



Marginal and Mature Field Development and Operation

6 – 7 August 2024 | KUALA LUMPUR, MALAYSIA

11 key initiatives proved to be indispensable for a productive, safe, and profitable mature field reactivation applied in Mexico.

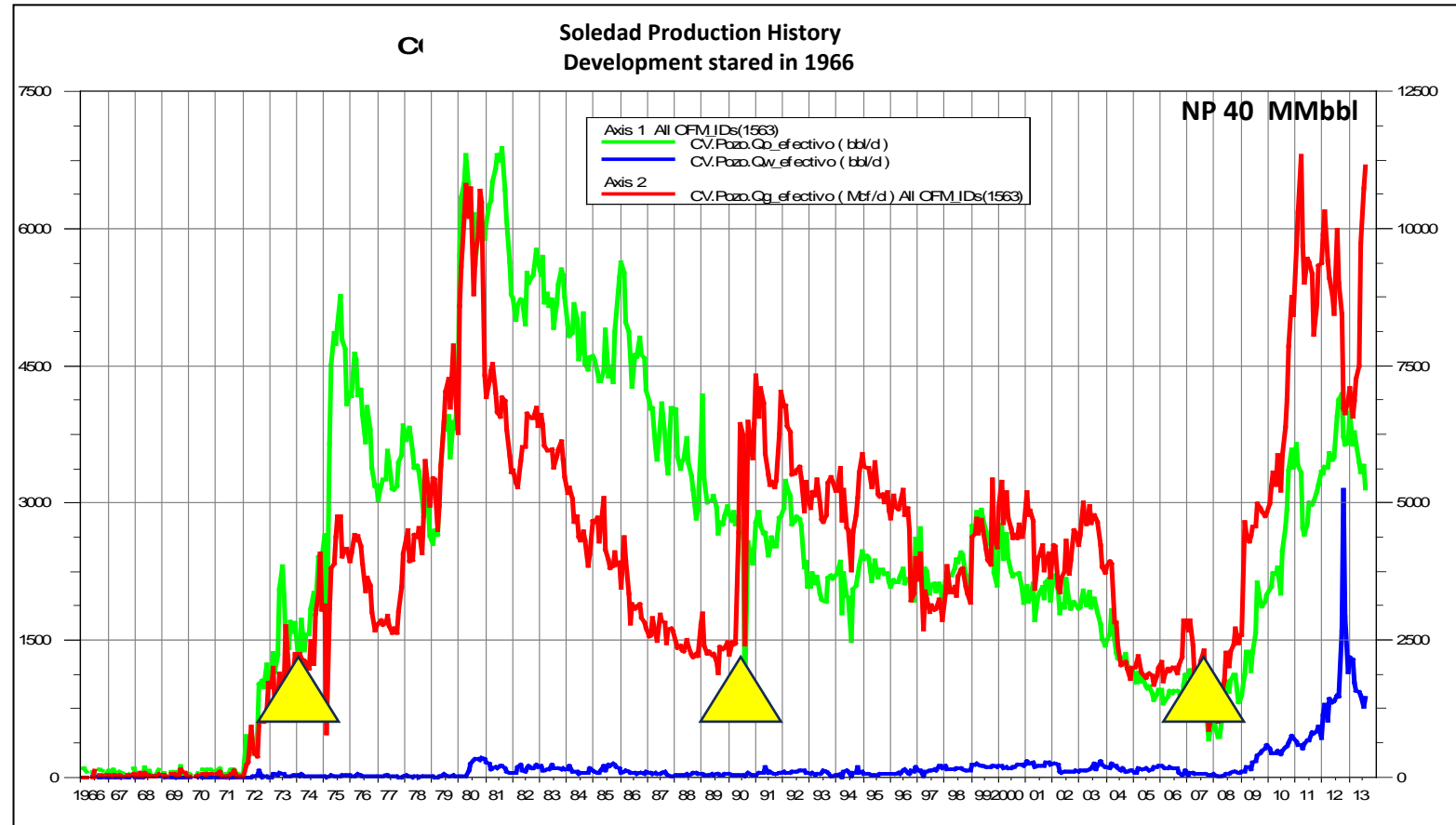
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Asset life cycle – More than one Field Reactivation



Discovered	1943
Area	125 km ²
Formation	Tertiary/Mesozoic
°API	26-30
Initial Pressure	80-130 kg/cm ²
Current Pressure	15-50 kg/cm ²
Total Wells	494
Active Wells	217



