OSIsoft® UC2010

Real Time Information — Currency of the New Decade

Hilton San Franciso Union Square | San Francisco, CA

April 26-28, 2010

Using PI to Model and Monitor World Class Oil and Gas Assets

Ken Startz
Adv Senior Business Analyst, Marathon Oil Corporation

Laura Murakami
Senior Consultant, SAIC

© Copyright 2010, OSIsoft LLC. All rights reserved.

About Marathon Oil Corporation

Marathon is an integrated international energy company engaged in exploration and production; oil sands mining; integrated gas; and refining, marketing and transportation operations. Marathon has principal operations in the United States, Angola, Canada, Equatorial Guinea, Indonesia, Libya, Norway, Poland and the United Kingdom. Marathon is the fourth-largest United States-based integrated oil company and the nation's fifth-largest refiner.

© Copyright 2010, OSIsoft LLC. All rights reserved.

Background

- Oil and gas production in nine countries. Refined product sales in 18 states.
- PI systems:
  - Four in upstream (Houston, MEGPL, EGLNG, and Norway)
  - Eight in downstream (refineries in Illinois, Kentucky, Louisiana, Michigan, Minnesota, Ohio, and Texas).
  - A supply and distribution PI server was recently implemented in our downstream headquarters in Findlay, Ohio.
- Our first PI implementation was Robinson, Ill in 1988. Our first PI system was sold to us by Pat Kennedy.

© Copyright 2010, OSIsoft LLC. All rights reserved.

Business Challenges

- No easy way to retrieve time-series data for upstream assets
- Requirements to gather data from six different control systems (including system with no existing interface)
- Embrace standards such as thin client using SharePoint®
- Integrate with Digital Oilfield initiatives such as Viewpoint
- Retrieve data from JV partners
- Advanced computation capability to highlight problem areas and prioritize workflows
- Provide knowledge management and knowledge transfer to newer technical professionals
- Integration with modeling applications such as Kappa Diamant, Kappa Saphir, HYSYS, ECLIPSE.

SharePoint is a registered trademark of Microsoft Corporation in the U.S. and/or other countries.

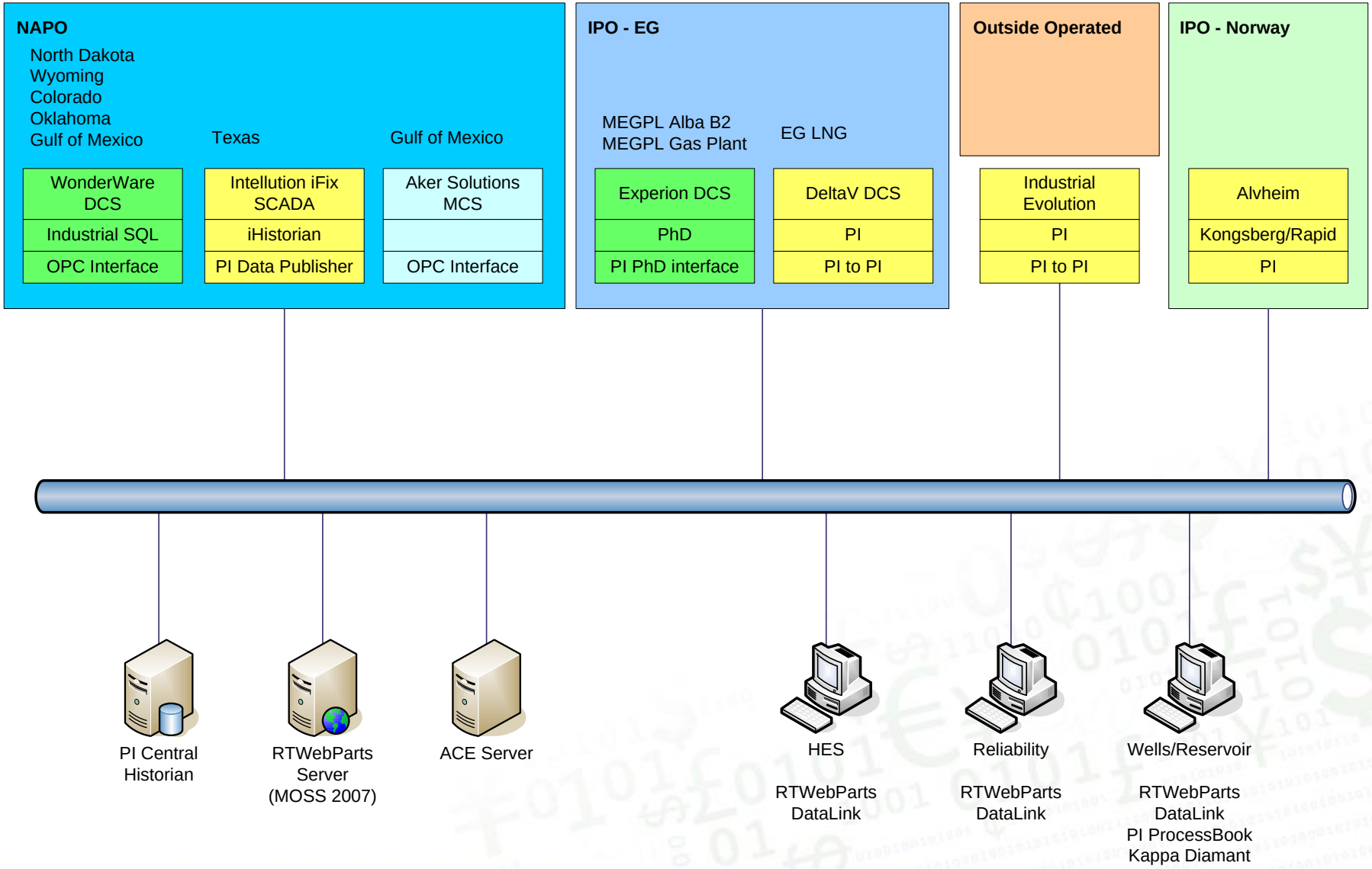
© Copyright 2010, OSIsoft LLC. All rights reserved.

Contents

- Modeling: Equatorial Guinea
- Modeling: Droshky (Gulf of Mexico)
- Monitoring and Alerting: Mimm's Creek Plunger Lift Well Diagnostic Tools

© Copyright 2010, OSIsoft LLC. All rights reserved.

Central Historian Architecture Overview



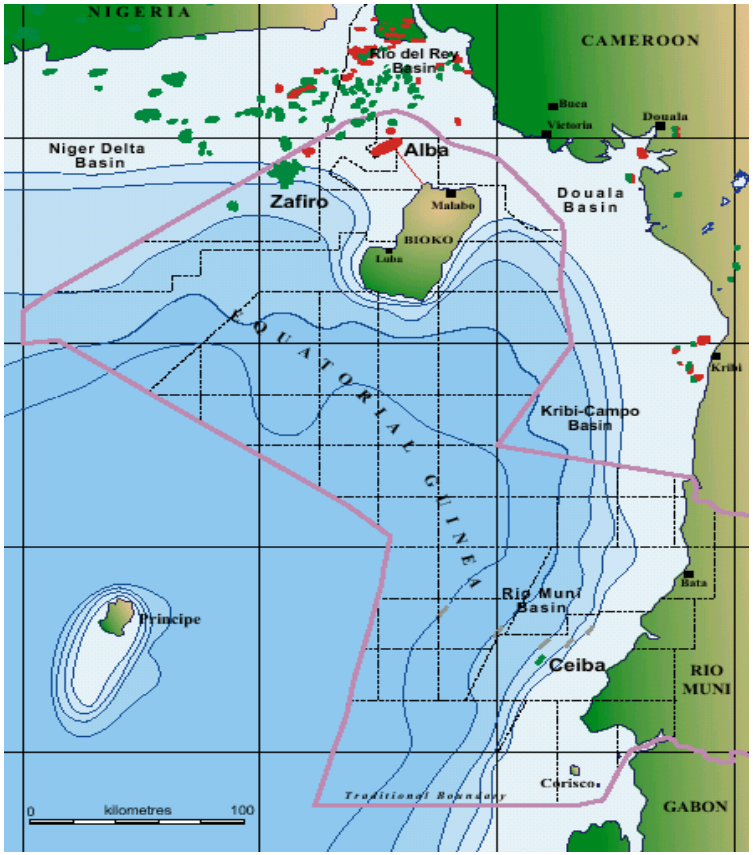
© Copyright 2010, OSIsoft LLC. All rights reserved.

Equatorial Guinea

- World class asset - Bioko Island – West Africa
- Honeywell Control Systems both offshore and in gas plant
- Existing PI users at EGLNG (another company in Punta Europa complex)

© Copyright 2010, OSIsoft LLC. All rights reserved.

Marathon: Equatorial Guinea



Ownership in Alba Block

Marathon	**63.25%**	**(65.21% W.I.)**
Noble	**33.75%**	**(34.79% W.I.)**
GEPetrol	**3.00%**	**(Carry)**

Ownership in Alba LPG Plant:

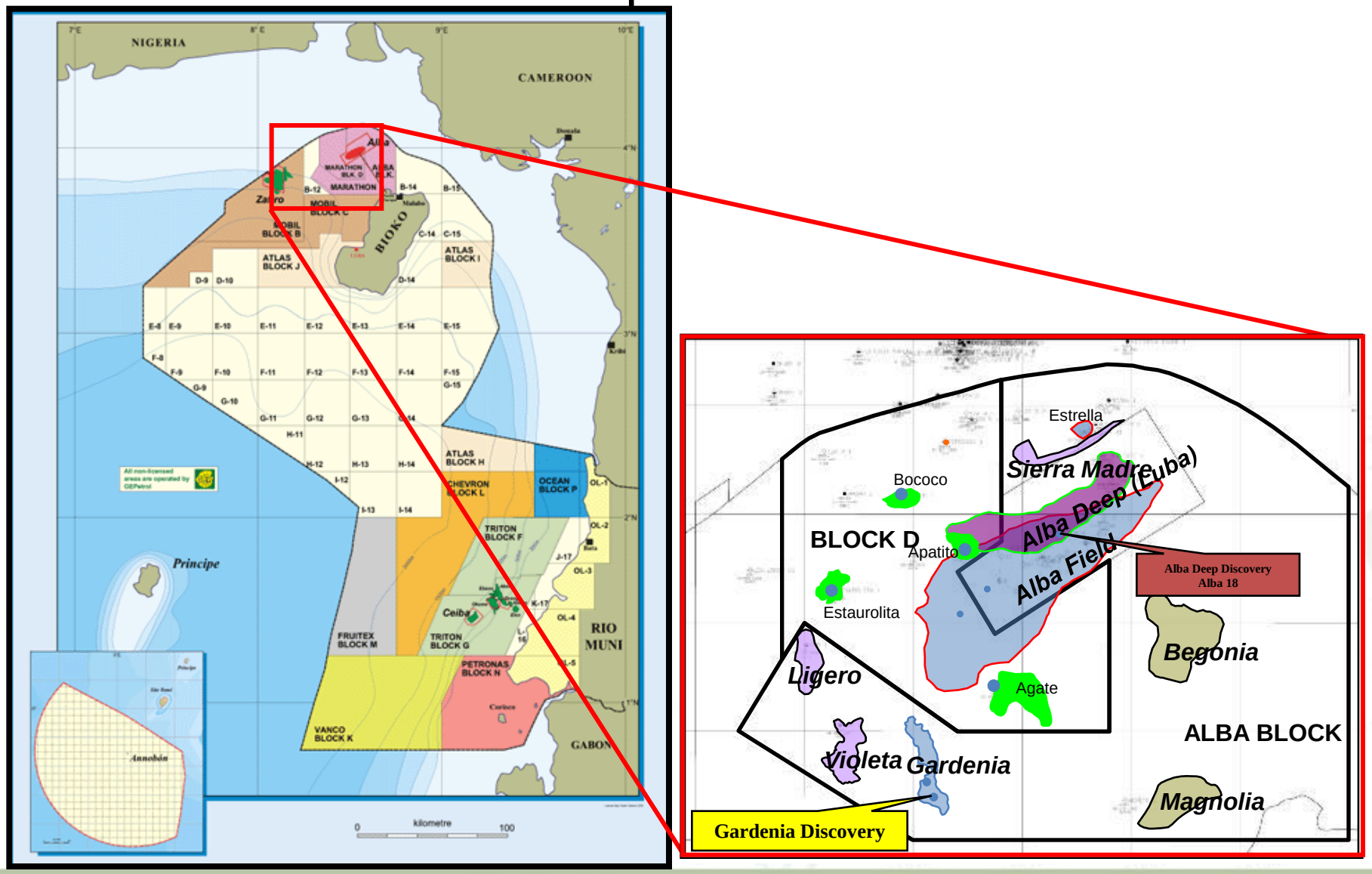
Marathon	**52.17%**	**(65.21% W.I.)**
Noble	**27.83%**	**(34.79% W.I.)**
SONAGAS	**20.00%**	**(Repaid Carry)**

Alba Field is located 18 miles NW of Bioko Island, Equatorial Guinea in Rio Del Ray Basin.

