AFMS

Gulf of Mexico Region Update

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Surface Commingling and
Production Measurement Section
Gulf of Mexico Region

April 19, 2011

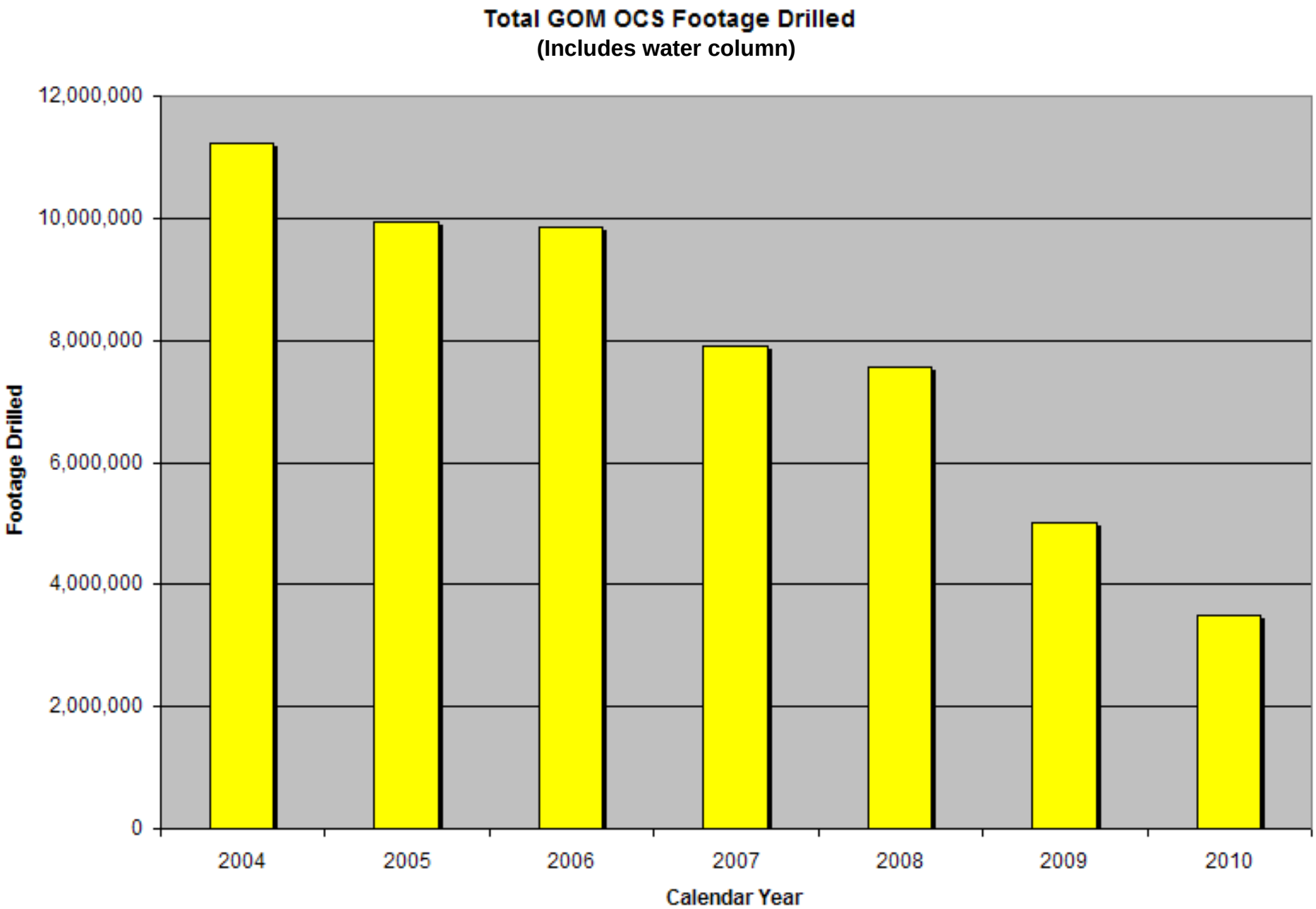
Topics

- Gulf of Mexico Activity
- Update on Specific Development Projects
- Gas Plant Inspections Update
- Regulatory/Measurement Updates and Issues

Current Gulf of Mexico Activity

GOMR Rig Activity (Mar 11)

GOMR Rigs Activity	2010	2011
Total Rigs Drilling	49	22
Total Rigs Working	85	47
Rigs Drilling in Water Depths > 500 Ft	40	14
Rigs Drilling in Water Depths > 5000 Ft	13	2


Total GOM OCS Footage Drilled
(Includes water column)
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
Footage Drilled
2004
2005
2006
2007
2008
2009
2010
Calendar Year

Shelf Deep Gas Discoveries in 2010

Area / Block	Prospect Name	Operator	Well TD (Ft.)	Water Depth (Ft.)
SM 234#2	DAVY JONES (TUSCALOOSA)	McMoran	27,900	20
SS 263 B-1	NAUTILUS	Contango	16,771	174
SM 217 #234	HURRICANE DEEP	McMoran	Drilling	20

