



**Shell Global
Solutions
Oman LNG**

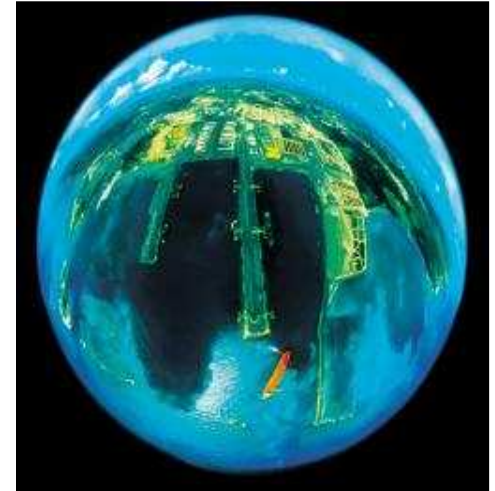
A STEP CHANGE IN LNG OPERATIONS THROUGH ADVANCED PROCESS CONTROL



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Topics



Part 1

- Setting the Scene
- Opportunities and benefits of APC in LNG

Part 2

- The Oman LNG story - Real life example
- Final remarks

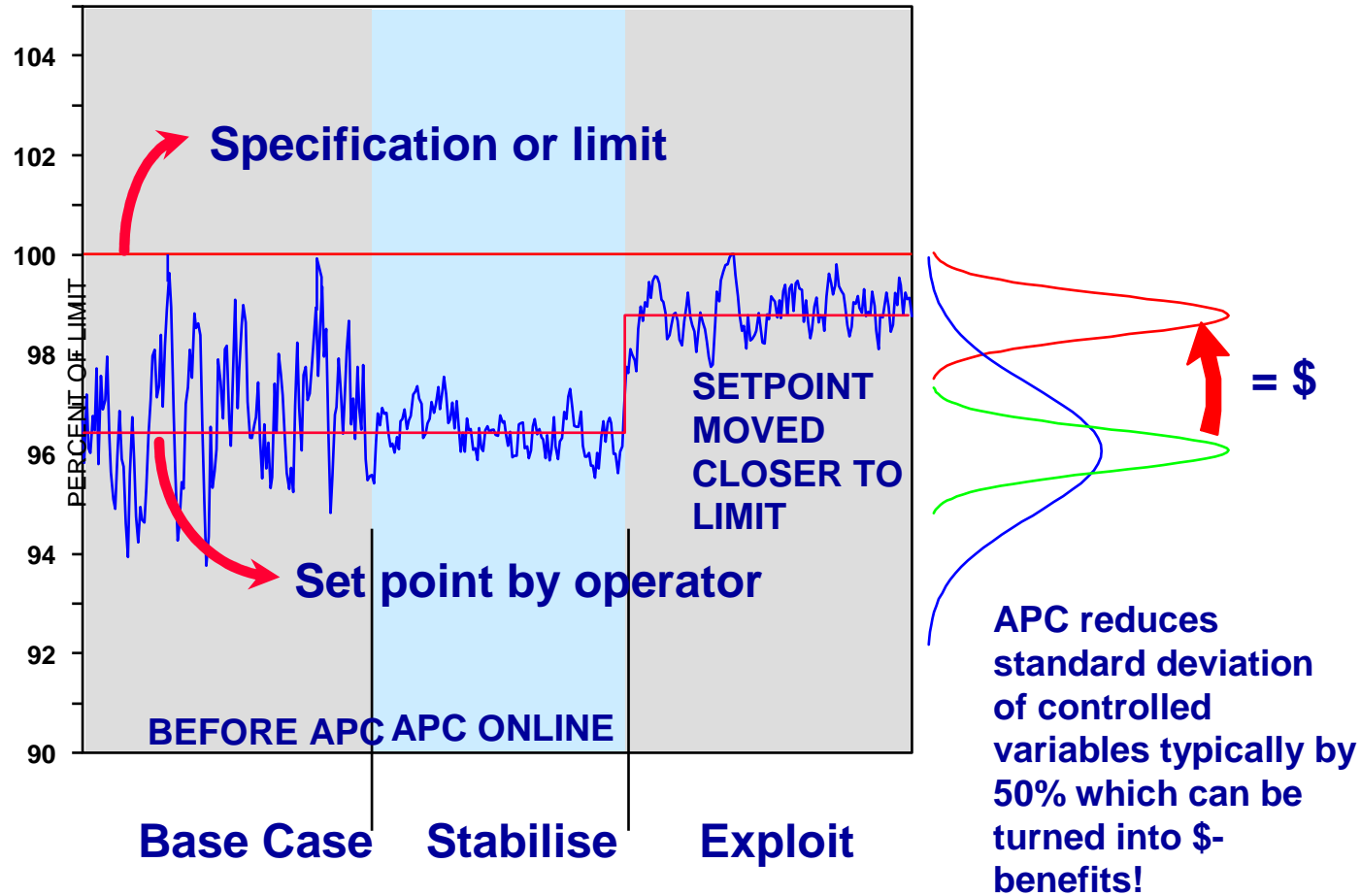


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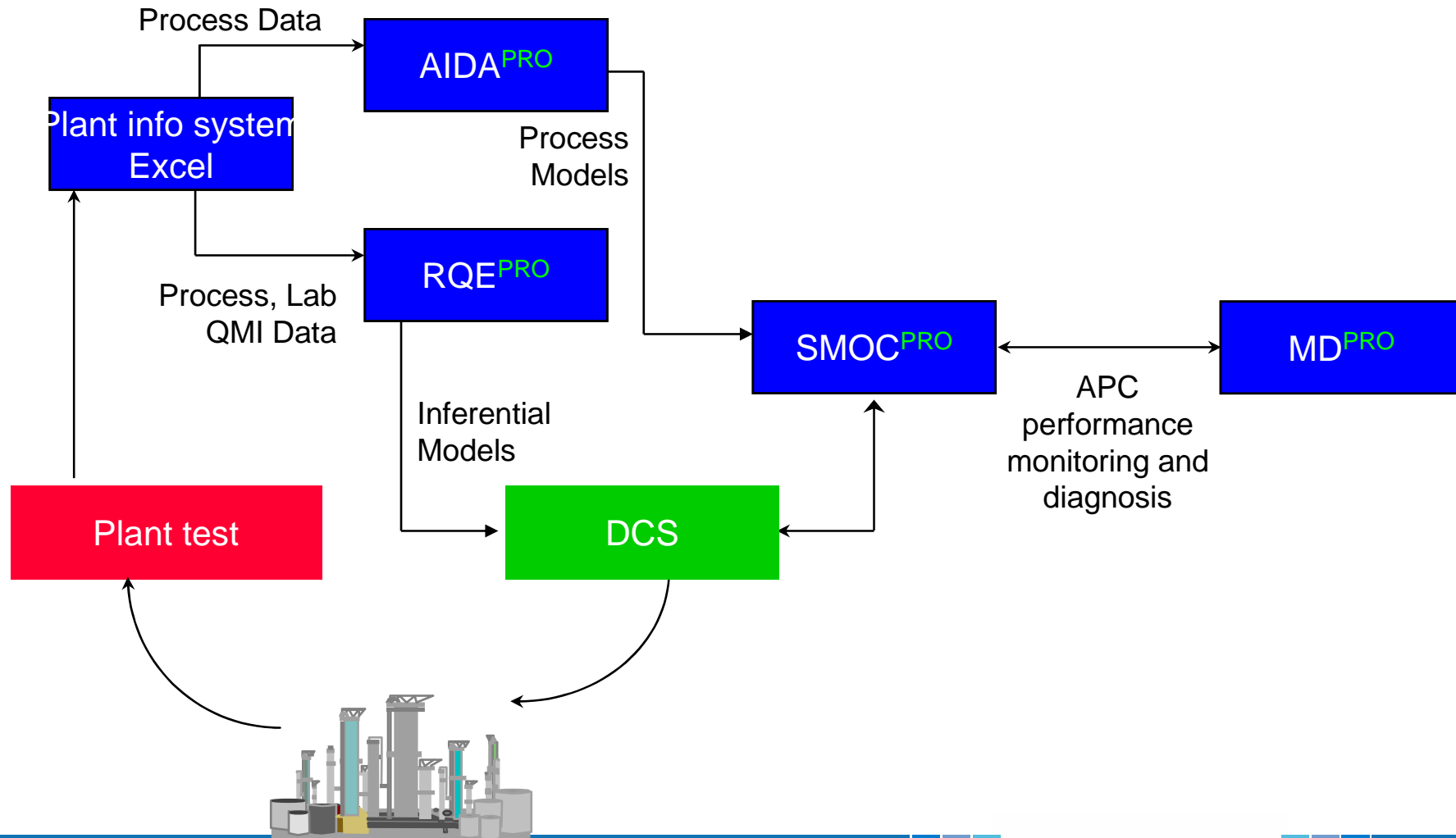
Setting the Scene



What is Advanced Process Control achieving?



