# **OFFSITE MANAGEMENT SYSTEMS LLC**

Offsite Operations Automation Consultants and Solution Providers for Chemical, Oil & Gas (COG) Industries



## Offline Blend Planning, Optimization and Scheduling System (gomsPOFBlend<sup>™</sup>)

## Background

The planning of refinery blend products and the subsequent optimal control of the blending process has a significant immediate impact on refinery profitability and excess inventory. gomsPOFBlend<sup>™</sup> off-line blending planning package considers production planning, inventory management, and the quality and value of blending components to optimize blending operations. It is a comprehensive package, which can be modularly integrated in a refinery's CIM structure.

# **Applications**

Offline Product blending optimization, planning and scheduling system (gomsPOFBlend<sup>™</sup>) can be used very effectively for:

- Single recipe generation for Gasoline, Diesel and Fuel oil products
- Multi-period blend planning for weekly inventory control and monthly production forecast
- Conducting blend studies for operational change modeling and LP verifications
- Reblending to correct off-spec blends
- Backcasting to calculate blend models parameters and bias terms
- Analysis of compliance with EPA, CARB rules
- Blend Recipe Management and Automatic downloading of next blends recipes to online execution

# **Benefits**

- Shift usage of more economical components
- Determine and exploit on-the-spot opportunities quickly
- Link refinery-wide planning to short term logistics
- Remove guesswork and artistry from blend
  planning
- Production of economically optimum product blends, thereby adding to refinery's bottom line profitability



Figure - 1 OMS Blend Control, Optimization and Planning System Hierarchy

#### Features

- Basic
  - Blending full range of gasoline grades, aviation jet to diesel fuel for distillate blends, and fuel oil blends.
  - Multi-period planning with inventory control constraints.
  - Number of multiple periods, feedstock components, and product grades limited only by computer memory size availability.
  - Can choose non-linear predictive methods "on the fly" for qualities
  - Maximize profit, Minimize quality giveaway, Calculation only optimization Choices
  - Determine the header targets for properties for an online system
- Advanced
  - Inventory Management account for changing production and set timedependent limits
  - Group Specifications property constraints over groups of blends
  - Heel Tracking accounting for volume / qualities in tank already, for each use
  - Component Pooling simulate rundowns
  - Generalized free-formatted linear and non-linear equations generation and management system (GAMS<sup>™</sup>)
  - User Selectable options for multiple Correlations for 36 qualities
  - 3 User definable blend qualities

# **Product Blending Series**

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Figure - 2 Stock Availability Data Entry

- Extended
  - Octane Blending Values determine indices for use in LP's
  - Blend Property Control Interfaces- send recipes directly to on-line system
  - Biases add values to correct consistent errors
  - Giveaway Ranges ensure blend remains close to specification
  - Infeasibility Control recover from "impossible" situations, relax constraints until solution is found
  - "Distress" Buy / Sell provides indication of why problem won't solve, calculate volume / quality needed to make an infeasible problem solve

#### • Environmental

- EPA RFG Models blend to emission specifications, ignores extrapolations at iteration-level (may impact), report exactly as written
- CARB Phase II Predictive Model report emissions, report acceptability

#### • Modeling and Correlations

- Preferred Recipe Penalties encourages model to stay near a preferred Starting recipe
- Product Group Limits volume constraints over groups of blends
- Product Group Relations relate production of blends to each other
- User selectable built-in well proven correlations for over 40 properties for gasoline, diesel and fuel including EPA RGF and CARB models
- Optimal scheduling of multi-period blends

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#### Interfaces

gomsPOFBlend<sup>™</sup> allows direct interface with

- Regulatory and Online blend control and optimization system (gomsPONBlend<sup>™</sup>)
- Laboratory and Tank gauging data
- gomsTQTS<sup>™</sup> for online tank quality tracking system.
- Blend Information Management System for feedback of model biases (gomsBIMS<sup>™</sup>)

#### **Economics**

Economically, it is estimated an annual savings of 750K–1.5MUS\$ by Offline Recipe Optimization, and planning and Scheduling of blends.

#### System Requirements

Intel Core i7 or equivalent, 3+ GHz, 32GB RAM, 1TB+ HDD, CD ROM, 17"+ color monitor, Windows 7 and higher OS

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