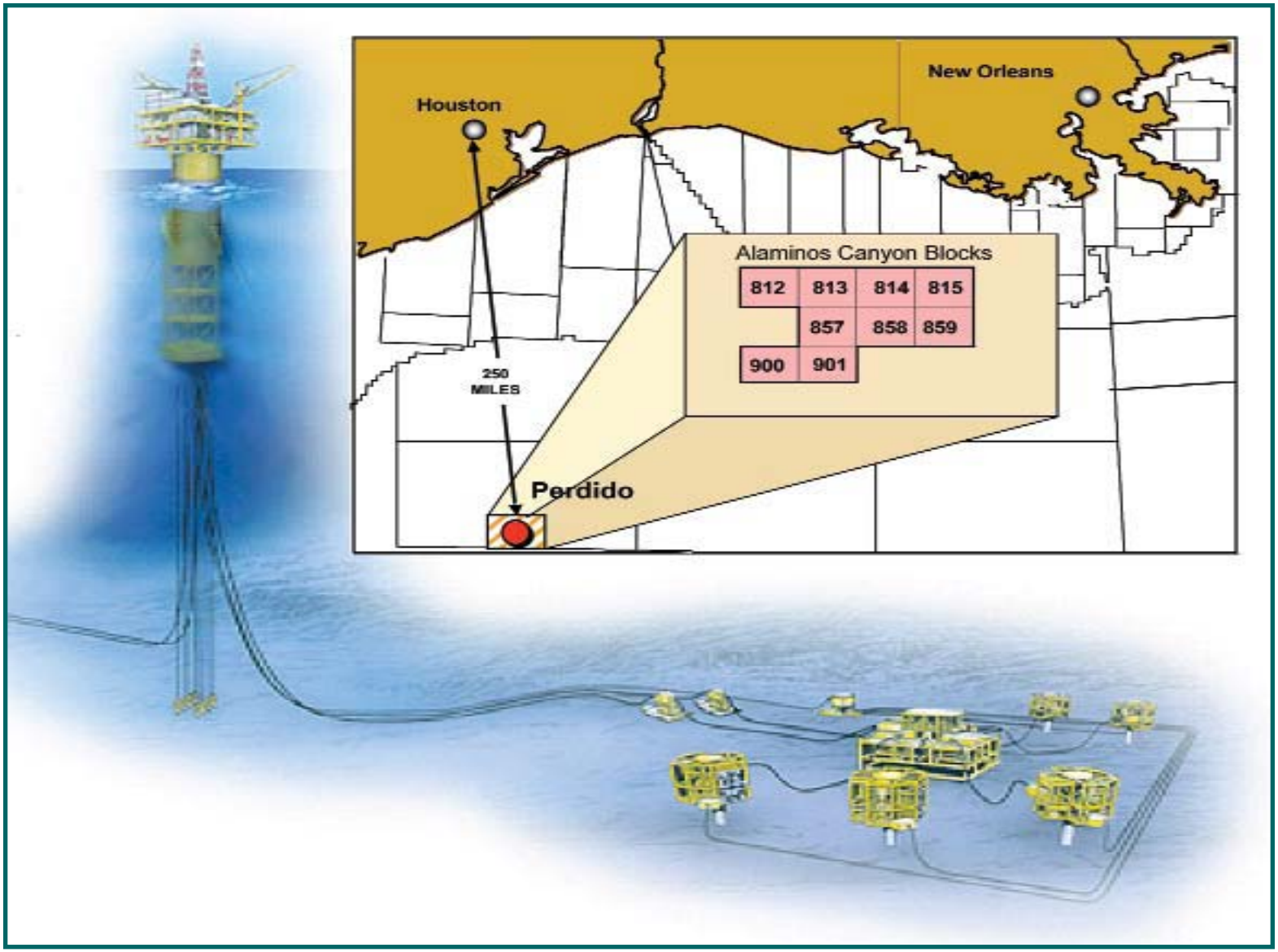
NOTE: Information retrieved from Individual Operator news releases

Industry-announced Deepwater Discoveries in 2010

Area and Block	Prospect Name	Operator	WD (Ft)
Mississippi Canyon 392	Appomattox	Shell	7,217
Desoto Canyon 4	Dalmatian North	Murphy	5,820
Green Canyon 685	Criollo	Cobalt	4,200
Green Canyon 511	Flying Dutchman	Marathon	3,700
Mississippi Canyon 199	Mandy	LLOG	2,465