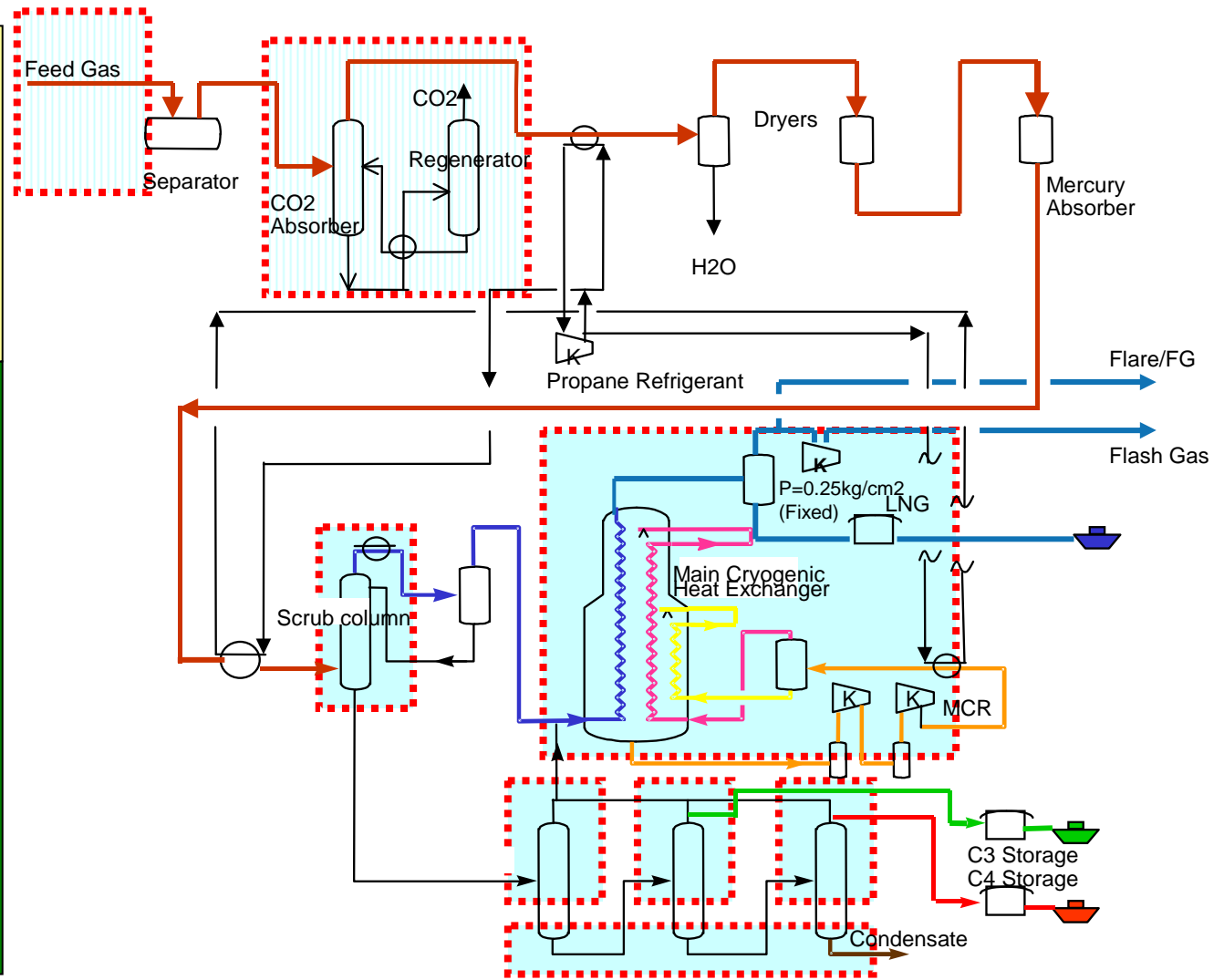
APC Products Overview



APC applications

- Model Based MVC Controller**
- **MCHE/MCR Controller**
 - **Scrubber Controller**
 - **De-Ethimizer Controller**
 - **De-Propanizer Controller**
 - **De-Butanizer Controller**
 - **Flow Stabilizer Controller**

- APC Objective / Target**
- LNG Production Increase**
⇒ **MCHE/MCR**
 - LPG Production Increase**
 - LNG HHV / Reduce C3)**
⇒ **Scrubber**
 - Push C2 into LPG C3**
⇒ **Deethanizer**
⇒ **Depropanizer**
 - Push condensate into LPG C4**
⇒ **Debutanizer**





