



25th world gas conference
"Gas: Sustaining Future Global Growth"

ADVANCED PROCESS CONTROL IMPLEMENTATION CHALLENGES & SUCCESS AT QATARGAS MEGA LNG TRAINS

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Venue: KL



Patron



Host



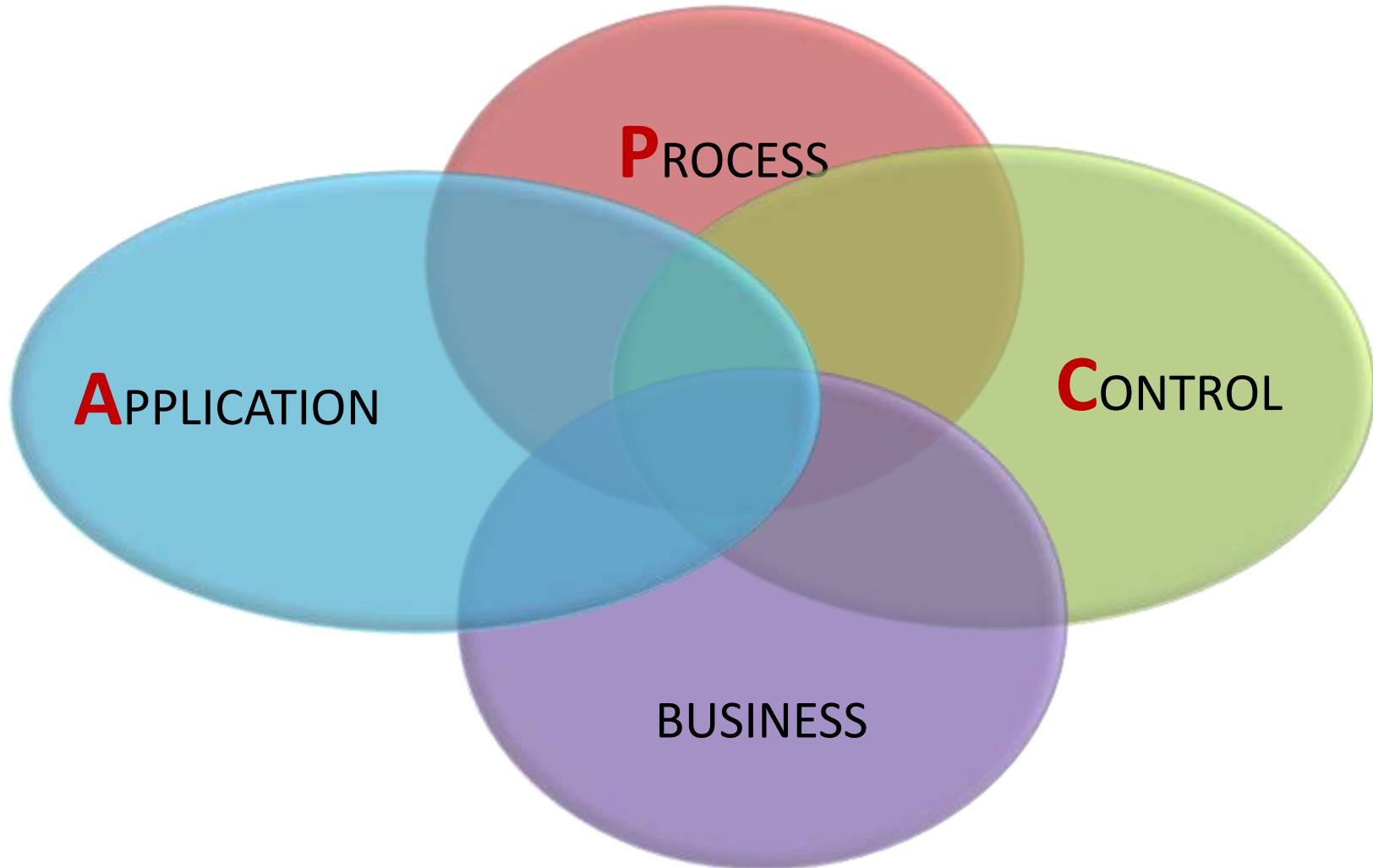
Host Sponsor



QATARGAS – ON THE MOVE

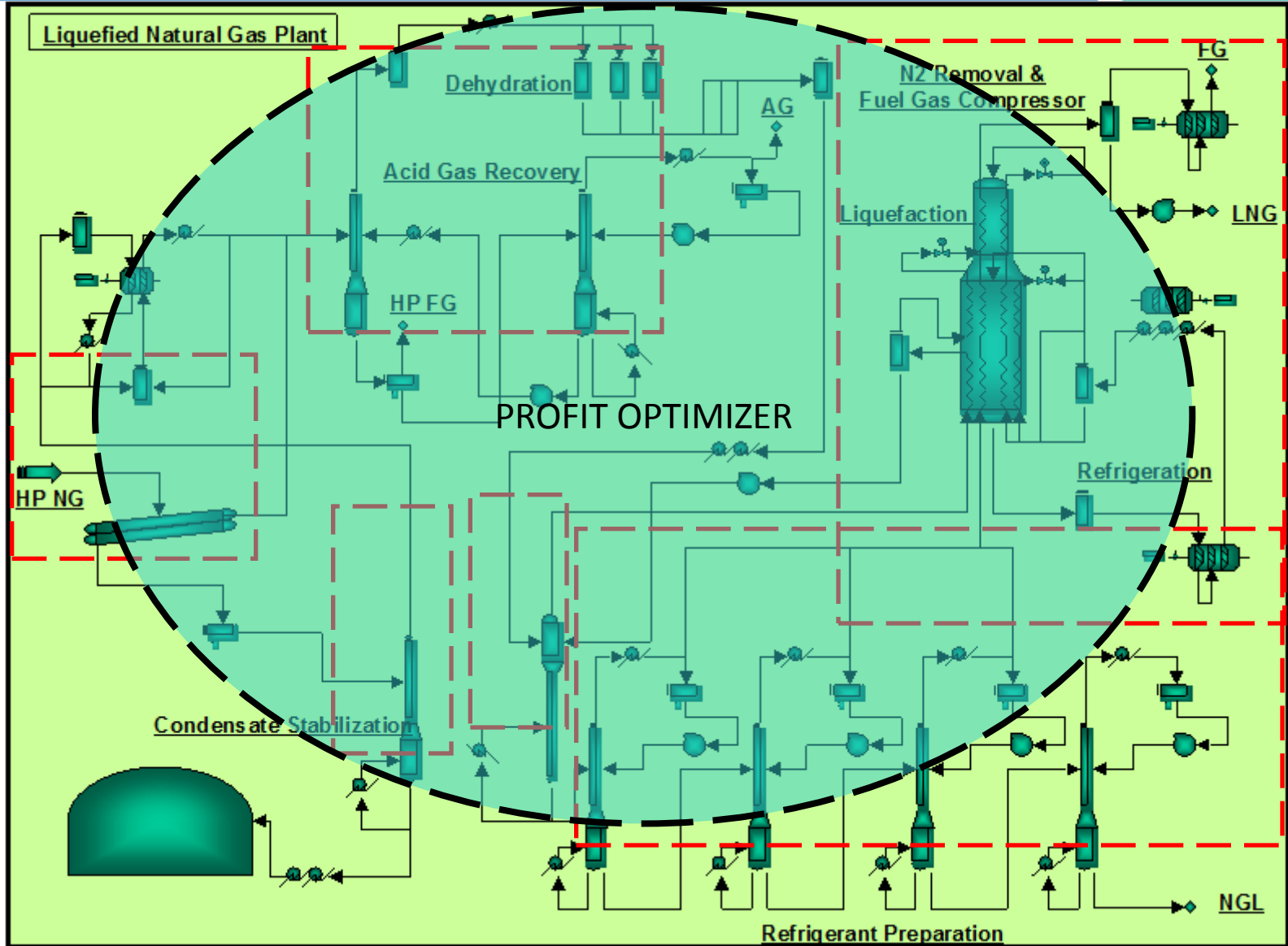


WHAT IS APC

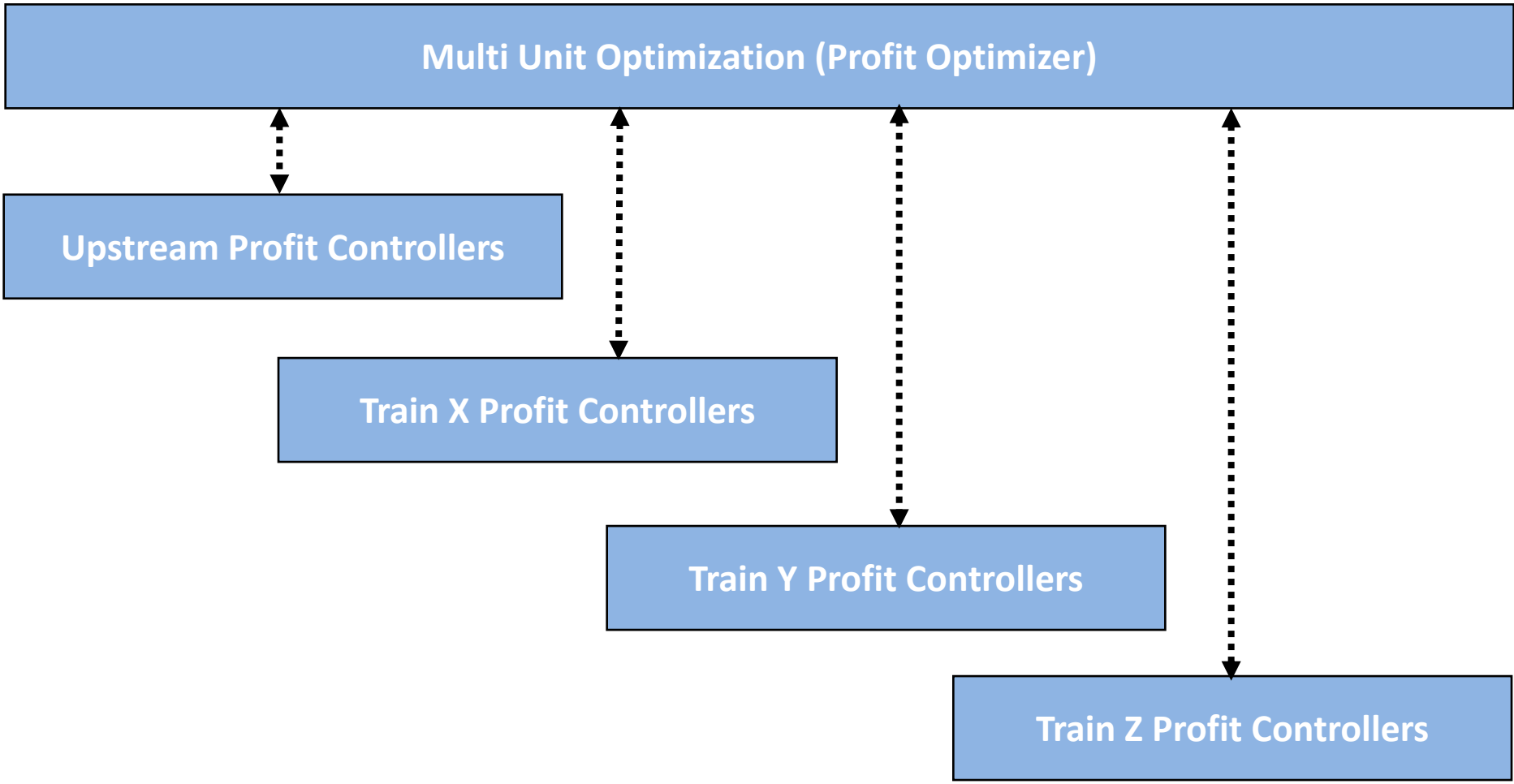


WHERE DID WE IMPLEMENT -APC

Dynamic Multi-Unit Optimization Application



PROFIT OPTIMIZER: MULTI-UNIT DYNAMIC OPTIMIZATION QATARGAS



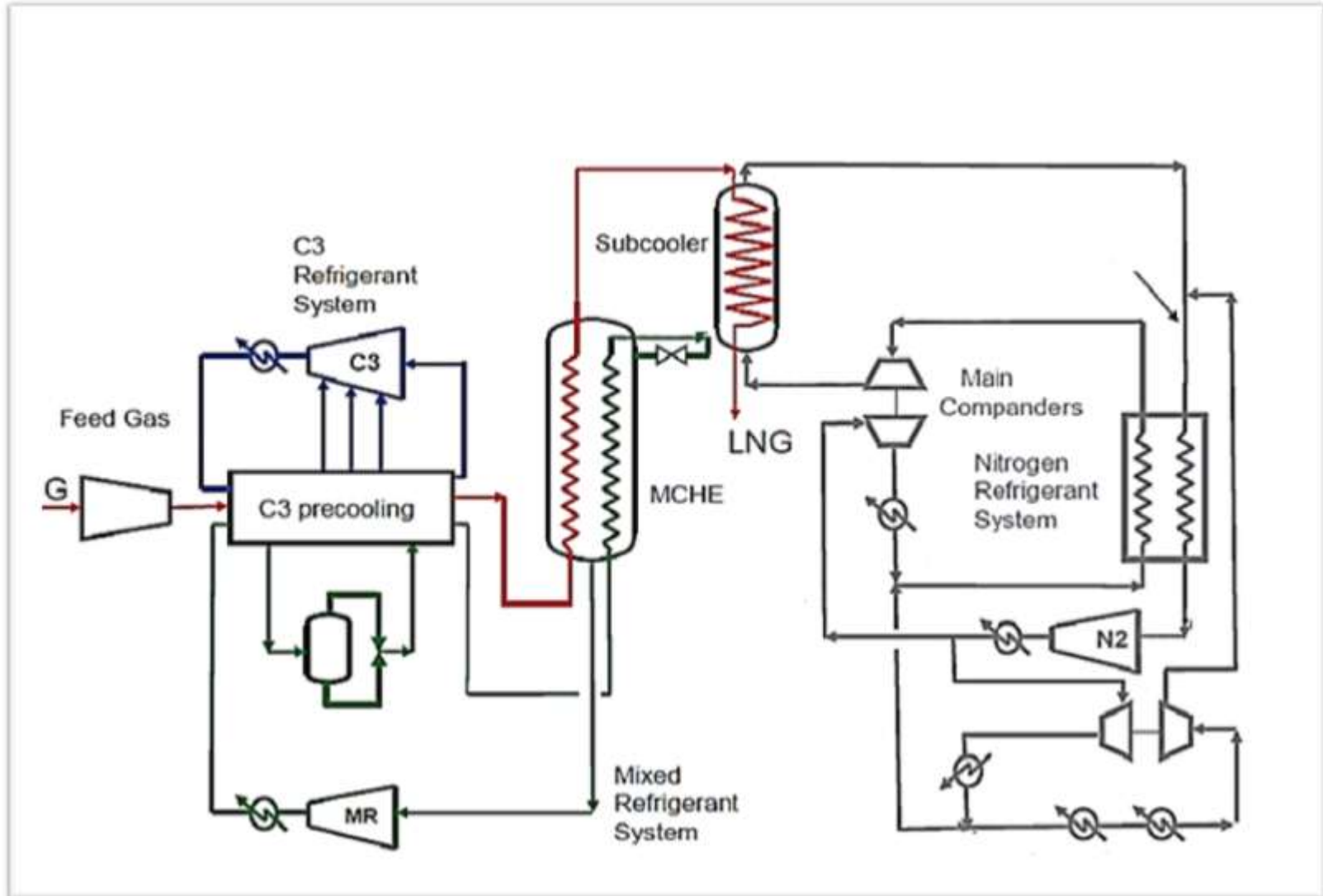
APC OBJECTIVES- WHAT WE NEED TO ACHIEVE



- Maximisation of LNG Production
- Improve energy efficiency of the processing Trains
- Stabilise the LNG Train's operation during feed variation
- Orchestrated operation of upstream and LNG Trains through Dynamic Real-time Optimisation
- Smoother and safer plant operation within Defined Operating Window
- Smart process control with KPI indicators
- Effective utilisation of operator expertise/knowledge

- Scope document preparation
- Feasibility study
- Functional design
- Detailed design
- Implementation
- Benefit analysis
- Training

APX PROCESS AT MEGA TRAINS



Source :- APCI (Air Products)

Frame 9 – GT Rotor:



Design:

- To build offline integrated plant dynamic model embedded with APC model
- Identify critical constraints
- Develop strategies for optimization
- Dynamic testing on offline simulated virtual plant
- Identify design issues well before start-up
 - Temperature control on MCHE (High Dead Time)
 - N₂ liquid formation
 - Ethane purity control

Implementation:

- Readiness of advanced facility for advanced control implementation
- Change Management
- Operator Training
- Development of new APC – DCS Interface

