Making smart decisions for an asset, integrating models achieving efficient and sustainable operations for HOCOL

September 21-23th / 2022
Lucerne - Switzerland
HOCOL STRATEGIC PRIORITIES TO BE SUSTAINABLE.

Hocol belongs to Ecopetrol Business Group

Growth
Energy transition

Returns
Knowledge
Sustainable

People
Environment
Agility
Growth
Communities

GENERATION OF VALUE
## BENEFITS OF APPLYING INTEGRATED MODELS

### INCREASE RESERVES
- Up to 10%
- RF: 80%

### ANALYSIS & SENSITIVITIES
- Unlimited full integrated model with insights all variables

### DIGITAL TRANSFORMATION
- Use Big Data & Cloud

### PRODUCTIVITY INCREASE
- Full cycle analysis reduces 80% of manpower time.

### CONNECTIVITY & TEAM WORK
- Integration Reservoir, Wells & Facilities

### EMISSIONS REDUCTION
- Zero CO2 emissions
- Arjona Case
PROJECT SCOPE - WHAT ARE WE EXPECTING?

1. Understanding
   Understand the asset behavior and create strategies to increase production.

2. Validation
   Validate operational decisions to keep gas production stable over time.

3. Creation
   Create an effective and fast digital solution.

4. Integration
   Integrate reservoir, production & facilities teams to get the best field development plan.

5. Fast
   Provide a fast model capable to run unlimited sensitivities of any variable in any node.
MAK I NG SMART D E CI SI O NS

Reservoir Modeling +
Wells & Networks

PETREL
INTERSECT
ECLIPSE
OIL FIELD MANAGEMENT
Integrated model complete with IAM
PRODUCTION PROFILES

- Increase 10% reserves
- Production adjustment to commercial conditions
- Extend Plateau
WELL BEHAVIOUR: LIQUID LOADING PREDICTION

(LLVR > 1) Critical rate to unload Water

Outlet -LLVR

Outlet –Gas Velocity (ft/s)

LLVR > 1
FLOW ASSURANCE

Use integration model to avoid solid formation & minimize pressure drop.

Solids Formation

Network Flow Limits
FACILITIES LIMITATIONS

Facility adjustment optimization to ensure product conditions

By reducing the operating pressure at the plant entrance, the efficiency of the dehydration tower decreases.

As the inlet pressure to the production separator decreases, an increase in the water content is observed in the gas stream towards the J-T process and in the gas for sale.
MAKING SMART DECISIONS
EMISSION CO2 REDUCTION

Dewatering Flaring Reduction

Emissions [TonCO2e] Arjona Field

High Gas emissions due to Keep operational gas well conditions

Reduce Considerably Dewatering Facilities Process

Compresor System Reach Zero

Well type

ARJONA

SLB-Private
EMISSION CO2 REDUCTION

Dewatering Flaring Reduction

Cumulative Emissions [TonCO2e] Arjona Field

- **2020 High Em**
  - YE 2020: 2386

- **2021 Min Em**
  - 712 Tons CO2e Less than last year
  - 1009 Tons CO2e Less than 2020
  - YE 2021: 1134

- **2022 Zero Em**
  - 143
**NEXT STEPS**

**IT REQUIREMENTS**

- Include IAM in (DELFII) environment. Faster & high-performance models.

**PRODOPS INTEGRATION**

- Automate real data with ProdOps ML/AI algorithms.
- Include FDP planner to evaluate economical decisions.

**ENVIRONMENTAL TASKS**

- Energy savings strategies
- Carbon footprint reduction
- Create new products from production processes wastes.
- End-to-end emissions solutions (SEES).

**VISUALIZATION AND KNOWLEDGE SHARE**

- Improve dashboards visualization.
# ACKNOWLEDGMENT

## Team HOCOL
- Hugo Roberto Caycedo Garcia (DM)
- Diana Marcela Pérez Rodríguez (RE)
- Gerson Orlando Rivera Ortega (RE)
- Jose Manuel Bermúdez González (RE)
- Wilson Murillo (PE)

## Team SLB-GU-ECP
- Linda Cristina Guevara Saavedra (PL)
- Olga Lucia Villarreal Barragán (AM)
- Julieta Alvarez Martinez (PL)
- Dulce Roció Canul (PE)
- Sasha Baptista Parra (PE)
- Nicolas Gomez Bustamante (PE)
- Diana Marcela Victoria (RE)
- Ruben Dario Gutierrez Bedoya (RE)
- Jesus Antonio Borjas Nery (PE)
¡THANK YOU!

www.hocol.com.co - Colombia

QR CODE
Do not hesitate to contact me
Diego Rodriguez
Production Technology Engineer