

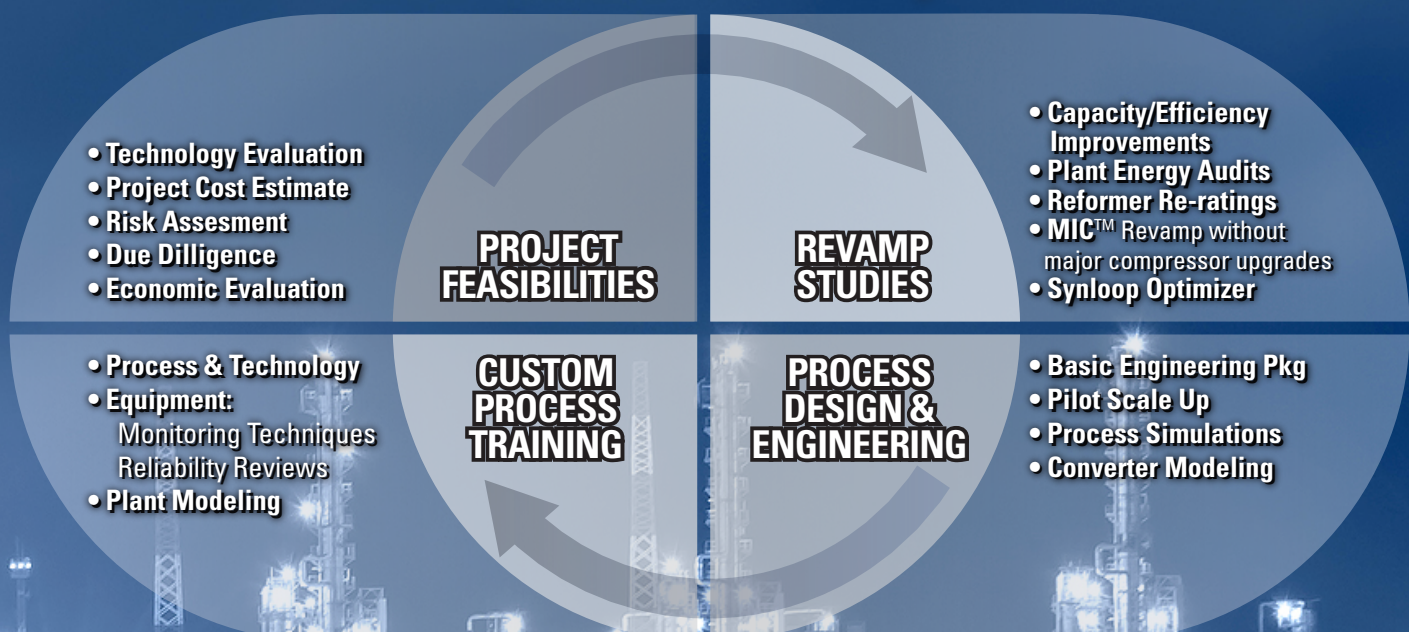


Kinetics Process Improvements, Inc.

Independent Consultants & Engineers

Serving to Improve & De-bottleneck

- **Ammonia Plants**
- **Methanol Plants**
- **Primary Reformers**
- **CO2 Removal Systems**

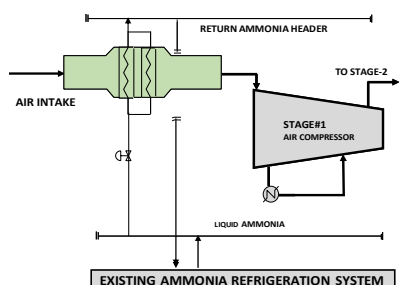


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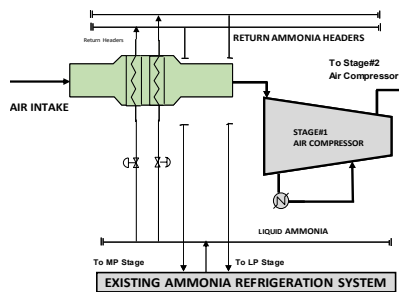
16000, Park Ten Place, Suite#903, Houston, TX- 77084 (USA)

Phone: 281-773-1629 • Fax: 832-565-9360

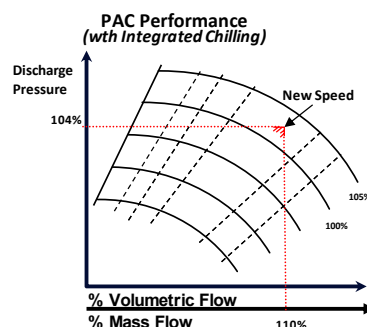
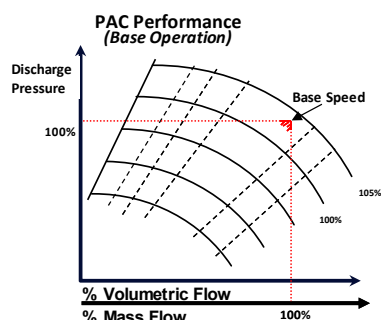
E-mail: process@kpieng.com • Web: www.kpieng.com



SIC™ - Single Stage Integrated Chilling



MIC™ - Multi Stage Integrated Chilling



'INTEGRATED CHILLING' PROVIDES MAXIMUM CAPACITY UPGRADE OF PAC WITH LEAST CAPEX & OPEX

"Integrated Chilling" to Upgrade Process Air Compressors

More Reforming
Reduced Inerts
More Ammonia
Less CO₂ Emissions

SINCE 2006

Integrated Chilling to Upgrade PAC* Maximize Reforming with Least Capex & Opex

by Kinetics Process Improvements, Houston

KPI-Houston is an *Independent Process Technology, Design & Engg Consulting* group specializing in Ammonia & Methanol Plants Revamps since 2006 to improve Capacity, Efficiency, Reliability & CO₂ footprint. **Over 60 Revamp Studies completed**

Integrated Chilling

- Integrated Chilling uses existing Ammonia Refrigeration System with Process Air Compressor (PAC)
- Single or Multistage Scheme
- No Additional Compressor

Benefits of Integrated Chilling

- **110% PAC Capacity**-with Single Stg
- No Utilities for Integrated Chiller
- Least Cost & Space requirement
- Least incremental power for PAC
- Reduced firing in Reformer
- Reduced CO₂ footprint
- Efficient Synloop with lower inerts

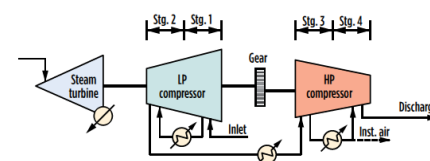
*PAC- Process Air Compressor

Services

- Integration Study with PAC
- **Basic Design Package**
- **Provide Performance Guarantees**
- **Engineering & Supply thro' approved Vendors**

References

- *Approved for two large Ammonia Plants*
- *Two Patents granted (2017 & 2019)*
- *Refer "Increase Reforming Capacity", N₂ & Syngas Conference, 2018*



Kinetics Process Improvements

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Suite#903

Houston- 77084 (USA)

Phone: 281 773 1629

Fax: 832 565 9360

Email: process@kpieng.com

Web: kpieng.com, kpieng.net