11



Key initiatives for a Productive, Safe, and Profitable Mature Field Reactivation (PSP)



1

Context Focus

Political & Legal

Social

Environmental

Commercial

Security

Facilities Access Permits/Authorizations



2



Facilities & Hydrocarbons

- Facilities Identification & Status
- Maintenance Record
- Mechanical Integrity
- Fluids Properties
- Facilities Capacities

3



Energy Resources

- Sources of energy
- Quantities & Reserves
- Facilities for fuel and Energy transportation
- Natural Resources: Conservation, Regulations, and Management
- Cost of energy

4



Production History

- Validate production History from official to Operational source
- Material Balance vs Operational history
- Identify past contingent events
- Identify main oper. Variables
- Go to the field, smell & taste

5



Assets Surveillance & Accounting

- Validate assets official Report vs. operational
- Surveillance well by Well, platform by Platform
- Check every well even Candidate for aband.
- Measure key environmental parameters (CO2, H2S)
- Make Report in detail (include photos)

6



Subsurface Understanding

- Initiate Static & Dynamic modeling.
- Inputs to modeling base on initiatives (1 - 5)
- Modeling main input for Initial Period (2 yrs) development plan

7



Neighboring Assets

- Review neighboring Assets and activity plan
- Identify possible Facilities share.
- Identify leverage & optimization through common activities.

8



Storage & Delivery

- Validate Actual Storage capacity.
- Mechanical Integrity of Storage tanks and Pumping-Compression Availability.
- Validate status of export pipelines.
- Mechanical integrity certification.

9



Metering & Export

- Validate status of export metering system.
- Measurement equip. calibration (oil, gas & Water)
- First oil need to be exported and account.

10



Commercial Model & Contractual

- Since initiative 1 have in hand the answer for: "What the Contract T&C, Local & Regional Legislation and Companies' compliance Rules says".
- Permits & Authorizations available. How long it takes!!!

11



Ad Hoc Technology Portfolio

- Based on Initiative 6, It is built the Technology Portfolio & Solutions.
- Local and Regional Availability is Critical
- Risk-Reward Analysis.
- Marginal & Mature Field Development & Oper. will succeed only if a PSP technology Portfolio & Solutions is applied.

11



Key initiatives for a Productive, Safe, and Profitable Mature Field Reactivation (PSP)



1

Context Focus

Political & Legal

Social & Security

Environmental

Commercial

Facilities Access
Permits/Authorizations

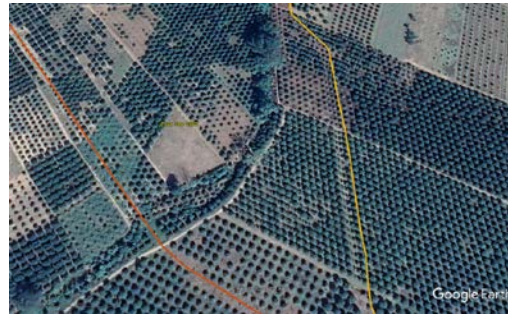


Political, Legal, Social & Security



- Communities Priorities
- Human Resources
- Legislations
- Cultural & Development

Environmental



- Natural Resources
- Protected Areas & Anthropology
- Environmental Legislation
- Topography drives Facilities
- Seasonal effects

Commercial



- Local Services available
- Technology access
- Basic utilities availability

Facilities Access Permits/Authorizations



- Access road and dimensions
- Closest main cities
- Production facilities close by

11



Key initiatives for a **P**roductive, **S**afe, and **P**rofitable Mature Field Reactivation (PSP)



2



Facilities & Hydrocarbons

- Facilities Identification & Status
- Maintenance Record
- Mechanical Integrity
- Fluids Properties
- Facilities Capacities

- Physical assets inspection
- Operational analysis
- Social and Environmental assessment:

It allowed detection of anomalies and aspects for improvement in 35 pads and 30 access roads.

3



Energy Resources

- Sources of energy
- Quantities & Reserves
- Facilities for fuel and Energy transportation
- Natural Resources: Conservation, Regulations, and Management
- Cost of energy

- Evaluation of fuel gas sources (supply/consumption) of Artificial lift Systems.

It allowed the identification of high consumption of LP gas as fuel, opening the opportunity to the use of natural gas from the same well.

