Texas Industrial Energy Management Forum
Held in conjunction with the
8th AIChE Southwest Process Technology Conference
October 6, 2016
Moody Gardens Hotel and Convention Center
Register online at

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<th>Speaker</th>
<th>Thursday, Oct. 6, 2015</th>
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<td>Ankur Kumar (Co-authors: Michael Baldea, and Thomas F. Edgar)</td>
<td>Achieving Higher Energy Efficiency in a H2 Plant via Smart Manufacturing (9:30-10 am) Steam methane reformers (SMRs) provide the bulk of the hydrogen consumed in refineries and for production of several important chemicals. Consequently, these are large scale systems, with modern hydrogen plants producing above 100 million standard cubic feet hydrogen per day. In this context, energy efficient operation is an imperative necessity for long-term economic viability and mathematical modeling of SMRs becomes a crucial tool for achieving high energy efficiency. The models can be either high-fidelity (e.g., using computational fluid dynamics), data-driven (and typically low-order) empirical models, or a combination of both. Furthermore, the development of mathematical models should be accompanied by online deployment. The latter must be supported by a smart manufacturing framework, that includes, i) capabilities for acquiring appropriate process data via systematically placed sensors, ii) adequate high-performance computational resources for just-in-time computations, and, iii) a user-friendly visualization interface for operator use. Moreover, rapid adoption of such practices demand that such an IT infrastructure</td>
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should be easy to use and deploy. These requirements constitute the natural and essential form of ‘Smart manufacturing’ (SM). In this work, we present an example application of SM concepts to an industrial scale steam methane reformer along with the benefits obtained.

| Srinivas (Srini) Karra, Ph.D. Staff Applications Engineer (Co-authors: Idorenyn Luke, Alexis Nelson, Larry Kemp and Pamela Gage) ExxonMobil Chemical Company | Ethylene Furnace Recovery Quench Oil Circuit Optimization (10 – 10:30 am) A 50% reduction in heat dissipation to cooling tower water was achieved in the ethylene furnace recovery section at Beaumont Chemical Plant via improvements in constrained multi-variable control by a team of operations and engineering. Following strategy was employed successfully:
1. The Primary Fractionator cutpoint temperature was maximized against tower overheads and bottoms constraints – resulted in lessening the heat losses to CT water.
2. Quench oil flow to downstream distillation tower reboilers was maximized against hydraulic constraints in quench oil circuit while minimizing supplemental reboiler steam.
This amounted to an additional 175,200 MMBTU/Y energy being recovered from quench oil as reboiler duty in downstream distillation towers while unloading the CT exchangers in QO circuit. |
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| Heidi Holmes Advanced Control & Optimization Technology Manager (Co-author: Dan Bowers) The Dow Chemical Company | Energy Advantage with Light Hydrocarbons Furnace Fuel Flexibility (11:00-11:30 am) Large integrated manufacturing facilities utilize cogeneration for meeting thermal and electrical energy needs. Efficient use of by-product fuel plays a key role in optimizing site energy costs. Varying feed slates in light hydrocarbons plants necessitate new furnace fuel flexibility options to provide the best advantage for site heat rate. Working across business lines at Dow’s Louisiana Operations Division results in reduced fuel use, reduced carbon emissions and operating cost for all business partners on site. |
| Ben Janvier President Enero Solutions Inc. | The Role of Steam Simulators for Advanced Controls Implementation, Operator Training, Process Safety and Plant Operational Excellence (11:30-12 pm) Advanced Process Controls (APC) is usually the solution for improving steam plant runnability, safety and profitability. However, commissioning of an APC package on a steam system is risky and the long-term maintenance of these packages is so cumbersome that most APC are eventually turned off after just a few years of operation. This presentation shows how first-principle simulations can be used to reduce commissioning risk, improve the long term operability of an APC package, and train operators. The speaker will also present recent APC project results where simulators were used to test the logic, tune the controllers and train the operations team. In these projects, the “virtual steam plant” approach allowed the new APC logic to be commissioned with no production losses and with the expected long-term safety and profitability goals. |