PCSB Domestic Idle Well Data Management

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Technical Data, Technical Global
PETRONAS Carigali Sdn. Bhd. (PCSB)

Digital Energy Journal Conference, Kuala Lumpur:
Doing more with Subsurface, Production & Drilling Data
5th October 2015
Impiana Hotel, Kuala Lumpur

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Overview

- What is an idle well?
- Business driver for idle well management
- Issues without idle well data management
- Scope of idle well data management
  - Solution architecture
  - Idle well dashboard
- Conclusion
  - Benefits of idle well data management
What is an Idle String?

PETRONAS definition: A string that has not produced or injected for more than 90 consecutive days. The idle string is categorised based on the state of its capacity.

- Effective
  - Facilities
  - Mechanical
  - Operations
  - Artificial Lift
  - Remedial

- Non-Effective
  - Facilities Limit
  - Reservoir Management

- Depleted
  - Reservoir
  - Ultimate Recovery
Business Driver for Idle Well Management

- Achieve management target of having 85% well availability.
- Fast and precise decision making for well activities prioritization.
- Achieve PCSB’s production targets.
Issues Before Idle Well Data Management Rollout

Idle Well Data Issues

- No single source of truth leading to inconsistent information flow
- Data scattered & not stored in centralised manner
- Multiple versions of excel spreadsheet with different individual
- Manual data capture and consolidation
- Inconsistent reporting format
- Data manipulation for management reporting
- Management do not have overall picture of well availability and idle status tracking
- Manual and cumbersome tracking of initiatives for well reactivation
- Pending well reactivation plans might not be captured
- Difficulty in estimating soon to be idle wells
Solution Architecture

- Existing production database, PETRONAS Global Production System (PGPS) was chosen as the platform to manage the data

Diagram:
- PGPS
- Auto generate idle candidate list
- Verification process
- Idle well dashboard
Why is PGPS an Ideal Platform?

- Most of production related data has been captured in PGPS
  - Automated idle string inventory can be generated
  - Well-structured workflow can be introduced for idle well management

- PGPS is a readily available resource, there is no need for investment in a new system.

- Users who are involved in idle well management are already familiar with PGPS.
Idle Well Standard Dashboard

Idle Well Report
Report for JUN-2015
Data as of 01-JUN-2015 0000hrs

REGIONAL WELL INVENTORY

<table>
<thead>
<tr>
<th>Well Inventory</th>
<th>PMO</th>
<th>SKO</th>
<th>SBO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>200</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>Emerging</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Idle</td>
<td>60</td>
<td>80</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>290</td>
<td>420</td>
<td>200</td>
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<tr>
<td>% Active String</td>
<td>79.3</td>
<td>81.0</td>
<td>75.0</td>
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MALAYSIA WELL INVENTORY

<table>
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<th>Well Inventory</th>
<th>Malaysia</th>
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<tr>
<td>Active</td>
<td>600</td>
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<tr>
<td>Emerging</td>
<td>120</td>
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<tr>
<td>Idle</td>
<td>190</td>
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<tr>
<td>Total</td>
<td>910</td>
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<tr>
<td>% Active String</td>
<td>79.1</td>
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Idle Well Standard Dashboard

Report for JUL-2015
Data as of 01-JUL-2015 0000hrs

Idle Well Inventory: Oil Producer

<table>
<thead>
<tr>
<th>Locked-In Potential (bbl/d)</th>
<th>PMO</th>
<th>SKO</th>
<th>SBO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective Idle (EI)</td>
<td>4,000</td>
<td>2,060</td>
<td>1,500</td>
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<tr>
<td>Non-Effective Idle (NEI)</td>
<td>1,300</td>
<td>6,000</td>
<td>820</td>
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<tr>
<td>Depleted (D)</td>
<td>50</td>
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</tr>
<tr>
<td>Total</td>
<td>5,350</td>
<td>8,360</td>
<td>2,520</td>
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Idle Well Inventory: Gas Producer

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<th>Locked-In Potential (MMscf/d)</th>
<th>PMO</th>
<th>SKO</th>
<th>SBO</th>
</tr>
</thead>
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<tr>
<td>Effective Idle (EI)</td>
<td>89.00</td>
<td>300.00</td>
<td>400.00</td>
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<tr>
<td>Non-Effective Idle (NEI)</td>
<td>8.20</td>
<td>15.00</td>
<td>4.35</td>
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<tr>
<td>Depleted (D)</td>
<td>0.50</td>
<td>0.80</td>
<td>0.99</td>
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<tr>
<td>Total</td>
<td>97.70</td>
<td>315.80</td>
<td>405.34</td>
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Idle Well Standard Dashboard

Report for JUN-2015
Data as of 01-JUN-2015 0000hrs

Total Idle, Growth & Restored String – Field X

<table>
<thead>
<tr>
<th>Month</th>
<th>Total Idle</th>
<th>Plan of reactivation (WPB)</th>
<th>Restoration</th>
<th>Growth</th>
<th>Actual Gain Oil (bbl/d)</th>
<th>Gas (MMscf/)</th>
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<td>Dec-15</td>
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<td>2</td>
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<tr>
<td>Mar</td>
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<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>373</td>
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<tr>
<td>Apr</td>
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<td>1</td>
<td>0</td>
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<tr>
<td>May</td>
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<td>Dec</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Total: 2 | 373 | 0
Idle Well Standard Dashboard

Report for JUN-2015
Data as of 01-SEP-2015 0000hrs

Idle Well Proposal Status Movement – SKO

Number of strings

JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC

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## Conclusion - Benefits of Idle Well Data Management

### Before
- No Centralised data storage
- No single source of truth
- Difficulty of tracking emerging idle and manual tracking of initiatives for well reactivation
- Data manipulation for management reporting
- Time consuming process for HQ to gather data for management reporting
- Inconsistent reporting format

### Current
- Centralised data storage
- PGPS is the single source of truth
- Automated email notification and graphical representation in report
- Management idle well report restricted to management team
- Fast report generation
- Standard reporting across all domestic fields
Thank you

Acknowledgment to team members:

• Ngu King Chai
• Naveen Gupta
• Rizuwan Zaz Wandy
• Nur Ismawati
Paper Abstract

Leaving a well idle is equivalent to losing production from that well. Many of the idle wells are potential producers and majority of these wells stop producing due to operational issues instead of due to depleted resources. Prematurely plugging these wells would cause permanent loss of large quantities of oil and gas. An effective and efficient idle management system is important to achieve the high well availability. Properly managed idle well data provides a timely, consistent and accurate information to production technologist that will assist in faster and better decisions on managing these idle wells.

PCSB have a standard practice which makes full use of the existing production and deferment data to generate the idle well inventory automatically. This paper highlights the standardize and systematic idle well data management workflow and reporting (dashboard) that provides information transparency to PCSB production technologist and management in helping them monitor and take action to restore the idle well in a prudent manner in line to support PCSB meet its production target.