior technical consultant to under Power Central Asia Program of USEA/USAID.
- Worked as consultant to USEA on project Digital Substation Technology – Kazakhstan Electricity Grid Operating Company (KEGOC) of Kazakhstan Government.
- Played Key roles in development of electricity markets in India, from its inception with Availability Based Tariff (ABT) in 2002 and Open Access in 2008, followed by Power Exchange, Day Ahead Market, Cross Border Energy Markets, and recent launch of Real Time Market.
- Steered the automation projects on Real Time Market, National Open Access Registry, Ancillary Services, Power exchange transaction handling, energy scheduling. Fostered Cyber Security systems in grid operations and smart grids – implemented enterprise-wide whitelisting in SCADA system. Created a customized cyber security framework for the organization. Initiated usage of indigenous time synchronization in the power sector. Imparted training on Power grid and Smart Grid Cyber Security to Malaysian grid operator and regulator.
- Experience in complete life cycle management and integration of Supervisory Control and Data Acquisition (SCADA) system and Renewable Energy Management Centers (REMC), Wide Area Monitoring Systems (WAMS). Pioneered synchrophasors technology in Indian power system in 2009.
- Conceptualized and applied innovative technologies like Blockchain and AI/ML in the power system operation and markets.

Retired from POSOCO Ltd as Director, market operation and Chief Information Security Officer. Previously worked in power plant, transmission system, HVDC System, grid etc. after joining NTPC Ltd in year 1981 as executive trainee. After 12 years joined Powergrid in year 1993 subsequently transferred to POSOCO. Written and published over 50 technical papers and articles. Contributed chapters in books on power system. Delivered invited technical talks in many Internationals and National conferences, panel sessions, etc.

Shwetank Jain, Founder, CEO, P2Power, India



Brief Biodata:

Mr. Shwetank Jain, Founder and CEO of P2 Power, has been actively involved in innovating avant garde clean technologies with a single focus of making this environment sustainable for future generations. He is a futurist and an E-Mobility Enthusiast with a Bachelor of Technology (B.Tech) Hons degree in Electrical Engineering from Indian Institute of Technology, Kharagpur and an MBA from XLRI Jamshedpur.

With a demonstrated history of working in the power electronics manufacturing industry and skilled in Advanced Power Electronics solutions for Power Quality, Energy Management and Electric Vehicle domain, he has vision to develop technologies indigenously, in India for the world.

Started in 2006, at IIT Kharagpur, P2 Power has come a long way by providing high end technology solutions that are currently being used globally by major corporate and industrial houses. P2 Power is on a mission to develop an ecosystem of innovations in India so that we can reduce our reliance on imported technologies, develop core engineering talent, and make India, an innovation hub for the world. With the strong technical knowledge and vision of Mr. Jain, P2 Power has been continuously creating success stories in both Power quality as well as EV charging domain. With over 5000+ installations and 400+ esteemed clients across the country in almost all sectors, P2 Power has become one of the leaders in the respective domains.

Saikat Roy Chowdhury, MD, Galilei Solar India Pvt. Ltd, India



Brief Biodata:

Mr. Saikat Roy Choudhury is the Managing Director at galileisolar India Pvt Ltd., a sole business partner for KACO new energy GmbH. Power Electronics has been his area of Key Interest for a long time. At a very early age he chosen this line as his profession with completion of BE from BITS Pilani in 2001 with special emphasis on Power Electronics. He has also completed MBA from IIM Calcutta with emphasis on Finance. Having considerable experience in designing solar power plants he like to design power plants at the correct cost with the best Bill of Materials. Strong believer that India has stepped the wrong way as far as solar PV is concerned - the future is in roof tops not large sized solar power plants in the MW scale.

Devendra Gupta, CEO/Co-Founder, Ecozen Solutions Pvt. Ltd., India



Brief Biodata:

Devendra is an alumnus of the prestigious IIT Kharagpur. He has an in-depth understanding of the cleantech, agri-value chain and aspires to disrupt the way perishables are handled today. He heads product management, strategy & finance for the company. He has marshalled product development initiatives and has lead product design and market study for the product launches. He has been instrumental in building the team, strategic partnerships & raising funds at Ecozen.

