Production Optimization Software & PI System

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Integrated Production Optimization Solution

Real-Time Production Optimization Software Suite

Wellhead Equipment

Surface Instrumentation

Cables & Connectors

Transducers

Hardware for Real-Time Data Collection

Lift Equipment
Field Office™ Software Suite

- Production Optimization Software
  - Single Well Optimization
  - Full-Field Optimization
  - Real-Time Data Collection and Monitoring
  - Real-Time Analysis Workbench
Technology in the Production Domain
Field Office™ – Surveillance

Surveillance
- Automation
- Alarms
- Call outs

Analysis
- Engineering workbenches

Planning
- Work over scheduling
- Economics

Execution
- Cost
- Workflow
- Approvals

KPIs
- ROI
- Exceptions
- Scorecard

Best Practices–Operations, Engineering, Work Over, Drilling

Corporate Standards and Workflows

Enterprise Integration
Field Office™ – Surveillance

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Enterprise Integration
Surveillance

Features

- Remote monitoring with statistical filtering
- Remote control and adjustment of operating parameters
- Standard alarming, trending, and reporting tools
- Direct support for over 100 different end devices
Artificial Lift Design and Analysis Modules

- ESP
- Gas Lift
- Jet Pump
- PCP
- Plunger Lift

- Manufacturer Databases
- Design and Performance Analysis
- Optimum Operating Conditions
ESP – Analysis Workbench

AWB Functionality

- Pressure Traverse Plot
- Operating Point Analysis
- Pump Performance
- Inflow Performance Calculations
- Multi-Vendor Pump Performance Catalog
Beam – Analysis Workbench

Beam Diagnostics

**Operational Limit**
The measured beam load of 267% of the API rating exceeds the acceptable limit of 0%.

**Rod Stress**
The peak rod stress of 95% exceeds the acceptable limit of 0% for taper 1.
The peak rod stress of 117% exceeds the acceptable limit of 0% for taper 2.
The peak rod stress of 117% exceeds the acceptable limit of 0% for taper 3.
The peak rod stress of 60% exceeds the acceptable limit of 0% for taper 4.
The peak rod stress of 68% exceeds the acceptable limit of 0% for taper 5.

**Net Pump Efficiency**
The net pump efficiency is OK.
PCP – Analysis Workbench

Model Pressure Profile Top Down to Perf

Measured PIP

Model Pressure Profile Bottom Up to PIP

Measured PIP

Calculated Operating Point

Measured Operating Point

Pump Curve

Well Curve
Gas Lift – Analysis Workbench
Field Office™ – Work Over Execution

- Surveillance
  - Automation
  - Alarms
  - Call outs

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  - Engineering workbenches

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Best Practices–Operations, Engineering, Work Over, Drilling

Corporate Standards and Workflows

Enterprise Integration
Score Cards – Job Summary

- Cost by period
- Cost by failure/reason
- Trend of a failure
i-Do, Centered at the Asset

- Petrel® Reservoir Model
- PanQL®
- PanSystem®
- WellFlo®
- Finder®
- ReO Connect®
- Other Modeling software
- LOWIS SCADA
- DCS
- Realtime Wellsite Data
- Portable Well Test
- Non Instrument Well
- Manual Well Test
- ESP Wells
- Other Corporate Systems
- ReO Forecast
- Reservoir Model
Single Asset Overview – Current Status, Prediction Optimization Potential, Alerts, Equipment Status, Quick Well View
Well Life Prediction –
Display of PI System Data
Production Optimization Context
Production Information –
Available from Coresite
Automatically Updated in Well Model
i-DO Architecture

- Other Intranet sites
- User Access Internet Explorer
- User Access Internet Explorer
- User Access Internet Explorer

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- User Access Internet Explorer

- i-DO Website
- SILVERLIGHT / WCF WEB SERVICES

- i-DO Engine
- .NET Windows Service

- i-DO Metadata DB

- Message based Communications MSMQ

- i-DO Adapters
- .NET Windows service

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- OLEDB / OPC / Web Services / Custom API’s

- PI System

- Corporate Databases

- Eng. Models

- Other Applications
$6 million per year annual savings – Real Benefit
Field Office™ – Acceptance

>350,000 Wells Using Weatherford’s Monitoring / Optimization Solution

North America
330,000

South America
9,000

Africa and Europe
3,000

Middle East & Asia Pacific
6,000

Far East
4,000
Weatherford Artificial Lift

Optimization

- Appraise
- Select
- Design
- Monitor
- Analyze
- Adjust