A digital transformation journey for a mature field using production technologies and innovation principles

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Senior Production Engineer

The world is changing

1920

1970

2010

Now

$1M* Cost Saving
in Nigeria via IoT sensors & connectivity

6%* Production Increase
in US via Ambyint' s AI-powered artificial lift solution

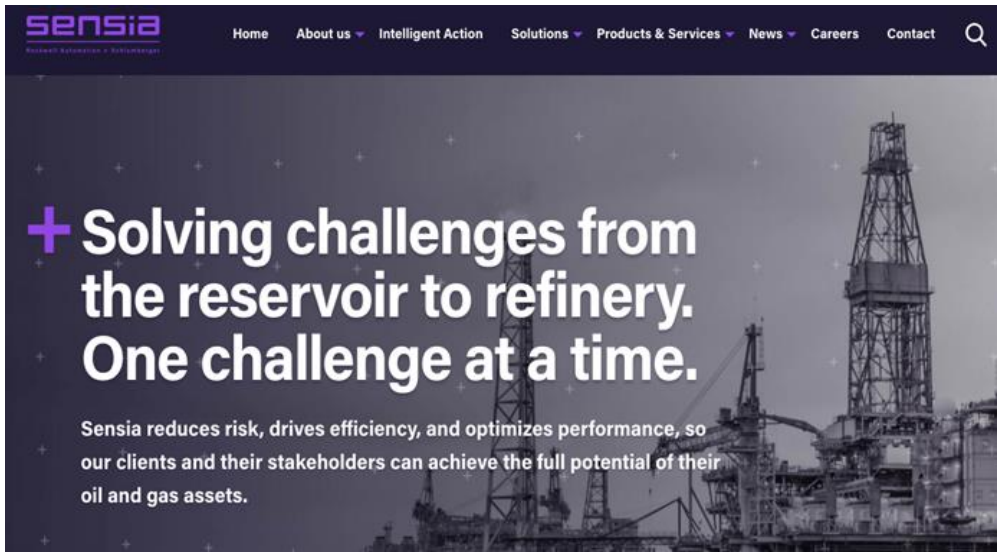
Adapting to Oil and Gas Industry

Agora

- Startup created and incubated by Schlumberger
- Think big, prototype small, and scale fast
- IIoT platform—edge computing with ML/AI

Sensia

- JV between Schlumberger and Rockwell
- Process automation +Petrotechnical Expertise
- 1,000+ experts serving customers globally



Problem Definition

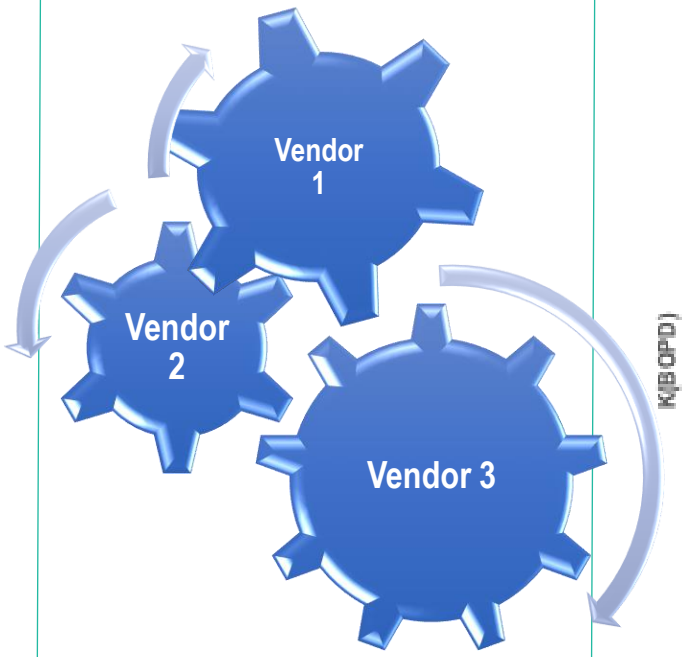
Challenge
Mixed equipment and Opex concerns

400+ Assets
(ESP, Meters, SRP etc…)