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Opportunities and benefits

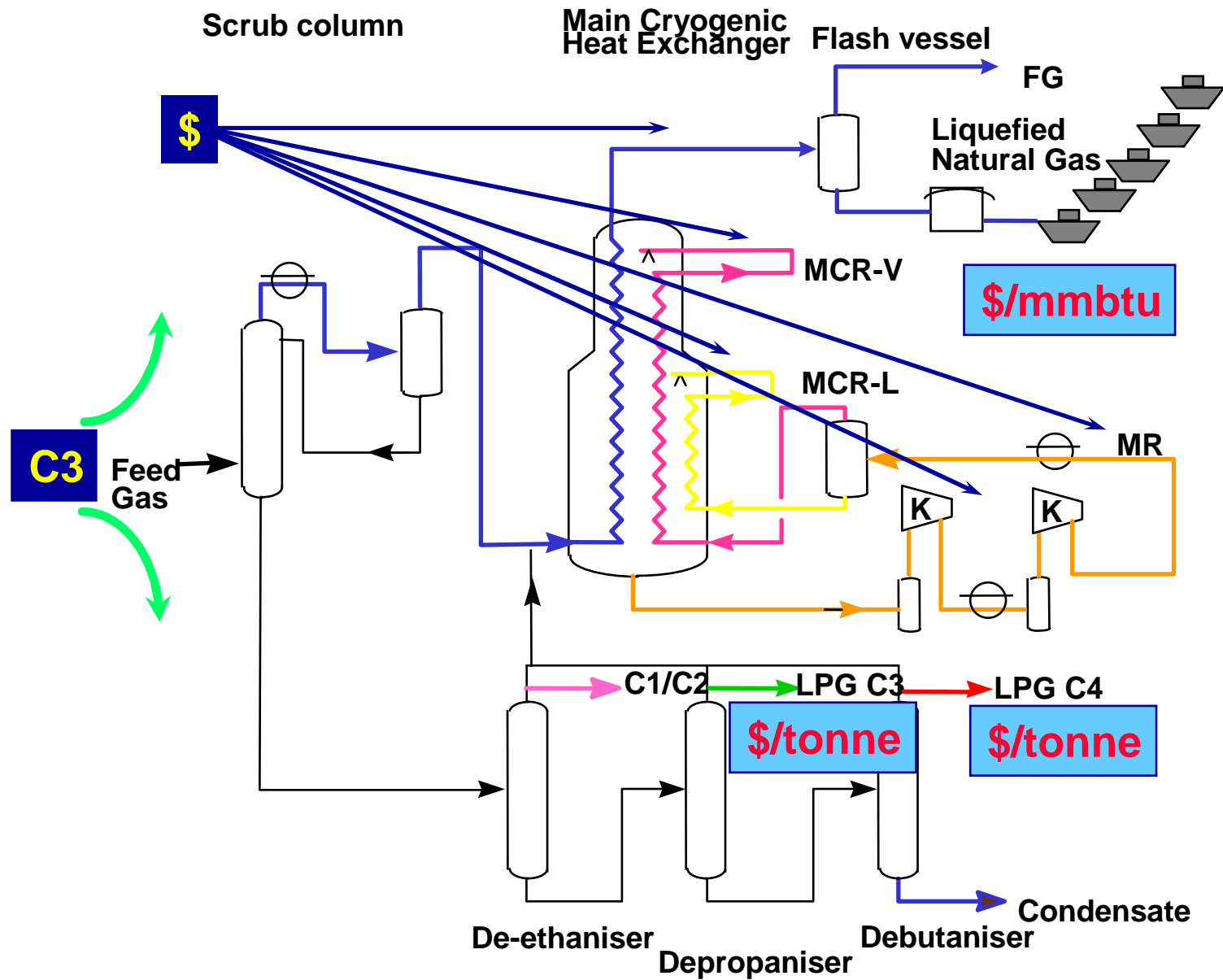


Characteristics of LNG market

- LNG market is production constraint
- Products need to meet specification (complex interactions LNG and LPG).
- LNG is a growing industry with high volumes and margins
- Gas plants need flexibility in operating objective

Opportunities for APC in LNG

- Maximization of production and efficiency is complex
- Different wells produce gas with different compositions.
- LPG and LNG:
Gap between specification and production.
- MCHC often on Manual Control (CRIC, FRIC).
- Diurnal temperature changes causing optimum conditions to vary.



Typical Benefits of APC

- LNG maximisation (1- 3 %)
- Better thermal efficiency
- LPG or NGL maximisation (1-5 %)
- Less flaring
- Higher availability (less temperature shocks)
- Tighter control of product specs (e.g. HHV or CO₂)
- More consistent operations
- Process stabilisation