Update on Specific Development Projects

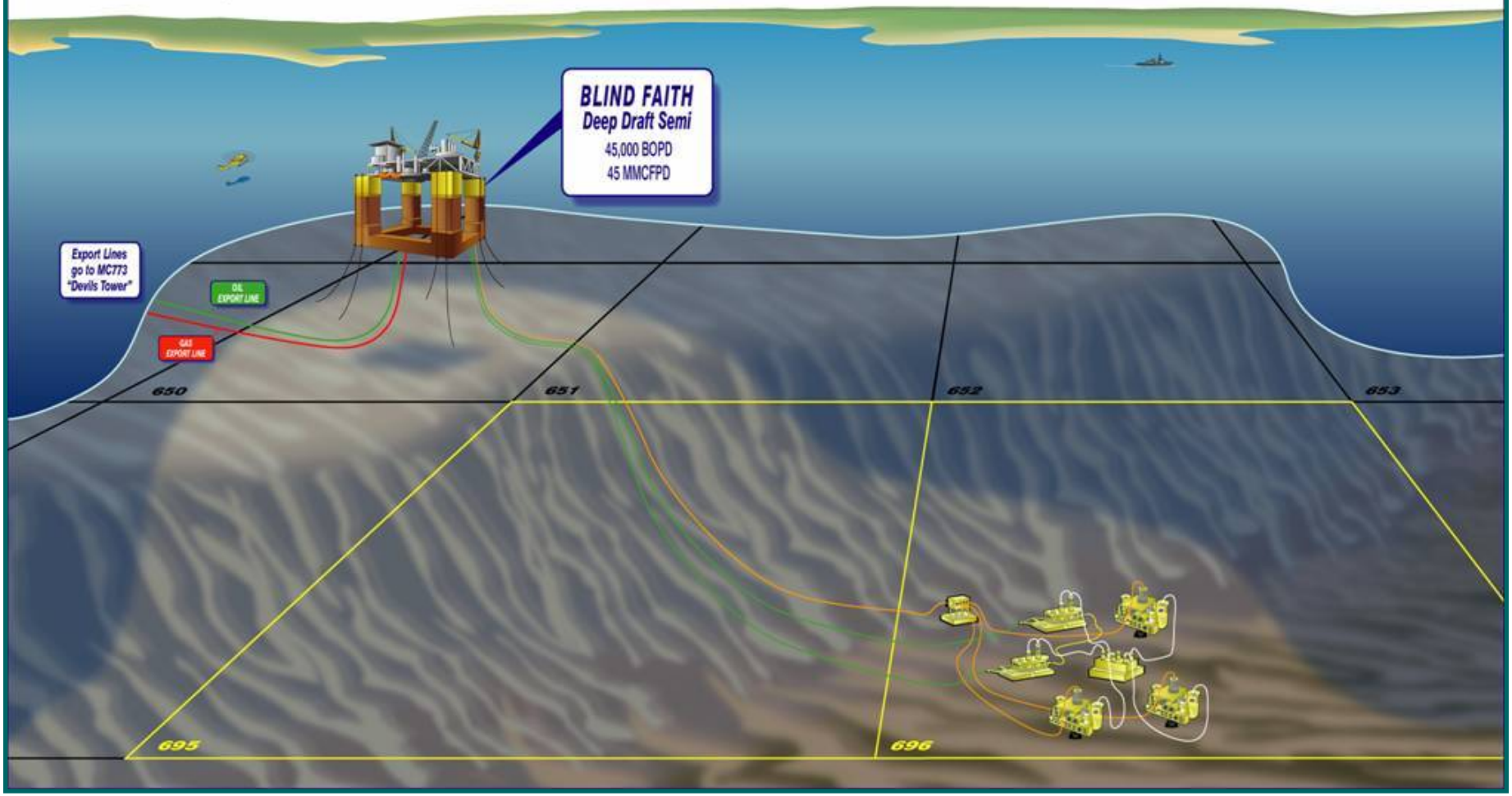
Perdido Hub


Houston
New Orleans
Alaminos Canyon Blocks
812
813
814
815
857
858
859
900
901
250
MILES
Perdido

Perdido Hub

- Host facility is the deepest direct vertical access spar in the world (nearly as tall as the Eiffel Tower), moored on the Great White field about 200 miles south of Freeport, TX in about 8,000 feet of water.
- On the seafloor, 22 wells are planned to be eventually linked to the spar. Production from Great White, Tobago, & Silvertip tiebacks are separated subsea and boosted to the drilling and production hub designed with capacity to process 100,000 BOPD and 200,000 MMCFD.
- The Tobago satellite will be the world's deepest subsea completion in about 9,627 feet of water.
- Project commenced production on March 31, 2010. January 2011 production from 2 subsea wells was 21,000 BOPD and 40 MMCFD.
- Ultrasonic meters are being used for the royalty measurement of gas production and positive displacement meters are being used for the royalty measurement of liquid hydrocarbons.