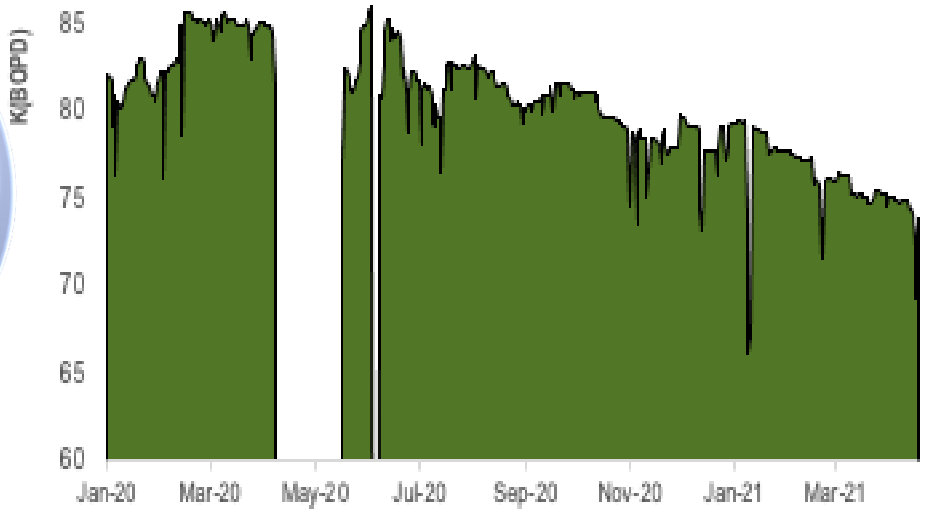
5,000+ Field Visit/Quarter

~72,000 km Driven/Quarter

Vendors
Lack of integration



Operator
Declining production and increasing costs



Manage production decline (29%)