11



Key initiatives for a Productive, Safe, and Profitable Mature Field Reactivation (PSP)



4



Production History

- Validate production History from official to Operational source
- Material Balance vs Operational history
- Identify past contingent events
- Identify main oper. Variables
- Go to the field, smell & taste

- Detailed review of production history, operational problems and relevant facts

contributed to the short-term maintenance plan to ensure production management safely and without impact to the environment

5



Assets Surveillance & Accounting

- Validate assets official Report vs. operational
- Surveillance well by Well, platform by Platform
- Check every well even Candidate for abandon.
- Measure key environmental parameters (CO₂, H₂S)
- Make Report in detail (include photos)

- Inspection of 450 wells
- Optimization of 393 wells
- Recovery of 10 production facilities
- Reactivation of more than 50 wells
- Shut down 20 wells in economic limit.



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Key initiatives for a Productive, Safe, and Profitable Mature Field Reactivation (PSP)



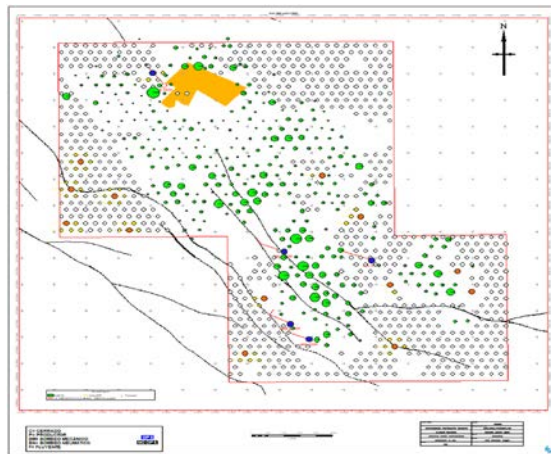
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Subsurface Understanding

- Initiate Static & Dynamic modeling.
- Inputs to modeling base on initiatives (1 - 5)
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40 Major WO
35 New Wells



7



Neighboring Assets

- Review neighboring Assets and activity plan
- Identify possible Facilities share.
- Identify leverage & optimization through common activities.

- Evaluation hydrocarbon sources from external facilities:

It allowed the identification of gas sources with high H₂S content. Therefore, pipeline shut down.

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Key initiatives for a Productive, Safe, and Profitable Mature Field Reactivation (PSP)



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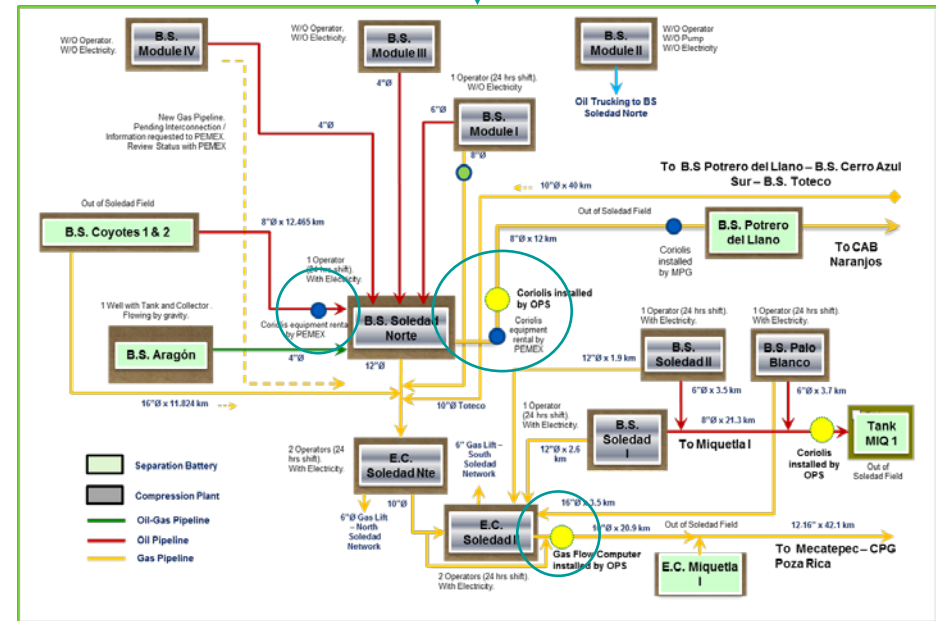
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Metering & Export

- Validate status of export metering system.
- Measurement equip. calibration (oil, gas & Water)
- First oil need to be exported and account.

