

Report on 20th Edison Memorial Lecture of IEEE PES-IAS Delhi Chapter

20th Thomas Alva Edison Memorial Lecture was organized by IEEE PES-IAS Delhi Chapter on Dec. 09, 2016 in the Department of Electrical Energy Committee Room, Delhi Technological University Delhi. Prof. Ambrish Chandra, FIEEE, Université du Québec, Montréal, Canada delivered a talk on “Hybrid Renewable Energy Standalone Systems”.

Prof. A Chandra started his talk with the power supply scenario in Canada and Quebec. He showed the wind and solar radiation profiles in these areas and noted that several isolated areas in the world currently use only diesel generators (DGs) to serve their requirements of electrical energy. However, the use of DGs has many drawbacks: 1) high cost of electricity, 2) air and noise pollution, 3) Loss in fuel efficiency and maintenance cost. To overcome those problems it is better to generate power from a cost- effective, environmental friendly renewable energy sources (RESs) such as wind, solar, hydro, biomass, etc. RESs are clean and almost available all over the planet but are intermittent in nature, especially wind and solar power generations. This makes their integration to micro-grid with DG difficult, especially if the local grid is not connected to the main grid. Hybrid standalone system consists of many elements such as photovoltaic panels, wind turbines, DG, energy storage system, AC and DC loads, dump load etc. Most of these elements are connected to the AC or DC bus via power electronic devices. In his presentation, he discussed many possible configurations of hybrid renewable energy standalone systems. Control of some of these systems was also discussed in detail.

Thereafter, he talked about the isolated Esker mine site under study which is located in the south of Scheffer ville in the province of Newfoundland and Labrador. Currently, this mine site is isolated from grid and uses only one Diesel generator (DG) of 150 kW capacity to fulfill their need of electrical power. The maximum load power demand does not exceed 40 kW. Therefore, the existing DG is oversized, which leads to high fuel consumption and less DG efficiency. The integration of renewable energy sources available locally in Esker mine site with existing diesel generator was discussed. He also proposed new configurations, which is able to operate with low wind speed and under severe climatic conditions to ensure clean, stable and uninterruptable power supply to the connected load with reduced cost. He discussed the possible solutions, simulation results and the controllers developed for the same.

The talk was well received faculty members, research students, PG/ UG students who attended the lecture with great interest.