Excellence in Execution

Proposed Solution

Digital Production Approach

ProdOps

3. Production Workflow Orchestrator

sensia
Rockwell Automation + Schlumberger

Automation ⇄ Edge Computing

Agora

Micro-solutions

2. Automation & Control

Smart Physical Assets

259 x Producers

3 x Injectors

1 x Flare

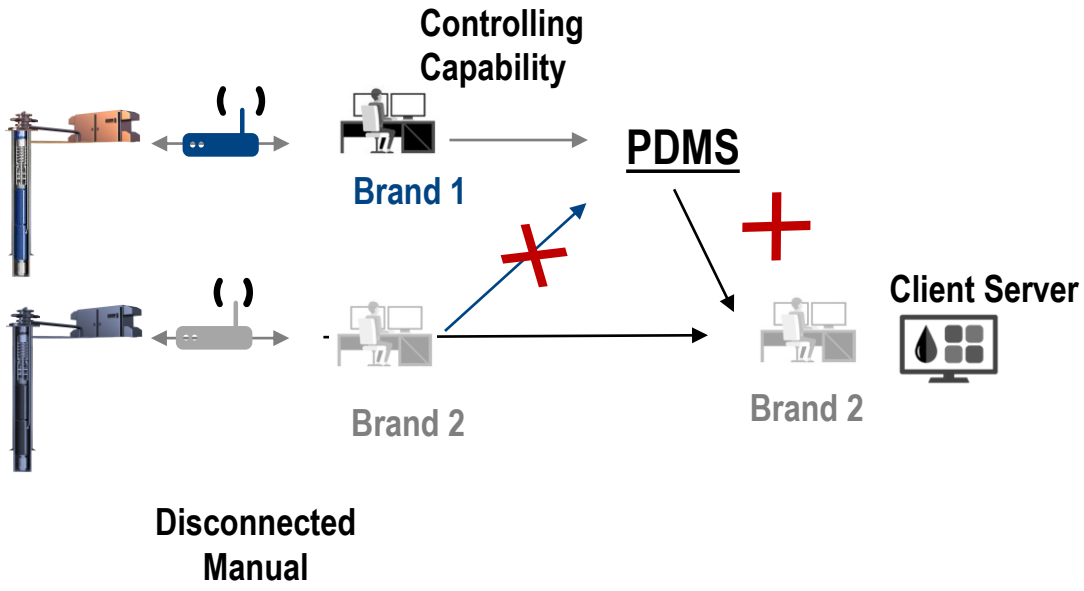
1 x Vx Spectra

4 x HPS

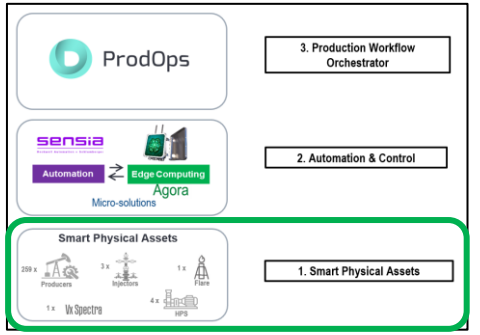
1. Smart Physical Assets

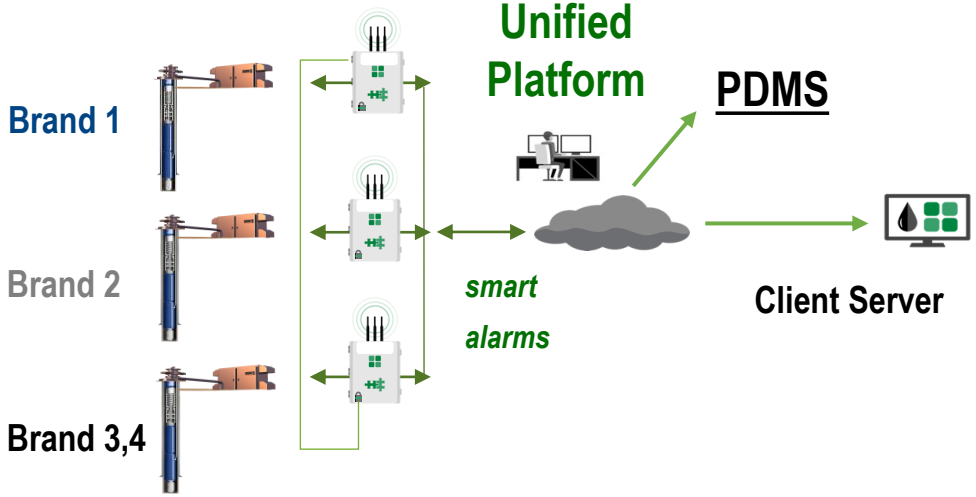
Excellence in Execution

The Compelling Event - The ESP Surveillance



Problem



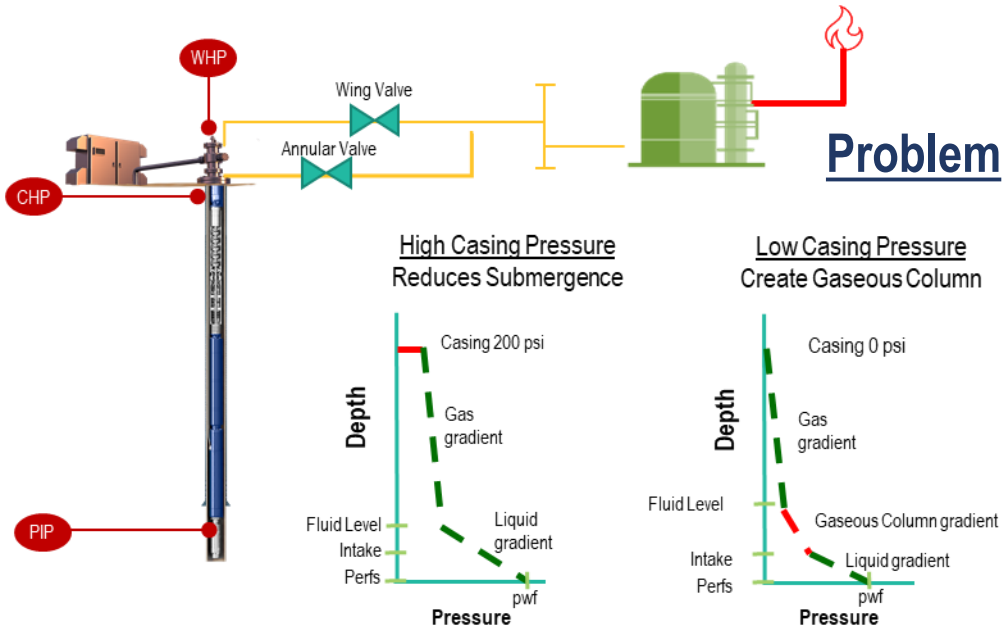


Solution

Reduce downtime and improve people efficiency

- Contextualized data aggregation, transmission, and visualization for multiple vendors
- Early Events Detection (Change manual process)
- Provide edge AI at the well site with smart alarms
- Decrease field visits for operations support
- Reduce kilometers and CO_2 emissions