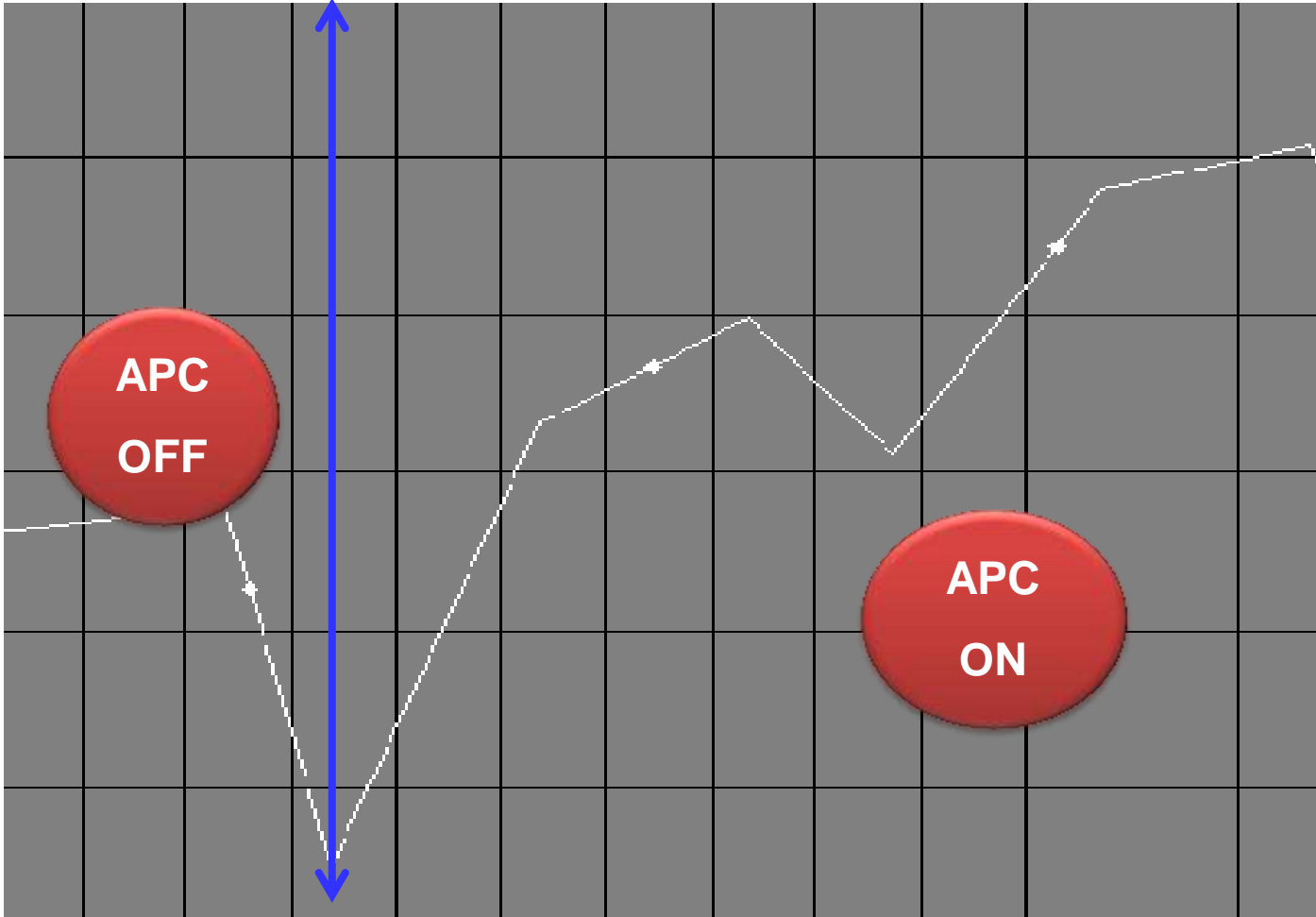
Sustain:

- Define and measure Key Performance Indicators (KPI's)
- Install performance monitoring software and dashboards

Innovation:

- Integrate electrical and turbine power to generate total spare power available
- Developed innovative operator interface
- Operations dashboard for KPI's

