

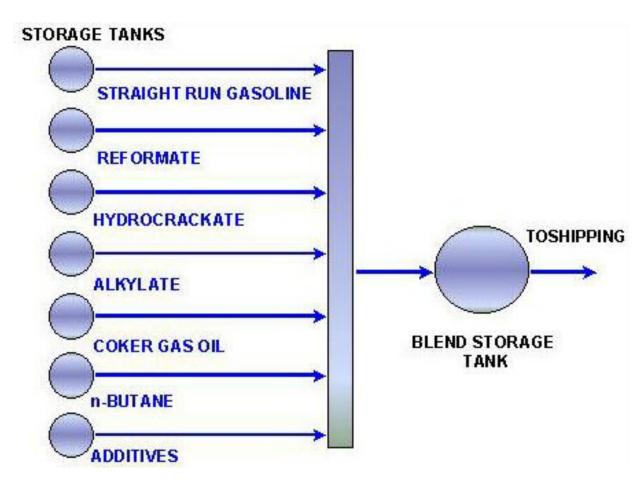
# Refining

# **Gasoline Blending Optimization**

#### **Outline**

- Gasoline Blending Overview
- Online Blend Controller & Optimization
- Benefits

# **Blending Overview**



# Regulatory Level

- Blend lineup and component selection
- Recipe handler with pacer
- Volume integrator
- Quality reports
- Good solutions available at DCS level

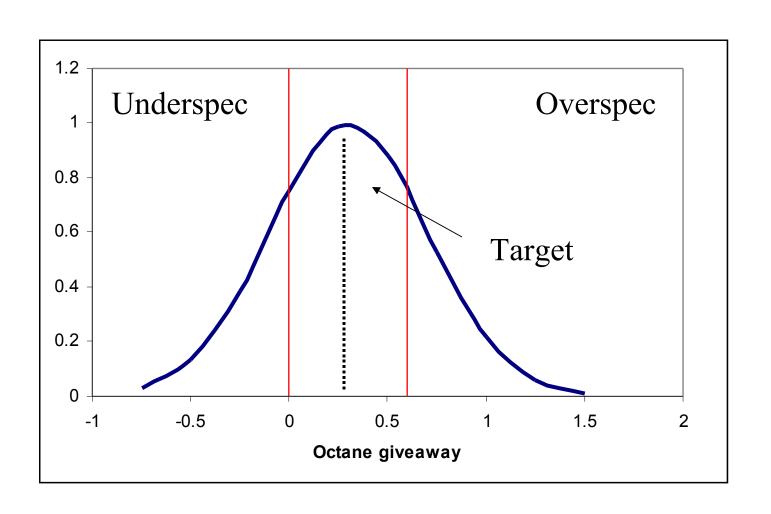
#### **Evolution of Blending Advanced Control**

- Manual systems
- First level control
- Current technology

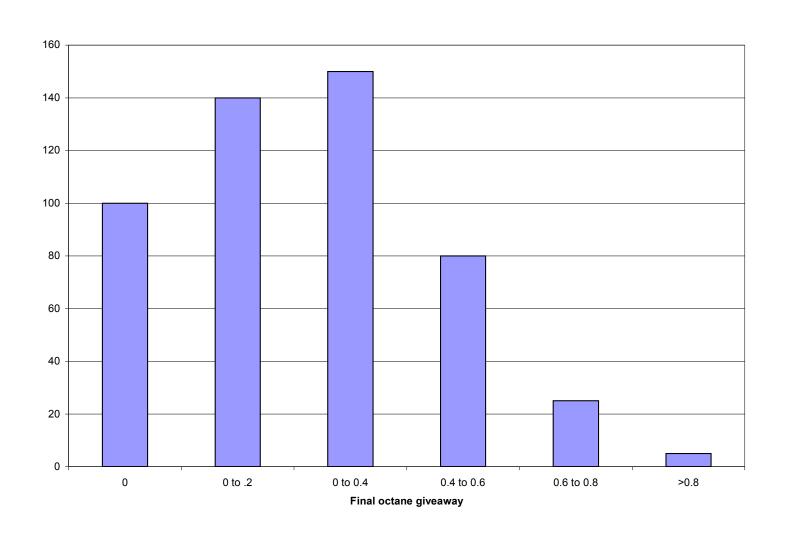
# **Manual Blending**

- Typical giveaway 0.35 octane numbers
- Can be reduced with reblends
- Lab sampling during blend
- Expert corrects recipe on the fly