Moving to the next Level - Annular Gas Handling

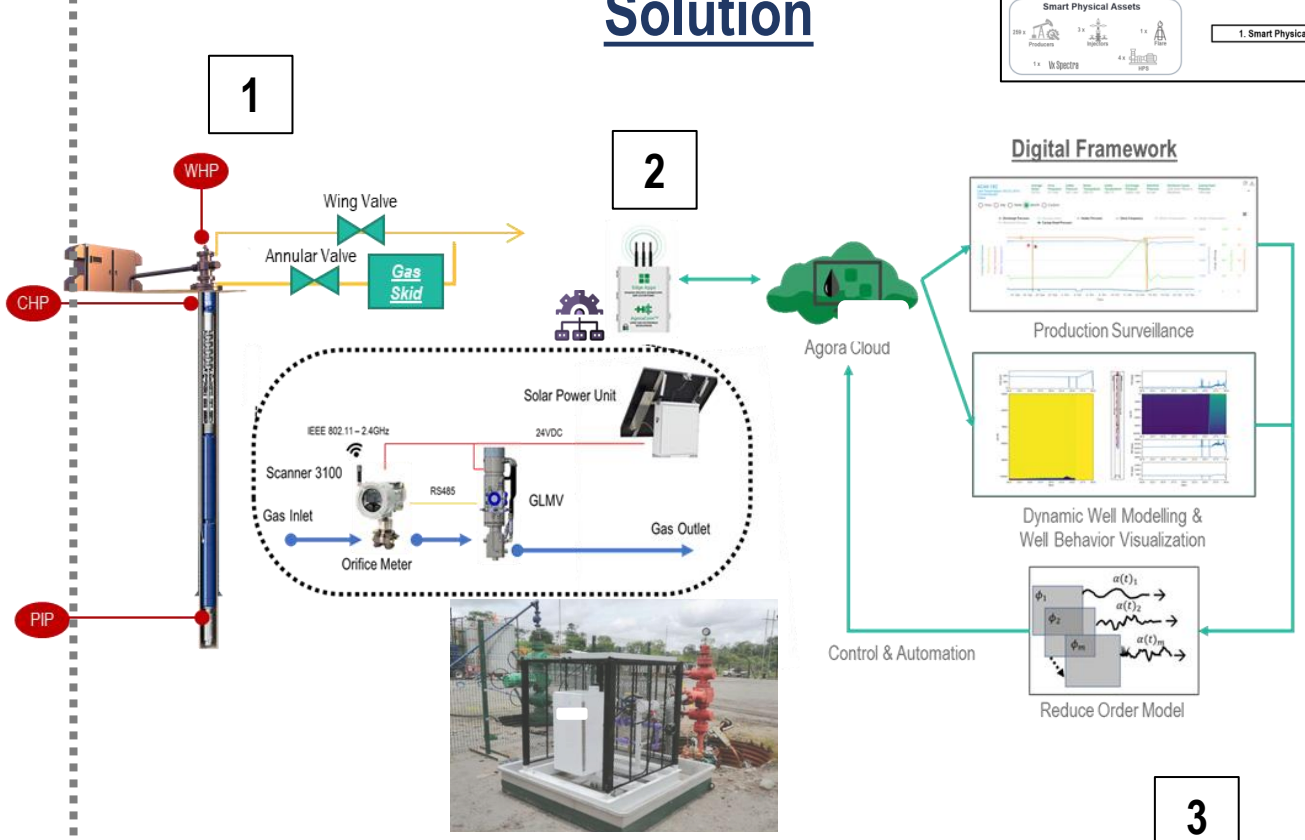


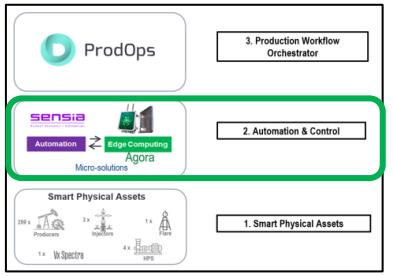
Problem

Previous Operation

- Manual bleed off annulus
- ~100 trips/month/well to optimize production
- High PIP fluctuation – ESP performance
- Non-optimized wells

