

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

Invited Paper II D

Date: Friday, Dec 17, 2021

Time: 05:10 PM-05:30 PM

Speaker: Dr. Nagaraja Ramappa, MD, PRDC, Bangalore, India

Abstract:

In Dec. 2015, India has set itself the ambitious goal of generating 175 GW of renewable energy by 2022. India has achieved 100GW RE penetration by 31st August, 2021. This has enabled India to look beyond 175 GW RE integration into the grid and India has set a target of 450 GW RE additions by 2030. The major initiatives taken to achieve the RE integration include: Deployment of storage facilities like pumped hydro storage as grid connected balancing sources, Enabling of secondary reserves like Automatic Generation Control (AGC) at generation sources, Utilization of Renewable Energy Management System to control the renewable energy as per grid requirements, Improving system operational practices with advanced technologies and tools in control centres, Dynamic reactive power control at grid level. At the planning front, deployment of country wide Integrated Resource Mapping tools like demand forecasting, generation adequacy and optimization can facilitate the DISCOMs to know the mix of generation resources including renewables for future years with present generation at least possible cost. These tools help to design the required generation mix in the grid for future years and to quantify the correct amount of flexible sources like storage facilities with various use-case benefits applicable to Indian grid regulations. To mitigate the challenges of variability and uncertainty of the renewable generations, it is essential to add appropriately designed storage schemes. The storage system enables renewable generations to bridge the gap between the generation pattern of renewable sources of energy and the demand pattern. Electric transportation system being one of the cleanest among the alternatives in the transportation system and green, if the electricity required to this mode of transportation is produced through the renewable energy resources, like hydro, wind and solar power, the carbon footprint can further be reduced. The technical talk discusses in detail the various measures taken, way forward and emphasizes how best the future Indian grid can be managed and brings about the nexus between Renewable Energy (RE), Energy Storage (ES) and Electric Vehicle (EV).