APC- ON OPERATION

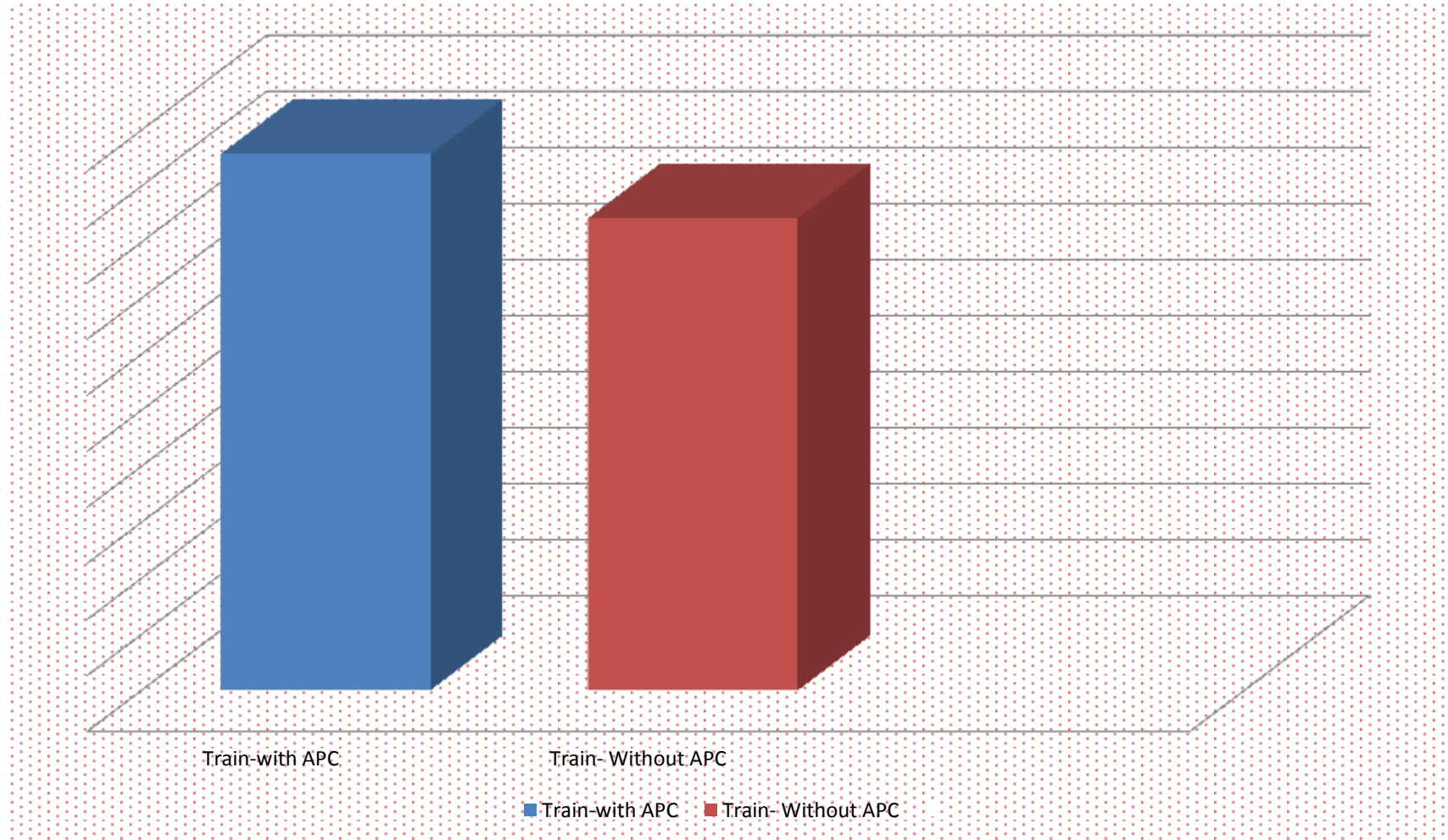


WHAT WE ACHIEVED

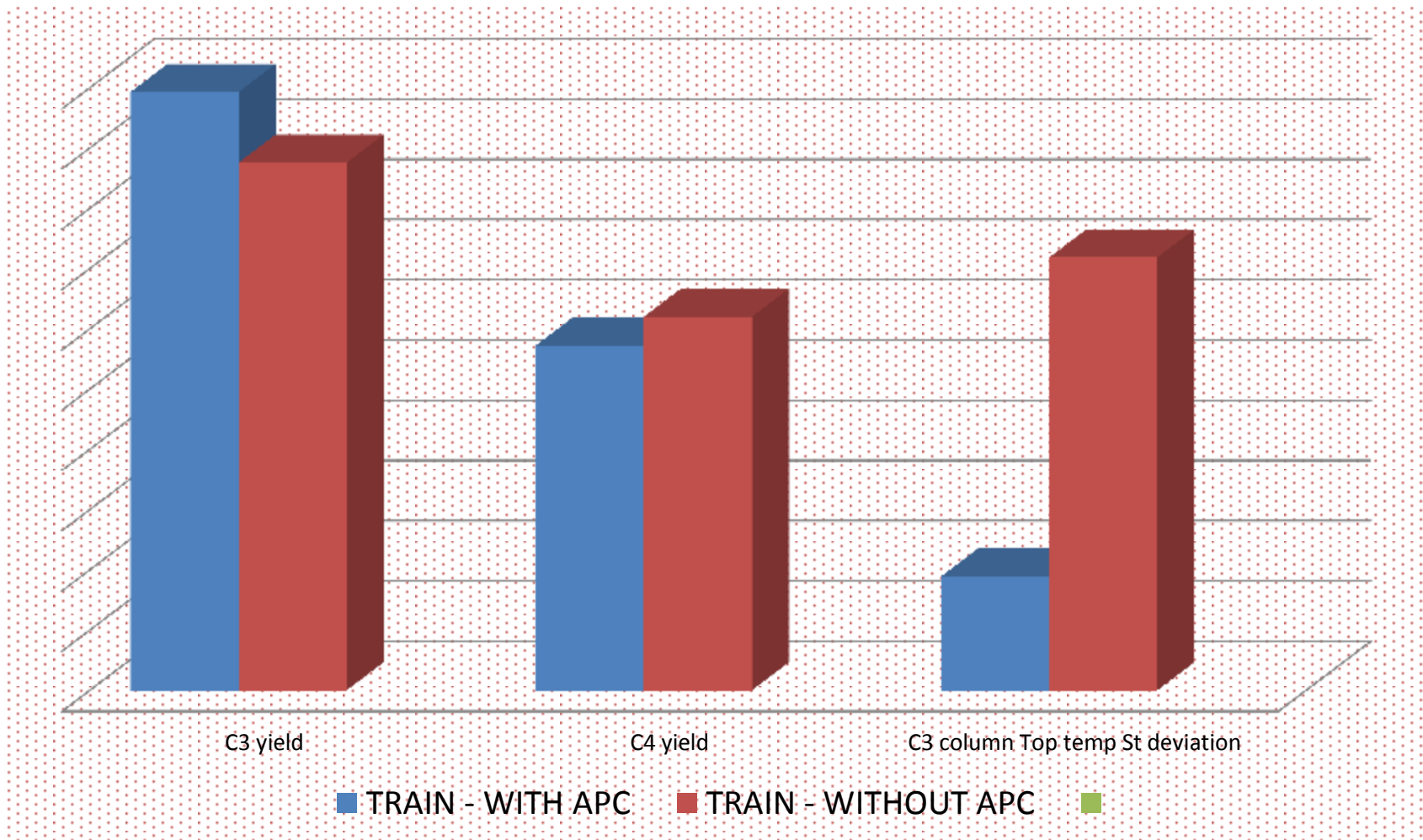


- Improvement in LNG yield
- Better realignment of molecules based on product value optimization
- Increased throughput
- Decreased energy consumption

