Refining Actuator Systems and Their Reliability, Lifespan Improvements Available in the Industry

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League City, TX, April 12-15, 2010
Extending the Lifespan of FCCU Hydraulic Actuator Equipment
Turn around chart in years
Typical Failures of FCCU Hydraulic Actuator Equipment

- Cylinder Rod Seals
- Servo Valves
- Feedback Devices
- Pumps
- Position Control Amplifiers
- Solenoid Valves
Turn Around Chart in Years / $
COSTS OF 4 YEAR TA CYCLE VERSUS COSTS OF 6 YEAR TA CYCLE

• 4 Year Cycle – 6 TA in 24 Years – Total Cost $198
• 6 Year Cycle – 4 TA in 24 Years - Total Cost $ 168
• Savings of $30 Million Dollars
SUPPLIED ALARM INFORMATION TO DCS
Actuator Systems in Early 1980’s
SUPPLIED DETAILED ALARM INFORMATION TO DCS
Late 1980’s
Typical Failures Equipment

- Cylinder Rod Seals
- Servo Valves
- Feedback Devices
- Pumps
- Position Control Amplifiers
- Solenoid Valves

BLAC INC. Solutions

- BLAC INC. Patented Cylinder
- BLAC INC. Designed Servo
- Dual Feedback Devices / Patent
- Much Higher Quality Pumps
- Complete High Performance Amps
- Complete Change in Design
SUPPLIED ALARM INFORMATION TO DCS VIA MODBUS AND HARDWARE
1990’s From BLAC INC.
Hydraulic Power Unit Status:

- Main Pump Pressures for Status of Operation
- Filter Discharge Pressure
- Circulation System Status
- Reservoir Level Transmitter
- Reservoir Temperature Transmitter
Hydraulic Control Unit Status:

- Main Accumulator Pressures
- ESD Accumulator Pressures
- ESD Function Confirmation
- ESD System Mode Status
- Auto / Manual Status
Hydraulic Control Unit Status:

- Accumulator Pre-charge Pressures
- Readout of Actuator Force Output
- Dual Feedback Devices
- Limit Switches for End of Stroke
- Handwheel Engagement Limit Switch
Electronic Controller Functions Indicated Through a Common or Individual Alarms:

- Loss of Command Signal
- Loss of Feedback Signal
- Loss of Tracking Signal (Deviation Compliance)
- Loss of Instrument Power Supply from UPS
- Loss of Internal Dual Redundant Power Supplies
Too many alarms!!!
In 1992 BLAC INC.

• Redundant Testable Online ESD Installed
• Redundant Hydraulic Positioning Control System Installed
• Created the Monitoring of Real Time Data From The Actuators and Hydraulic Power and Control Systems
• Provided Redundant Power Supplies on All Projects
BLAC INC. Methods to Achieve Long Term Operation Cycle

- Regular Change of Air And Oil Filters Ensures System Operation For 5-7 Years Without Failure
- Redundant Feedback Devices – BLAC INC. Is The First Company To Provide In 1994 - Now It Is In Most Of The Licensors Specifications
- Redundant Controlling Valves – BLAC INC. Is The First Company To Provide in 1992 - Now It Is In Most Of The Licensors Specifications
BLAC INC. Methods to Achieve Long Term Operation Cycle

• Redundant Emergency Trip Valves – 1992 – Now
  This is Part of Most Licensors Specs

• Circulation Systems To Circulate Fluid Continuously To Remove Moisture And Small Particulates

• Monitoring Of The Force Levels Of The Operated Valve Through It’s Stroke Sequence
BLAC INC. Methods To Achieve Long Term Operation Cycle

- Monitoring Of The Steam, Air Or Nitrogen Purge To The Valve Stem Packing
- Monitoring Of Valve Position With Respect To The Thrust Required To Move The Valve
BLAC INC. Methods To Achieve Long Term Operation Cycle

• We Now Use The Data Collected Over Time To Predict The Turnaround Requirements For The HPU and Actuators