He is an Unreasonable Fellow. He is also a part of Confederation of Indian Industry (CII) Task force for cold chain, & part of renewable energy committee of National Center for Cold Chain Development (NCCD). He has also been time and again a part of various agriculture & cold chain forums chaired by key leaders in the country. It is under his leadership that the company has been recognized with numerous awards such as the "CII award for Innovation in Cold Chain" in the year 2017, Fedex Small Business Grant in 2018, Rabo Food Loss Challenge in 2018, Best Startup in Pune, Pune-Connect 2014. He was chosen also amongst "50 Most Influential Sustainability Leaders list in 2017". He believes that we live in one of the most exciting times in the history, where technology enabled business models will address the long standing issues.

Abhishek Mangalick, CEO, Ecosense Sustainable Solutions Pvt. Ltd., India



Brief Biodata:

Mr. Abhishek Mangalick is the Founder and Chief Executive Officer at Ecosense. After completing his Graduation in Mechanical Engineering from IIT Mumbai in the year 2004, he worked with HPCL for two years. With a great enthusiasm for new and upcoming technologies and keenness to create a Product of value he left HPCL to start his entrepreneur journey.

Prior to founding Ecosense, he cofounded his first company V2learn in the field of online education way before the EdTech revolution in India. He handled it for four years and then

move on to set up Ecosense Sustainable Solutions Pvt. Ltd. in the year 2010. At Ecosense with his vision backed by a great team they created much needed equipments in renewable space to teach upcoming generations about Renewable Energy and Green Technology. Today Ecosense boasts of 500 Educational Institutes in India as their clients.

Chandan Chakraborty, Professor, Department of Electrical Engineering, IIT Kharagpur



Brief Biodata:

Chandan Chakraborty received B.E and M.E degrees in Electrical Engineering from Jadavpur University in 1987 and 1989 respectively and Ph.D degrees from Indian Institute of Technology Kharagpur and Mie University, Japan in 1997 and 2000 respectively. Presently, he is a professor in the Department of Electrical Engineering and Associate Dean, Sponsored Research & Industrial Consultancy, Indian Institute of Technology Kharagpur. His research interest includes power converters, motor drives, electric vehicles and renewable energy.

Dr. Chakraborty was the Lead of the UK-India project on Reliable and Efficient System for Community Energy Solution (RESCUES). Currently he is the India side Lead of UKICERI, a consortium of multi institutes from India and UK on clean energy research initiatives with IIT Kharagpur as the Lead institute from the India-side. Dr. Chakraborty received the JSPS Fellowship to work at the University of Tokyo during 2000-2002. He has also received many awards/recognitions including IEEE Bimal Bose Energy Systems Award in 2019, Avinash Gupta Chair Professor Award in 2021 etc. He has regularly contributed to IES conferences such as IECON, ISIE and ICIT as technical program chair/track chair. He is one of the founding members to conceptualize and start a new series of IEEE conferences entitled IESES (IEEE International Conference on Industrial Electronics for Sustainable Energy Systems). He has served as Associate Editor in IEEE Transactions on Sustainable Energy, IEEE Journal of Emerging and Selected Topics in Power Electronics, IEEE Transactions on Industrial Electronics and IEEE Industrial Electronics Magazine. He is the Founding Editor-in-Chief of IE Technology News (ITeN), a web-only publication for IEEE Industrial Electronics Society. He has served as a Co-EIC of IEEE Transactions on Industrial Electronics during 2018-19. Presently he is the Editor-in-Chief of IEEE Journal of Emerging and Selected Topics in Industrial Electronics (JESTIE). He is a Fellow of IEEE and Indian National Academy of Engineering (INAE).

The “LDC Excellence Award” is instituted to recognize the exceptional work done by the Load Despatch Centres (LDCs) in the Indian power sector. The 1st LDC Excellence award initiated with the ICPS 2021 held at IIT Kharagpur. The secretariat of Forum of Load Despatchers (FOLD), which is a forum for all the LDCs, in India, assisted in dissemination of information about the award to the LDCs, collecting nominations from the LDCs, forwarding the completed forms with compilation of data to an independent Jury. The Jury is constituted by the ICPS Core Steering Committee, to decide the Awardee.

The assessment methodology included very rigorous quantitative grading of various KPIs, like stakeholder's satisfaction, Adequacy and efficiency of internal processes, learning and growth besides financial prudence and future readiness and sub KPIs thereof. The methodology also included a write up and an interaction of shortlisted applicants with the Jury.