BLIND FAITH
FIELD DEVELOPMENT PLAN

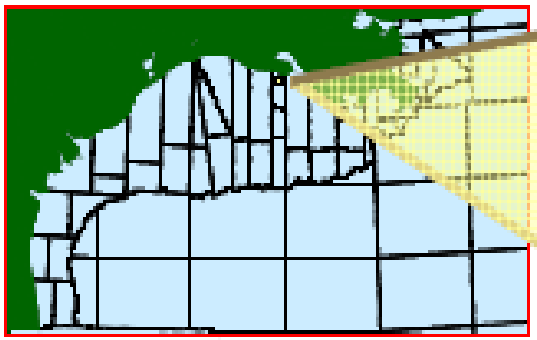


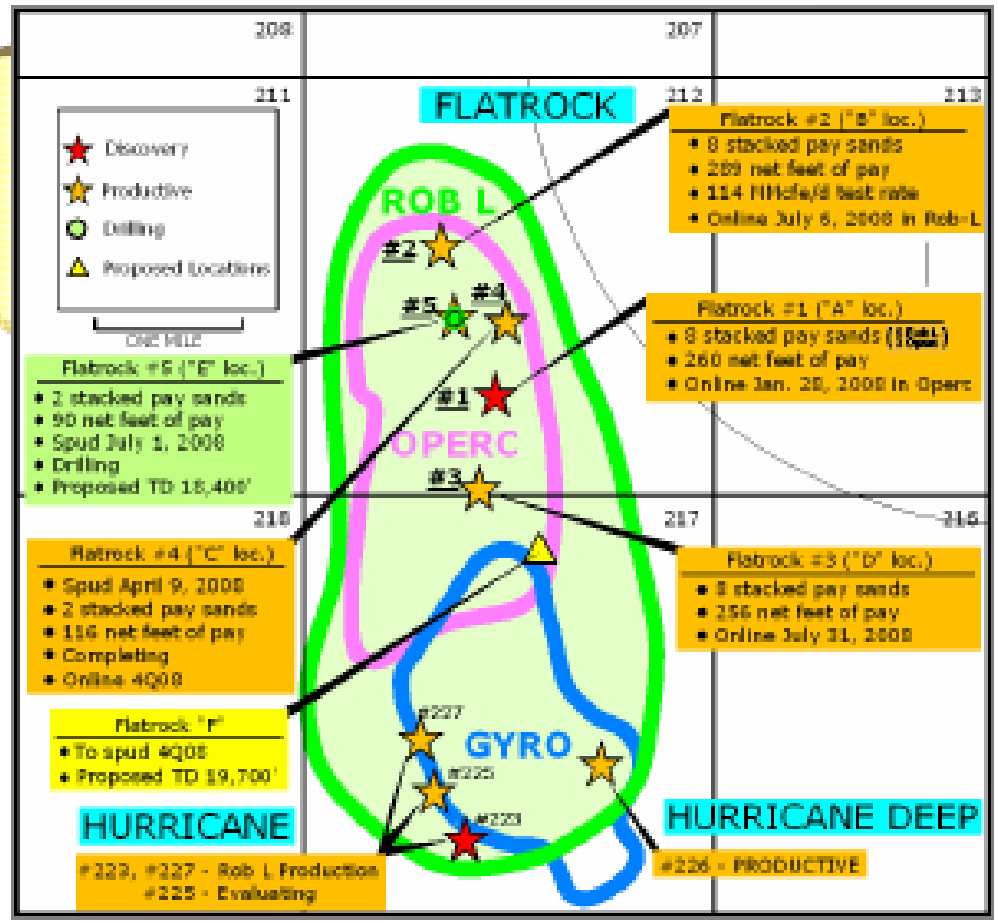
Blind Faith

- Mississippi Canyon Blocks 695 & 696, about 160 miles SE of New Orleans in 6,500 feet of water with the production wells in 7,000 ft of water.
- The first discovery well was drilled in 2001, hitting oil at a depth of 20,900 feet.
- Started producing oil in 4th quarter 2008.
- The production peaked in April 2009 at 65,000 BOPD and 41 MMCFD of natural gas per day from 4 wells at depths of more than 21,000 and 24,000 feet. Topsides were upgraded from 45,000 to 65,000 BOPD. See previous slide. Production rates are currently at 43,000 BOPD and 30 MMCFD. A 5th well is proposed and being assessed. The field is in a natural decline. Oil gravities are 29-34 degrees API.
- Ultrasonic meters are approved for the royalty measurement of gas production and helical turbine meters are approved for the royalty measurement of liquid hydrocarbons.

McMoRan Exploration Co.

Flatrock Major Discovery





Located on OCS 310 at
South Marsh Island Block 212
in 10 Feet of Water

5 Successful Wells Drilled to Date

Flatrock

McMoRan has drilled six successful wells. The six wells are currently producing at an aggregate gross rate of 165 MMcfe/d. Field peak production reached 280 MMcfe/d in early 2010

Well Number	Target Total Depth (Feet)	Net Feet of Pay
1	18,400	260
2	18,100	289
3	18,587	256
4	18,500	116
5	18,400	50
6	19,700	30

NOTE: Information retrieved from McMoRan news releases

DAVY JONES

McMoRan's News Release dated February 3, 2011 announced that it has drilled a second well in this prospect. This well encountered 100 feet of net pay in multiple Wilcox zones of the Eocene and Paleocene Geologic periods. The well was drilled in 20 feet of water depth.

Well Number	Target Total Depth (Feet)	Net Feet of Pay
1	29,122	200
2	27,900 (to be deepened to Tuscaloosa Trend)	100

Gas Plant Inspections Update

GOM Gas Plants

- The Code of Federal Regulations at 30 CFR 206.153 sets royalty valuation standards for processed gas from Federal leases based on the combined value of residue gas, all plant products, and any condensate recovered without resorting to processing. Since the measurement of production at gas plants has a direct impact on royalty, the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) will inspect meters at those plants which process production from Federal leases in the Gulf of Mexico Region.

