SustainAbility.

Craig Sedelmyer
Ethylene Gas Compressor Control
Dresser-Rand Control Systems

- Integrated control and condition monitoring solutions for industrial rotating equipment since 1959.
- Advanced OEM knowledge of engine, turbine and compressor control requirements.
- More than 3000 systems installed on all makes of rotating equipment.
- 100 employees Houston, 20 employees Kongsberg.
Dresser-Rand Control Systems

Houston, Texas
Established 1959
ISO 9001 Certified 1995

Kongsberg Norway
Established 1966
ISO 9001 Certified 1992
Dresser-Rand Control Systems

- Complete Controls Solutions for critical, complex rotating equipment:
  - Aeroderivative Gas Turbines
  - Industrial Gas Turbines
  - Steam Turbines
  - Centrifugal Compressors
  - Reciprocating Compressors
  - Generator Control
- Compressor anti-surge, capacity and load sharing
- Generator control
- Advanced Condition Monitoring
- Station Control Systems
- Safety Shutdown Systems
- SCADA
- Instrumentation and accessories
- Turnkey project management
Dresser-Rand Control Systems - Flexibility

- Numerous PLC and controllers supported
- Simplex, Redundant, TMR
- The right system for each customer and application
- Control platforms that meet customer’s individual needs
- Designed to easily integrate with existing plant equipment and information systems
- Simplifies operator training and maintenance requirements
- Custom packaged with various accessories
Envision™ Condition Monitoring

- Integrate operations, performance & diagnostics

  Homogenous HMI combining:
  - Process mimics
  - Surge maps
  - Compressor Performance
  - Gas Turbine Performance
  - Vibration Diagnostics
  - Alarms
  - Trending
  - Consolidated Reports
  - Client specific screens

- WWW Remote Access for a “Local Experience”
- Predictive Diagnostics
- Lowered Operating Costs
Dresser- Rand Controls / Chemtex Project

• New Motor Driven Reciprocating Compressor
  – Greencol Facility Taiwan Expansion
  – Eliminate traditional discrete PLC control
  – Maintain OEM warranty and control schemes
  – Embed total train control into C300 50 ms Controller

MACCRL 80,000 lbs. (355.9 kN)
MACGL 100,000 lbs. (444.8 kN)
Maximum HP 8,225 (6133 kW)
Standard Strokes 8.5 to 12 inch (216 to 305 mm)
Crankshaft Diameter 9.5 inches (241 mm)
Main Bearing Length 4.50 inches (114 mm)
Piston Rod Diameter 3.25 inches (83 mm)
Number of Throws 2, 4, or 6
Cylinder Bore Range 5 to 38.5 inches (127 to 902 mm)
Dresser- Rand Controls / Chemtex Project

• Compressor Start Permissives
  – YS-6320A) Auxiliary Lube Oil Pump In AUTO Position
  – (HS-6330D) DCS Process Ready
  – (ZS-63100) Barring Device Not Engaged
  – (ZS-63101) Locking Device Not Engaged
  – Compressor Unloaded
  – Compressor Stopped
  – All Unit Shutdowns Cleared
  – Capacity Control Unloaded
Dresser-Rand Controls / Chemtex Project
Dresser- Rand Controls / Chemtex Project

• Compressor Start Sequence
  – Lube Oil System Pressure and Time
  – Main Drive Motor (MCC)
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Dresser- Rand Controls / Chemtex Project

• Compressor Capacity Control
  – Load Delay Timers
  – Increment and Decrement Capacity Control steps
  – Adherence to Factory Engineered Matrix
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Dresser- Rand Controls / Chemtex Project

- Compressor Aux Lube Oil Pump Control
  - Local HOA Interface
  - Critical to emergency shutdowns

- Compressor Lube Oil Heater Control
  - Closed loop control
  - Interlocked with frame level
• Compressor Normal and Emergency Shutdown Sequence
• Compressor Alarm Handling
  – See attached Cause and Effect Chart
• Centrifugal Compressor Surge Control
  – Dresser-Rand Proprietary Surge Controller Evaluation (Patented)
  – Initial Surge Testing Title using C 300 20 ms w/CAB Support
  – Test Set Up was Simplex Controller & Simplex I/O. 1 AI, 1 AO 1 DI, 1 DO
  – Initial results have shown that C 300 20ms can safely execute up to 8 surge loops (no sequence logic)
  – Adding logic reduced performance to only six surge loops!
  – More formal testing scheduled for July
Dresser- Rand Controls / Chemtex Project