Total 33 submissions from various LDCs were received in 4 categories. The categorization of LDCs (i.e. NLDC, RLDCs, Large SLDCs, Medium SLDCs and Emerging SLDCs) is based on various factors like composite score of Peak Demand Met, Energy Supplied, and RE Installed Capacity. FOLD website (<https://forumofld.in/>) may be seen for detailed information regarding the award.

POSOCO Power System Awards (PPSA 2021) Thursday, 16 December 2021, 04.10 PM – 05.10 PM

The POSOCO Power System Awards (PPSA) is an initiative to identify and recognize research efforts and innovative work in the broad field of power systems related areas. The award is open for students of all the educational institutes offering PG programmes in the area of Power System in India. Power System Operation Corporation Limited (POSOCO), a government of India Enterprise instituted this award for the first time in 2012 in collaboration with Foundation for Innovation and Technology Transfer (FITT), industry interface organization at Indian Institute of Technology Delhi (IIT Delhi). This award is wholly funded by Power System Operation Corporation (POSOCO). PPSA recognizes two categories of Awards: Doctoral Category and Master Category. There are 15 awards in Doctoral category offering a cash prize Rs. 100,000/- along with certificate and 15 awards in Master category offering a cash prize Rs. 40,000/- along with certificate. The 10th edition of these awards was announced recently with the application deadline of 10th October 2021. For over last 9 years, this award has become a leading example of effective industry-academia partnership, with more than 350 awardees so far.

Best Contributory Paper Awards Saturday, 18 December, 2021, 04.30 PM – 05.30 PM

Contributory papers were invited on various themes and a total of 267 papers were received from various Government, Industry and Academic organizations. Upon peer review of all the papers, 112 papers are selected for oral presentation. Out of 112 papers accepted, total of 109 camera-ready papers were received for oral presentation in nine different tracks viz.: Power System Protection, Micro-Grid & Distribution System, Power System Dynamics & Stability, Load Forecasting& Demand-side Management, Renewable Integration & Electric Vehicle, Power System Security & Reliability, Power System Operation &Planning, Artificial Intelligence & Machine Learning, Condition Monitoring & System Characterization. A total of 25 sessions are scheduled in five parallel oral presentation sessions. Each session has a Session Chair and a Co-Chair to evaluate the best paper(s) in each track considering quality of paper and presentation in oral session. Best paper award is being declared in a session on Dec. 18 before valedictory session.

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
Mahmadasraf A. Mulla	SVNIT Surat	Arghya Mitra	VNIT Nagpur
Parul Mathuria	MNIT Jaipur	Arijit Baral	IIT Dhanbad
A. Ravi Teja	IIT Ropar	Arkadipta Chandra	IIT Kharagpur
Abanishwar Chakraborti	NIT Agartala	Arpan Pradhan	Jadavpur University
Abheejeet Mohapatra	IIT Kanpur	Arvind Jain	NIT Agartala
Ajit Kumar	NIT Patna	Asheesh Kumar Singh	MNNIT Allahabad
Alok Singh	POSOCO	Ashish Hota	IIT Kharagpur
Alok Verma	IIT Kanpur	Ashok Pradhan	IIT Kharagpur
aman gautam	POSOCO	Ashu Verma	IIT Delhi
Amit Singha	IIT Mandi	Ashwani Kumar Sharma	NIT Kurukshetra
Amod Umarikar	IIT Indore	Aurobinda Routray	IIT Kharagpur
Anandarup Das	IIT Delhi	Avik Bhattacharya	IIT Roorkee
Angshudeep Majumdar	IIT Kharagpur	Avirup Maulik	IIT BHU
Anirban Ghoshal	IIT Dhanbad	B Venkatesa Perumal	NIT Surathkal
Anirban Mukherjee	IIT Kharagpur	B. Subba Reddy	IISc Bangalore
Anish Modi	IIT Bombay	B.S. Rajpurohit	IIT Mandi
Ankit Dubey	IIT Jammu	Bablesh Jha	IIT Gandhinagar
Anup Shukla	IIT Jammu	Barjeev Tyagi	IIT Roorkee
Anurag Sharma	NUS, Singapore	Bhooshan Rajpathak	VNIT Nagpur
Aradhya Satapathy	IIT Kharagpur	Bibhu Prasad Ganthia	IGIT Sarang

