TEXAS A&M UNIVERSITY at QATAR

The Electrical and Computer Engineering Program presents
ECEN Seminar Series

Thermal Management Of High Density Energy Storage System

Dr. Nazar Al-Khayat
AllCell Technologies

Monday, 17 December 2012, 12 – 1 p.m.

Lecture Hall 144

Light lunch will be served

Thermal management of high energy density, Li-ion batteries in on/off-road application such as HEV/PHEV or smart grid is a major task. A well thought and designed thermal management circuit must take into account safety, system performance and cost of ownership.

The performances of Li-ion batteries are highly dependent on the operating temperature. Temperature is the most significant factors impacting both the performance and life of batteries. Thermal circuits; passive or active, and cooling strategies must all limit the operating temperatures and provides for a uniform distribution within the battery pack at various discharge rates.

A graphite loaded matrix of a phase change material (PCM) can provide effective, simple, and cost expensive thermal management that would assist in the development of larger packs across a wide range of environmental temperatures.

The PCM matrix usually designed to be in contact with Lithium cells. Heat rejected by the cells during use is absorbed as latent heat. PCM material can absorb a high amount of heat. If one cell goes into thermal runaway, PCM absorbs and wicks away heat to prevent a domino effect within the pack. In some cases, the heat is removed quickly enough to prevent the first cell from going into thermal run away.

The seminar will discuss the application of high energy Lithium batteries for on/off road application and how PCM is able to prevent the propagation of thermal runaway

Dr. Nazar Al-Khayat has a Ph.D. and MSc degrees in Power System and Electronics from Nottingham Trent and University of Manchester in UK. From 1989 to 1993 Al-Khayat worked as a research Fellow developing analytical models for condition monitoring of power transformers and power systems.
From 1994 to 1998 Dr Al-Khayat worked for Danfoss (UK) where he developed electromagnetic flow sensors for industrial applications. Since 1998 Dr Al-khayat held a number of senior engineering positions at Cummins Inc, WilliamsF1 and NGenTec in Europe, USA and ME. Dr Al-khayat has led the development of several key technologies such as electrical machines, power electronics, energy storage and controls for commercial and automotive applications.

Currently Dr Al-Khayat serves as VP of Engineering at AllCell Technologies (USA). His responsibilities include product development and company representation Dr Al-Khayat has 12 patents, with several additional pending. He has authored over 35 conference and transactions papers.

FOR MORE INFORMATION:

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