Solution



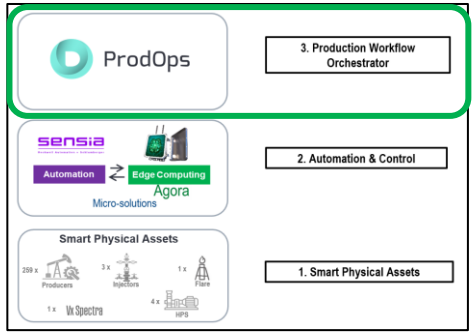


Current Operation

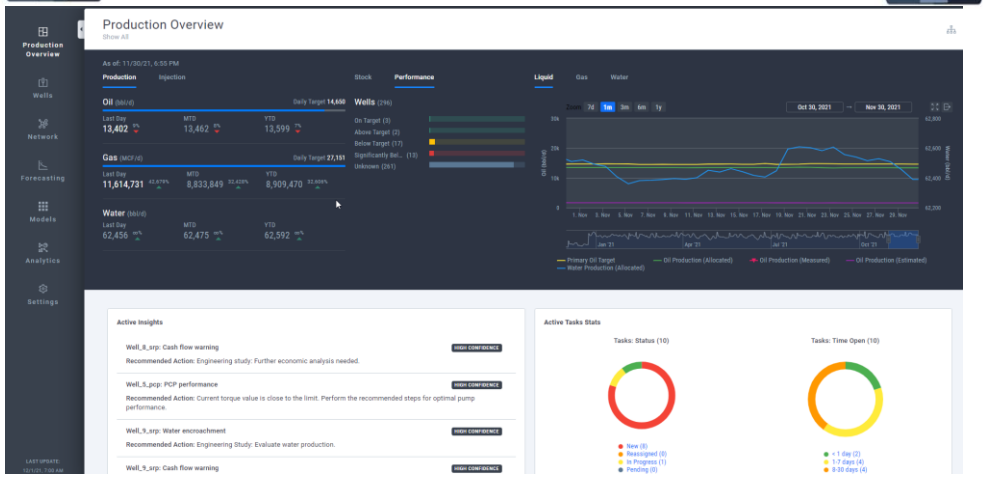
- Production Optimization
- ESP Power Consumption Reduction
- Reduce driving to location (connected, no valve manipulation)

Excellence in Execution

Production Workflows Orchestrator



- ✓ Concept Selection
- ✓ Design
- ✓ Define Plan
- ✓ Deploy
- ✓ Well Construction

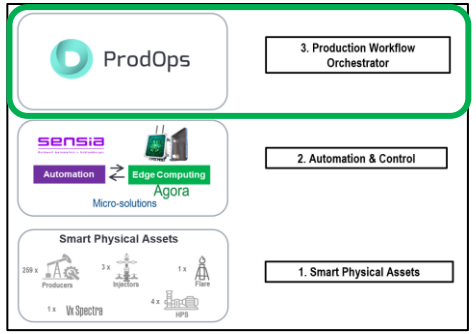


- ✓ Surveillance
- ✓ Analysis
- ✓ Diagnostics
- ✓ Optimization
- ✓ Decisions

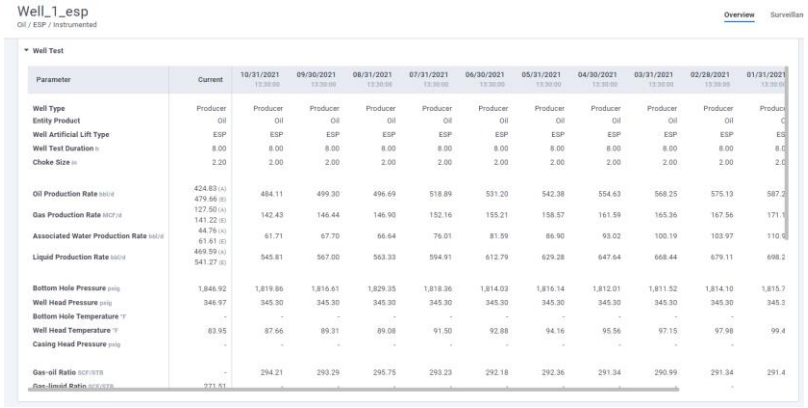
Well (Performance) → Network (Debottlenecking, Integrity) → Facility (Optimization) → Reservoir Management