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
Bidyadhar Subudhi	IIT Goa	Ananyo Sengupta	NIT Rourkela
Bikram Das	NIT Agartala	Dheeraj Khatoe	IIT Roorkee
Biman Kumar Saha Roy	NIT Durgapur	Gauri Shankar	IIT Dhanbad
Binoy Karmakar	Calcutta University	Manohar Singh	CPRI Bangalore
Chandrasekhar Perumalla	IIT Bhubaneswar	Altaf Badar	NIT Warangal
Chandrashekhar Bhende	IIT Bhubaneswar	Bibhu Padhy	IIT Ropar
Chiranjib Koley	NIT Durgapur	Ganesh P. Prajapat	GEC Bikaner
Chirodeep Bakli	IIT Kharagpur	Gurunath Gurrala	IISc Bangalore
Debaprasad Kastha	IIT Kharagpur	M. Veerachary	IIT Delhi
Debapriya Das	IIT Kharagpur	Mahendra Bhadu	GEC Bikaner
Debasmita Panda	NIT Warangal	Ramulu Chintam	NIT Warangal
Debdeep Saha	GIMT, Guwahati	Ranjana Sodhi	IIT Ropar
Debdeep Mukhopadhyay	IIT Kharagpur	Ravi Yadav	IIT Jodhpur
Deep Kiran	IIT Roorkee	Santosh Chandravadan Vora	NIRMA University
Deepak Lal	VSSUT Burla	Shabari Nath	IIT Guwahati
Deepak Pullaguram	NIT Warangal	Shambhu Sau	IIT Kharagpur
Dharmendra Dheer	NIT Patna	Sisir Nayak	IIT Guwahati
Dheeman Chatterjee	IIT Kharagpur	Surajit Chattopadhyay	GKCIET
Dipankar Debnath	IIT Kharagpur	Vijaya Bhaskar D	IIT Dhanbad
Sukumar Mishra	IIT Delhi	Yajvender Pal Verma	UIET Panjab University

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
Archana Sharma	BARC	K Shanti Swarup	IIT Madras
Parthasarathi Bera	KGEC Kalyani, West Bengal	Kailash Sharma	NIT Jalandhar
Ranjan Kumar Behera	IIT Patna	Kalpana Chaudhary	IIT BHU
Savier J S	GEC Barton Hill	Kalyan Chatterjee	IIT Dhanbad
Faheem Ahmed Khan Khan	Ghousia College of Engineering	Kalyan Boddeti	IIT Madras
G. Bhuvaneshwari	IIT Delhi	Kanungo Mohanty	NIT Rourkela
Ganesh Kumbhar	IIT Roorkee	Kapil Chauhan	IIT Ropar
Ganeswara Jada	ERPC, Kolkata	Kartick Jana	IIT Dhanbad
Gopakumar P	NIT Calicut	Kartik Pandya	CSPIT CHARUSAT
Himanshu Bahirat	IIT Bombay	Kaushik Das	Technical University of Denmark
Himanshu Misra	IIT Mandi	kiran jasthi	IIT Kharagpur
Indrajit Sarkar	NIT Rourkela	Krupa Shah	IITRAM Ahmedabad
Indrani Ray	UH	Kumaresan N.	NIT Tiruchirappalli
Iromi Ranaweera	University of Ruhuna	Kusum Lata Agarwal	JIET Jodhpur
Ishita Biswas	IIT Kharagpur	Lenin N C	VIT Chennai
J Ramprabhakar	ASE Bengaluru, Amrita Vishwa Vidyapeetham	Mahamad Alam	NIT Warangal
Jeevanand S	IIT Roorkee	Mala De	NIT Patna
Jitendra Kumar	NIT Jamshedpur	Man Mohan Garg	MNIT Jaipur
Jithendranath J	IIT Kharagpur	Manas Jena	IIT Palakkad
K Bhaskar	JNTUH College of Engineering, Hyderabad	Manish Uppal	ReNew Power

