IEEE Hamilton - Joint Chapter Power Engineering and Power Electronics

Date: 17th October 2017

Location: McMaster Innovation Park (MIP)

Time: Arrive at 18:30, presentations starts at 18:45 for approx. 1 hour

Transient energy sources to support renewable energy conversion systems

Abstract:

The input of renewable energy sources to electrical power networks at either grid or local utilisation voltage levels is becoming more and more accepted as electrical power network operators wrestle with the competing challenges of changing and increasing load demands, and continuing pressures to reduce net carbon footprint. Renewable energy resources are highly dynamic and somewhat intermittent compared to more traditional generation sources. Hence, they pose a challenge to the electrical network operator in terms of effectively managing their resources to maximise energy transfer while maintaining a stable interconnected network. A particular aspect of existing renewable energy resources is that they have a comparably low transient energy capability and as such reduce the total system stored energy – often referred to as system inertia.

The presentation will discuss the technical requirements for power system transient energy storage and the suitability of existing and potential technologies to implement this function. For example, electro-chemical devices (batteries and supercapacitors), electro-mechanical devices (flywheel motor-generator units) and other technologies.

The proposed technologies are assessed against typical grid transients and their suitability to provide grid stability. Further, the improvement of solar and wind energy capture facilitated by storage devices is illustrated.

The Speaker:

Nigel Schofield (M'06) received the degrees of B.Eng. (Hons.) and Ph.D. from the University of Sheffield, UK, in 1990 and 1997, respectively. Dr. Schofield was at the University of Sheffield (1990-95; 1997-2004) and a Design Engineer in industry (1995-97). He was a Lecturer (2004-09) and Senior Lecturer (2009-12) in the School of Electrical and Electronic Engineering, at the University of Manchester, UK. He was Full Professor with Tenure in the Department of Electrical and Computer Engineering, McMaster University, Ontario, Canada (2013-17).
In May 2017 he joined the University of Huddersfield, UK, as Professor of Electrical Engineering. Prof. Schofield is a member of the Institution of Engineering and Technology, U.K., and he is a Chartered Engineer in the U.K.

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