Texas Industrial Energy Management Forum

“Energy Efficiency in Plant Equipment”
Held in conjunction with the
7th AIChE Southwest Process Technology Conference
October 1-2, 2015
Moody Gardens Hotel and Convention Center
Register online at
http://www.aiche.org/conferences/southwest-process-technology-conference/2015

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<th>Speaker</th>
<th>Thursday, Oct. 1, 2015 9:30-Noon</th>
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| Keyur Shah  
Research and Technology, Albemarle Corporation  
Mike Lazzaroni, and Don Nelson, Albemarle Corporation | Sustainable Energy Reductions by Optimization of Flare Systems (9:30-10 am)  
As part of Albemarle’s commitment as an Energy Star Partner to reduce energy usage and adopt more energy-efficient operations, we recently made several improvements to the plant’s flare systems which resulted in significant cost savings and sustainable energy reductions.  
Excess hydrocarbons that cannot be reused or recycled are safely and efficiently combined with excess air and burned in flares at our site. Natural gas assist is used in the flares to ensure that environmental Btu limits are met while destruction and removal efficiency (DRE) of at least 98% is achieved. A cross-functional team evaluated the flare operation and identified several optimization opportunities. This presentation will cover how improvements in process flow measurement and a new controller technology based on a neural |
| **Nani Deole**  
Consulting Engineer  
LyondellBasell Inc. | **Major Olefin Plant Workover Dramatically Improves Energy Intensity** (10:00-10:30 am)  
The LyondellBasell La Porte site implemented a project in 2014 to increase olefin plant capacity. The project team took this opportunity to improve the energy intensity significantly by incorporating innovative technology, high efficiency equipment, and design concepts that were not obvious or commonly practiced but are applicable to significant segments of the chemical industry. The energy intensity improved by at least 6% from a 2013 full year average of 8,040 Btu/lb LHV to the September-December 2014 average of 7,549 Btu/lb LHV. The energy intensity is still trending down and has gone below 7,000 Btu/lb LHV in recent months. |

| **Thomas Lestina**  
Vice President  
Engineering Services  
Heat Transfer Research, Inc. | **Enhancing Heat Exchanger Performance** (11:00-11:30 am)  
Process heat exchanger performance can be enhanced by a number of different methods. For fouling applications such as for exchangers in a crude oil preheat train, performance is enhanced by implementing fouling mitigation measures. For some exchangers fouling can be mitigated by correcting design mistakes; for other exchangers, flow and temperature distribution can be optimized to reduce fouling tendencies. For applications which have low heat flux using traditional designs, such as with light hydrocarbon vaporization, enhancements which eliminate film boiling should be considered. Finally, new efficient process designs can have a low temperature difference between the hot and cold fluid streams, and enhancements which increase heat transfer coefficients are essential to reap the benefits of these new processes. The application of enhancement technology is more practical now than ever before with continuing improvements in heat transfer prediction and availability of commercial enhancement technology. |

| **Srinivas (Srini) Karra, Ph.D.**  
Staff Applications Engineer  
ExxonMobil Chemical Company | **Distillation Tower Energy Efficiency Improved by Advanced Control Techniques** (11:30-noon)  
A 43.65 MMBTU/HR energy reduction was achieved in the co-product recovery distillation section of Beaumont Chemical Plant via improvements in constrained multi-variable control. Various novel techniques were employed in order to improve the energy efficiency of the distillation towers:  
• Reduction of multiple tower refluxes via tighter control at upper thresholds on tower overhead key component concentrations. This task involved deployment of inferential quality estimators (where analyzers were absent) with a feedback enforced via lab samples.  
• Employing tray analyzer prediction-error feed-forwards for tighter control of distillate purity on long time-to-steady-state towers  
• Recycle stream flow was reduced by more than 50% while optimizing tower weeping and reboiler constraints on the first tower in co-product recovery train,  
These activities resulted in a 43.65 MMBTU/HR reduction in combined reboiler duties, which is equivalent to |
| ~35.7% of total energy utilization by all distillation towers in co-product recovery section. An associated reduction of 4,432 tons of annualized net CO2 emissions was also realized. |