GOM Gas Plants

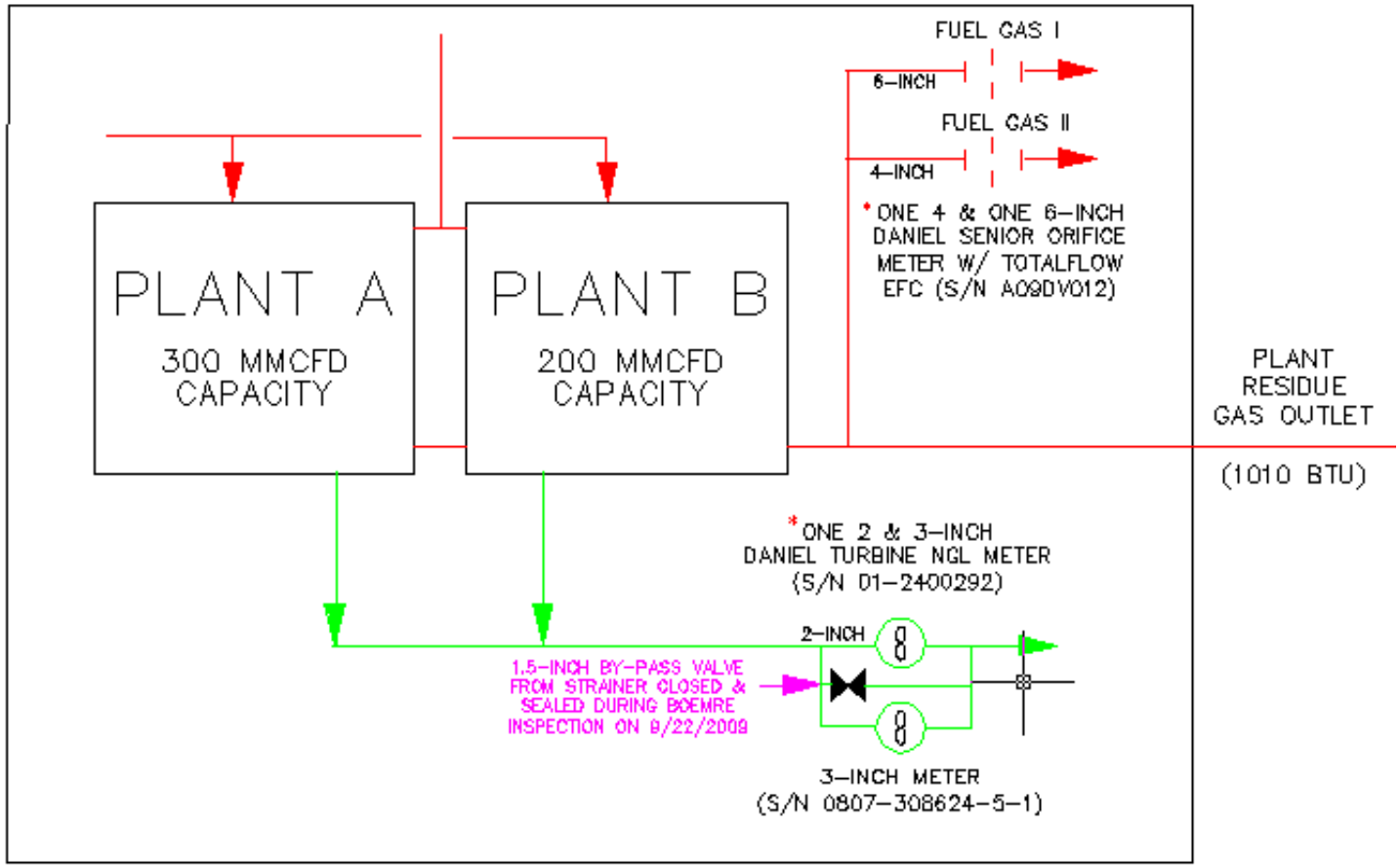
- The following gas plant meter information will now be included in our records:
  - Meter operator
  - Service (what does it measure)
  - Location (relative to process flow)
  - Meter make, type, model, size, serial number
  - Flow Recorder make, type, model, serial number
  - Sampler make, type, model
  - Associated pipeline information (if applicable)

    P/L operator, origin, size, contact info

GOM Gas Plants

- For reference, a simplified process schematic which includes the measurement devices observed during our initial inspection is attached. We recommend that you retain the documents in your field records and promptly notify our office of any process flow or metering changes.

