



PLANT AUTOMATION AND DECISION SUPPORT SESSION

Monday, October 12

10:15 a.m. – 5:00 p.m.

Fundamentals

Scheduling for Performance: From Managing Inventory to Managing Quality

Mark Georgen, Tesoro

Refineries are looking for ways to improve profits under the pressures of business climate, regulatory compliance, and customers' demands. One way is to improve the utilization of current assets through scheduling for performance. Scheduling refining processes is thus reaching beyond inventory management to quality management to cope with feedstock variations, process unit limitations, and product requirements. With the forecasting power of scheduling tools, our refineries are tracking the quality of crude oil charges to ensure that the crude units are operating in the right mode.

How Best to Represent Complex Process Operations in Refinery LP Models

Robert Powell, KBC

The vast majority of petroleum refiners use simple linear "Base-Delta" models to represent complex process units in their most important economic and planning tool, the venerable LP. In this paper, a typical refinery LP will be used as a basis to quantify what level of technical detail makes sense in representing key units such as FCCs, hydrocrackers, and reformers in an LP. The study will start with the simplest approach (fixed yields), to the industry's current accepted methodology (Base-Delta) to the use of more advanced (non-linear models) and investigate if use of these different models lead to economically different optimum operations. As a side study, we will look at the penalty refiners pay for the inaccurate yields and properties generated by poor or outdated unit models in the LP.

Justification of DCS Investments and Measurement of Hard Dollar Benefits

Rick Jones, Solomon Associates

In today's economy all major expenditures must have hard economic justification. In the past, hard dollar benefits of automation projects have been difficult to identify. Solomon Associates has developed and patented a methodology to baseline, target and measure the reliability impacts of new automation systems. This method has been proven by successful application on refinery process units, but is applicable to petrochemical, chemical, plastics, power and other industrial operations.



Optimal Gasoline Blending

David Seiver, ConocoPhillips

The ConocoPhillips Wood River refinery has three in-line (direct to pipeline) gasoline blenders that rely on a sophisticated optimization system utilizing on-line Near Infrared (NIR) analyzers to certify gasoline properties. Optimal Gasoline Blending contributes more than half of the APC savings of the entire refinery. The blending control system is a TDC-3000 utilizing Honeywell's Blend Ratio Control (BRC) to control recipe ratios, Blend Property Control (BPC) to on-line optimize the recipes. The systems needed to effectively and optimally in-line blend and on-line certify are many. The presentation focuses on the work processes, systems, and keys to optimally blend gasoline in a competitive refining economy.

Optimizing Blending Operations Across Chevron

Himal Munsif, Chevron and Dimitrios Varvarezos, Aspen Technology

Refineries today strive to maximize margins from available component streams, while producing a range of products that meet challenging regulatory and market requirements. Optimizing the overall blending process is the key for maximizing refinery profits. The tool used, Aspen MBO, is an event-based, multi-period and multi-blend solution that generates optimal blending schedules for both short- and long-term campaigns.

This paper presents the workflow around an optimized blending process that satisfies demand, reacts to changes in fuel standards and reduces costly quality giveaway, inventory holding costs, stock-outs and overages. It describes the successful deployment of Aspen MBO at eight Chevron refineries, the lessons learned and the benefits captured. The paper discusses the project timeline, the organizational structure and the change management process associated with a rollout of such scope. The benefits of deploying a state-of-art blending solution are presented along with the challenges that were overcome along the way.

Removing the Trials and Tribulations of PID Tuning

Mark Darby, CMID Solutions

A new approach based on optimization technology is described for reducing the time and effort required to tune PID loops, without the need to iterate. For interacting loops, modern identification techniques are used to develop an accurate multivariable dynamic model. For single loop applications, simplified modeling techniques tailored to instrument technician level can be used. The resulting model is used in an optimization that explicitly considers process-specific safety and operability objectives associated with the controlled and manipulated variables to determine optimal PID tuning parameters. A key feature of the approach is that robustness margins are explicitly addressed to ensure stability in case of future plant-model mismatch. In the following sections, the methodology and technology are described in detail. Results are presented for an interesting industrial application.



Center for Operation Performance Alarm Research Results
Dave Strobhar, Belville Engineering

The results of alarm research funded by the Center for Operator Performance will be presented. Multiple alarm rates were presented to subjects via two different display formats. Statistically significant differences were observed in performance for both alarm rate and presentation.