LNG YIELD



C3/C4 YIELD

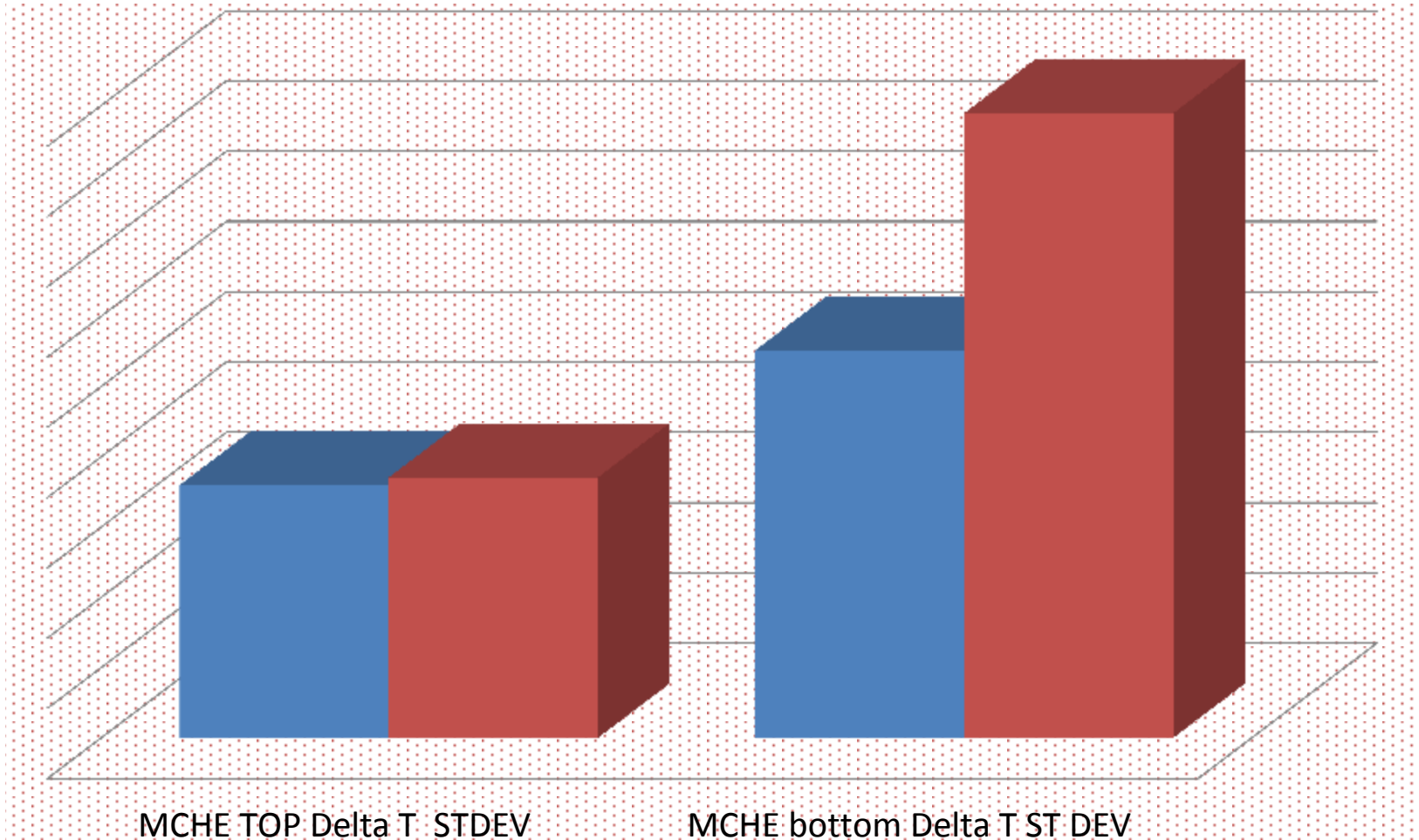


- KPI monitoring and benchmarking
- 24/7 support
- APC controller tuning
- APC controller modifications
- Profit expert system
- Movement analysis
- Constraint analysis

- Upgrades
- Operator interface improvements
- Engineering studies
- Sustain benefits
- New opportunity assessment
- Update business scenarios
- Review objectives