Water Depth ~250 ft

© Copyright 2010, OSIsoft LLC. All rights reserved.

Location Map - EG License

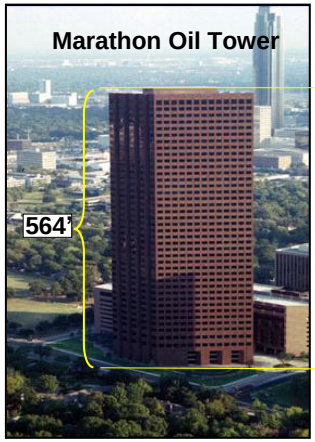


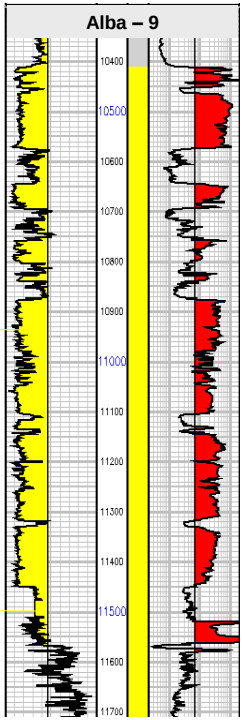
© Copyright 2010, OSIsoft LLC. All rights reserved.

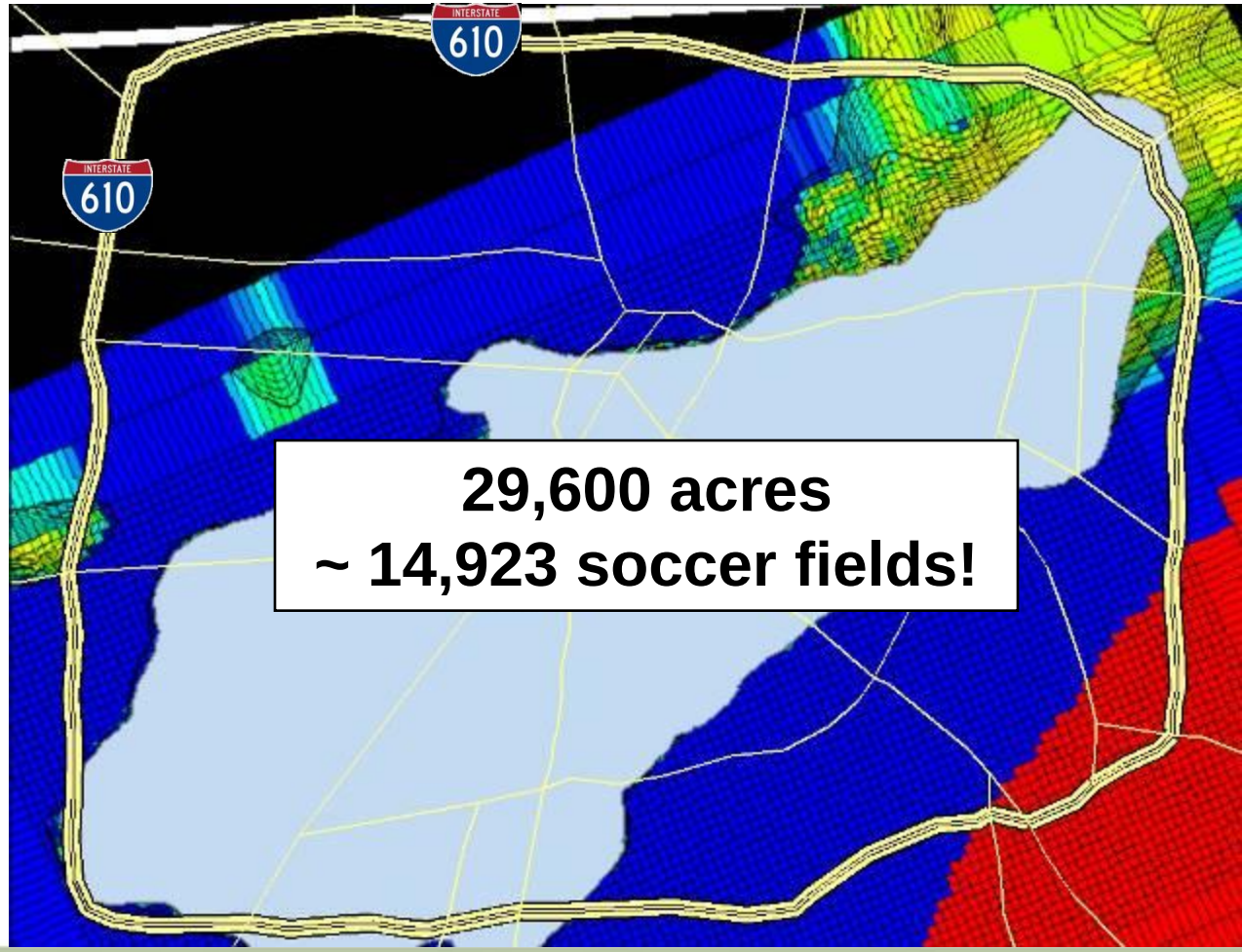
Alba Field

Is all about the scale!

Alba 9 Well
and Marathon Oil Tower
Houston, Texas







© Copyright 2010, OSIsoft LLC. All rights reserved.

Alba Field Development

Economic Value Chain

	Alba PSC	Alba Plant	AMPCO	EG LNG
Partners	• Marathon • Noble Energy • GEPetrol	• Marathon • Noble Energy • SONAGAS	• Marathon • Noble Energy • SONAGAS	• Marathon • SONAGAS • Mitsui • Marabeni
Products	• Condensate • Natural Gas	• Propane • Butane	• Methanol	• LNG
Operator	MARATHON	MARATHON	ATLANTIC METHANOL	EG LNG

Long-life assets with diverse product and revenue streams

Gross Production

~ 220,000 boepd

MARATHON

SAIC From Science to Solutions

© Copyright 2010, OSIsoft LLC. All rights reserved.

Alba Field Development Timeline

- **Jan. 2002 - Marathon acquires Alba assets**
- **May 2007 - EGLNG facilities first production**
- **Nov. 2007 - PI system implemented at EGLNG**
- **Nov. 2009 - PI system implemented at MEGPL**

© Copyright 2010, OSIsoft LLC. All rights reserved.

2002

500
Meters
2007

Finished Platforms

© Copyright 2010, OSIsoft LLC. All rights reserved.

ART CARLSON
PORT VILA

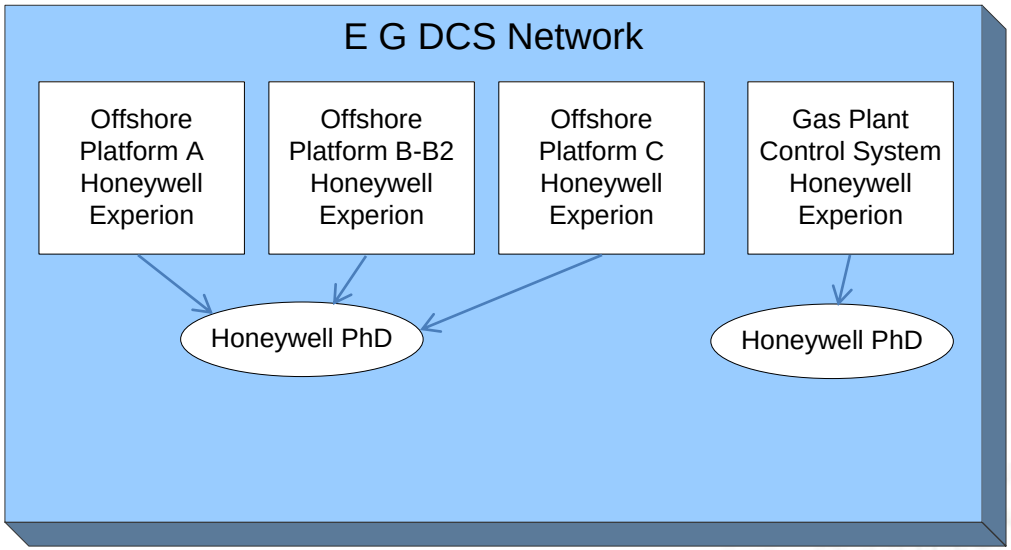
MEGPL Gas Plant

© Copyright 2010, OSIsoft LLC. All rights reserved.

Housing Complex

© Copyright 2010, OSIsoft LLC. All rights reserved.

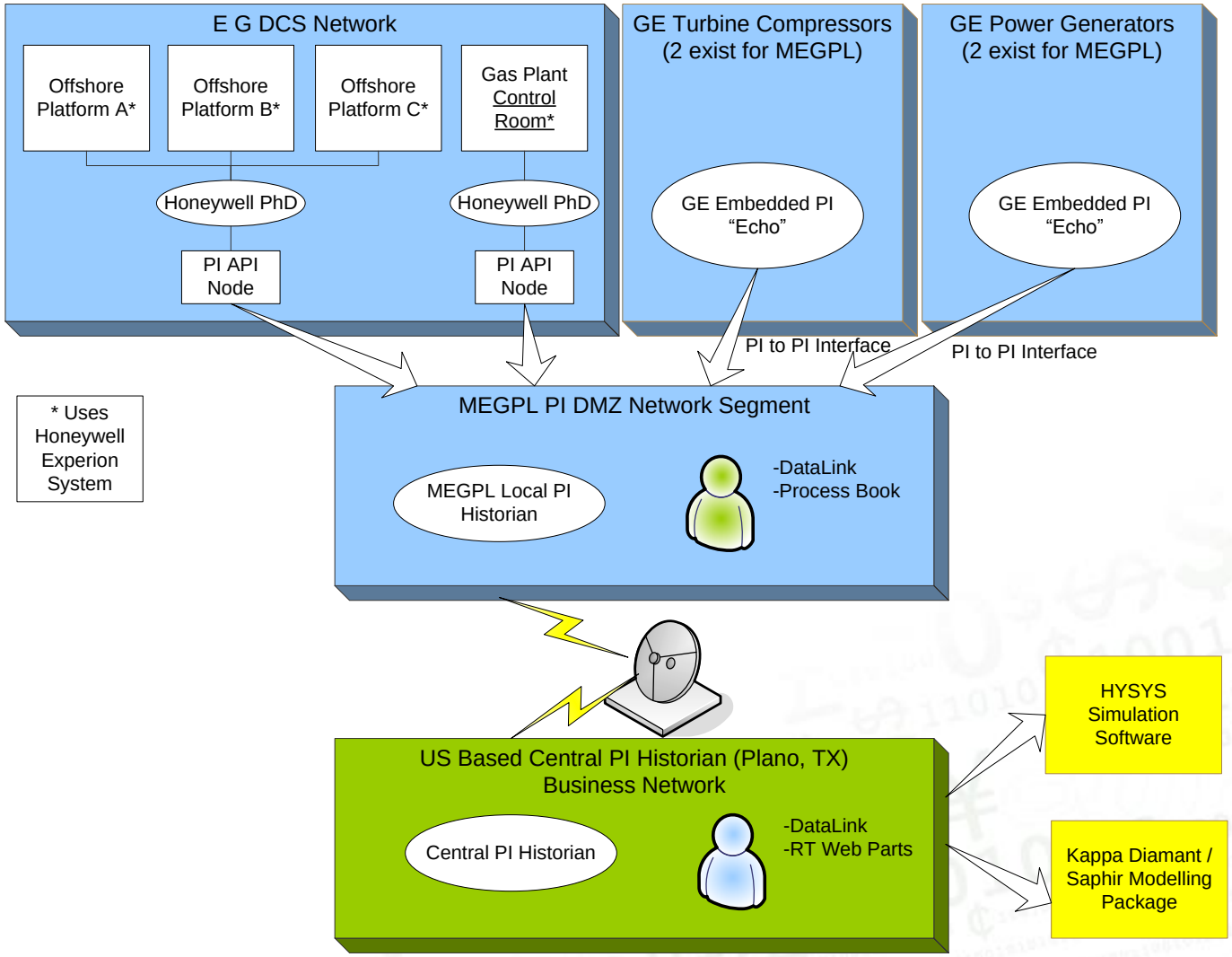
Equatorial Guinea – Before PI



One PC Worldwide
PHD Access

© Copyright 2010, OSIsoft LLC. All rights reserved.

Equatorial Guinea – After PI



© Copyright 2010, OSIsoft LLC. All rights reserved.

Equatorial Guinea - Benefits

- Interface to HYSYS simulation package
- Interface to Kappa modelling packages
- Worldwide viewing of EG data
- Exports to GE and other service companies
- Time stamp matching of offshore and on-shore data

© Copyright 2010, OSIsoft LLC. All rights reserved.

