Mexico Series
Challenges in Deepwater Mexico

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Mexico International Account Director
and Deepwater Adviser
January 19, 2015
Houston, Texas
80 Years of continuous operations in México

- Schlumberger logged first well in Mexico
- PEMEX is created
- PEMEX creates its service department
- IMP (Instituto Mexicano del Petróleo) is created
- Cantarell is discovered
- México becomes 4th largest oil exporter in the world
- PEMEX reaches 3,4 MBOPD production
- PEMEX Restructured in 4 Subsidiaries
- PEMEX Reform
- Energy Reform

México Oil and Gas Industry evolution and Schlumberger’s parallel journey
CNH 5 Years Rounds Plan (2015-2019)

Areas / Fields                  Play Type

<table>
<thead>
<tr>
<th>244</th>
<th>Exploitation (Extraction/Production)</th>
</tr>
</thead>
<tbody>
<tr>
<td>379</td>
<td>Exploration Conventional</td>
</tr>
<tr>
<td>74</td>
<td>Burgos</td>
</tr>
<tr>
<td>67</td>
<td>Tampico Misantla</td>
</tr>
<tr>
<td>43</td>
<td>Veracruz</td>
</tr>
<tr>
<td>54</td>
<td>South East Basins</td>
</tr>
<tr>
<td>141</td>
<td>Deep Water (10 in Round 1)</td>
</tr>
<tr>
<td>291</td>
<td>Exploration No-Conventional</td>
</tr>
<tr>
<td>61</td>
<td>in Round 1</td>
</tr>
<tr>
<td>914</td>
<td>Total in 5 years</td>
</tr>
</tbody>
</table>
CNH Round 1.4 Deepwater

Dec 17, 2015: Opened DW Rounds

10 blocks in Perdido and Salina de Istmos Region

Jan 6, 2016 Access to Data Room

Aug 24, 2016, announce pre-qualified companies

Q4 2016, announce winners

http://ronda1.gob.mx/
Known Pre-Miocene/Paleogene Discoveries and Paleogene Trend
Gulf of Mexico as of August 2006

2011: 18 Discoveries/26 attempts
69% Discovery success rate

Source: John R Dribus, SLB + MMS
Gulf of Mexico Deep-water Fold Belts and the Central Gulf Salt Sheet

Source: Modified from Rick Kear, 12/2004
Mexico Deepwater Basins
Regional Technical challenges

Perdido Priority #1: specific challenges
1. Ultra deepwater depths >2900 m (+9500 ft)
2. Shallow geohazards very eminent
3. Logistics challenged-no infrastructure
4. Pore pressure uncertainty (abnormal pressures and strong pore pressure regression)
5. Loop currents and hurricanes
6. Subsea (sand control completions)
7. Paleogene (lower Tertiary) very low recovery factors <low teens %

Oreos Priority #2: specific challenges
1. Same as Perdido
2. Sub-salt drilling hazards
   - Salt exit hazard uncertainty
   - Salt creep, geomechanical uncertainty

Catemaco Priority #3: specific challenges
1. No salt, Water depth less extreme
2. Pore pressure uncertainty
3. HP HT wells
4. Highly fractured – potential for heavy losses

Holok/Temoa Priority #4: specific challenges
1. Shallow geohazards
2. Sub-salt challenges
3. Gas Hydrates
4. Sandstones are gas bearing
5. Carbonates are heavy oil
From 2003 to 2015, Mexico drilled 52 deep and ultra-deep-water wells in water depths ranging from 512 m to +2,900 m.
Mexico Oil and Gas
People and Services
Our Mexico Workforce

Hiring, training, development and retention of the best talent where we work

37 Nationalities

Mexico Offshore
- 1200 employees
- 20 nationalities
- 180 International Staff
Schlumberger – Mexico portfolio

**Reservoir Characterization**
- WesternGeco Land & Marine Seismic
- Wireline Logging
- Testing Services
- Schlumberger Information Solutions
- Petro Technical Services

**Drilling**
- Smith Bits & Advanced Technologies
- M-I SWACO
- Geoservices
- Drilling & Measurements
- Drilling Tools & Remedial Services
- Dynamic Pressure Measurement
- Integrated Project Management

**Reservoir Production**
- Well Services (Cementing, Stimulation)
- Well Intervention (Coiled Tubing, Slickline)
- Completions
- Artificial Lift
- OneSubsea
- Schlumberger Production Management

All SLB Services are available in Mexico with relative easy access to North America resources
Mexico Trade & Customs

2014 SLB Statistics
8391 transactions

Mexico City/Toluca
Customs Declarations: 2687 (IMP) 1046 (EXP) 28 (TEMP)

Manzanillo/Lazaro Cardenas
Customs Declarations: 145 (IMP) 20 (EXP)

Reynosa/Laredo
Customs Declarations: 3413 (IMP) 549 (EXP) 30 (TEMP)

Altamira/Veracruz/Dos Bocas/Progreso
Customs Declarations: 295 (IMP) 168 (EXP) 10 (TEMP)
What is Mexico missing?

