



2009 WISCONSIN

## Renewable Energy Summit

Renewables, Sustainability, Energy Efficiency,  
Social Responsibility, and Green Energy Practices

## Business: Green Technologies & Practices

## Session #2-4

**DATE:**

**Breakout Session 2-4:**

**Time:**

**Presenters:**

**THURSDAY, MARCH 26, 2009**

**2:00pm – 3:45pm**

### **Fault Prognostics, Diagnostics and Mitigation in Electric Drive/Generation Systems in Renewables**

Nabeel A. O. Demerdash, Marquette University

Gennadi Sizov, Marquette University

Edwin E. Yaz, Marquette University

Research on diagnostics, prognostics and fault mitigation methods applicable to electric drive and renewable electric energy generation systems will be presented. These methods enhance the survivability, reliability and overall performance of such systems. Examples of such faults include: short-circuits in windings of electric motors, electric wind generators, failures of electronic switches and components in electric drives and power electronic conditioners in wind and solar electric energy generation systems. These methods rely on electronically monitoring the signals at the terminals of these devices, based on which fault prognostics, diagnostics and fault mitigation actions are initiated to prolong the useful life and adequate performance of such systems. Details of these methods that enhance the reliability and survivability of these systems will be given throughout this presentation.

### **Kettle Foods - A Unique Green Manufacturing Facility**

Ellen Skorpinski, ACSsome business operation.

In 2007, there were a few industrial LEED Gold facilities in the United States and none of them were potato chip manufacturing facilities. ACS changed this statistic, and offered Kettle Foods Inc. expertise in equipment integration, design, and construction services.

Kettle Foods Inc. Beloit Facility, designed and built by ACS, is an innovation in design. The process of manufacturing potato chips employs a tremendous amount of energy due to the high volume fryers. With this facility only being able to score a few points in the Energy and Atmosphere section of LEED, ACS had to think outside the box for the LEED Gold Certification points. Some of the highlights included water efficiency of the building with a grey water system, rooftop wind turbines, restoration of five acres of prairie around the facility, use of materials and resources, and an indoor air quality management plan to name a few.

By making organic potato chips in an environmentally friendly manufacturing facility, Kettle Foods has become a market differentiator in a sustainable world. Kettle Foods has lowered their environmental impact and created their facilities to be a healthier, happier workplace for employees to continue their commitment to making all natural potato chips.

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biographies  
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### Presenter Biographies:

#### **Nabeel A. O. Demerdash**

Nabeel A. O. Demerdash received the B.Sc.E.E. degree (distinction with first class honors) from Cairo University, Cairo, Egypt, in 1964, and the M.S.E.E. and Ph.D. degrees from the University of Pittsburgh, Pittsburgh, PA, in 1967 and 1971, respectively. He is the author or coauthor of more than 100 papers published in various IEEE Transactions. His research interests include power electronic applications to electric machines and drives, electromechanical propulsion and actuation, computational electromagnetics in machines and drives, as well as fault diagnostics electric energy systems. He is a Life-Fellow of IEEE.

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#### **Ellen Skorpinski**

Ellen Skorpinski is a mechanical engineer with ACS, Inc., specializing in sustainable design and construction. She has presented for the Lorman Education series, Effective Green Building Project Delivery, currently leads internal training sessions for LEED accreditation at ACS, and is the G.A.M.E. (Greening ASHRAE Meetings and Expositions) Committee Chair for ASHRAE's Madison Chapter. Ellen's experience includes project engineering on two LEED Gold projects, engine test cell facilities, manufacturing facilities, and laboratories. Ms. Skorpinski received her Bachelors degree in Mechanical Engineering with a minor in Technical Writing from University of Wisconsin-Madison.