



## 2nd International Symposium on Sustainable Energy and Technological Advancements

National Institute of Technology, Meghalaya (NITM), Date: 24th -25th Feb'2023

A Special Session on

### **Importance of Power Quality Control and Reliability – towards a balanced and sustainable microgrid system**

#### **Aims and scope:**

Presented research effort is mainly divided into two extensive areas - power quality control and reliability assessment for microgrid systems. Under power quality control performance, an utility interactive DC-AC connected to renewable energy system (RES) is analyzed using DC-DC and DC-AC control techniques. Therefore, finding an appropriate intelligent robust control strategy along with a proper balancing circuitry is very decisive in this application. In a power network, any load with lower power factor usually draws higher electric current than a load with higher power factor for an equal amount of active power transmission. Higher the current drawn, higher will be the energy lost in the system. Henceforth, a perfect control technology can not only empower power transfer processes but also produces quality of power. Electric power supply with lower harmonic level and higher power factor help the customers in paying less electricity bills. But, the system may face fewer reliability related difficulties. Therefore, designing a DC-DC and DC-AC control strategy exhibits a hardcore attention to ensure good system power quality, stability and reliability. In recent years, modern power systems are acquiring more attention to arrive at reliable and sustainable power infrastructure during any calamitous situation. Therefore, reliability assessment and maintenance of a modern power system are fundamental requirements of system designers. The reliability of a system may be affected either by attaining quality or redundancy. As the percentage of penetration of RESs is increasing day by day, reliability challenges and its innovative solutions are necessary to analyze to sustain system availability. It can provide the system designers, operators and customers probable failure modes of a system/sub-system/component beforehand. Therefore, reliability analysis of a modern power system is very necessary to analyze either at the component level or at the system level.

### **Subtopics:**

1. Effects of RESs on climate control.
2. Challenges in integration of RESs into existing grid.
3. Control (DC-DC/DC-AC/Synchronization) techniques for microgrid system.
4. Application of soft computing in non-linear systems.
5. Application of adaptive control techniques for fastest and balanced modern power systems.
6. Application of optimal and adaptive control techniques in non-linear systems.
7. Power quality aspect towards microgrid system.
8. Improvement of power quality.
9. Role of reliability aspect in microgrid.
10. Reliability assessment of microgrid systems either at load level or system level.
11. Reliability assessment of hot and cold standby microgrid system.
12. Reliability assessment of IEEE based microgrid systems.
13. Application of conventional/intelligent reliability assessment techniques.

### **Special Session Organizer 1**



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**Dr. Moushumi Patowary**, received the bachelor degree in electrical engineering from Jorhat Engineering College, Jorhat, Assam, India in 2005, master degree in power systems from Assam Engineering College, Guwahati, Assam in 2012 and a Ph.D. degree in electrical engineering from National Institute of Technology Meghalaya, (NIT Meghalaya) Shillong, India, in 2018. She has possessed over 12 years of experience in an inter-disciplinary field of academics and industries. During her industry exposures, she worked as a GET in TATA Motors, Pune, India and as an Expert Support Consultant in SAP Labs India Pvt. Ltd, Bangalore, India. In academics, her research interest entail distributed generation, modelling and control of microgrid systems, power quality assessment, microgrid reliability evaluation, artificial intelligence (AI) techniques, power electronics (PE) based power systems. She has published research articles in many SCI and Web of Science International Journals such as IEEE, IET, Elsevier, Sage, Springer, Wiley etc. She is also a reviewer for many reputed international journals such as IET-GTD, IET-RPG, Elsevier-ISA and many IEEE conferences/Symposium. Currently, she is working as Assistant Professor (DTE) in the department of Electrical Engineering, Jorhat Engineering College Jorhat-785007, Assam, India.

## **Special Session Organizer 2**



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