



**COMPRESSOR  
CONTROLS  
CORPORATION**

# OPTIM™

## ***Olefins Production Throughput Increase & Maximization Control System***

### ***CCC Raises the Bar of Excellence in Advanced Constraint Control Solutions for Ethylene Process***

#### **General-purpose control systems in the market are highly ineffective**

- Cannot prevent excursions of critical variables during plant upsets
- Rely on conventional closed-loop techniques
- Control action is inadequate
- High risk of tripping the compressor due to surge, low suction pressure, high discharge pressure, temperature, liquid level, and overspeed

**General-purpose control systems are configured with conservative safety margins that reduce the operating envelope of a compressor. This leads to lower yield, overall production decrease, loss of revenue, and operating profits.**

## ***CCC Offers a Reliable, Proven Solution***

CCC has developed and implemented an ***Innovative Olefins Production Throughput Increase & Maximization Control System (OPTIM)*** featuring:



- **FAST ACTING** adaptive constraint control response (patent pending)
- **ADVANCED** multivariable control techniques
- **PURPOSE-BUILT** hardware platform
- **INTEGRATED** Turbomachinery Control System
- Stringent **CONTROL** system **DESIGN**

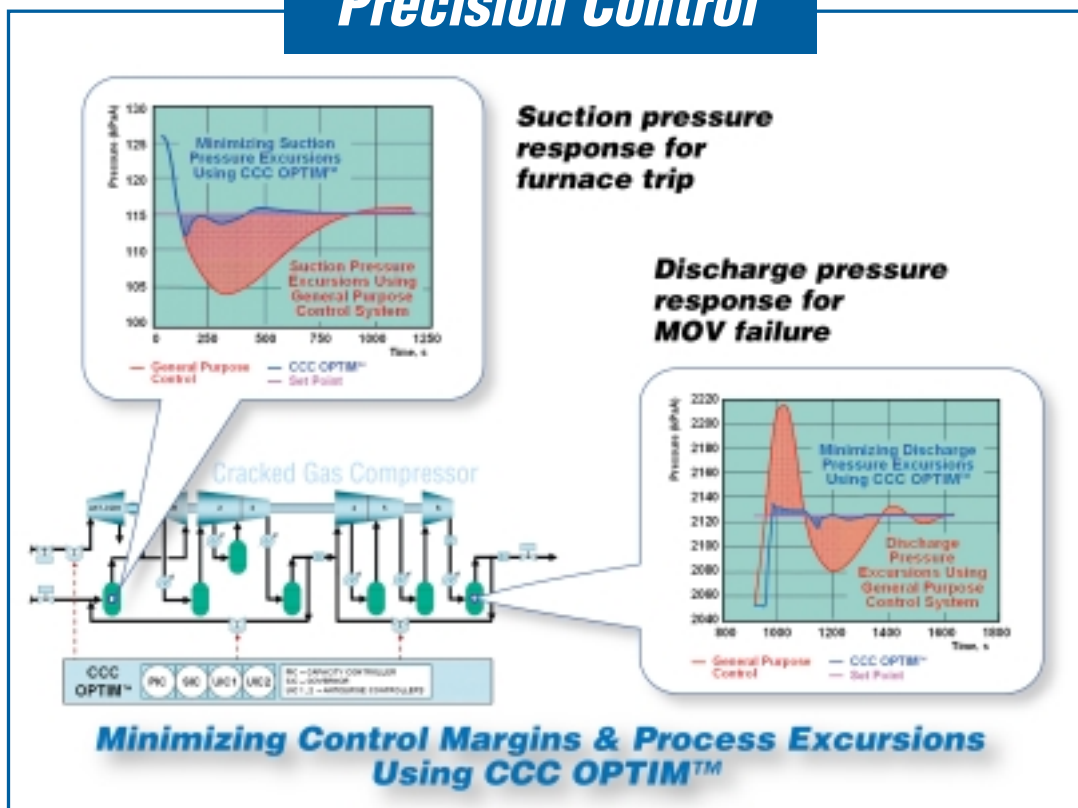
## Does your Olefins Plant suffer from lost production and loss of revenues as a result of the following problems?

1. Production is **constrained** due to Cracked Gas compressor limits?
2. Refrigeration capacity is **limited** due to the constraints on Propylene or Ethylene compressors?
3. Plant is subjected to unplanned **shutdowns** due to surge related problems on compressors?
4. Experiencing unplanned **shutdowns** due to high liquid level, temperature, pressure or over speed trip problems on refrigeration compressors?
5. The Cracked Gas compressor **does not operate safely** during furnace trips or failure of discharge MOV?
6. Suffering from **periodic plant upsets** leading to Manual operation of various control loops?
7. Frustrated with **loss of production revenues** due to conservative controls and wider safety margins?
8. Having **manpower shortage** from repeated manual operations?
9. Process **startup is stressful** and challenging with excessive flaring of toxic pollutants?
10. Compressors cannot sustain **major process upsets** and result in recurrent unplanned shutdowns?