## **Initial Quality Distribution**



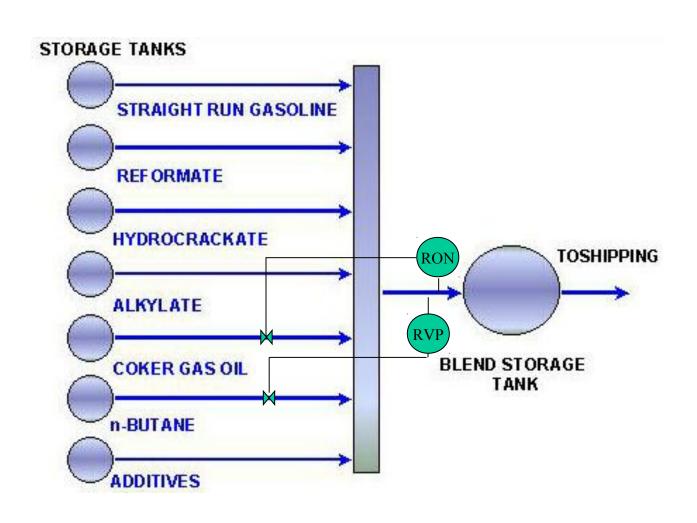
# After reblending



## **First Level Control**

- Trim blend with online analyzers
- Simple PID loops

# **Example of First Level Control**



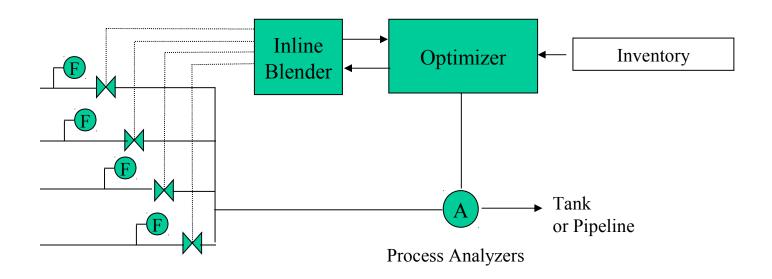
### **First Level Control**

- Reduces giveaway
- Can hide an unprofitable operation

# **Opportunity Cost**

Component	Price	Recipe 1	Recipe 2	ROAD	RVP
Α	\$4.60	0	17.8	74.05	4
В	\$13.50	0	0	86.45	4
С	\$9.50	0	66.3	85.76	13
D	\$26.88	23.8	0	101.75	0.5
Е	\$27.58	0	0	102.5	0.5
F	\$0.00	4.5	5.9	97.3	66.74
G	\$2.50	61.7	0	76.5	16.45
Н	\$27.50	10	10	115	16
	\$16.16	0	0	93	12
Average Cost \$/BBL		\$10.69	\$9.87		
Spread		\$0.82			

# **Modern Blending**



# Why Blend Optimization?

- Eliminate reblends
- Reduce quality giveaway: \$0.35/octane barrel
- Make recipe changes consistent with refinery drives example: maximize low cost components

# What is a Blend Optimizer

- An integrated suite of control technologies designed specifically to optimize on-line performance of the blender
- An applications product, not a generic software tool or algorithm
- The best control technologies are imbedded directly into the application giving the operator trouble-free operation

# The Cost of Giveaway

- LP gives marginal values for limiting specs
- These values are conservative
- Zero giveaway after reblend may not be "free" if achieved with expensive components
- Currently, average giveaway cost for a 100,000 BPD refinery is \$100,000/month

## **Elements of Blend Optimizer**

**Philosophy** 

**Blending Models** 

Precise Recipe Adjustment

On-line properties predictor

Update Planning
Blend Values

**Controller/Optimizer** 

Automatically Capture Benefits

#### **Benefit Areas**

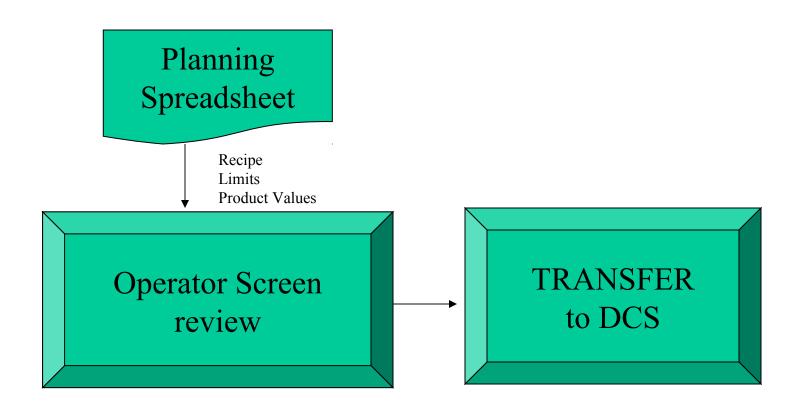
- Reduced variance cuts giveaway costs in half
- With online certification, blend target can be precisely at specification
- System consistently enforces lowest cost policy
- Up to date blending values for LP

# Blend Optimization Opportunity

- One year payout
- Meets today's and tomorrow's blend challenges
- Maintain competitive market position

Only an on-line optimizer is able to guarantee that the benefits are captured

## **Flowsheet**



# Summary

- Blend Optimization Highly Profitable
- Technology battle-tested
- Payout < 1 year