Promptly installation of:
2 Coriolis and
1 Gas Flow Computer.



11



Key initiatives for a Productive, Safe, and Profitable Mature Field Reactivation (PSP)



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Commercial Model & Contractual

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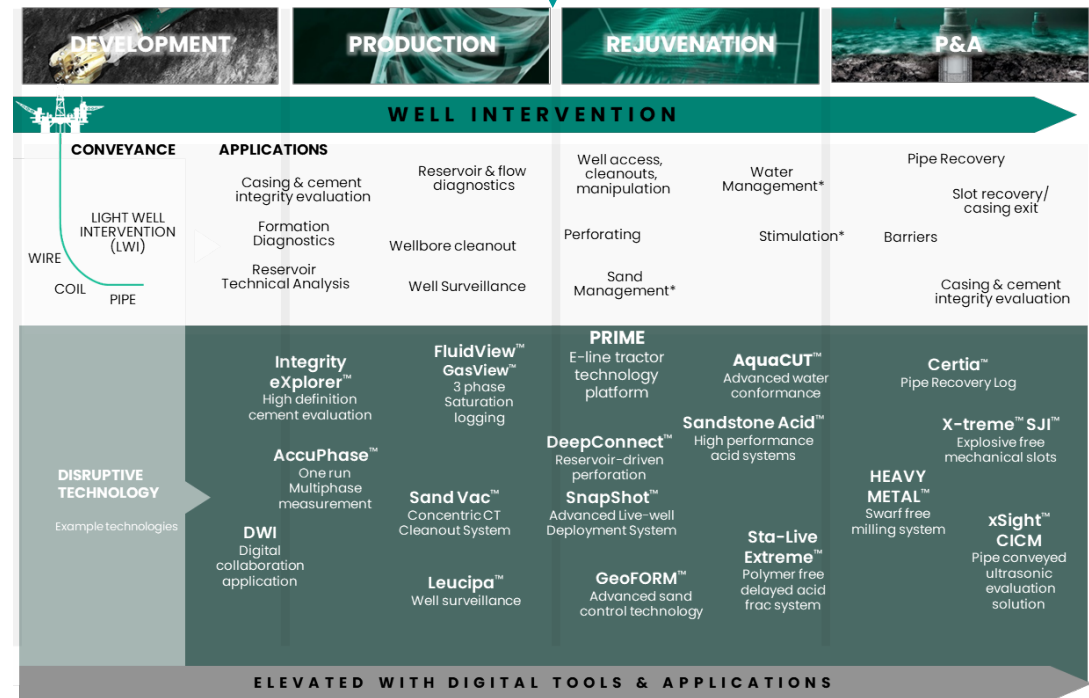
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Ad Hoc Technology Portfolio

- Based on Initiative 6, It is built the Technology Portfolio.
- Local and Regional Availability is Critical
- Risk-Reward Analysis.
- Marginal & Mature Field Development & Oper. will succeed only if a PSP technology Portfolio Is applied.

Early identification of key technologies (Procurement & Minimum Work Commitment)





11 key initiatives proved to be indispensable for a productive, safe, and profitable mature field reactivation applied in Mexico



