Rapid Digital Oil Field transformation Based on Edge Computing

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ARABIAN GULF OIL COMPANY
Introduction

One of National Oil Company in Libya

Production Capacity ~ 400K BOPD
50 years in operation

Sustainable Production Enhancement
Performance Driven by Technology

Enable Data Driven Decision Making
Leverage Digital Technologies To Maximize Team Efficiency
Develop Rapid and Scalable Digital Oil Field

IT & Production Department Shared Vision

Schlumberger
Edge Computing Solutions
Project Background

Remote Greenfield

- 30K BOPD Target
- Limited Infrastructure
- Site & Asset Security

Peak Performance

- Digital Enablement – Day “0”
- Maximize Well & Network efficiency
- Safety

50 Km

50 Km
Challenges and Goal

Virtual Flow Metering

DIGITAL TWIN
Solution Architecture

ASSETS
Oilfield devices and equipment

EDGE
Real-time data acquisition, computing and control

ADVISORY & ANALYTICS
Surveillance and Opportunities

DATA INTEGRATION
Existing BI & Applications

AUTOMATION
Sense Control

INTELLIGENCE
Analyze Optimize

AGORA OPS PORTAL

NETWORK LEVEL

WELL LEVEL

Flexible Analytics

Power BI
# Key Features of the Solution

## Virtual Flow Metering
- Naturally Flowing Well - Choke VFM
- Wells with ESP – PIPESIM on Edge

## Site Security
- Motion Detection Video Analytics
- Alarm System

## Packaged Solution
- SENSIA
- Production System – ESP / Metering & Valves
- Power & Connectivity

![Diagram of solution components: ESP Controller, Cameras, AGORA + Connectivity, Power + Instrumentation]
Virtual Flow Metering: Natural Flow Well

Output: RT Liquid Flow Rate

Initial Calibration

Trending THP and FLP

Well Test Data
WELL TEST DATA: MODEL CALIBRATION

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Site Security: Machine Learned Analytics

Security of AL equipment, Fuel Tanks and Instrumentation

Real Time Video Analytics at EDGE

Cost of Satellite Data Makes Normal Video Surveillance Economically Unviable in Remote Fields

- Minimal Data Transmission
- Economic Viability Achieved
Well Network Integration Model

PIESIM INTEGRATION:

- Agora data is consumed in PIP Network model.
- Production optimization.
- New Well Design
- Production bottleneck identification.
Data Ingestion from AGORA cloud to Our Databases and Application
Value Realization

- Digital Oil field in Green fields
- Package: Sensors, Power, Connectivity and Edge AI Intelligence
- 1st Ever: Edge deployment for Asset Security, Edge Flow rate
- Wells and Network performance: KPI Tracking
- Asset Security: HSE related trips reduced by 90%
- CO2 emission reduction: 16T / deployment / Year
- Planned scale Up: Gas Lift Optimization, Choke Control
Thank You!!

Q & A