**CCC's New OPTIM is the Solution to Your Problems!**

## CCC's VALUE PROPOSITION FROM NEW OPTIM SYSTEM

### Precision Control



**Precision control using fast acting adaptive control response will expand the operating envelope of Cracked Gas and Refrigeration compressors.**

## Remarkable R.O.I.

Every psi increase in inter-stage or final stage discharge pressure results in an estimated production increase of 1%

1 psi decrease in cracked gas compressor suction pressure results in an estimated production (or yield) increase of 0.75%

**For a world-scale Ethylene cracker with a nameplate rating capacity of 800,000 t/y (1.8 billion pounds/year), potential benefits per psi increase in compressor margins are**

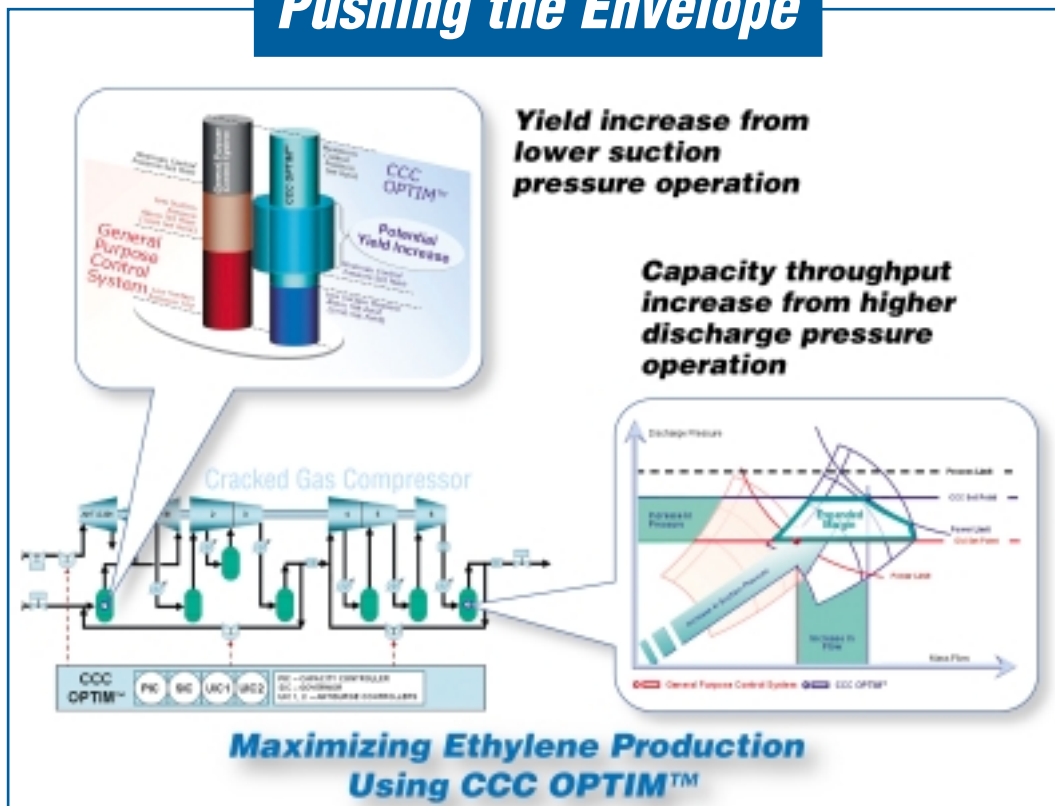
**\$6.8 million\* increase in production revenues**

**\$2.0 million\*\* increase in operating profits**

\* Assume price of \$850 per Metric Ton

\*\* Assume an operating margin of around 30%

## Pushing the Envelope



**Expanding the operating envelope of Cracked Gas compressor will maximize your plant operating revenues and profitability.**

# Major Benefits of CCC OPTIM

- Increase in reliability and availability of compressors
  - Eliminate shutdown from compressor surge, high liquid level, discharge pressure, temperature, and overspeed
- Expanding the operating envelope of Cracked Gas and refrigeration compressors in a safe, reliable manner
  - Maximize plant's operating revenues and profitability
- Plant startup is faster and less stressful
- Process startup can take place with fewer furnaces on line than before
  - Reduce flaring of toxic gases
- Totally integrated controls will automatically stabilize any process upsets
  - Minimize operator intervention
- Cracked Gas and refrigeration compressors operate safely during severe process disturbances
- Easy adaptation to changes from process revamp, turbomachinery re-rates, and instrumentation

**T**he constraints in the Cracked Gas or Ethylene or Propylene compressors should not diminish your potential to increase plant production. Due to ever-increasing global demand for ethylene, the opportunity from increased production is greater than before. This is not the time for an Olefins plant to lose production from unplanned shutdowns or turbomachinery constraints. Let us show you how CCC successfully solved the unique challenge faced by other Ethylene producers.

***For more information about OPTIM and other turbomachinery control solutions, call CCC today!***



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