Droshky - Background

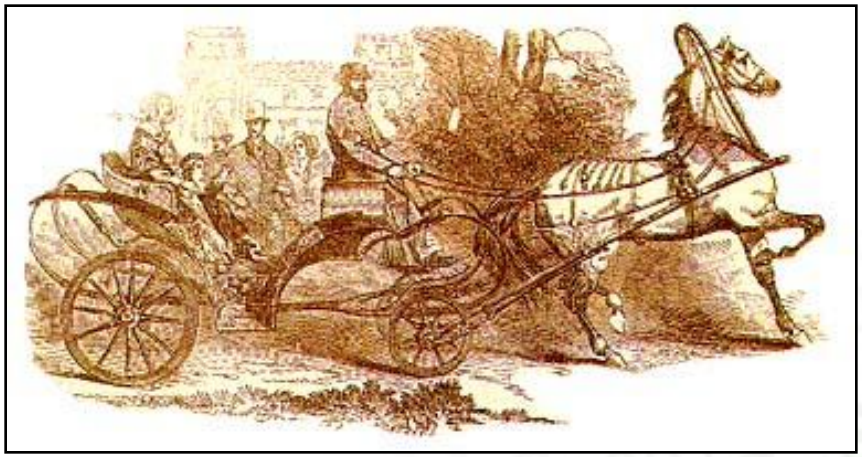
- 50,000 BPD crude potential – largest from any single Marathon field in U.S.
- The field is 100 percent Marathon (WI). The sub-sea wells tie back to Shell's Bullwinkle Platform, Gulf of Mexico. The tie back is through an 18-mile pipeline.
- The majority of the data will be acquired from Aker Solutions sub-sea control system.
- Some data will be extracted from Shell's PI system, coming from Industrial Evolution.
- First production anticipated mid-2010.
- Downhole calculations by Baker-Hughes DHTP Calibration server on the platform.
- Re-calibrations performed monthly by Baker-Hughes in Houston office.

© Copyright 2010, OSIsoft LLC. All rights reserved.

Droshky - Origin of Name

- Droshky chosen because of the connection to the Troika field
- Originally Troika Project involved three companies - Marathon, BP and Shell

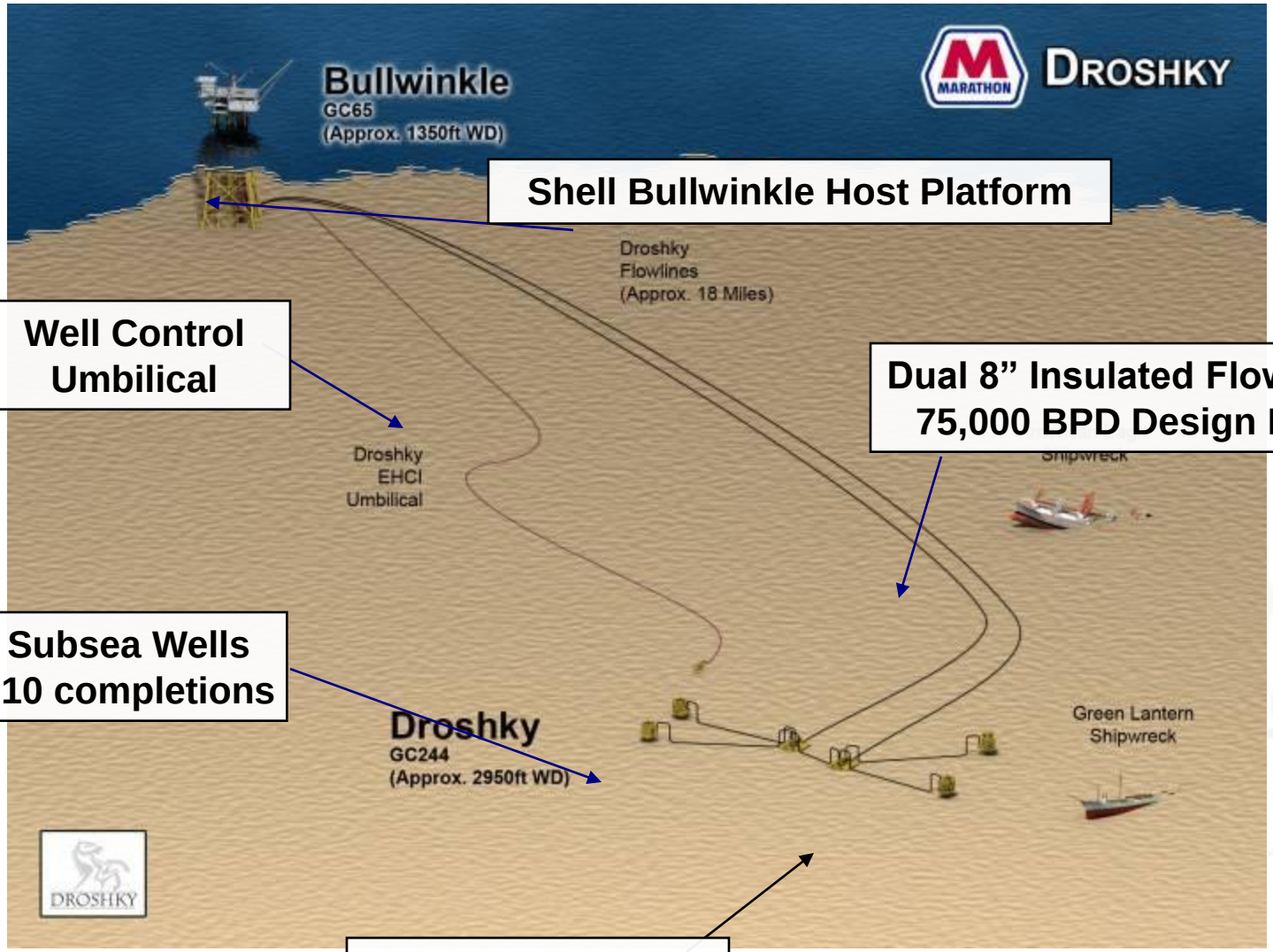
Troika: a Russian carriage pulled by *three horses* abreast



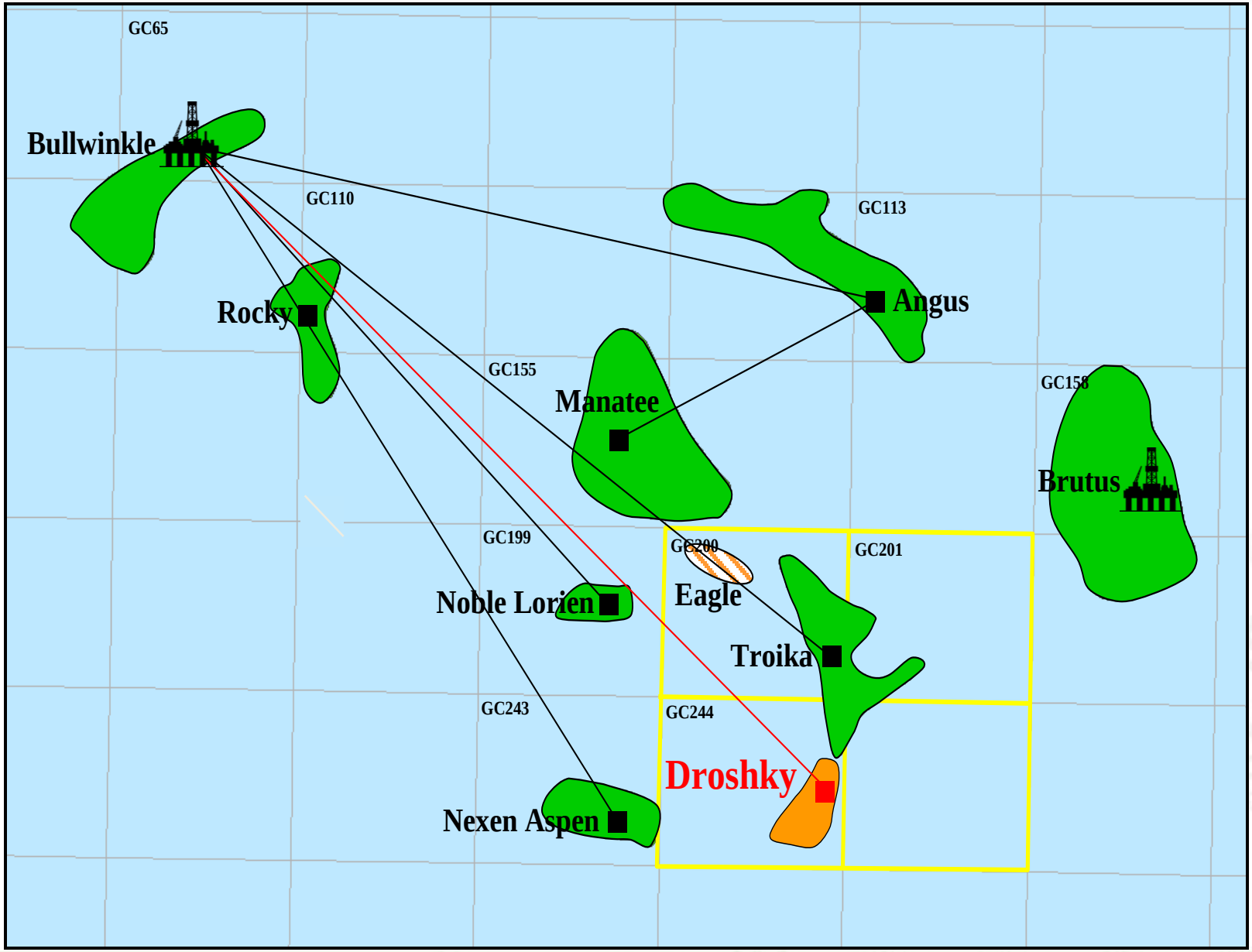
Droshky: low, four-wheeled, open carriage drawn by *one horse*

© Copyright 2010, OSIsoft LLC. All rights reserved.

Subsea Facilities

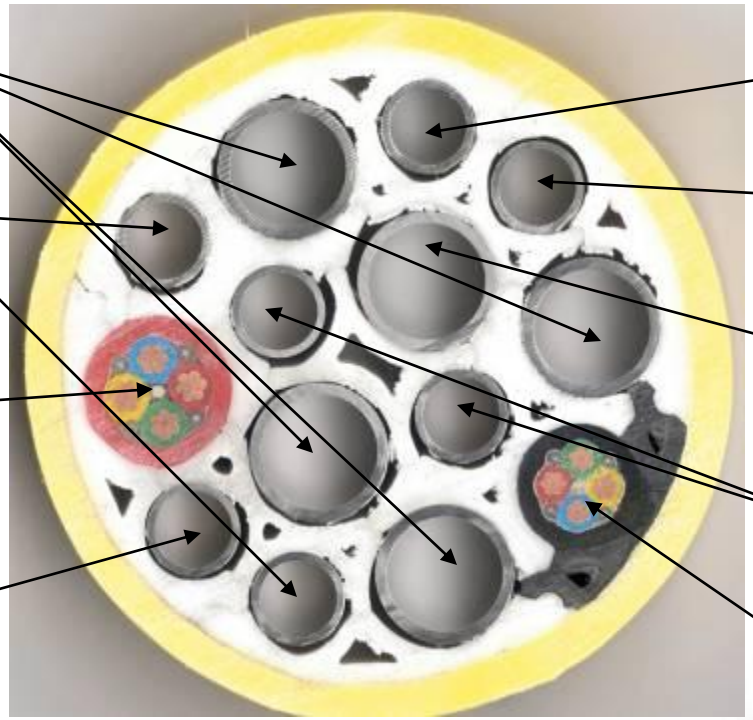


© Copyright 2010, OSIsoft LLC. All rights reserved.



© Copyright 2010, OSIsoft LLC. All rights reserved.