GOM Gas Plants



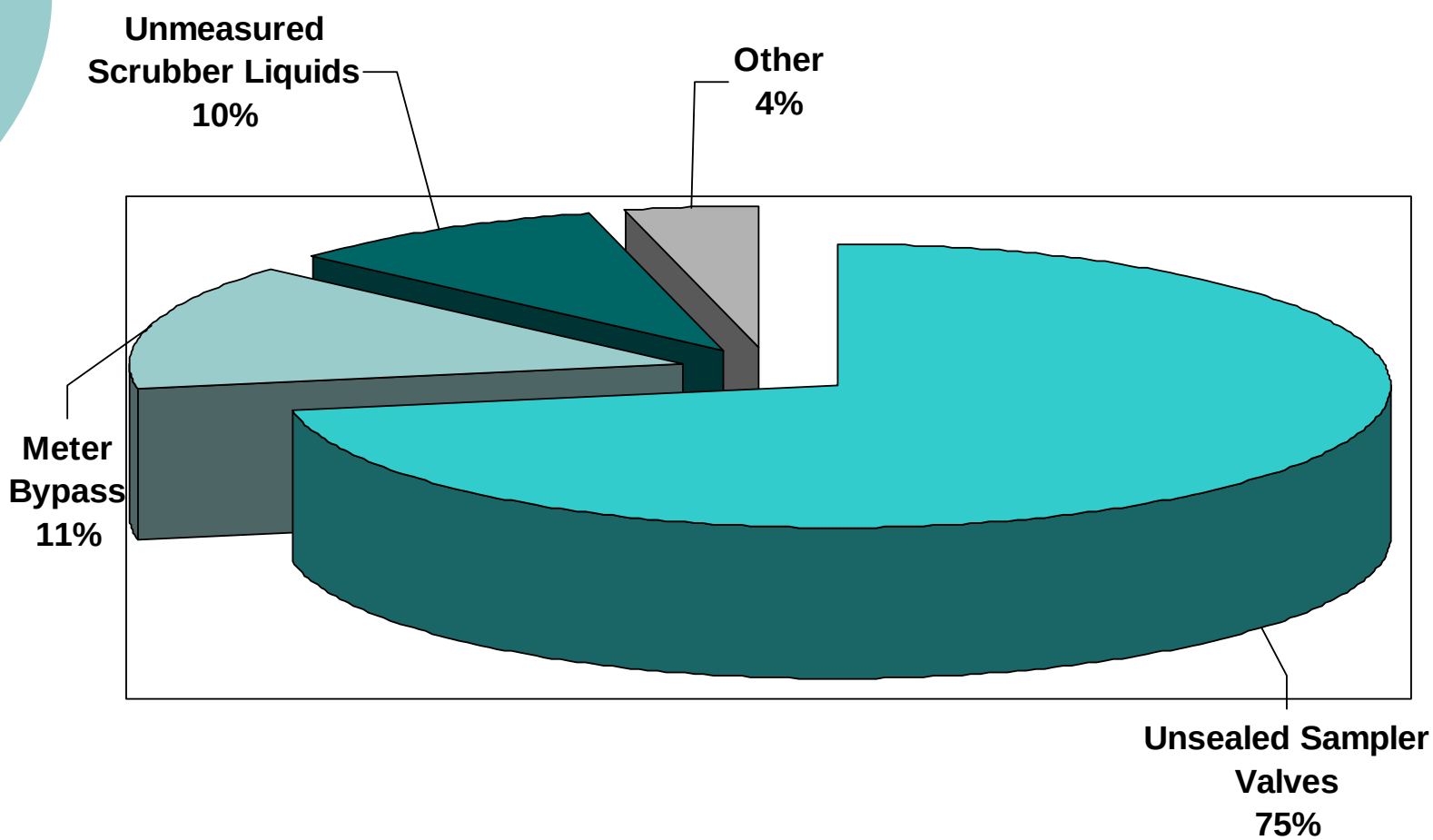
GOM Gas Plants

- Effective April 6, 2009, the BOEMRE GOM Region and its associated districts began inspecting the meters at those GOM gas plants which process gas production from Federal OCS leases.
- These plants are allocating residue gas and plant products to GOMR lessees and royalty is being paid on these products.
- Meters subject to inspection will include: all inlet meters, residue “outlet” gas meters, samplers, fuel and flare gas meters, scrubber condensate meters and plant product (raw mix) meters.
- Completed initial inspections September 22, 2009. Correspondence letters have been mailed out to the gas plant and pipeline meter operators. Annual inspections will resume later this year.

Gas Plant Inspection Summary

Total Number of Gas Plants	37
Active Plants Inspected	24
Plants Confirmed Inactive	13
Number of Meters Inspected	401

Non-Compliance Categories



Regulatory/Measurement Updates and Issues

Regulatory/Measurement Updates and Issues

- NTL No. 2010-N08 - Meter Status Definitions
  1. Active Meter
  2. Inactive Meter
  3. Terminated Meter
- Future Regulations/NTLs
  1. AD 53 Final Rule
  2. AD 63 Proposed Rule
  3. Proposed PVU Mailbox NTL
- Meter Calibrations/Proving
- Gas Volume Statements
- Mechanical Displacement/Tank Prover Calibrations

Meter/Tank Status Definition

- Notice To Lessees and Operators (NTL) No. 2010-N08
  - NTL Effective Date: September 20, 2010
  - BOEMRE's current policy for meter/tank status classifications
  - Lessees/Operators obligations regarding proving/calibration and site security for each status classification

Meter/Tank Status Definition

- Lessees/Operators May Access NTL No. 2010-N08 In The BOEMRE Database As Follows:
  - Enter the BOEMRE GOMR web site address: http://www.gomr.boemre.gov
  - Select <Offshore Operations>, select <Notices, Letters, and Information to Lessees and Operators>, then select <Notices to Lessees and Operators (Numeric Order)> to navigate to the NTL list
  - Select <2010-N08> to open the Meter/Tank Status Definition's NTL document

Meter/Tank Status Definition

- NOTE: Correction To NTL No. 2010-N08 Instructions To Access Current Meter/Tank Status Information In The BOEMRE Database
  - You must now select <Data Center> immediately after opening the BOEMRE GOMR web site address: http://www.gomr.boemre.gov
  - Continue following the instructions as shown in the Meter/Tank Status Definition's NTL document

Meter/Tank Status Definition
“Active” Status

- The status of a meter or royalty/inventory tank on a facility that is being utilized for royalty or allocation measurement. A meter/tank with an Active status must be approved by the GOMR office, must have an assigned Facility Measurement Point (FMP) number, and must meet the regulatory requirements outlined in 30 CFR 250.1202, 250.1203, and 250.1205.