Tuesday, October 13
8:30 a.m. – 2:00 p.m.

Filling Knowledge Gaps

Agile Supply Chain Planning
Craig Acuff, M3 Technology

Refinery planning begins with setting constraints and targets, and optimizing an objective function in a LP model. This presentation describes a planning workspace for accomplishing rapid iterative supply chain optimization including LP synthesis.

Optimization and Carbon Caps
Dustin Beebe, Prosys

In light of the tightening U.S. emission regulations, this presentation will analyze two major solutions: optimization via control and carbon sequestration. The range of possibilities and interaction between the solutions will be discussed.

Capturing As-Built Assets for Documentation and Virtualization
George Bauer, INOVX

Both refiners and producers in the oil and gas industry are beginning to develop intelligent virtual asset models for their key facilities based upon highly accurate laser scans of their assets. These laser scans and resulting models enable as-built asset documentation produced more efficiently while being more complete in content. In addition, these companies are finding these models can reduce the amount of rework and RFIs during the construction phase of projects by nearly 80%. The laser scanned as-built model enables engineering to accelerate the basic and detailed design phases, while significantly increasing the quality and accuracy of the final designs. The level and quality of detail in the laser scan based model is proving to surpass that produced by traditional surveying methods. In the later stages of the asset lifecycle, the virtual asset model is being leveraged as a basis for entirely new, virtualization enabled, work processes in areas such as reliability, operations, and maintenance.



Decision Support for Proactive Performance Detection

Hamdy Nouredin, Saudi Aramco

Improving Plant Performance and Safety in Continuous Processes Through Modular Procedural Automation

Maurice Wilkins, Yokogawa

This presentation will explore the issues surrounding procedural operations in continuous processes and propose a standards-based approach to manage these that will provide operational savings and improve safety.

2:00 p.m. – 5:00 p.m.

Cyber Security

CyberSecurity Roadmaps

TBD

Security Management Key for Success

Ernie Rakaczky, Invensys

Cyber Security for Wireless Field and Plant Networks

Neil Peterson, Emerson

Modern wireless technology includes field networks for field devices and plant networks for assets and people. This presentation discusses the cyber security methods built in to a modern wireless system, including advanced standards-based encryption as well as authentication, verification, key management, and anti-jamming techniques.

Benchmarking Process Control Security

Russell Brown, Solomon Associates

This paper describes the key areas Solomon uses to benchmark process control cyber security. The benchmark study was part of the Solomon Worldwide APC and Automation study, and remains open for participation. In today's environment, it is important to understand how vulnerable your automation system is, and what you can do to improve your situation.



Wednesday, October 14

8:00 a.m. – 11:00 a.m.

Enabling The Real-Time Enterprise (Why IT Matters)

The Digital Refinery: Progress and Promise

Doug White, Emerson

We are reminded daily of the rapid advances in computing and communication and the ways in which these advances have changed the way we live and work. Technology developments in high performance computing and high speed communication, and the advanced analytical and optimization methods based on this infrastructure have been the foundation for many advances in refinery sensors, automation, and information technologies. These advances have significantly changed the way refineries operate and will cause continuing change in the future, leading to what is termed “The Digital Refinery”.

Enabling the Real-Time Enterprise

Cliff Pedersen, Pexi – Pedersen Enterprises

Essentially all operating plants and factories have installed three levels of systems and software to increase plant/factory performance over the past thirty years - equipment monitoring/control (Operations & Asset Management), data retention/analysis (Production Management) and financial/fiduciary reporting (Business Management) with data transfer to a corporate Enterprise Resource Planning (ERP) system, the fourth level. Interchange of data/information between applications at each level as well as among levels has been achieved but usually on an application-to-application basis (point-to-point). As difficult as that was to achieve, the situation is exacerbated when the enterprise demands a more coordinated and synergized operation among the plants/factories - interfacing the plant/production systems to the business/enterprise systems has become a major issue.

This presentation will examine the need for a common application interface whereby every application can push/pull data from every other application through a common transport layer, as well as introduce the Open O&MTM Initiative - a collaboration of standards based connectivity, communications and data interchange, driven by Owner/Operator companies to realize significant cost/performance benefits for the manufacturing industry.

Convergence of historical BI/warehouse and Real-time

TBD

Optimizing the Refining Fuels Value Chain by Leveraging Streaming Real Time Business Intelligence, Unified Communications, and Dynamic Office Business Applications

Mike Bannon, Microsoft Corporation