Umbilical

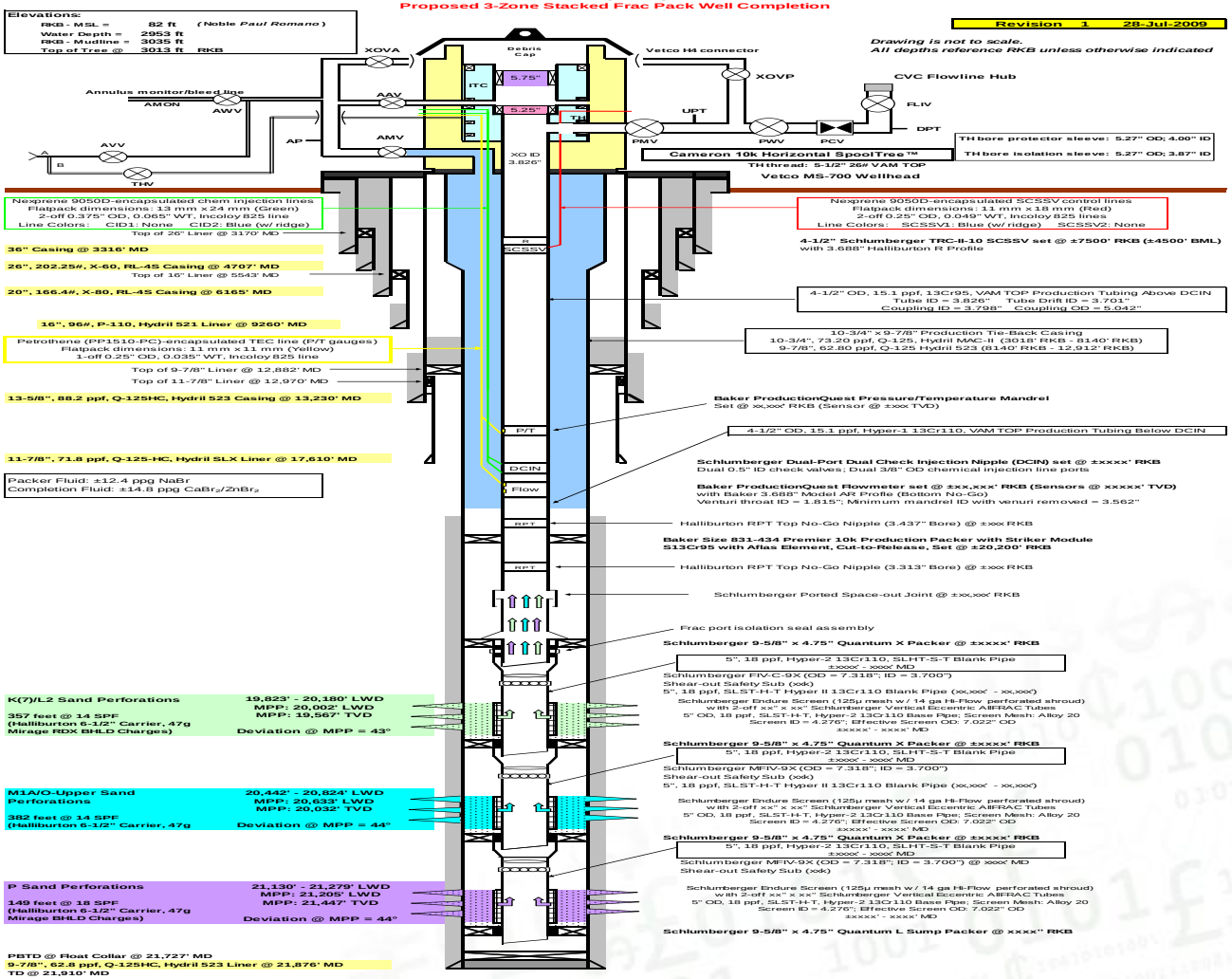


- 18.5-mile “extension cord” that connects the tree control pods to host platform
- Allows monitoring and control of the wells

© Copyright 2010, OSIsoft LLC. All rights reserved.

DRAFT

Green Canyon 244 #4
OCS-G-11043
Droshky Project
Proposed 3-Zone Stacked Frac Pack Well Completion



© Copyright 2010, OSIsoft LLC. All rights reserved.

The pipe goes through the tensioners and off the ramp onto the reel.

© Copyright 2010, OSIsoft LLC. All rights reserved.

The pipe landing on the reel as seen from the bridge. The average rate for spooling is 22m of pipe per minute.

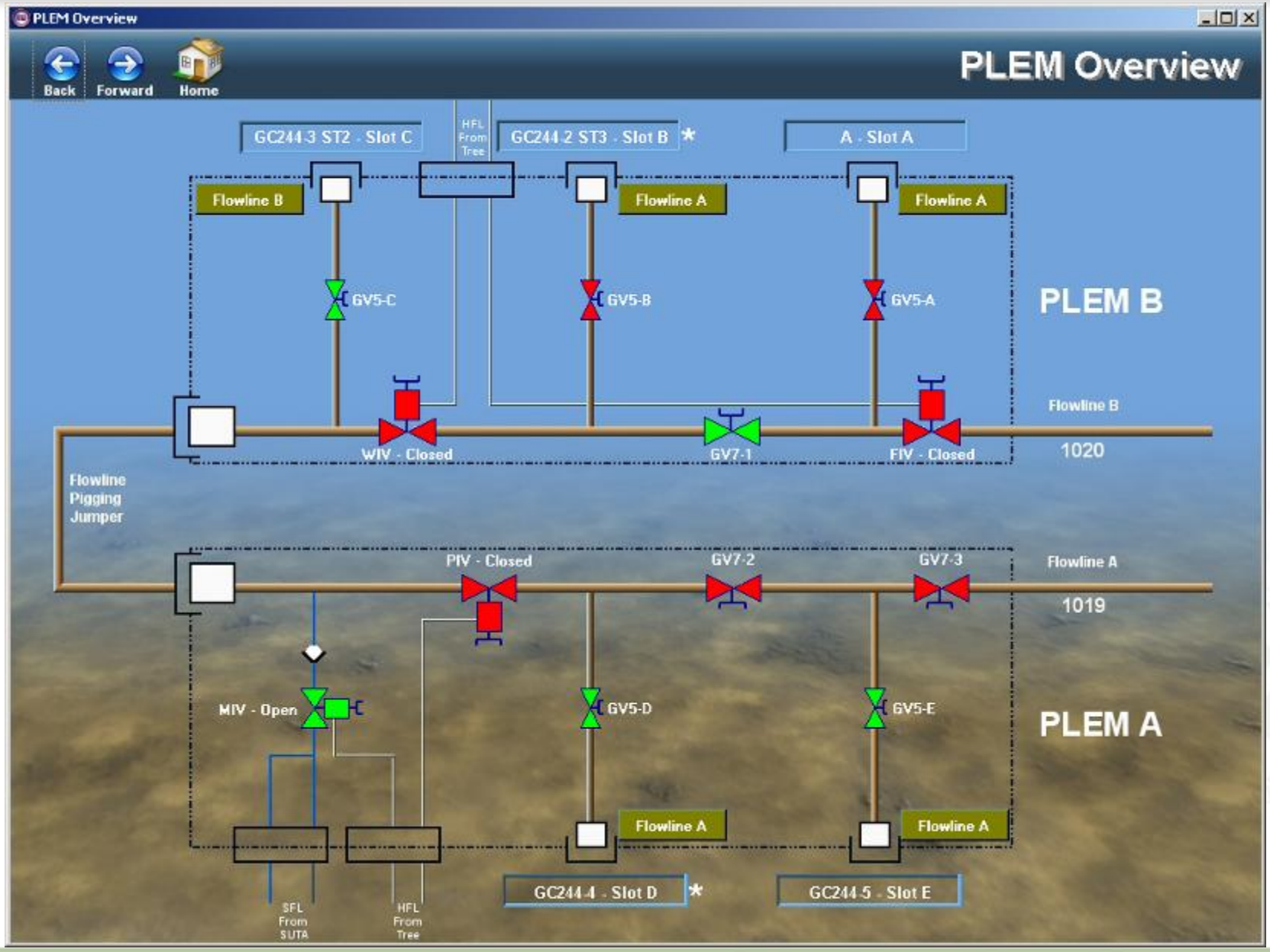
© Copyright 2010, OSIsoft LLC. All rights reserved.

Flowline A being laid at the Angus umbilical crossing. 64 total concrete mattresses were used for the Droshky flowlines and umbilical.

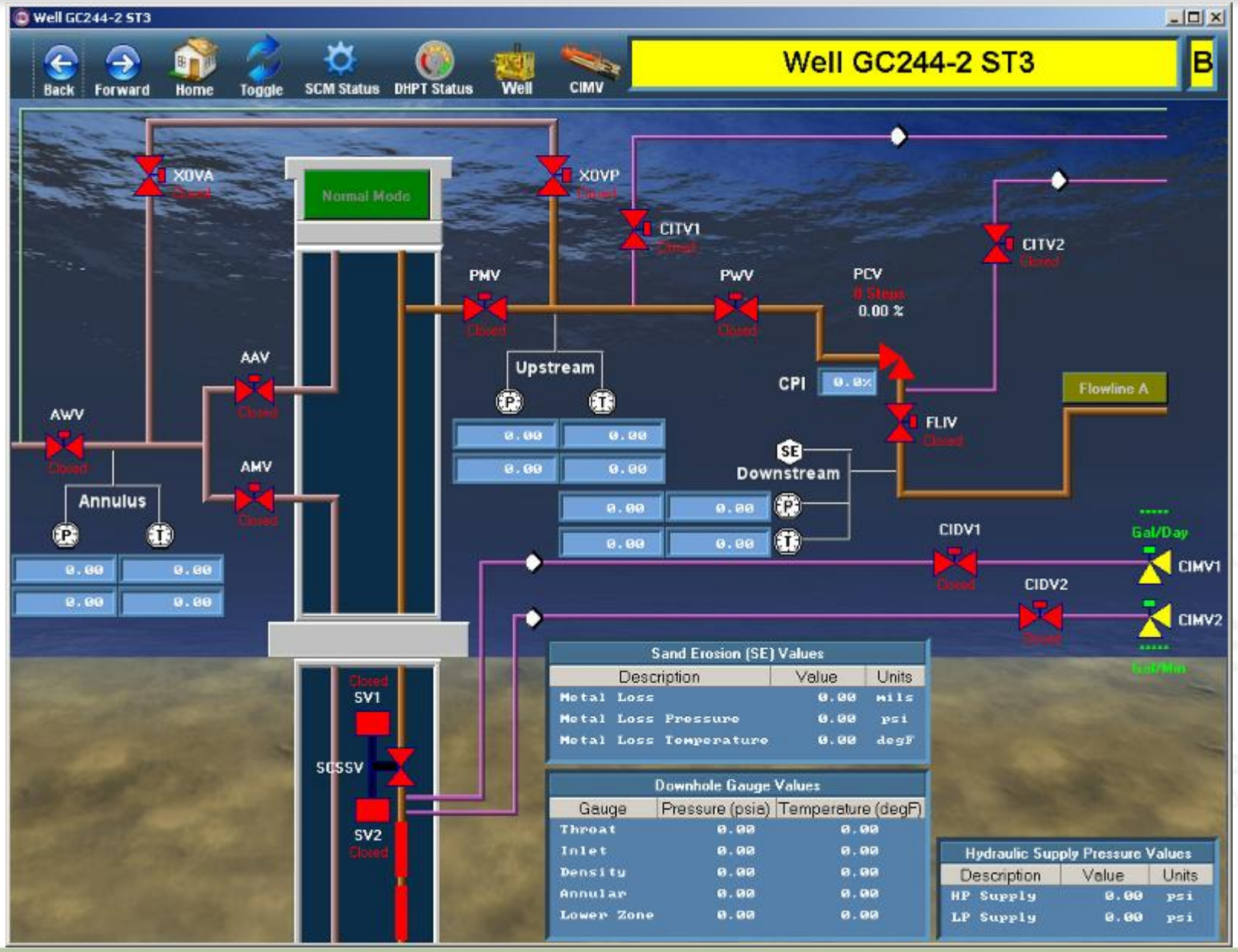
Flowline A shark encounter.

© Copyright 2010, OSIsoft LLC. All rights reserved.

© Copyright 2010, OSIsoft LLC. All rights reserved.

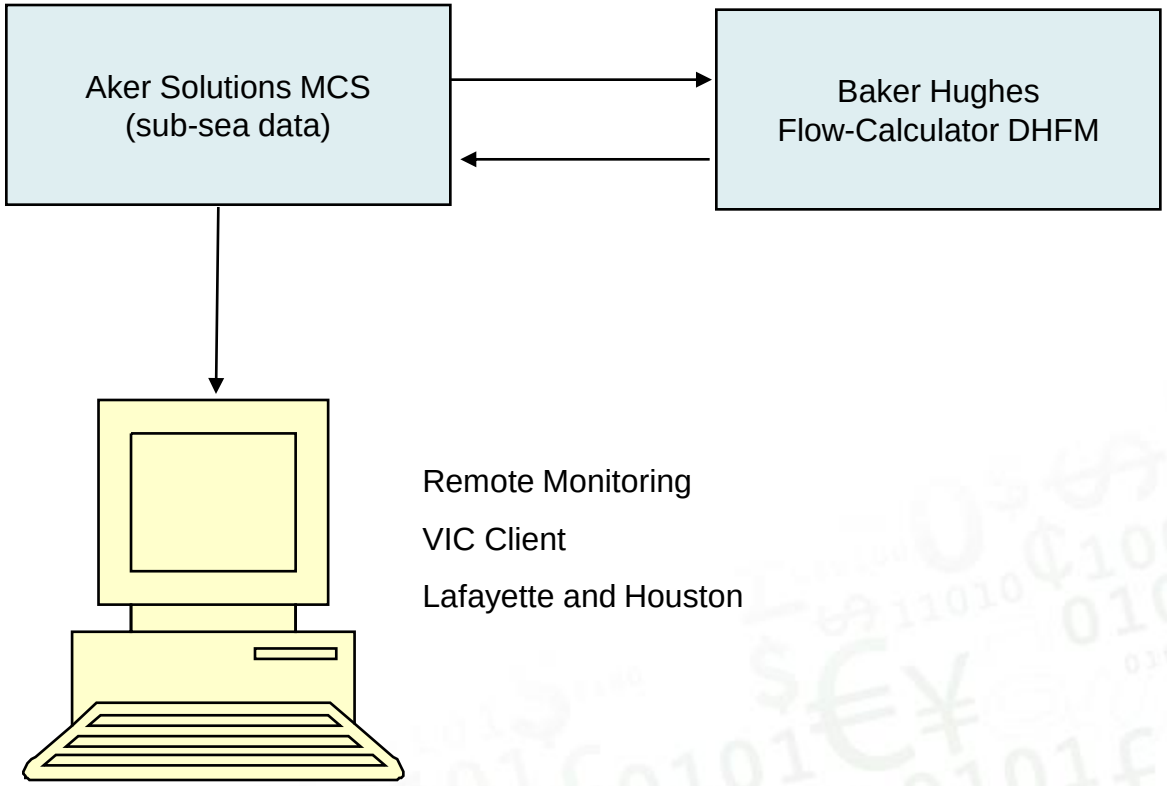


© Copyright 2010, OSIsoft LLC. All rights reserved.