- An Active status meter can be classified as “operating” or “non-operating”. An Active “operating” meter is a meter that is used for royalty or allocation measurement during a proving/calibration cycle and is required to be proved/calibrated as per the regulations. An Active “non-operating” meter is an idle meter that is not used for royalty or allocation measurement during a proving/calibration cycle and does not need to be proved/calibrated for that cycle, but must be proved/calibrated prior to being returned to service.

Meter/Tank Status Definition "Active" Status - Cont'd

- Valves located upstream and downstream of an Active "non-operating" meter must be closed but do not need to be sealed.

- Copies of run tickets and gas volume statements indicating zero volume must be submitted to the GOMR office on a monthly basis for all Active "non-operating" royalty meters.

- Notification must be made to and confirmation received from the GOMR office in order to effect a change in meter/tank status from Active to Inactive.

Meter/Tank Status Definition
"Inactive" Status

- The status of a meter or royalty/inventory tank on a facility that is no longer being utilized for royalty or allocation measurement.

- A meter/tank with an Inactive status must have all applicable measurement equipment installed and must be isolated by closing and subsequently sealing an individual valve located both upstream and downstream of the meter/tank. The seals must be numbered and recorded.

- Approval must be obtained from the GOMR office prior to changing a meter/tank from an Inactive status to an Active status, and meters must be proved/calibrated prior to being returned to service.

Meter/Tank Status Definition "Terminated" Status

- The status of a previously-approved royalty or allocation meter or royalty/inventory tank that has been either physically removed from a facility with the meter/tank connections blinded or permanently removed from service and isolated with a skillet or spectacle blind.

- Notification <u>must</u> be made to and confirmation received from the GOMR office in order to effect a change in meter/tank status from Active/Inactive to Terminated.

Future Regulations/NTLs

- Production Measurement Documents Incorporated by Reference-AD 53 Final Rule, 15 New Standards
  - Some of the New Production Measurement Standards Include:
    - API MPMS Chapter 5.6-Measurement of Liquid Hydrocarbons by Coriolis Meters
    - API MPMS Chapter 5.8-Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters
    - API RP 86-Measurement of Multiphase Flow
    - AGA Report No. 7-Measurement of Natural Gas by Turbine Meters
    - AGA Report No. 9-Measurement of Gas by Multipath Ultrasonic Meters
    - AGA Report No. 10-Speed of Sound in Natural Gas and Other Related Hydrocarbon Gases

Future Regulations/NTLs

- Natural Gas Fluids Measurement; Gas Sampling – AD 63 Proposed Rule
  - Under 30 CFR 250.1203 (b)(5), the current gas sampling frequency requirement is once every 6 months
  - Gas sampling study conducted to gather information on gas sampling methods & frequencies and the reporting of Btu values on the OGOR
  - Incorporate by reference API MPMS Chapter 14, Section 1 – Collecting and Handling of Natural Gas Samples for Custody Transfer
  - Incorporate by reference GPA Standard 2261 – Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography
  - Establish minimum gas sampling frequency based on volume throughput for royalty and allocation facility measurement points (FMPs)

Future Regulations/NTLs

- Propose NTL To Establish Production Verification Unit (PVU) Mailboxes
  - Liquid Verification System (LVS) Mailbox to submit meter/tank tickets and meter proving reports

    Example: ‘ProductionVerification_LVS@boemre.gov’
  - Gas Verification System (GVS) Mailbox to submit gas volume statements and, if requested, gas analysis reports

    Example: ‘ProductionVerification_GVS@boemre.gov’
  - Consideration being given to establish an individual mailbox for liquid hydrocarbon and gas royalty and allocation meter waiver requests

Meter Calibration/Proving

- Current – Royalty and allocation meters are required to be verified/calibrated or proved every month not to exceed 42 days. Exception – Liquid hydrocarbon allocation meters may be proved quarterly if the flow rate is less than 50 BPD per meter.

- Future Regulatory Consideration – Allow quarterly verification/calibration or proving of royalty and allocation meters if the flow rate is less than 50 BPD per measurement location (oil) or 1.0 MMCFD per measurement location (gas).

- Waiver requests must be submitted in a timely manner.

