

DC distribution grids: Providing comprehensive tools for a more efficient and reliable design

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PhD. Juan José Valera, from Ingeteam Power Technology, and PhD. Jon Andoni Barrera, PhD. Gonzalo Abad, PhD. Argiñe Alacano and PhD. student Eneko Unamuno, members of the research group in Electric Energy at Mondragon Unibertsitatea, offered a tutorial about the most recent research related to the development of DC distribution grids at the European Conference on Power Electronics and Applications (EPE 2017 ECCE Europe) in Warsaw, Poland, on the 11th of September.

The interest on the so called DC distribution grids, DC power systems or DC micro-grids has increased during the last years thanks to the technological evolution of the power semiconductors, the establishment of reliable power converter topologies and the appearance of cost effective protective devices, amongst other factors. In many applications areas and scenarios, employing innovative DC grids rather than traditionally used AC grids, can produce several benefits to the system that can be measured in terms of cost, energy consumption, efficiency, volume, reliability and safety.

The main objective of the tutorial offered by Ingeteam and Mondragon Unibertsitatea was to develop global analysis methods and global simulation tools that will enable to optimally and cost effectively design and operate efficient, safe and reliable DC distribution grid systems. The tutorial will study this issue with a general perspective, but also will apply the developed methods and analysis on one realistic specific scenario: DC distribution grids for marine vessels. It will be shown that combining specialized simulation component libraries (such as Matlab/Simulink™ & SimPower Systems™ or any equivalent), together with oneself developed analytical models and tools, can result in an effective and holistic working approach for designers in general and specially for power electronics engineers.



PhD. Gonzalo Abad during his presentation at the European Conference on Power Electronics and Applications