© Copyright 2010, OSIsoft LLC. All rights reserved.

Droshky – Without PI

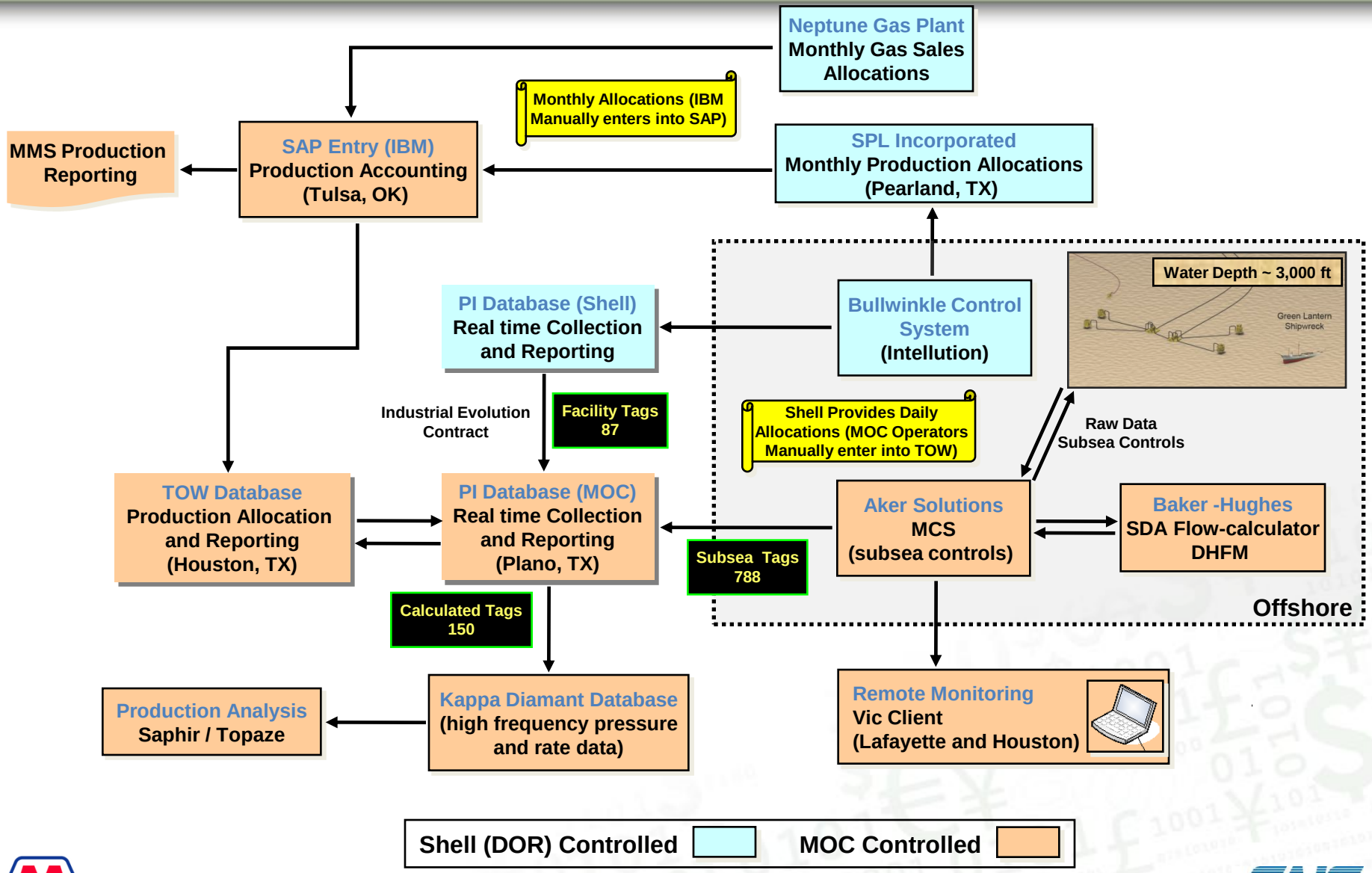


Remote Monitoring

VIC Client

Lafayette and Houston

© Copyright 2010, OSIsoft LLC. All rights reserved.



© Copyright 2010, OSIsoft LLC. All rights reserved.

Droshky - Benefits

- Savings of $5K per user for displays vs. VIC client
- Daily input deck for Eclipse models saving vs. hand-typing by engineers.
- Automatic daily entry into production allocation system (TOW)
- One source of the truth using PI OLEDB COM connectors into TOW.
- Monthly updates for re-calibration of Baker-Hughes downhole data using PI Universal File Loader (UFL). PI is considered “Gold Database”.
- Sub-surface modeling with automatic channel created to Kappa Modeling Suite.

© Copyright 2010, OSIsoft LLC. All rights reserved.

Engineering Models Used

- ECLIPSE: Sub-surface reservoir modeling for multi-phase flow through porous media. (Entire Field)
- Kappa Diamant/Saphir: Pressure transient analysis. Used in the early stages of a well to evaluate properties in the close vicinity to the well. (One well at a time)
- HYSYS: Topsides modeling. Usually used for offshore platforms. Maximize fluid recovery to optimize surface production facilities.

© Copyright 2010, OSIsoft LLC. All rights reserved.

Benefits (Modeling)

Project value estimates were based on 0.1% of worldwide production, based on greater well equipment reliability, and well characterization for future wells.

© Copyright 2010, OSIsoft LLC. All rights reserved.

Reservoir Engineer Quote

"A new well drilled and completed in Deepwater Gulf of Mexico or Equatorial Guinea can cost up to $125 million. Proper reservoir characterization includes flow and pressure build-up data down to the six-second level, in order to avoid wasting capital on unproductive wells. PI will be instrumental in capturing this data."

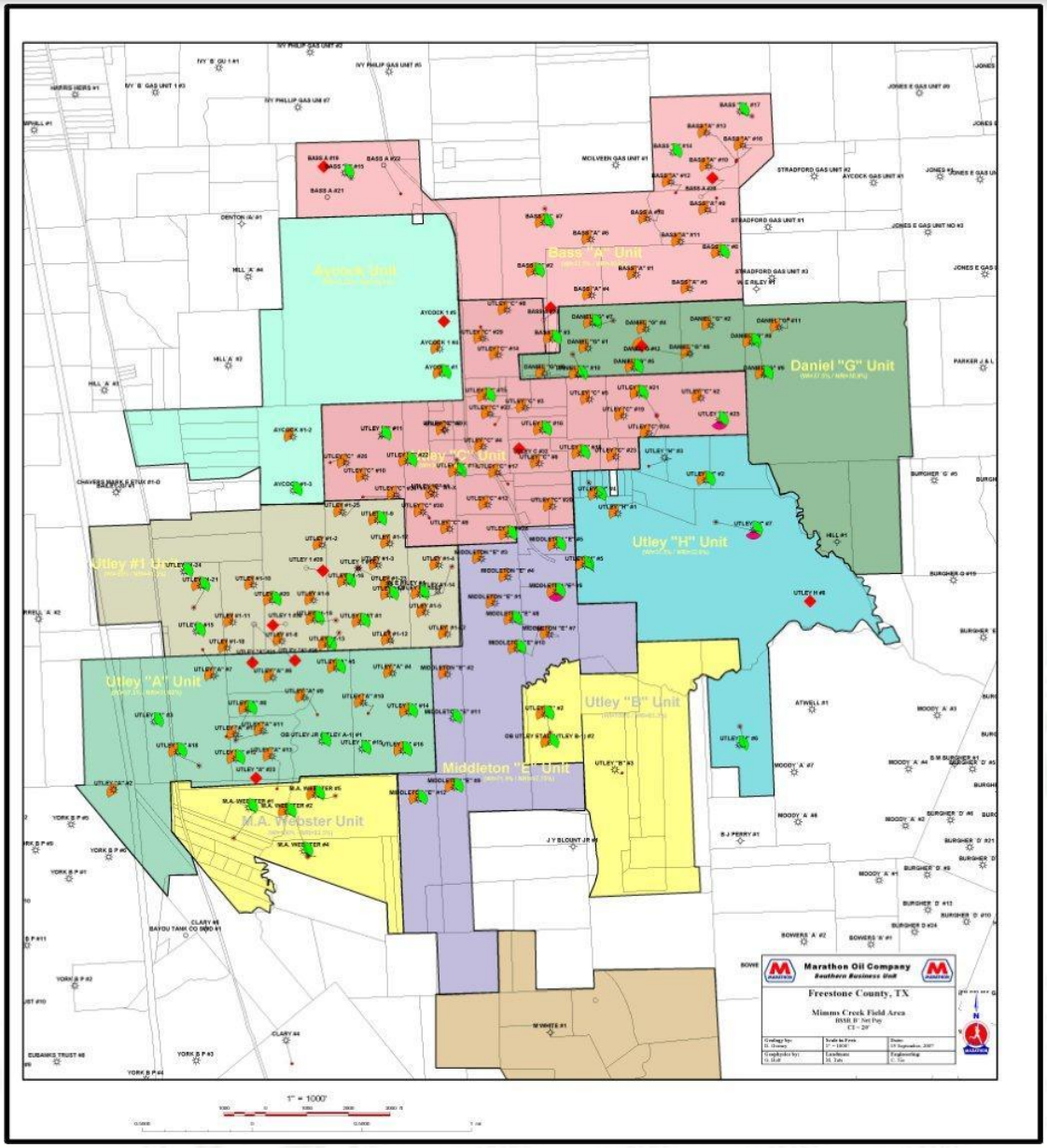
© Copyright 2010, OSIsoft LLC. All rights reserved.

Mimm's Creek Plunger Lift Diagnostic Tool

- Operators are overwhelmed with tasks (operate by exception)
- Requested by the Technology Services group (R & D function)
- Result of a six-month study to optimize production

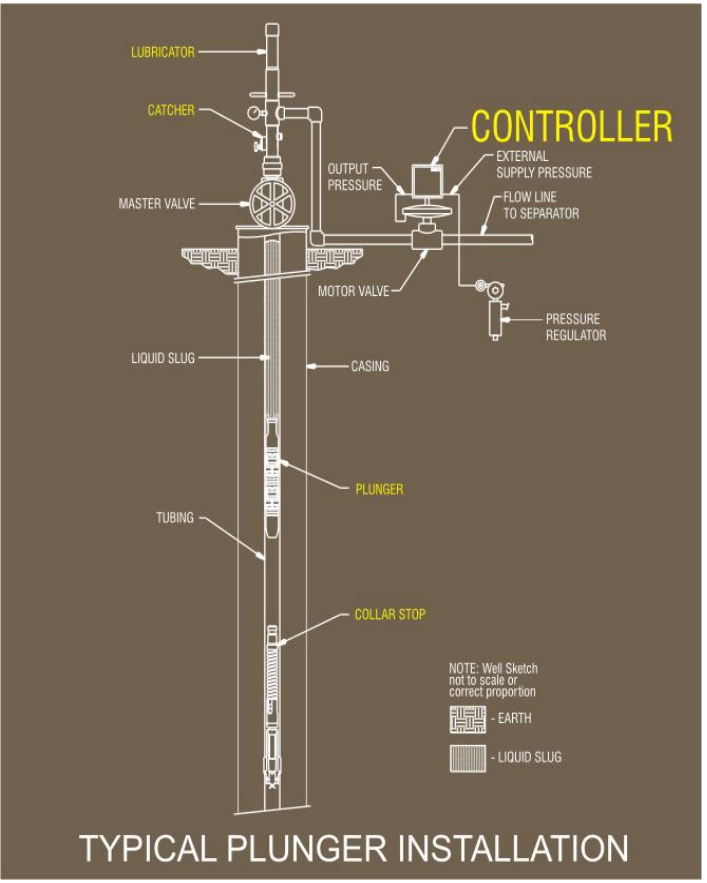
© Copyright 2010, OSIsoft LLC. All rights reserved.

- Large number of gas wells
- Spread out across numerous counties in Texas



© Copyright 2010, OSIsoft LLC. All rights reserved.