MEETING DEEPWATER CHALLENGES

Subsea Risers
Subsea Flowlines
Gas Processing and Reinjection
Surface Well Systems
Tension Leg Platforms
Floating Production Storage & Offloading Vessels
Turret Mooring Systems
Subsea Boosting
Subsea Risers
Subsea Manifold
Guidelineless Deepwater Trees

LAKACH – 1st in Mexico
Deepwater Subsea Gas Development
Mexico Offshore Infrastructure
MEETING MEXICO
Onshore and Offshore Challenges

Mexico – Location of SLB Operational bases and Ports

- **SLB Mega Base** – All services
- **SLB D&M Center** Reliability & Efficiency Maint.
- **SLB Operations Base** or Infrastructure at the port
- **Major onshore lease blocks here**

![Map of Mexico showing SLB Operational bases and Ports](image-url)
Future Potential Port/Base in the North Region
Campeche Region Multiclient Seismic Acquisition
(Shallow and Deepwater)

- Round 1 Blocks with a winner
- Round 1 Blocks without a winner
- Round 0 - Pemex

- Deepwater Region
- B1
- C1
- B2
- C2
- A2
- A1
- 45 km
- 95 km
- 271 km
- 289 km
- 13,000 km²
- 15,000 km²

Approximately 13,000 km² and 15,000 km² are marked in the map.
Phase One
Shallow water

<table>
<thead>
<tr>
<th>Port name</th>
<th>Draft in the port to dock side</th>
<th>Port security</th>
<th>Airport</th>
<th>Air type</th>
<th>Helicopter</th>
<th>Personal Risk level</th>
<th>SLB facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coatzacoalcos</td>
<td>4.1 m, anchorage point = 12.5 m</td>
<td>Port entry gate</td>
<td>CME (Carmen)</td>
<td>Daily Natl and Intl Flights</td>
<td>CME airport</td>
<td>Low</td>
<td>Large SLB Operational presence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Only Western Geico Boats present</td>
</tr>
<tr>
<td>Dos Bocas</td>
<td>6.1 m (to be dredged to 9.75 m in July 2015)</td>
<td>Port entry gate</td>
<td>VSA (Villahermosa) 90 km away</td>
<td>Daily Natl and Intl Flights</td>
<td>Located at Dos Bocas Port</td>
<td>Low</td>
<td>MI &amp; WS Stimulation plants, SLB support office in Paraiso (&lt;5 km from port)</td>
</tr>
</tbody>
</table>
Security
1. Define Risk Level through Risk Evaluation Tool.
2. Implement Security Measures.
3. Follow up
Col. Villa las Flores, Infonavit Las Gaviotas, La rueda, Independencia, Prensa nacional, Lázaro Cárdenas, Las vegas, Nacional, Los Laureles, Arroyo del maíz, Insurgentes I, II, Ignacio Zaragoza, Las granjas, Laredo, Flores Magón, Ampliación Morelos, Complejo Pemex, Pescadería y Mercado, Cementerio, Infonavit Coatzintla, José Ma Morelos y Pavón, Kawatzin, Faja de Oro, Troncones y potrerillos.

New Multi Client Seismic Programs for Exploration offshore Mexico
Mexico Multi Client Portfolio

High end portfolio designed to address different imaging challenges in Mexico

Schlumberger Multiclient portfolio provides the largest and most comprehensive seismic program in Mexico

Our program covers the offshore Yucatan platform, the deep waters of the Campeche Escarpment; the highly prospective corridor of Comalcalco and Salinas Del Istmo basins, the Mexican Ridges; and Perdido basin

Our projects:
- Campeche 3D WAZ (ongoing)
- Perdido 3D WAZ
- Campeche Re-Imaging
- Perdido Re-Imaging
- Campeche-Yucatan Regional 2D – JV with PGS & SpectrumGeo (ongoing)
Campeche WAZ Program

**Campeche WAZ Acquisition:** 75,000 km² of WAZ 3D seismic data.

Campeche WAZ 1 acquisition started on July 28, 2015 and expected completion in Feb 2016

- Pre-stack fast track products will be delivered in two phases: first phase by end of 2015 and second phase 6 weeks after last shot point

Campeche WAZ 2 expected completion in December 2015

- Pre-stack fast track product will be delivered 6 weeks after last shot point

- Full broadband RTM image delivered 10 months after end of acquisition
Multi-Client Re-Processing Existing 3D Seismic

**Perdido Re-imaging**: 46,000 km² of WAZ and NAZ
- Tie the US GOM Alaminos Canyon protraction area to the offshore Mexico Perdido by incorporating existing NAZ and WAZ seismic surveys, over an area of 46,000 sq km.
- Existing legacy fast track volume (delivered upon signature of the licensing agreement)
- Re-Imaging Fast Track, Final RTM Image volume raw & with filtering and scaling, Final velocity model & salt horizons

**Campeche Re-imaging**: 60,000 km² of 3D seismic data to cover deep and shallow water blocks
- Consistent data after 6 weeks of CNH data delivery
- Final product (Kir & RTM) after one year
**Perdido WAZ Program**

**Perdido WAZ Acquisition:** 45,000 km² of WAZ/FAZ 3D seismic data.

- Permit in process with CNH
- To be acquired in 3 phases covering most of the 5 year plan blocks
- Acquisition across the border into Alaminos Canyon to produce a uniform and contiguous product
Sea Floor Elevation Profiles
Campeche Shallow water blocks
Linear WAZ Geometry & Shallow Hazard Cubes

- Linear WAZ Geometries enable illumination of complex salt bodies and sub-salt features.

- Geohazard cube can be generated out of these WAZ data.

Highly Rugose sea floor
Deepwater GOM USA and Deepwater Mexico Reference material

NOTE: MUST REGISTER FIRST

- Enter Deepwater Mexico for GOM USA articles or
- Enter Deepwater Pemex for Mexico articles

Resources
Case studies
Industry articles in SEG, AAPG, SPE, SPWLA, IADC, OTC etc
Thank You

Questions

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