FCCU Overhaul Safety Options

League City (Houston) Tx. April 12-16, 2010
AGENDA

• Setting the Stage for Safety
• Challenges of conventional techniques
• Technology as a Strategy for Safety Improvement
• Showcase Project Details
  – Project Overview and Challenges
  – Details of Overhaul Process
  – Best Practices / Lessons Learned
• Conclusion
Philosophy of Safety

• In the Energy Industry, what is usually the first mentioned aspect in decision criteria?

• How do you judge the safety of a process or contractor?

• What are the consequences of an incident?

• What is a practical, operating philosophy for evaluating safety?
Challenges of Conventional Techniques

- Generally Familiar
- Somewhat predictable
  - Outcome
  - Risk
- Preserves the continuous improvement momentum
- Not disruptive / generally won’t get in trouble
Technology as Strategy for Safety

• Cutting and Parting of Metal Components
  – Flame Cutting
  – Machine Cutting
  – Hydrocutting

• Welding / Joining of Metal Components
  – Joint design and Prep
  – Automatic vs. Manual
  – Training and Experience
FCCU Project – Scope Overview

• Overall Original Scope: Work in four different vessels and modification of plant piping system.
• FCCU Regenerator Refurb: R/R overhead piping, top head, internal cone riser and 20 cyclones.
• Reactor Replacement: Overhead piping, reactor riser, spent catalyst standpipe and life/feed distributor.
• Frac Tower R/R overhead piping and 2 major shell sections.
Regenerator Refurbishment Details

- Hydrocut removal of Overhead Piping
- Hydrocut of Vessel Head
Removal of Internals
Distributor Section Replacement

Air Distributor
Challenging Accommodations
Reinstallation of Distributor / Cone Riser
Regenerator Head Assembly
Preparation and Welding of Head
Miscellaneous Modifications and Repairs

- Section replacement
- Remove / replace or reposition connections
- Reconfigure nozzle sizes and locations
Lessons Learned Related to Safety

- Scope expansions
- Schedule disruptions
- Dimensional deficiencies
- Design changes
- Added oversight
- Culture
- Short term employees
Lessons Learned Related to Technology

- Automation vs. Manual
- Advanced tooling
- Alternative processes
- Alternative and available mix of methods
- Experience, resourcefulness and adaptation
Conclusion (Summary)

Best Practices / Lessons Learned
- Pre-Planning / Optimized Coordination
- Utilize Depth of Resources
- Applied Technology / Innovation

Value Potential:
- Safety Improvement
- Reduced Schedule Risk and Duration
- Lower Cost
- Improved Quality/Longevity
Questions......

Thanks....

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