Plunger Lift Basics

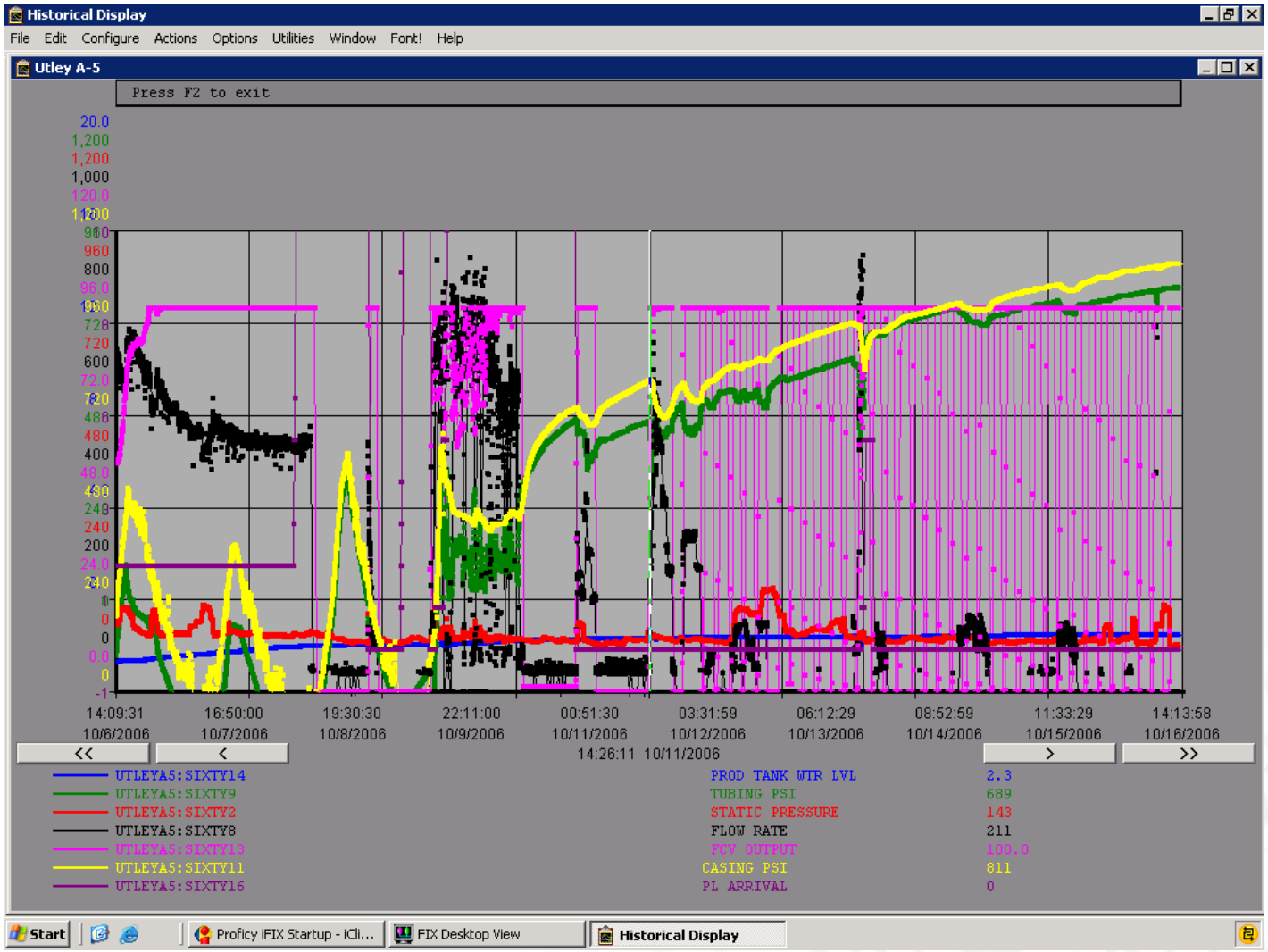


TYPICAL PLUNGER INSTALLATION

- **Plunger is dropped through fluid in production tubing with bypass valve open**
- **Flow control valve (FCV) is opened and gas is injected below the plunger. This forces the bypass valve to close and the plunger to rise, carrying with it any fluid.**
- **Plunger is caught at top while fluid is produced.**
- **After a designated amount of time, FCV is closed, the plunger is dropped and the cycle repeats.**
- **Controller at surface orchestrates all of this.**

© Copyright 2010, OSIsoft LLC. All rights reserved.

© Copyright 2010, OSIsoft LLC. All rights reserved.



© Copyright 2010, OSIsoft LLC. All rights reserved.

Shut-in Well Flags

- Plunger in lubricator
  - **Check sensor value for indication that plunger is falling**
- Flow Control Valve leaking
  - **Look for gas flow during shut-in**
- Dump valve leaking
  - **Based on drop in line pressure during shut-in**
- Possible dump valve leaking
  - **Based on tank level changes during shut-in**
- Leak in system
  - **Check for casing or tubing pressure decrease during shut-in**

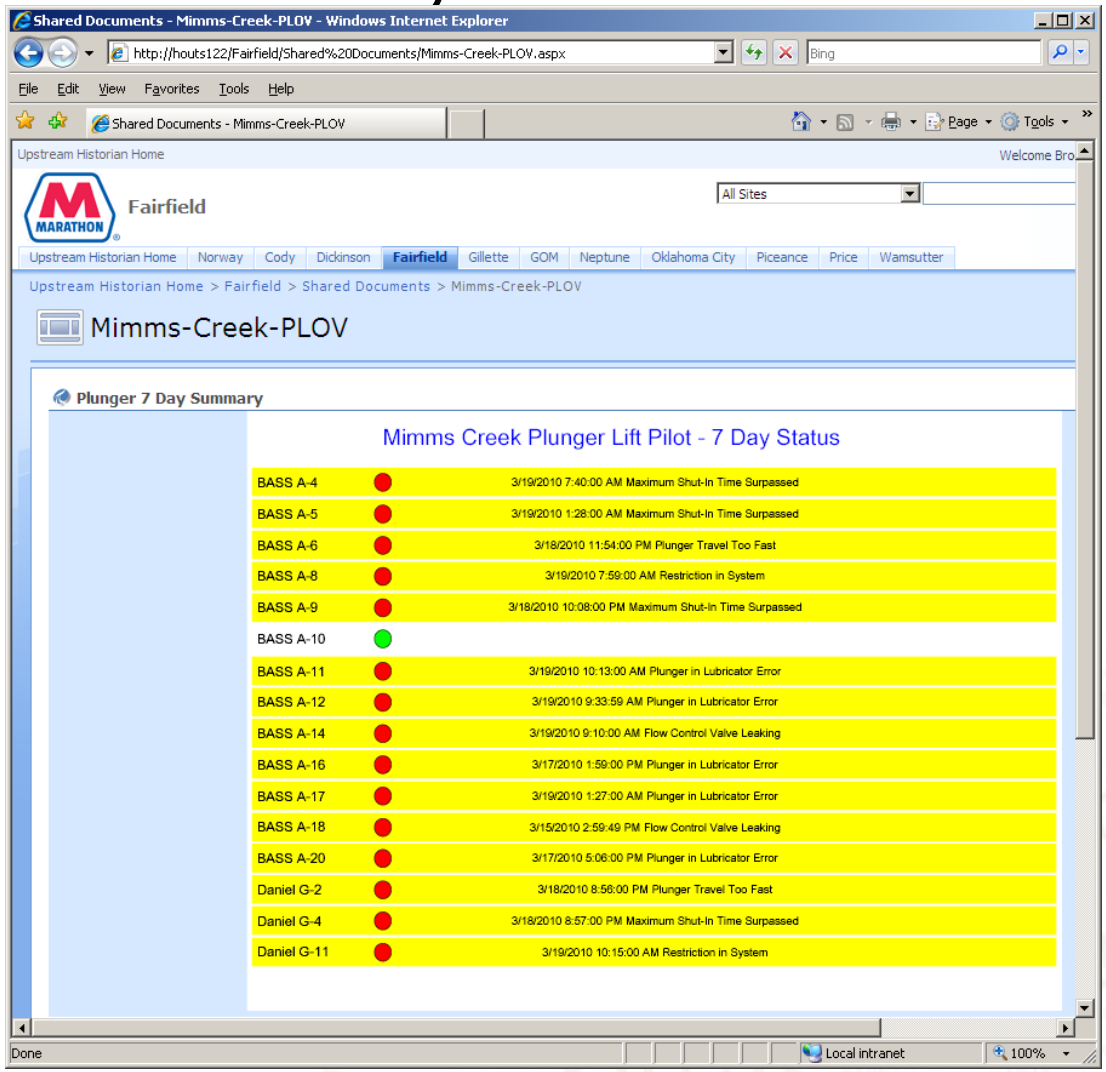
© Copyright 2010, OSIsoft LLC. All rights reserved.

Flowing Well Flags

- Insufficient plunger fall time
  - **Flow Control Valve (FCV) opens before expected Plunger Fall Time has elapsed**
- Minimum pressure not achieved
  - **FCV opens before min pressure setpoints have been achieved**
- Maximum shut-in time surpassed
  - **FCV does not open before max shut-in time has elapsed**
- Plunger travel too fast/slow **and** plunger arrival not detected
  - **Based on plunger arrival sensor value**
- Over range gas meter
  - **Check max gas rate during flow**
- Restriction in system
  - **Pressure delta between tubing and static pressure should not be increasing too much during flow**
- Rate below minimum unload rate
  - **As flow decreases, controller should instruct FCV to close well**

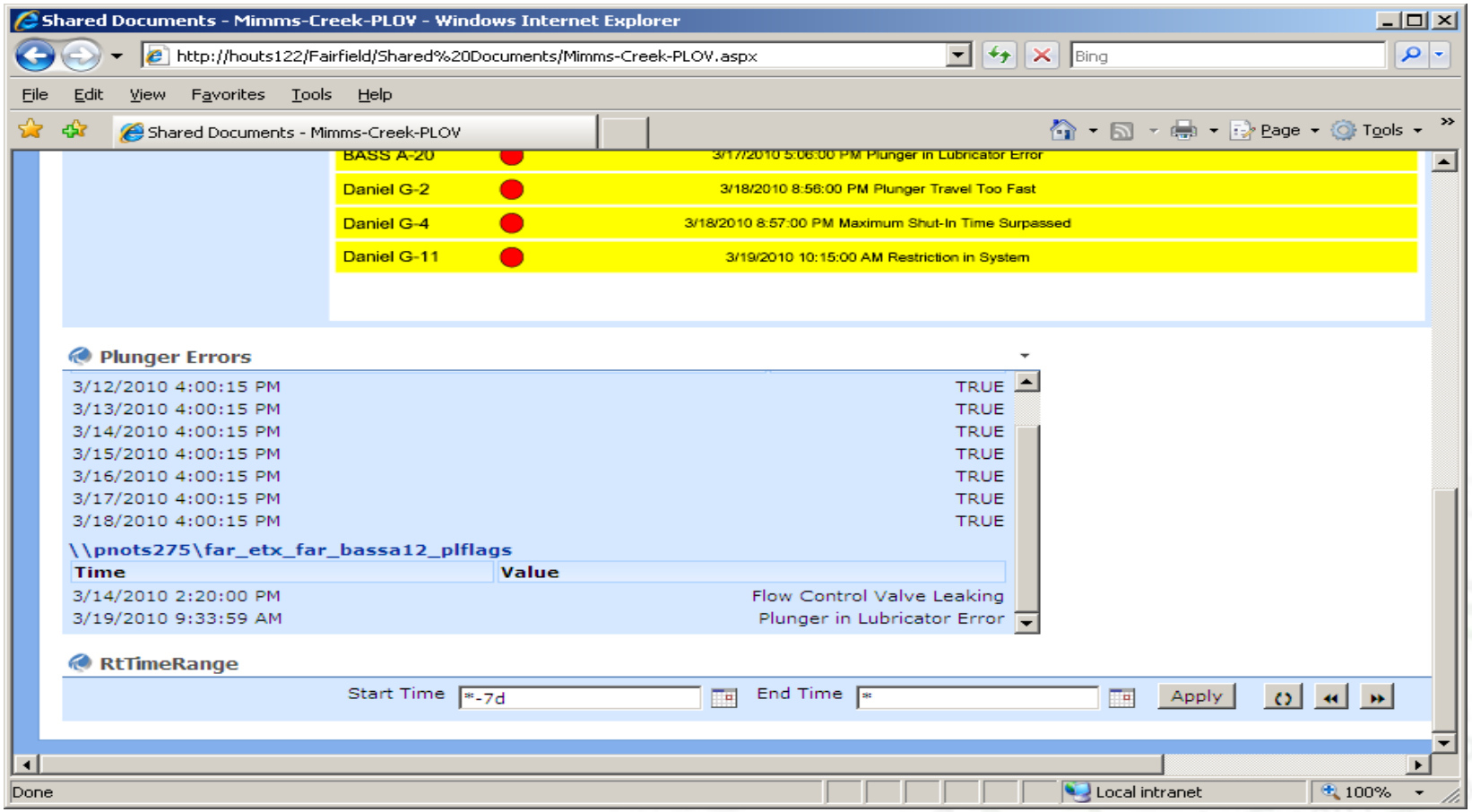
© Copyright 2010, OSIsoft LLC. All rights reserved.