OPERATING PARAMETERS

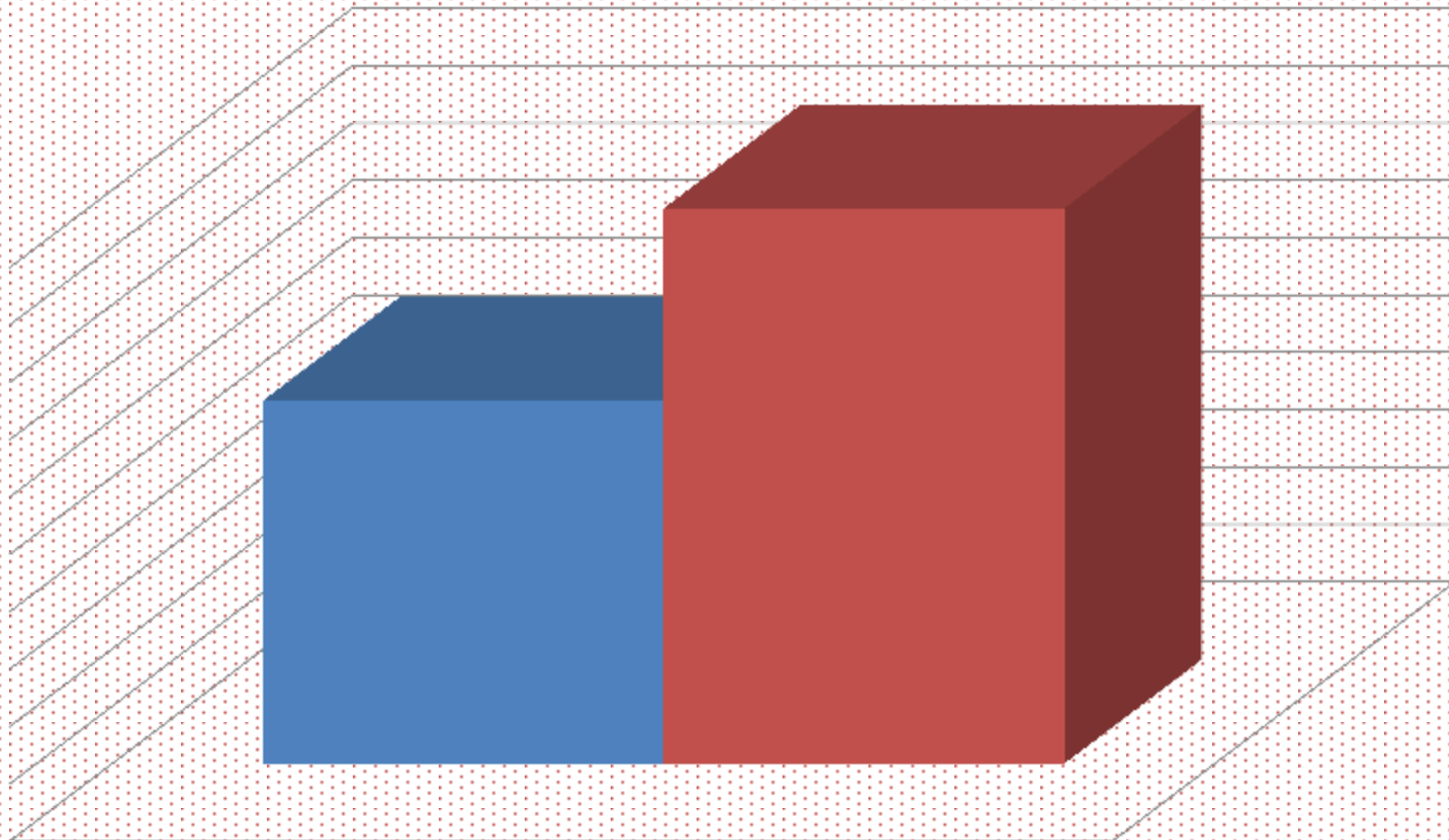
MAIN CRYOGENIC EXCHANGER TEMP



■ TRAIN - WITH APC

■ TRAIN - WITHOUT APC

DELTA T BETWEEN MAIN CRYO AND SUB COOLER

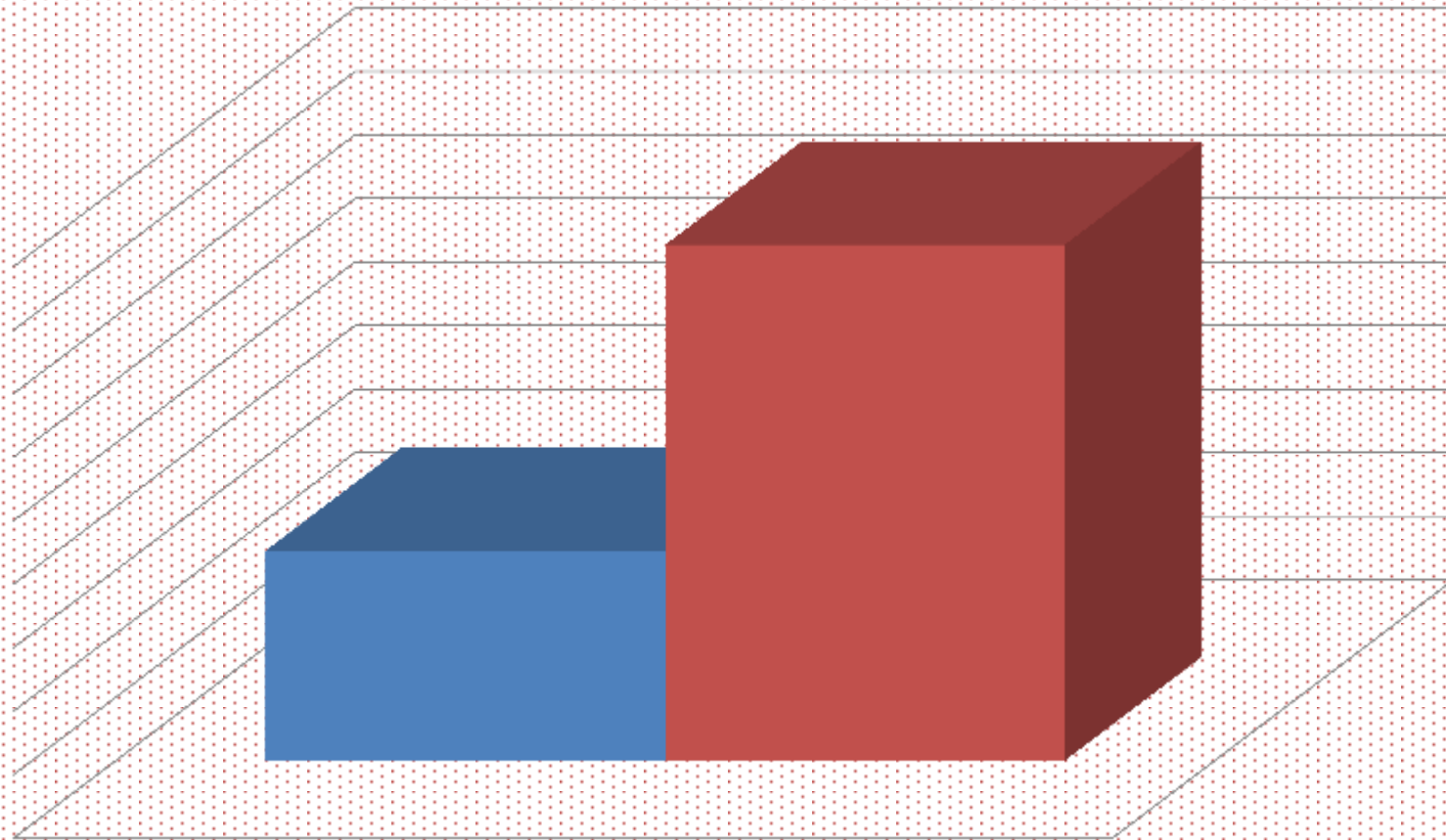


DT MCHE O/L & SCHE N2 O/L

■ TRAIN - WITH APC

■ TRAIN - WITHOUT APC

SUB COOLER TOP TEMP