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
MD Ahmed	CPU Kota Rajasthan	Olive Ray	IIT Bhubaneswar
Mitresh Kumar Verma	IIT BHU	Omhari Gupta	NIT Jamshedpur
Mohan Aware	VNIT Nagpur	Paresh Nayak	IIT Dhanbad
Monalisa Biswal	IIT Raipur	Prijat Bhowmick	IIT Kharagpur
Moumita Das	IIT Mandi	Partha Kayal	NIT Silchar
Mukesh Singh	Thapar University	Pavani Ponnaganti	Aalborg University
N K Kishore	IIT Kharagpur	Pinkymol K.P	NIT Thiruchirappalli
Naran M. Pindoriya	IIT Gandhinagar	Pradeep Kumar	NIT Kurukshetra
Narayana Prasad Padhy	IIT Roorkee	Pradyumn Chaturvedi	VNIT Nagpur
Naren Bharatwaj V	Hitachi ABB Power Grids	Prajof P	NIT Surathkal
Naruttam Kumar Roy	Khulna University of Engineering & Technology	Prakash Kulkarni	VNIT Nagpur
Nasirul Haque	NIT Calicut	Prakash Ray	CET Bhubaneswar
Nataraj Pragallapati	NMSU	Prakash Sahu	SOA University
Naveen Jain	College of Technology an Engineering , Udaipur	Pramod Singh	POSOCO Ltd.
Neeraj Gupta	NIT Srinagar	Pranab Datta	IIT Kharagpur
Nitai Pal	IIT Dhanbad	Pranav Darji	SVNIT Surat
Nitin Kumar Saxena	KIET Group of Institutions, Ghaziabad	Prashant Agnihotri	IIT Bhilai
Nutan Saha	VSSUT Burla	Prashant Navalkar	IIT Bombay
O D Naidu	HITACHI ABB Power Grids	Prasid Syam	IEST Shibpur
Obulesu Y.P	VIT Chennai	Pratim Kundu	IIT Mandi

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
Pratyasa Bhui	IIT Dharwad	Ragavan K	IIT Gandhinagar
Praveen Tripathy	IIT Guwahati	Rajat Samal	VSSUT Burla
Praveen Agarwal	POSOCO	Rajat Subhra Chakraborty	IIT Kharagpur
Premalata Jena	IIT Roorkee	Rajendra Pandey	IIT BHU
Premila Manohar	Ramaiah Institute of Technology, Bangalore	Rajendran S	IIT Gandhinagar
Prerna Jain	MNIT Jaipur	Rajesh Gupta	NIT Allahabad
Priyanka Paliwal	MANIT Bhopal	Rajesh Farswan	Dyson Singapore Technology Centre
Priyanka Kushwaha	MNIT Jaipur	Rajib Sutradhar	POSOCO Ltd.
Priyesh Chauhan	IITRAM	Ram Krishan	NIT Warangal
Dheeman Chatterjee	IIT Kharagpur	Ramachandra Sekhar	IIT Ropar
Parthasarathi Sensarma	IIT Kanpur	Ramanujam Sarathi	IIT Madras
Abhijit Abhyankar	IIT Delhi	Ranjit Mahanty	IIT BHU
Ankush Sharma	IIT Kanpur	Rashesh Mehta	Birla Vishvakarma Mahavidyalaya
N C Sahoo	IIT Bhubneswar	Ratna Rahul Tupakula	NIT Warangal
Nagamani C	NIT Trichy	Ravi Shankar	NIT Patna
Nilanjan Senroy	IIT Delhi	Ravi kumar Goli	Bapatla Engineering college
Saikat Chakrabarti	IIT Kanpur	Ravikumar Setty	IIT Kharagpur
Mainak Sengupta	IEST Shibpur	Ravindrakumar Yadav	Dr APJAKTU Lucknow University
R. K. Misra	IIT BHU	Riddhi Ghosh	Jadavpur university
Rabindra Mohanty	BITS Pilani, Hyderabad	Ritesh Keshri	VNIT Nagpur