Seven Day Status of All Wells



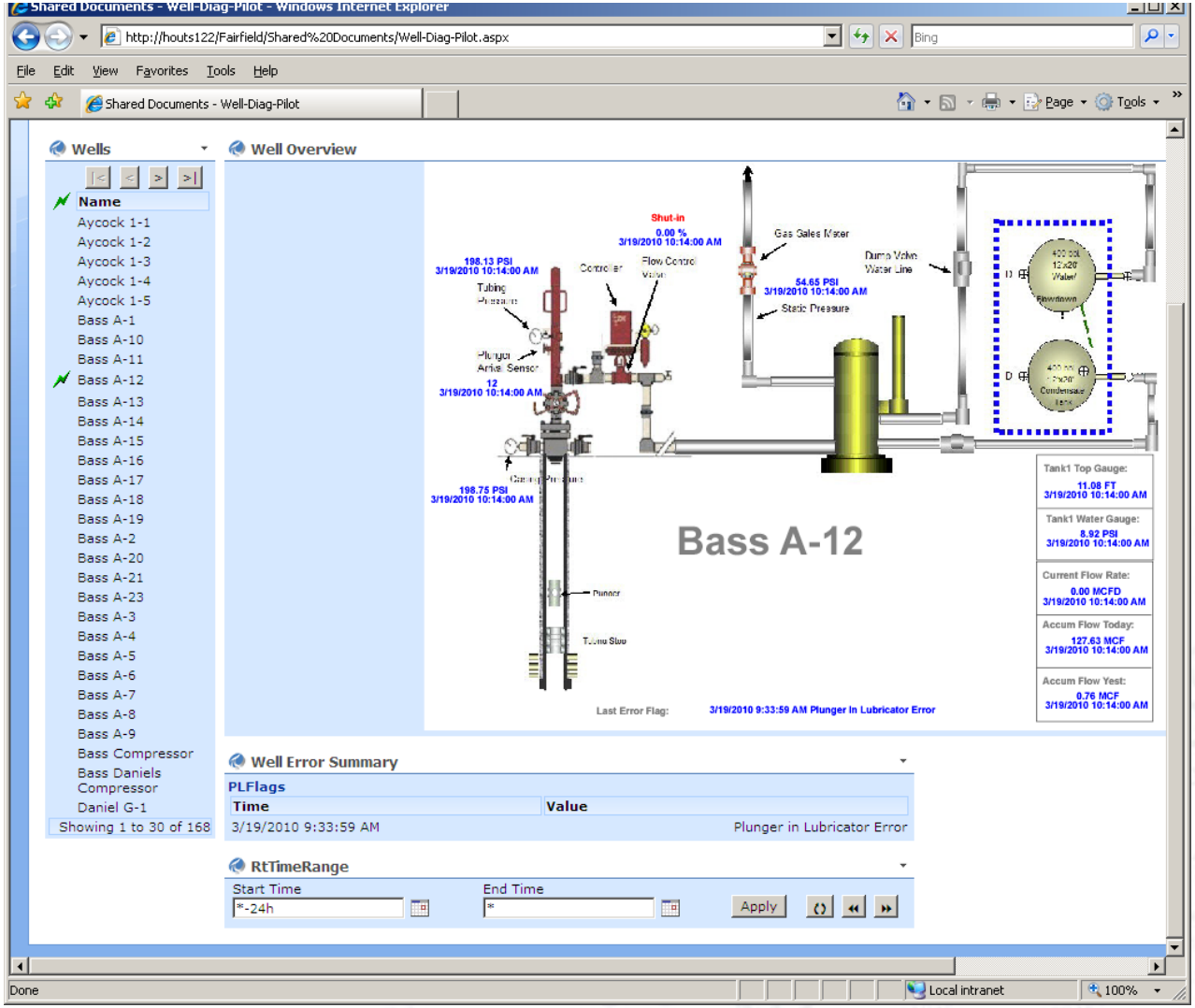
© Copyright 2010, OSIsoft LLC. All rights reserved.

Seven Day Status of Individual Well



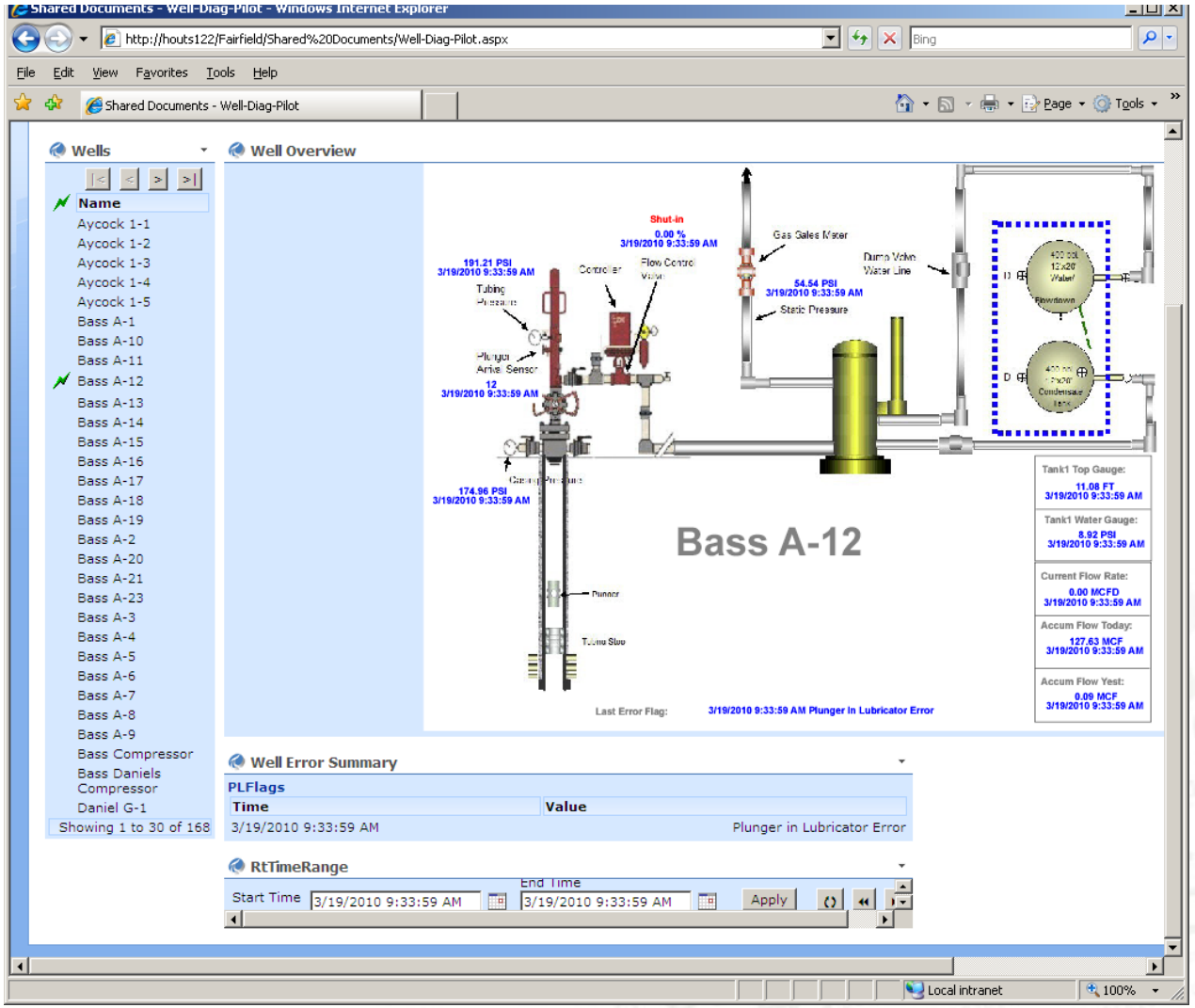
© Copyright 2010, OSIsoft LLC. All rights reserved.

Well Current Status



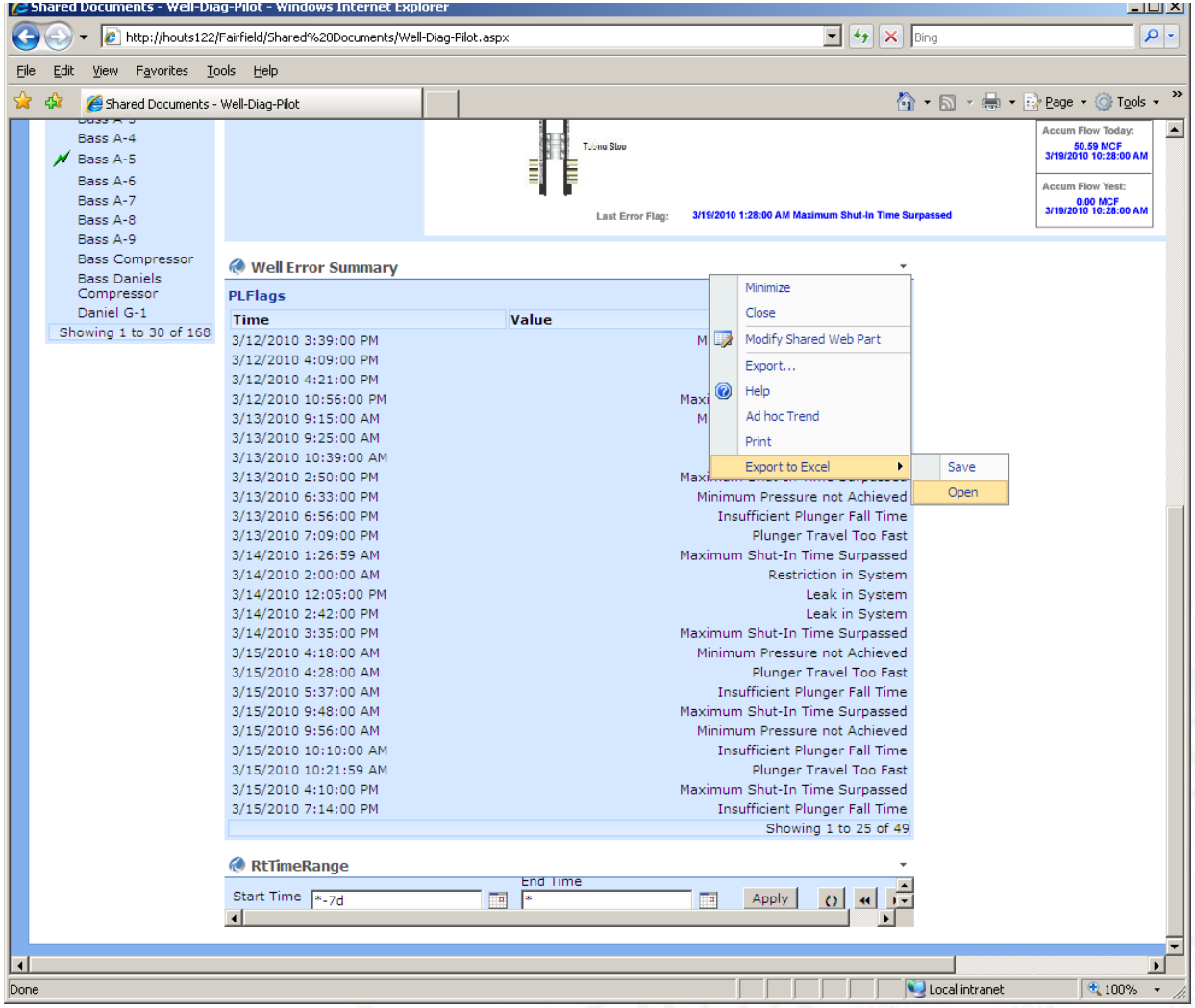
© Copyright 2010, OSIsoft LLC. All rights reserved.

Well Status at the Time of the Last Error



© Copyright 2010, OSIsoft LLC. All rights reserved.

Exporting Well Errors to Excel



© Copyright 2010, OSIsoft LLC. All rights reserved.

