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Biography

Prof. Sukumar Mishra received his M.Tech. and Ph.D. degrees in electrical engineering from the National Institute of Technology, Rourkela, in 1992 and 2000, respectively. After spending nine years as a lecturer at Sambalpur University (Orissa), Prof. Mishra joined BPUT (Orissa) as a Reader at the Electrical Department and served there for two years. Currently he is a Professor with the Indian Institute of Technology (IIT) Delhi and has been its part for the past 17 years, and has been functioning as Associate Dean R&D of IIT Delhi from March 2020. He has won many accolades throughout his academic tenure of 27 years. He has been a recipient of Young Scientist Award (1999), 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). He has been selected as the Mission Innovation National Champion (2019) under the Mission innovation initiative to accelerate clean energy in India. He has been granted fellowships from many prestigious technical societies like IET (UK), NASI (India), INAE (India), IETE (India), and IE (India) and is also recognized as the INAE Industry-Academic Distinguish Professor. Apart from all research and academic collaborations, Prof. Mishra is very actively involved in industrial collaborations. He is currently an 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 has so far authored more than 80 IEEE Transactions/Journals, 30 IET Journals and 30 other international journal papers. He has supervised 31 PhD students (16 on goings), 40 Master students (2 ongoing). Prof. Mishra has also authored five book chapters so far and has 13 patents to his credit. His research interests include power systems, power quality studies, renewable energy, and smart grid. Prof. Mishra has been working in close association with the 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 and was an Area Editor for the IET Generation, Transmission and Distribution.

Abstract

Talk: Enhancing the grid resilience with renewable assisted EVs

The increasing penetration of renewable energy sources and the rapid adoption of electric vehicles (EVs) present a unique opportunity to enhance the resilience of power grids. EVs can provide grid services such as peak shaving, load following, and backup power, which can help to reduce stress on the grid and make it more resilient to disruptions. One way to enhance the grid resilience with renewable assisted EVs is to use V2G (Vehicle-to-Grid) technology. V2G allows EVs to discharge their batteries back into the grid, providing a source of backup power during outages or other disruptions. V2G can also be used to help balance the grid by providing a source of demand during peak hours. Another way to enhance the grid resilience with renewable assisted EVs is to use smart charging. Smart charging allows EVs to be charged at times when the grid is less stressed, such as during off-peak hours. This can help to reduce peak demand and make the grid more resilient to disruptions. However, several challenges must be addressed to fully realize the potential of renewable assisted EVs in grid resilience. These include the development of robust V2G infrastructure, the management of EV charging and discharging patterns to avoid straining the grid, and the establishment of regulatory frameworks to incentivize and govern V2G participation. So, leveraging the synergy between renewable energy resources and EVs holds promise for enhancing grid resilience. By integrating renewables into the grid and utilizing EVs as flexible energy assets, we can improve the reliability, adaptability, and sustainability of power systems, thereby paving the way towards a more resilient and low-carbon future.