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Abstract

Title: DC Microgrids: Benefits, Architectures, Perspectives and Challenges

One of the major paradigm shifts that will likely be observed in the energy mix is related to distribution networks. Until now, this type of electrical grids was characterized by an AC transmission. However, a new concept is emerging, as the electrical distribution networks characterized by a DC transmission begin to be considered as a promising solution due to technological advances. In fact, we are now witnessing a proliferation of DC equipment associated with renewable energy sources, storage systems and loads. Thus, such equipment started to be considered in different contexts. In this way, taking into consideration the requirement for a fast integration of these equipment's into the existing electrical network, DC networks started to become important. On the other hand, the importance of the development of these DC networks is not only due to the fact that today the number of DC equipment's started to be huge. In reality, when compared with the classical AC transmission systems, the DC networks are considered more efficient and reliability, as well as, does have any issues regarding the reactive power and frequency control and synchronization. Although much research work has been done, several technical aspects have not yet been defined as standard. This uncertainty is still an obstacle to a faster transition to this type of network. There are also other aspects that still need to be focused of study and research in order to allow this technology to become a day-to-day solution. Finally, there also many applications in which this kind of DC microgrids can be applied, but still not addressed. Thus, all these aspects are considered as important challenges that need to be addressed. This talk will address an overview of the existing and possible solutions for this type of microgrid, as well as the challenges that need to be faced now..

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