Resulting Spreadsheet

Microsoft Excel - 222ae968-8faf-4443-be5d-451962f0fbef.xml [Read-Only]

File Edit View Insert Format Tools Data Window PI PI-SMT Help

F50 Maximum Shut-In Time Surpassed

	A	B	C	D	E	F
1	Dataset	Dataset.Server	Dataset.Tag	Dataset.Context	Time	Value
2	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/12/2010 3:39:00 PM	Minimum Pressure not Achieved
3	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/12/2010 4:09:00 PM	Insufficient Plunger Fall Time
4	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/12/2010 4:21:00 PM	Plunger Travel Too Fast
5	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/12/2010 10:56:00 PM	Maximum Shut-In Time Surpassed
6	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 9:15:00 AM	Minimum Pressure not Achieved
7	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 9:25:00 AM	Plunger Travel Too Fast
8	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 10:39:00 AM	Insufficient Plunger Fall Time
9	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 2:50:00 PM	Maximum Shut-In Time Surpassed
10	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 6:33:00 PM	Minimum Pressure not Achieved
11	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 6:56:00 PM	Insufficient Plunger Fall Time
12	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/13/2010 7:09:00 PM	Plunger Travel Too Fast
13	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/14/2010 1:26:59 AM	Maximum Shut-In Time Surpassed
14	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/14/2010 2:00:00 AM	Restriction in System
15	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/14/2010 12:05:00 PM	Leak in System
16	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/14/2010 2:42:00 PM	Leak in System
17	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/14/2010 3:35:00 PM	Maximum Shut-In Time Surpassed
18	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 4:18:00 AM	Minimum Pressure not Achieved
19	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 4:28:00 AM	Plunger Travel Too Fast
20	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 5:37:00 AM	Insufficient Plunger Fall Time
21	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 9:48:00 AM	Maximum Shut-In Time Surpassed
22	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 9:56:00 AM	Minimum Pressure not Achieved
23	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 10:10:00 AM	Insufficient Plunger Fall Time
24	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 10:21:59 AM	Plunger Travel Too Fast
25	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 4:10:00 PM	Maximum Shut-In Time Surpassed
26	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/15/2010 7:14:00 PM	Insufficient Plunger Fall Time
27	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 8:14:00 AM	Restriction in System
28	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 9:11:00 AM	Minimum Pressure not Achieved
29	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 9:21:00 AM	Plunger Travel Too Fast
30	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 11:14:00 AM	Insufficient Plunger Fall Time
31	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 3:25:00 PM	Maximum Shut-In Time Surpassed
32	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 5:06:00 PM	Minimum Pressure not Achieved
33	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/16/2010 5:16:00 PM	Plunger Travel Too Fast
34	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 3:13:00 AM	Leak in System
35	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 6:38:00 AM	Maximum Shut-In Time Surpassed
36	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 10:04:00 AM	Insufficient Plunger Fall Time
37	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 10:06:00 AM	Minimum Pressure not Achieved
38	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 10:16:00 AM	Plunger Travel Too Fast
39	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 6:04:00 PM	Insufficient Plunger Fall Time
40	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/17/2010 6:16:01 PM	Plunger Travel Too Fast
41	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 12:41:59 AM	Maximum Shut-In Time Surpassed
42	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 1:20:00 AM	Plunger Travel Too Fast
43	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 4:15:01 AM	Leak in System
44	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 9:28:00 AM	Minimum Pressure not Achieved
45	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 12:18:00 PM	Insufficient Plunger Fall Time
46	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 4:29:00 PM	Maximum Shut-In Time Surpassed
47	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 6:39:00 PM	Minimum Pressure not Achieved
48	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 7:09:00 PM	Insufficient Plunger Fall Time
49	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/18/2010 7:21:00 PM	Plunger Travel Too Fast
50	PLFlags	pnots275	PLFlags	uspo\fairfield\mimms creek\bass a-5	3/19/2010 1:28:00 AM	Maximum Shut-In Time Surpassed
51						

Well Error Summary

Ready NUM SCRL

© Copyright 2010, OSIsoft LLC. All rights reserved.

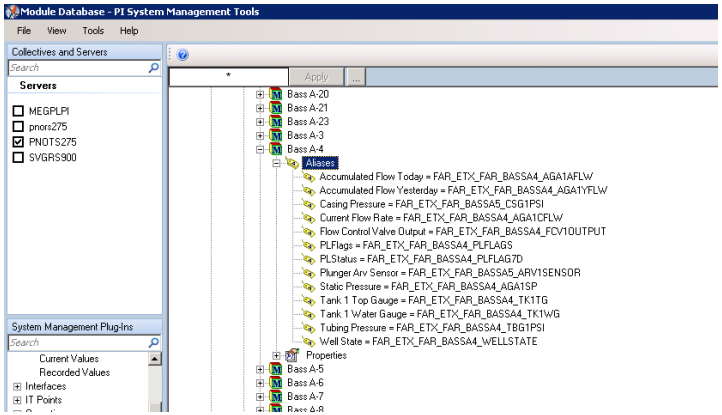
Pilot ACE Specifics

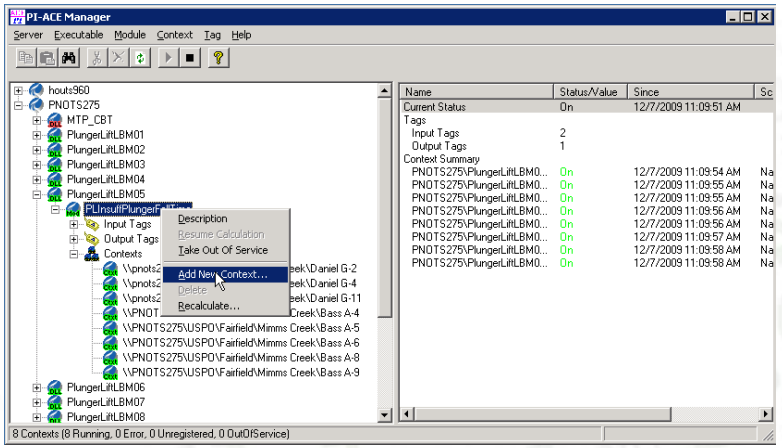
- A new well-state tag needed to be added for each well. The states are: Well Shut-In, Well Transition, Well Flowing.
- ACE kicks off the Well State Determination process every time a new value is written to the Valve Position Indicator tag.
- The remaining ACE calculations run based on the value of the Well-State tag.
- A new digital state tag was also added for each well to store current and historical error flags.

© Copyright 2010, OSIsoft LLC. All rights reserved.

PI-ACE Calculation Implementation

- All of the calculations have been developed generically to allow new wells to be added quickly and easily.





© Copyright 2010, OSIsoft LLC. All rights reserved.

Fairfield SCADA and PI-ACE Architecture

ROC

AutoSOL SCADA Server

ROC Link

Proficy Server

PI Pub.

PI ACE server

ACE Manager

ACE Sched.

ACE exe/dll

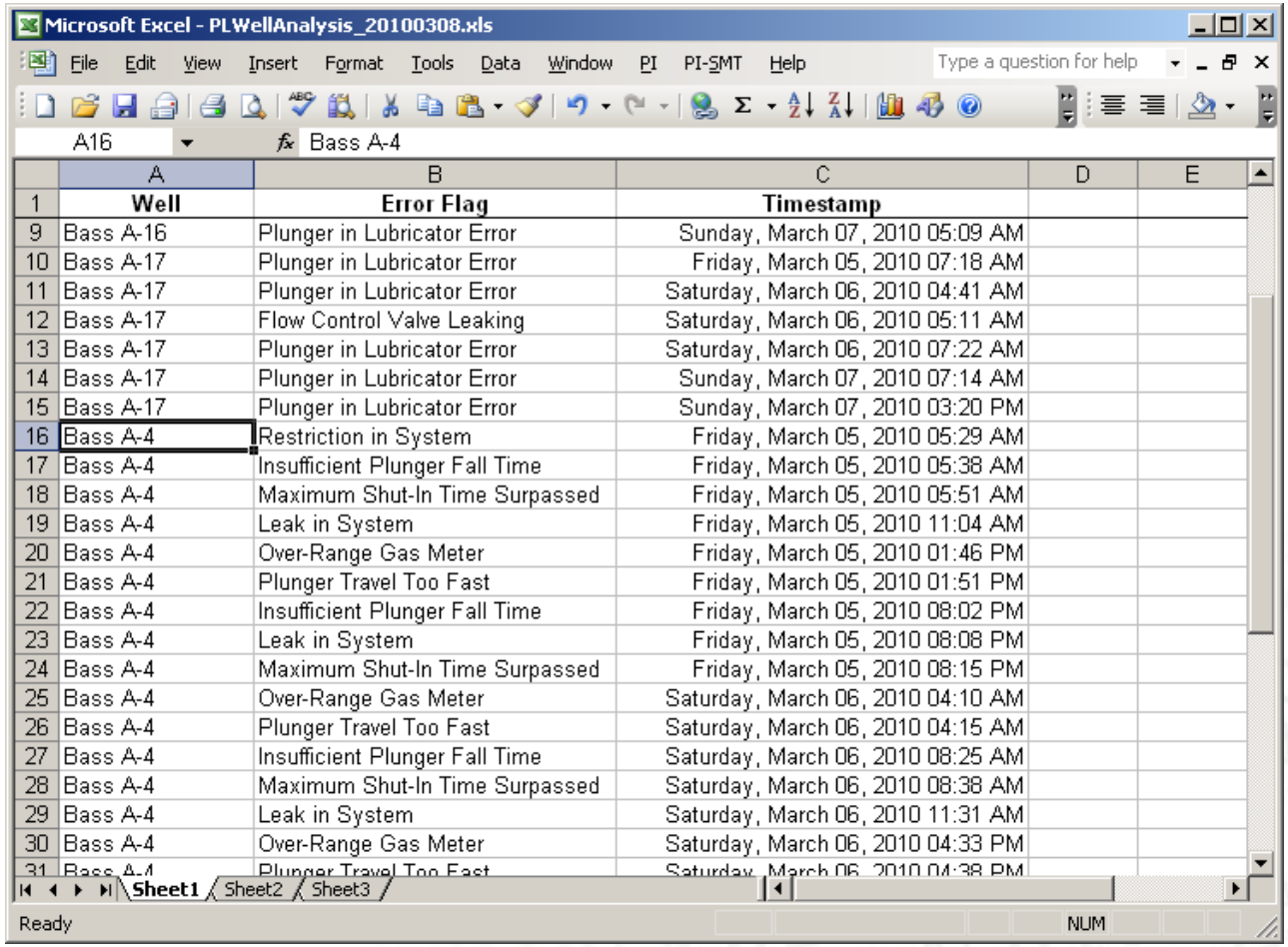
PI server

ACE MDB structure

PI Archive

© Copyright 2010, OSIsoft LLC. All rights reserved.

FUTURE - Daily e-mail Spreadsheet



Microsoft Excel - PLWellAnalysis_20100308.xls

File Edit View Insert Format Tools Data Window PI PI-SMT Help Type a question for help

A16 Bass A-4

	A	B	C	D	E
1	**Well**	**Error Flag**	**Timestamp**		
9	Bass A-16	Plunger in Lubricator Error	Sunday, March 07, 2010 05:09 AM		
10	Bass A-17	Plunger in Lubricator Error	Friday, March 05, 2010 07:18 AM		
11	Bass A-17	Plunger in Lubricator Error	Saturday, March 06, 2010 04:41 AM		
12	Bass A-17	Flow Control Valve Leaking	Saturday, March 06, 2010 05:11 AM		
13	Bass A-17	Plunger in Lubricator Error	Saturday, March 06, 2010 07:22 AM		
14	Bass A-17	Plunger in Lubricator Error	Sunday, March 07, 2010 07:14 AM		
15	Bass A-17	Plunger in Lubricator Error	Sunday, March 07, 2010 03:20 PM		
16	Bass A-4	Restriction in System	Friday, March 05, 2010 05:29 AM		
17	Bass A-4	Insufficient Plunger Fall Time	Friday, March 05, 2010 05:38 AM		
18	Bass A-4	Maximum Shut-In Time Surpassed	Friday, March 05, 2010 05:51 AM		
19	Bass A-4	Leak in System	Friday, March 05, 2010 11:04 AM		
20	Bass A-4	Over-Range Gas Meter	Friday, March 05, 2010 01:46 PM		
21	Bass A-4	Plunger Travel Too Fast	Friday, March 05, 2010 01:51 PM		
22	Bass A-4	Insufficient Plunger Fall Time	Friday, March 05, 2010 08:02 PM		
23	Bass A-4	Leak in System	Friday, March 05, 2010 08:08 PM		
24	Bass A-4	Maximum Shut-In Time Surpassed	Friday, March 05, 2010 08:15 PM		
25	Bass A-4	Over-Range Gas Meter	Saturday, March 06, 2010 04:10 AM		
26	Bass A-4	Plunger Travel Too Fast	Saturday, March 06, 2010 04:15 AM		
27	Bass A-4	Insufficient Plunger Fall Time	Saturday, March 06, 2010 08:25 AM		
28	Bass A-4	Maximum Shut-In Time Surpassed	Saturday, March 06, 2010 08:38 AM		
29	Bass A-4	Leak in System	Saturday, March 06, 2010 11:31 AM		
30	Bass A-4	Over-Range Gas Meter	Saturday, March 06, 2010 04:33 PM		
31	Bass A-4	Plunger Travel Too Fast	Saturday, March 06, 2010 04:38 PM		

Sheet1 Sheet2 Sheet3

Ready NUM

© Copyright 2010, OSIsoft LLC. All rights reserved.

Benefits

- Reduce Lost Production
- Reduce Maintenance
- Opportunity to focus on higher value items
- Operators are better able to prioritize their daily routine
- Fewer problems “slip through the cracks”
- Conservative Estimate

© Copyright 2010, OSIsoft LLC. All rights reserved.

Conclusions

<u>OSIsoft Real-Time Infrastructure</u>

- Visibility into Operations
- Separation of consumers
- Application Platform

© Copyright 2010, OSIsoft LLC. All rights reserved.