Petrobras implements web applications to meet regulatory changes in Well Integrity

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HOW DID WE START?

ANP new regulation for well integrity management (2016)

PETROBRAS needed to implement several systems to guarantee the documental requirements for well integrity management specified in SGIP (Sistema de Gerenciamento de Integridade de Poço).

Many management requirements including:

- Well Integrity information and documentation
- Workforce shifts
- People certification
- Equipment quality
- Audits
- Well Integrity Incidents
- Well Safety Barriers definition
- Many others...

First Deadline: nov/2018
After negotiation: nov/2020
HOW DID WE START?

ANP new regulation for well integrity management (2016)

PETROBRAS needed to implement several systems to guarantee the documental requirements for well integrity management specified in SGIP.

Requirements

- Compliance and Documentation
- Wells Technical Info
- Interface between Wells and Production

Proposed Solutions

- DecisionSpace® Integration Server
- POÇO WEB
- Wellsom
HOW DID WE START?

ANP new regulation for well integrity management (2016)

PETROBRAS needed to implement several systems to guarantee the documental requirements for well integrity management specified in SGIP.

DSIS Applications
- SISP – Integrity management for wells and rigs
- APTO – People certification control
- SPOB – Offshore crew management
- LESSONS – Critical equipment life cycle
- SSMS – HSE Management

PoçoWEB Applications
- CSB – Well safety barriers calculator
- WellHandover – Critical equipment life cycle
- Matriz – Well Complexity Matrix

Production Applications
- Wellsom – Production Area Information System
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Development Timeline

- Oct-14: Poço Web Portal - Matriz (Well Complexity)
- Mar-16: WELLSOM (Production Info)
- Nov-16: ANP Regulation (Well Integrity Management)
- Jan-17: SISP (Rig Equipment and Well Integrity control)
- Nov-17: CSB (Well Safety Barriers)
- Dec-17: APTO (People certification Control)
- Sep-18: Well Handover (Wells information for Production)
- Jun-19: LESSONS (Lessons learned management)
- Jul-19: SPOB (People on board management)
- Dec-19*: SSMS Ocorrências (Wells HSE information)

Developers:

- Petrobras
- Halliburton
- Intelie
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PORTAL CTPS (DSIS)

**Objective:** Centralize many developments in Wells Area related to Well Integrity in order to attend Brazilian Regulation.
PORTAL CTPS (DSIS)

**Objective:** Centralize many developments in Wells Area related to Well Integrity in order to attend Brazilian Regulation.

1. SISP
2. SSMS Suite
3. LESSONS
4. APTO
5. SPOB
**Objective:** Monitor *documental compliance* for well control and rig during well interventions (construction, maintenance and abandonment).

- Rig equipment certificate
- *Holdpoints (stop the operation)*
- *Check points (don’t stop the operation)*
- Change Management
- Documents
PORTAL CTPS (DSIS)

Objective: Centralize many developments in Wells Area related to Well Integrity in order to attend Brazilian Regulation.

1. SISP
2. SSMS Suite
3. LESSONS
4. APTO
5. SPOB
SSMS Suite - HSE-related systems

Objective: Centralize Wells HSE information through six modules:

**Production**
- Automated Safety Alerts;

**Development in progress**
- Ocorrências
  - Agency communication
  - Safety Incidents registration
  - Action plan evaluation;

**Future development**
- Documents Compliance;
- Audits management
- BI-panels;
- 3rd parties ranking (HSE performance)
### SSMS Suite - HSE-related systems

**Alerts System:** overview

![Alerts System](image_url)

**Legend**
Objective: Centralize many developments in Wells Area related to Well Integrity in order to attend Brazilian Regulation.
LESSONS – MANAGEMENT OF LESSONS LEARNED

Objective: Make “PETROBRAS experts consciousness” accessible to all the workforce.

- Reduce dependency on human memory
- From well design to well construction/interventions

Freeing stuck pipe in salt sections

- Water slug 65%
- Drilling Jar 72%
- Water slug and drilling Jar 93%

[Graph showing data on well interventions]
LESSONS – MANAGEMENT OF LESSONS LEARNED

Objective: Make “PETROBRAS experts consciousness” accessible to all the workforce.

- Link with well construction ontology.

Lessons from OpenWells®

Well construction ontology

# L01
# L02
# L12
# L107
LESSONS – MANAGEMENT OF LESSONS LEARNED

Objective: Make “PETROBRAS experts consciousness” accessible to all the workforce.

- Gamification concept.
Objective: Centralize many developments in Wells Area related to Well Integrity in order to attend Brazilian Regulation.
**Objective:** Evaluate offshore crew certificates to execute the functions they are assigned for the operations.
Objective: Centralize many developments in Wells Area related to Well Integrity in order to attend Brazilian Regulation.
Objective: Control people on board to manage people rotation in all the rigs

- Monitor employees
  (rig and period on board)
- Manage the people rotation
- Integration with APTO
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1. WELL HANDOVER

2. CSB

3. MATRIZ
**Objective:** Software used to consolidate all the wells information necessary for the Production Area to safely operate them.
1. WELL HANDOVER

2. CSB

3. MATRIZ
Objective: Software used to draw all well safety barriers from the list of equipments installed. All the well configuration is automatically imported from POÇOWEB.
POCOWEB

1. WELL HANDOVER

2. CSB

3. MATRIZ
Matriz – Well Complexity information

**Objective:** Software used to categorize wells by its complexity. Categorization based on predefined checklists.
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**Objective:** Software used to centralize Production information for Well Handover.
WELLSOM (Life cycle information)
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WELL HANDOVER INTEGRATION

OpenWells

Wells Information

DADOS BÁSICOS

CSB

MATRIZ

WELLS HANDOVER

Production Information

Wellsom
Development Timeline

2014
Oct-14
Poço Web Portal
- Matriz (Well Complexity)

2015
Mar-16
- WELLSONS (Production)

2016
Aug-16
- ANP Regulation (Well Integrity Management)

2017
Oct-17
- LESSONS (Lessons learned management)

2018
Nov-18
- SSMS Ocorrências (Wells HSE information)

2019
Jan-19
- SISP (Rig Equipment and Well Integrity control)

Dec-19*
- LESSONS (Lessons learned management)

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First Deadline: Nov/2018
After negotiation: Nov/2020

Many management requirements including:
- Well Integrity information and documentation
- Well integrity incidents verification
- Well integrity barriers definition
- Many others...

Developers:
PETROBRAS
HALLIBURTON
INTELIE
QUESTIONS?

POCOS/CTPS/EO (Wells Automation)

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