



# A Summary of the Air and Steam System Audits Conducted in Conjunction with the DOE

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Cedar Bayou Plant



# Outline

- Cedar Bayou Plant Statistics
- Purpose of the Audits
- Steam Audit Summary
- Air System Walkthrough Summary
- Overall Summary

# Cedar Bayou Plant Background

- Located 28 miles east of downtown Houston on Interstate Highway 10
- The plant has been in operation since 1963.
- 6.56 Billion Lbs/Yr produced for 9 product lines:
  - Olefins: Ethylene, Propylene, Heavy Olefins.
  - Polyethylene: LDPE, LLDPE, HDPE.
  - AO/AB: NAO, PAO, AB.





# *Goals of the Audits*

- Find opportunities to reduce energy costs
- Find opportunities to reduce operating costs
- Find opportunities to improve productivity



# *Steam System Statistics*

- 2 packaged 400 psig boilers
- 3 field erected 600 psig boilers
- 26 waste heat boilers capable of producing 1500 psig, 170 psig, and 100 psig steam
- Total Steam Cycle of 1,500,000 lb/hr



# *Steam System Audit Focus*

- Steam Generation Efficiency
- Steam Distribution
- Large Scale Opportunities



# *Steam System Audit*

## **Steam Generation**

- Further investigate and fix hotspots identified on 400# boilers
- Continue investigation of retrofit 1500# steam superheaters into convection section of ethylene furnaces.

## **Steam End Use**

- Install correct trapping scheme on 600# boiler steam preheater coils
- Install traps on air blower turbines to prevent purging steam to atmosphere



# *Steam System Audit Summary*

- Steam System Assessment Score of 330 out of 360
- Few large opportunities identified
- Focus of new efforts on small scale opportunities
  - Steam trap program
  - Insulation audit of condensate lines
  - Steam system optimization



# *Air System Statistics*

- 3 Different Air Systems
- 11 Total Compressors (10 centrifugal, 1 oil free rotary screw)
- Total Air Compressor Capacity of approx. 25,000 SCFM
- Each System Operates at approximately 120 psig



# *Air System Walkthrough Focus*

- Supply Side
- Demand Side
- Large Scale Opportunities



# Air Systems Walkthrough Plastics

## 1792

- Reduce dryer purges
- Eliminate open drainages
- Retrofit eight dust collectors in bag houses

## 1796

- Convert dryer to vacuum regeneration
- Eliminate air horns
- Retrofit bag houses with additional storage
- Install header between 1792 and 1796 to allow second compressor in 1796 to backup 1792, thus eliminating need for rental compressor



# Air Systems Walkthrough Chemicals

## Utilities

- Install 600 hp motors on electric driven Elliot compressors to increase output
- Install new controls on the Elliot compressors to automate system
- Increase control receiver size to 30,000 gallons

## Normal Alpha Olefins

- Eliminate crossover valve between utilities
- Increase pipe size between utilities
- Install 20,000 gallons of control storage behind a Press/Flow Controller
- Base load utilities centrif. compress. & use AO screw compressor for swing load



# *Air Systems Walkthrough Summary*

- Total Potential Savings: 6,147,001 kWh/year or **\$233,587/year**
- Task Force begun to address air system issues and walkthrough findings in each area



# Overall Summary

- Steam Audit - SSA score of 330 out of 360, focus on smaller opportunities
- Air Walkthrough – Potential \$233,587/yr savings, teams formed to review results
- Questions?