Excellence in Execution

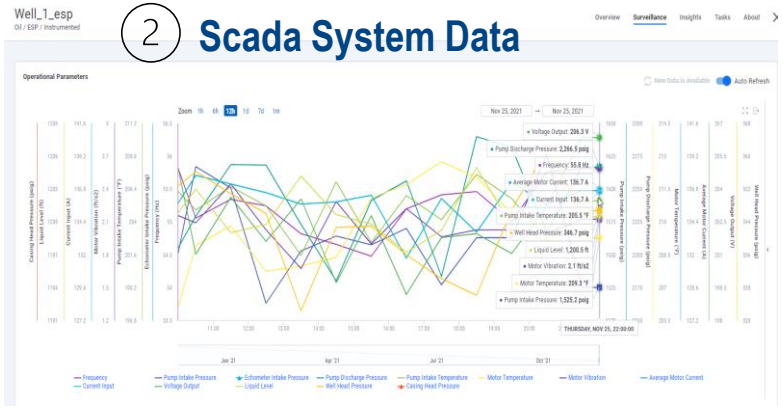
Production Workflows Orchestrator



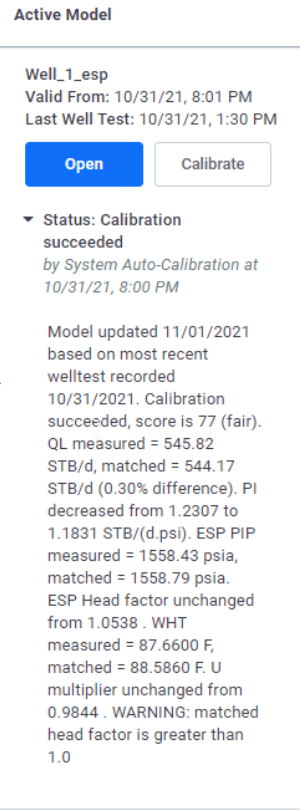
1 Operational Data



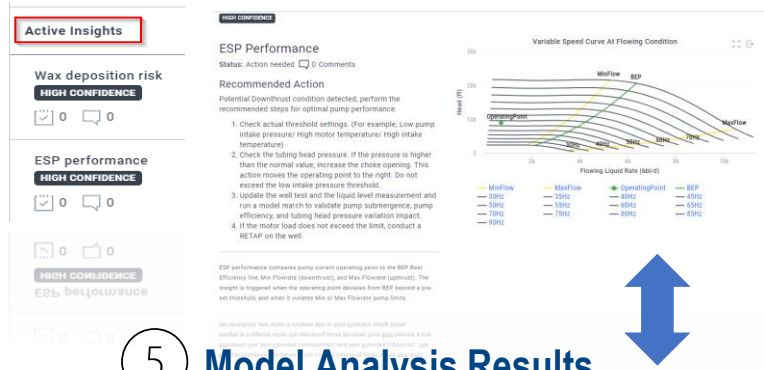
2 Scada System Data



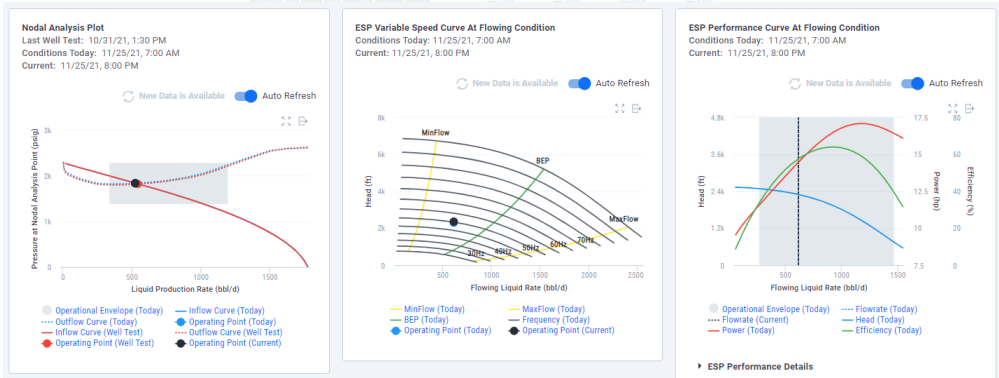
3 Software Integration

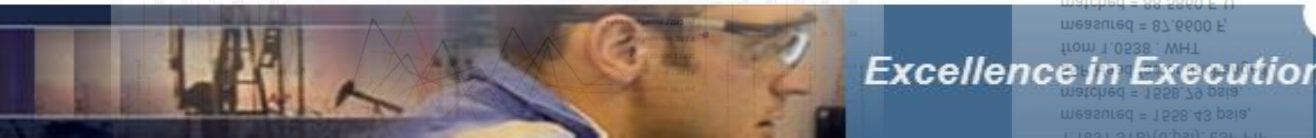


4 Machine Learning Algorithms



5 Model Analysis Results





Created Value

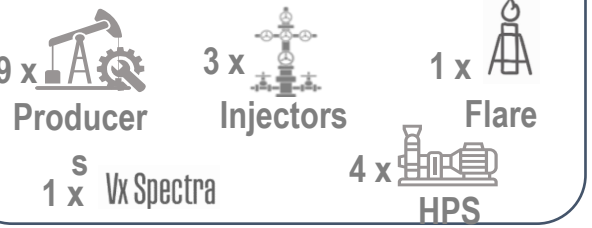
Production Workflow Orchestrator

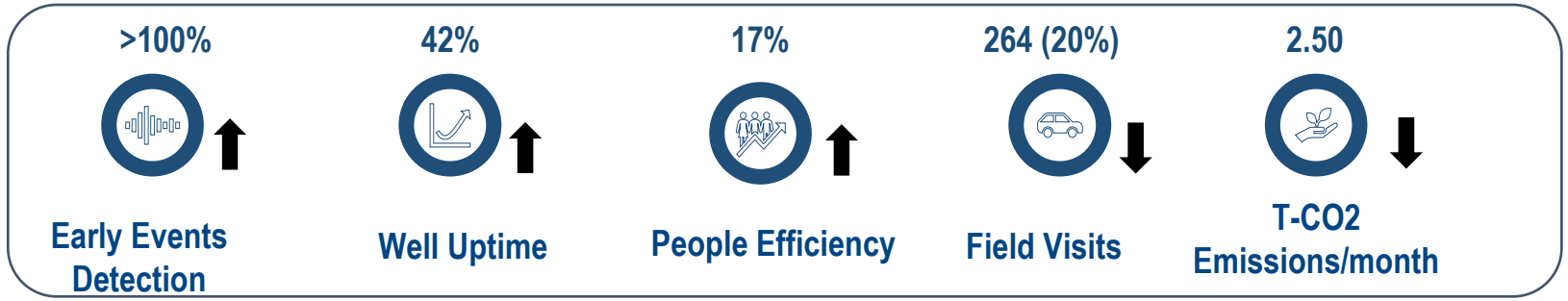
Silos Breaking (Zones Distribution)

Asset Built ("Build Your Own")

Control & Automation

Automation ⇄ Edge Computing





Excellence in Execution

Conclusions

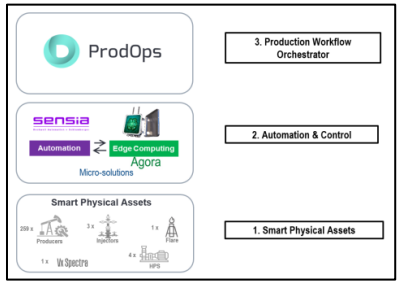
1. Remote centers expansion

2. Reduce operational costs

3. ML and AI unlock production

4. Personnel Exposure

5. Environmental Commitment



6. Digital Production Approach

Acknowledgments

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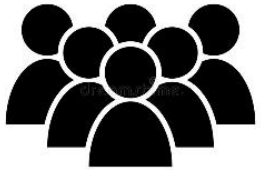
Willian Guerrero
Production Engineer



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thank you
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rahmat
diolch
ευχαριστώ
merci
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감사합니다
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