Gas Volume Statements (Measurement Audit Statements)

- Regulatory Authority Under 30 CFR 250.1203 (b) (6) & (8)
- Notice To Lessees and Operators (NTL) No. 2003-G20
  - NTL Effective Date: January 1, 2004
  - Submit a copy of the monthly gas volume statement by the last day of the month following production to the PVU
  - Gas volume statement shows <u>gas measurement data</u>, including the volume (MCF) and quality (Btu) of natural gas that flowed through the meter
  - Volume and quality must be reported at 14.73 psia
  - FMP Number and Meter ID and/or Recorder Serial Number must be included on gas volume statement

Gas Volume Statements (Measurement Audit Statements)

- Required Monthly For Each Royalty Meter With An Active ‘Operating’ Or Active ‘Non-Operating’ Meter Status (see NTL No. 2010-N08)
  - Including zero gas volume statements for Active ‘non-operating’ status royalty meters
- Submit A Copy of All Revised Monthly Gas Volume Statements To The PVU
- The Following Documents Are <u>NOT</u> Gas Volume Statements:
  - Summary statements
  - Allocation statements
  - Operator Excel spreadsheets

Gas Volume Statements (Measurement Audit Statements)

Example 1

GAS VOLUME STATEMENT

CLOSED DATA
Sea Robin Pipeline Company
Standard Conditions
In Service

January, 2011

Pressure Base: 14.730 psia **Temperature Base:** 60.00 °F **HV Cond:** Dry **Meter Type:** EFM **Contract Hr.:** 9 AM
Water Vapor Corr. Technique: Equivalent Dry Volume **Water Vapor Corr. Method:** 1955 IGT-Bulletin 8

CO2	N2	H2O	H2S	O2	He	C1	C2	C3	I-C4	N-C4	I-C5	N-C5	C6+
0.654	0.210					90.795	4.537	1.911	0.491	0.608	0.242	0.181	0.371

Tube I.D.	Interval	Tap Location	Tap Type	Atmos. Pressure	Calc. Method	Fpv Method
1.939 in.	1 Hour	Downstream	Flange	14.700 psi	AGA3-1992	AGA8-GM2

Day	Differential (In. H2O)	Pressure (PSIG)	Temperature (°F)	Hours Flow	Relative Density	Plate (inches)	Volume (Mcf)	Heating Value (BTU/scf)	Energy (MMBTU)
1	1.21	902.82	75.61	23.58	0.6375	0.750	24	1123.00	27
2	3.30	910.23	70.21	13.69	0.6375	0.750	24	1123.00	27
3	1.00	913.38	82.88	19.46	0.6375	0.750	24	1123.00	27
29	3.12	912.41	118.52	2.94	0.6375	0.750	20	1123.00	22
30	3.22	917.68	113.08	2.46	0.6375	0.750	17	1123.00	19
31	3.85	907.43	102.90	2.65	0.6375	0.750	22	1123.00	25
TOTAL	2.92	896.28	88.87	207.18	0.6375		782		874

Gas Volume Statements (Measurement Audit Statements)

Example 2

Spectra Energy
M1 - Monthly Gas Meter Volume Statement

Meter:
GQ Source: 73162
Metering Method: Orifice Meter
Data Source: Orifice EFM
Meter Description:

Period: January 2011
Closed Date: 07-Feb-2011 16:55

Pressure Base: 14.73 PSI
Temperature Base: 60 F
Delivery Conditions: Dry
Atmospheric Press: 14.7 PSI

Contact: Connie J. Rice
Phone: 713-627-4578
Fax: 713-989-3165

Time	Stat Rng	Temp Rng	Diff Rng	Tube Dia	Orif Dia	Tap Type	Tap Loc	Press Base	Temp Base	Orif Calc	HV Calc	Supercomp
01-Jan-2011 09:00	0 - 1	1 - 1	0 - 1	6.062	1.250	Flange Tap	Downstream	14.73	60.00	AGA-3 1992	GPA-2145-00	AGA-8 1992 Gross 2

Time	Avg Press (PSIG)	Temp (F)	Diff Prs (inches of H2O)	Flow Time (Minute)	Spec Grav	N2 (mol percent)	CO2 (mol percent)	Heat Val (BTU(IT)/CF)	Volume (MCF @ 15.025 PSI)	Volume (MCF)	Energy (MMBTU(IT))	Modified After Close
01-Jan-2011	1137.47	72.73	6.18	1440.00	0.596	0.294	0.313	1066.000	761.66	776.92	828.19	
02-Jan-2011	1137.47	74.38	5.22	1440.00	0.596	0.294	0.313	1066.000	796.19	812.13	865.74	
03-Jan-2011	1137.47	78.13	5.00	1440.00	0.596	0.294	0.313	1066.000	772.27	787.74	839.73	
30-Jan-2011	1142.85	77.96	4.57	1440.00	0.594	0.272	0.292	1064.000	739.60	754.41	802.69	
31-Jan-2011	1140.55	79.89	4.71	1440.00	0.594	0.272	0.292	1064.000	752.45	767.52	816.65	
Total				44025.00					24361.82	24849.72	26485.33	

Mechanical-Displacement/Tank Prover Calibrations

- Regulatory Requirements Under 30 CFR 250.1202 (f) Are:
  - Calibrate mechanical-displacement and tank provers once every 5 years
  - Submit a copy of the calibration report to the Regional Supervisor within 15 days after the calibration
  - Lessees/Operators often only submit the calibration certificate instead of the entire calibration report

THANK YOU

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