KINGS COLLEGE OF ENGINEERING
Recognised under 2(f) & 12(B) of UGC
Approved by AICTE, New Delhi.
Affiliated to Anna University, Chennai.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
ACADEMIC YEAR 2023-24 ODD

Internal IEEE Seminar– Report

Title of the seminar	: Analysis and Realization of Hybrid AC/DC Microgrid with Interlink Converter
Date	: 23.11.2023
Resource Person	: Dr.S. Vasantharaj, AP/EEE, KCE
Beneficiaries	: EEE Faculty Members –9
Venue	**:**EEE – Smart Classroom

On behalf of Department of EEE, IEEE Branch has organized Internal Seminar on "***Analysis and Realization of Hybrid AC/DC Microgrid with Interlink Converter***" for faculty members, Department of EEE on ***23.11.2023***. The main objective of the internal seminar is to provide exposure to various research areas to our faculty members.

The following points were discussed during the session:

- Investigate the seamless integration of AC and DC components within a microgrid framework.
- Assess the overall performance of the hybrid microgrid, focusing on power distribution, reliability, and stability.
- Analyze and understand the specific role of the interlink converter in facilitating communication and power flow between AC and DC components.
- Evaluate the efficiency of the hybrid microgrid system, considering energy losses, conversion processes, and overall system effectiveness.
- Explore how the hybrid microgrid accommodates and optimizes the integration of renewable energy sources, such as solar or wind power.
- Investigate how the hybrid AC/DC microgrid, with the interlink converter, enhances the reliability and resilience of the overall power distribution system.
- Develop and implement optimization strategies for the microgrid, with a focus on achieving efficient energy utilization and management.
- Identify and propose any novel technological advancements or innovations that contribute to the efficiency and effectiveness of the hybrid microgrid system.

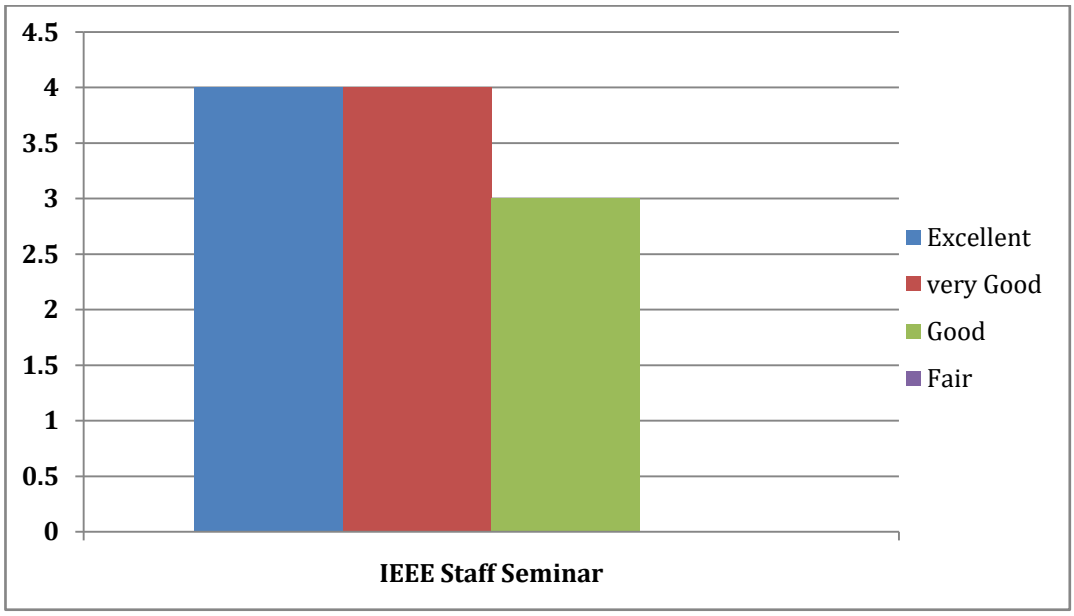
- Address and propose solutions for any operational challenges encountered in the integration and functioning of the hybrid AC/DC microgrid.
- Perform a comprehensive cost-benefit analysis to evaluate the economic feasibility of implementing a hybrid AC/DC microgrid, considering initial setup costs, operational expenses, and long-term benefits.

Conclusions:

In conclusion, our investigation into a Hybrid AC/DC Microgrid with Interlink Converter has shown that integrating different components in a microgrid works well. The interlink converter played a crucial role in making communication and power exchange between AC and DC elements smooth. The hybrid microgrid proved to be efficient, offering optimized power distribution. We successfully integrated renewable energy sources, making the system adaptable to sustainable practices. Real-world testing confirmed that our proposed system is practical. The microgrid's enhanced reliability and stability contribute significantly to robust power distribution. It's also scalable for different power needs, and a thorough cost-benefit analysis indicates its economic feasibility. Our compliance with regulations ensures a safe and lawful deployment framework. This research advances our knowledge of hybrid AC/DC microgrid technology, providing useful insights for future developments in sustainable and efficient energy distribution systems.

Snapshot from Seminar

Feedback Analysis:



References:

1. López-Erauskin, R., González, A., Petrone, G., Spagnuolo, G., &Gyselinck, J. (2020). Multi-variable perturb and observe algorithm for grid-tied PV systems with joint central and distributed MPPT configuration. *IEEE Transactions on Sustainable Energy*, *12*(1), 360-367.
2. Faith Cingoz, Ali Elrayyah and Yilmaz Sozer. Optimized Resource Management for PV-Fuel-cell-based microgrids using load characterizations. IEEE Trans. Ind. Appl. 2016; 52 (2): 1723-1735.
3. Ramon Zamora and Anurag K. Srivastava, Multi-Layer Architecture for Voltage and Frequency Control in Networked Microgrids. IEEE Transactions on Smart Grid 2018;9(3): 2076–2085.
4. Vazquez, S., Acuna, P., Aguilera, R. P., Pou, J., Leon, J. I., &Franquelo, L. G. (2019). DC-link voltage-balancing strategy based on optimal switching sequence model predictive control for single-phase H-NPC converters. IEEE Transactions on Industrial Electronics, 67(9), 7410-7420.

Faculty In-Charge 28/11

HOD/EEE 28/11/23

28/11/2023
Principal