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
Rohit Bhakar	MNIT Jaipur	Sarathi R	IIT Madras
Rupesh Wandhare	IIT Hyderabad	Saroja Sahoo	GE Digital Grid
S Sivasubramani	IIT Patna	Satish Sharma	MNIT Jaipur
S V S Phani Kumar Ch	NIT Raipur	Satish L	IISc Bangalore
Sachin Jain	IIITDM	Satish Naik Banavath	IIT Dharwad
Sadhan Gope	Mizoram University,Aizawl	Saumendra Sarangi	MNNIT Allahabad
Saket RK	IIT BHU	Saurav Raj	Alliance University
Sanand Dilip	IIT Kharagpur	Saurav Pramanik	IIT Kharagpur
Sandeep Chawda	Finolex Academy of Management and Technology, Ratnagiri	Sayani Chatterjee	IIT Kharagpur
Sandeep Anand	IIT Bombay	Selvan M	NIT Trichy
Sandip Ghosh	IIT BHU	Seshadri Sravan Kumar Vanjari	IIT Hyderabad
Sanjeev Mallik	NIT Patna	Shakthi Prasad	IIT Goa
Sanjib Ganguly	IIT Guwahati	Shreevardhan Soman	IIT Bombay
Sanjiv Jain	Medi-Caps University,Indore	Siva Kumar	NIT Warangal
Sanjoy Debbarma	NIT Meghalaya	Sivakumar Keerthipati	IIT Hyderabad
Sanjoy Kumar Parida	IIT Patna	Somnath Sengupta	IIT Kharagpur
Sankarsan Mohapatro	IIT Bhubaneswar	Soumitri Jena	IIT Kharagpur
Santanu Bandyopadhyay	IIT Bombay	Soumya R. Mohanty	IIT BHU
Santosh Jain	POSOCO	Soumyabrata Barik	BITS Pilani Goa Campus
Sarasij Das	IISc Bangalore	Sourav Patra	IIT Kharagpur

List of Reviewers ICPS 2021

Reviewer Name	Reviewer Affiliation	Reviewer Name	Reviewer Affiliation
Srikant Allamsetty	KIIT DU	Suvarun Dalapati	IEST Shibpur
Srinivas Karanki	IIT Bhubaneswar	Swami Naidu N K	IIT BHU
Srinivasa Rao Gampa	Seshadri Rao Gudlavalleru Engineering College	Tanaya Datta Das	Techno India University
Srinivasa Rao Gummadi	V.R.Siddhartha Engineering College (Autonomous)	Tanmoy Bhattacharya	IIT Kharagpur
Subhasish Deb	Mizoram University	Tanmoy Roy Choudhury	KIIT University
Subhendu Dutta	IIT Delhi	Teja Bandaru	IIT Kharagpur
Subhransu Samantaray	IIT Bhubaneswar	Trapti Jain	IIT Indore
Subrat Sahoo	Hitachi	Valentin Robu	Heriot-Watt University
Sukanta Das	IIT Dhanbad	Vaskar Sarkar	IIT Hyderabad
Suman Maiti	IIT Kharagpur	Vasundhara Mahajan	SVNIT Surat
Suman M	MNNIT Allahabad	Vedanta Pradhan	Hitachi ABB PowerGrids
Suman Sharma	SKIT M&G JAIPUR	Vignesh V	IIT Tirupati
Suman Murugesan	MNNIT Allahabad	Vivek Lal	IIT BHU
Sumedh Puradbhat	Eaton India	Vivek Prakash	Banasthali Vidyapith
Sumit Ghatak Choudhuri	IIT Roorkee	Yashwant Kashyap	NIT Suratkal
Supriyo Das	NIT Meghalaya	Yogesh Bichpuriya	TCS Research
Suryanarayana Gangolu	NIT Uttarakhand	Zakir Rather	IIT Bombay

List of Volunteers for ICPS 2021

Bonu Ramesh Naidu	Priyanka Mishra
Atanu Mondal	Partha Chakrabarti
Annu Ahlawat	Ashrit Swain
Abhishek Mishra	Sheshadri Shekhar Rauth
Arghya Mallick	Ishita Biswas
Mohamed Ismail Yasar Arafath K	Srushti Sengarap
Suparna Rooj	Subrata Ghosh
Rasmita Muduli	Mriddika Paul
T Madhava Rao	Aniruddha Guha
Triptendu Chaudhury	Subrata Bagdi
Sayani Chatterjee	Pradipta Patra
Pratik Harsh	Suman Mondal
Satyam Jha	Mannem Venkateswarlu
Surbhi Simoliya	Sourav Mitra
Supratik Bhowmick	Krishan Kumar Saini

PLATINUM SPONSOR



GOLD SPONSOR



SILVER SPONSOR



BRONZE SPONSOR



COPPER SPONSORS



ORGANISED BY



**Department of Electrical Engineering
and
School of Energy Science & Engineering
Indian Institute of Technology Kharagpur**



INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR
Kharagpur, West Bengal 721302