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## **Efficiency Enhancement for NGL Plants with CCS through Cycles Innovation and Process Optimization**

By

**Dr. Abdullah Alabdulkarem**

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**Abstract:** Liquefied natural gas (LNG) plants are energy intensive. As a result, the power plants operating these LNG plants emit high amounts of CO<sub>2</sub>. To mitigate global warming that is caused by the increase in atmospheric CO<sub>2</sub>, CO<sub>2</sub> capture and sequestration (CCS) using amine absorption is proposed. However, the major challenge of implementing this CCS system is the associated power requirement, increasing power consumption by about 15-25%. Therefore, the main scope of this talk is to discuss this challenge by minimizing CCS power consumption as well as that of the entire LNG plant through system integration and rigorous optimization.

The second portion of the talk would cover the work performed under the alternative refrigerants evaluation program which is part of an ongoing effort by the Air Conditioning, Heating, and Refrigeration Institute (AHRI). The work was testing a 3 ton split heat pump unit using R410A as a baseline refrigerant as well as three R410A low-GWP alternative refrigerants.

**Brief Biography:** Dr. Abdullah Alabdulkarem obtained a PhD degree in 2014 and an MS degree in 2010 in Mechanical Engineering from the University of Maryland, College Park. He worked with the Center of Environmental Energy Engineering group under the Integrated Systems Optimization Consortium and the Alternative Cooling Technologies and Applications Consortium.

Dr. Alabdulkarem obtained a BS degree in Mechanical Engineering from King Saud University in 2006. He is a member of the American Society of Heating, Refrigerating and Air-Conditioning (ASHRAE), the Association of Energy Engineers (AEE) and the American Society of Mechanical Engineers (ASME). He is a reviewer for several journals and conferences.

His research interests are in natural gas liquefaction, CO<sub>2</sub> capture and sequestration, optimization of thermal systems, renewable energy, energy conversion technologies and HVAC&R.

**Date: Wednesday**

**Time: 1:00-2:00 PM**

**November 19, 2014**

**Place: Room 2C -68**

**Refreshment will be served**