

# BRASKEM - A-150 NATURAL GAS DEETHANIZATION UNIT

## FEASIBILITY STUDY AND CONCEPTUAL DESIGN

BRASKEM, Camacari Petrochemical Complex, Bahia, Brazil



### PROJECT SUMMARY

In December 2005 TDE was awarded the Contract for feasibility study, conceptual design, and additional engineering / site services for the revamp of existing natural gas deethanization unit, for the following original production:

Natural Gas	2.015 MMm <sup>3</sup> /d
Ethane	8.3 t/d

This engineering project is being completed in several stages, and will be completed in October 2006.

The scope of the studies include analysis of existing equipment to determine the restrictions, and revamp of existing equipment to achieve design flow rates; also to analyze 8 new proposed feed cases, with the conceptual design phase including further detailed engineering on the 2 TDE recommended cases.

The proposed cases to be analyzed include a combination of flow rates of 2, 3, and 5 MMm<sup>3</sup>/d, of natural gas feed from 3 different facilities, with different outlet specifications, 8 cases in total.

The contract includes submission of engineering documents in Process, Mechanical, Rotary Equipment, Fixed Equipment, Instrumentation & Control disciplines.

## PROJECT DELIVERABLES

Thermo Design will generate engineering documents as a result of process design, optimization and modification of operating and conceptual information. A summary of documents to be generated for each of the cases analyzed by Thermo Design follows.

### Process

- Basis of Design
- Description of Process Modifications
- Alternative Solutions
- Preliminary Sizing of new Equipment
- List of New and Modified Equipment
- Process Simulations
- Detailed Process M&H Balances
- Utility M&H Balances
- Flow Diagrams (BFD, PFD, UFD)
- P&I Diagram (Process)
- Thermal Rating of Existing Heat Exchangers
- Process Data Sheet for new, modified, and existing Equipment, Control/Safety Valves
- Process/Utility Line Sizing
- Equipment List / Utility Summary
- Feasibility Study Final Report
- Conceptual Design Final Report
- Process Design Book

### General

- Budget Cost Estimates for each study case

### Safety / Environment

- Risk Assessment

### Piping / Layout

- General/Unit Plot Plans

### Fixed Equipment

- Mechanical Data Sheets for new Shell & Tube Heat Exchangers, Cold Heat Exchangers, Pressure Vessels

### Rotary Equipment

- Mechanical Data Sheet for Existing Compressor Re-rating, and New Compressors, Pumps

### Instrument & Control

- Description of New and Modified Control Loops
- Instrument Index
- List of Analyzers



## PROJECT EQUIPMENT SCOPE

The engineering documentation was prepared for the process & utility equipment as summarized below:

### **Natural Gas Deethanization Plant**

- Feed Gas Compression (new and existing)
- CO<sub>2</sub> removal (new)
- Gas Dehydration unit (new and existing)
- Mercury Removal (new)
- Gas fractionation to Methane, Ethane and C<sub>3+</sub>. (existing)
- Nitrogen removal (new)

### **Natural Gas Deethanization Plant Utilities Analyzed**

- Fuel gas system
- Instrument and plant air systems
- Quench Water System
- Propylene Cooling System
- Regeneration Gas System