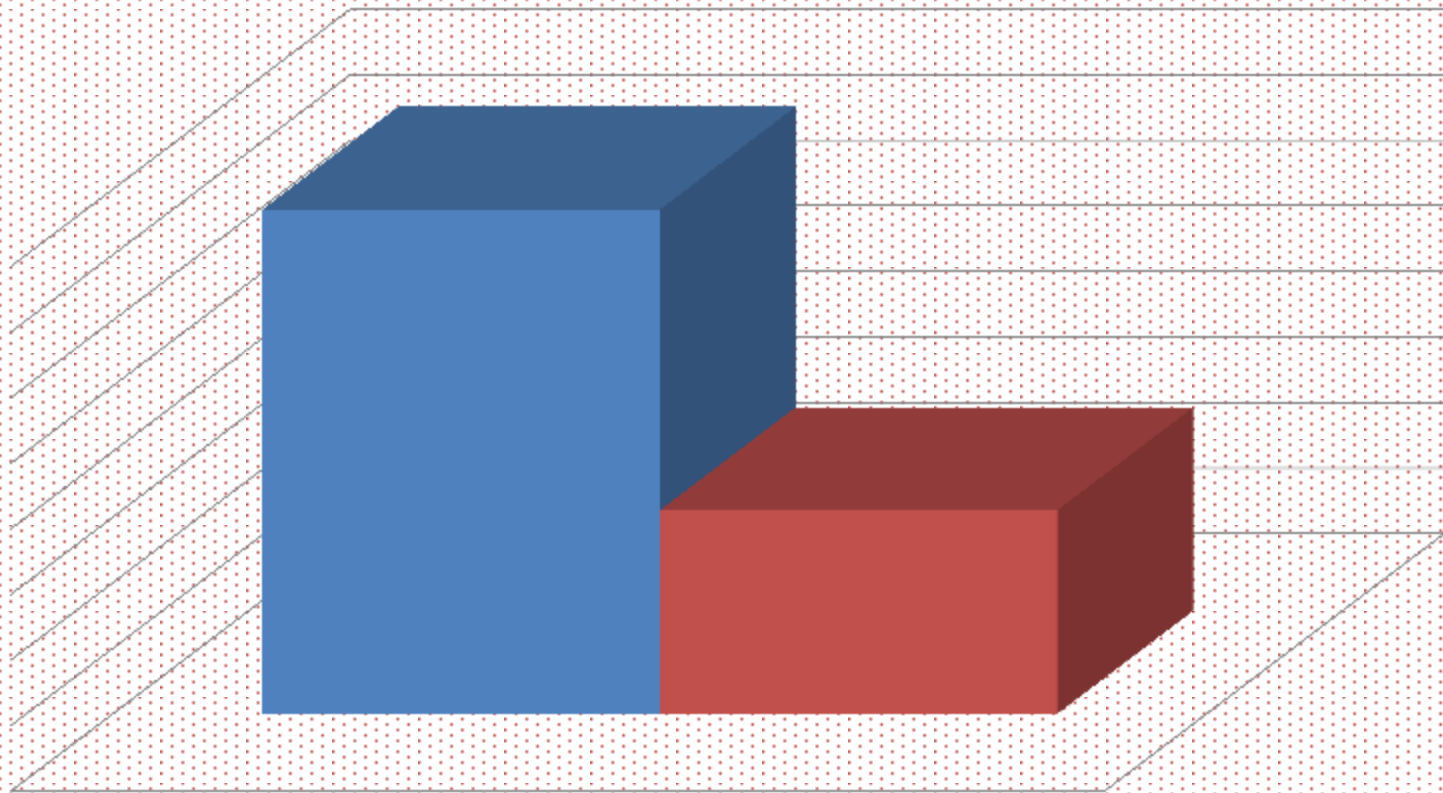
SCHE outlet temp STDEV

■ TRAIN - WITH APC

■ TRAIN - WITHOUT APC

DIFFERENTIAL PRESSURE ACROSS EXPANDERS

DP ACROSS N2 COMPANDER



DP Across N2 Componder

■ TRAIN - WITH APC

■ TRAIN - WITHOUT APC

THANK YOU

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