11 Key initiatives in numbers – Case History in Mexico

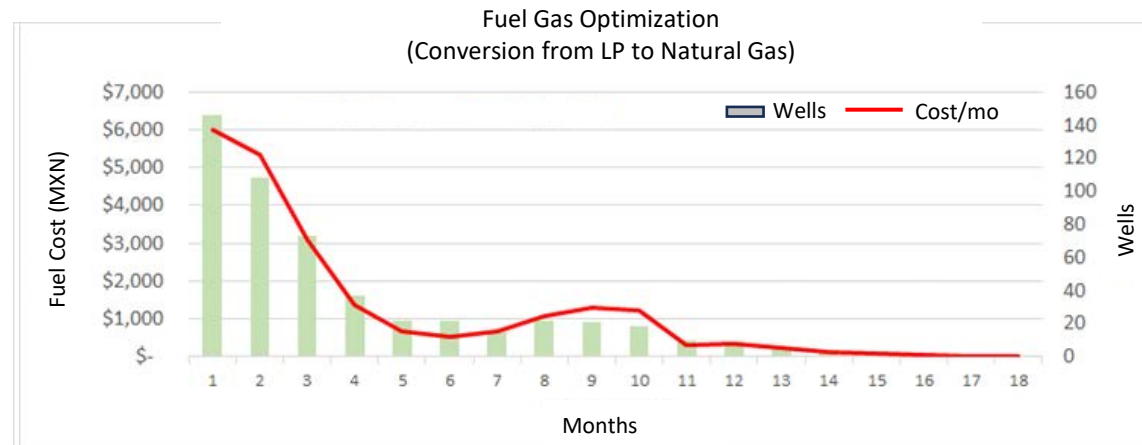
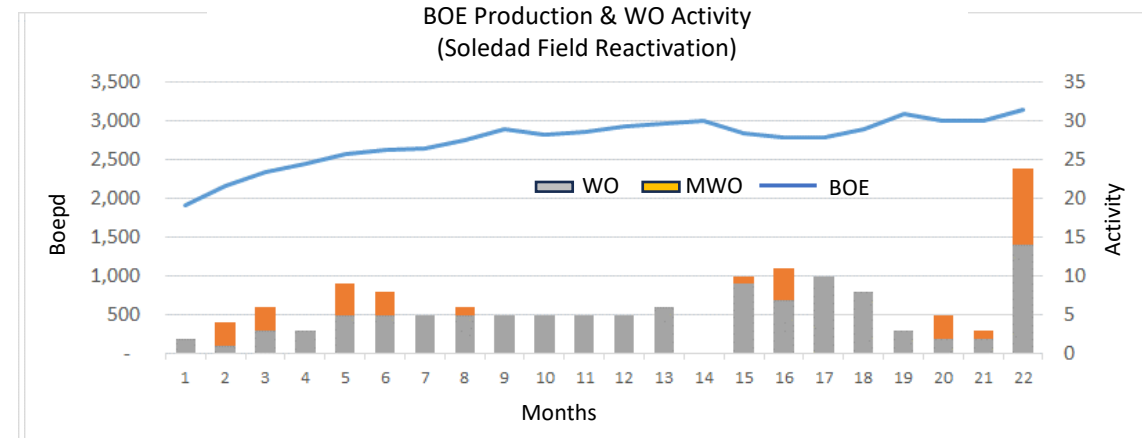
- Implementation of the 11 key actions allowed the increase in production from 1,907 BOE to 3,143 BOE in the first 22 months.
- 15% OPEX reduction.
- Zero labor incidents, facilities and operational continuity greater than 90%.

100 Minor WO
40 Major WO
20 Reactivations

60% production increase in first 2 yrs

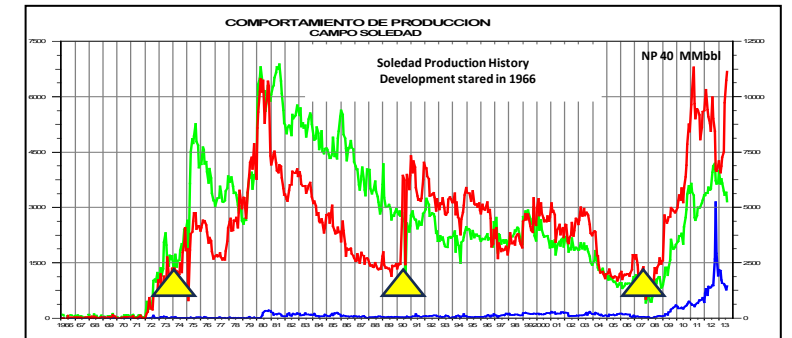
146 wells were converted from LPG to Natural Gas fuel

Reduction in operating costs of 400K USD/mo



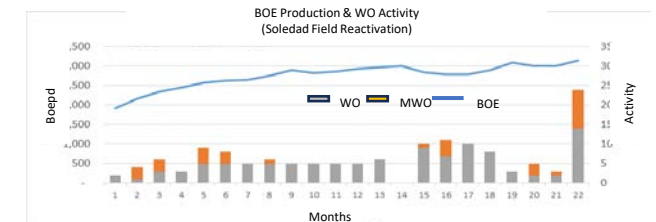
Conclusions: 11 Key initiatives make feasibly and safe a Mature field Reactivation

- A Marginal & Mature Field; due to its extensive development is subject to **more than one change of administration/operations** control and therefore total or partial Reactivation.
- These actions must integrate the **social, environmental, commercial, technical and operational** aspects, in this way facilitating oil field development with high standards of operational efficiency, safety, quality and compliance with the regulations established by the competent organizations.
- The 11 key actions implemented on time in mature fields in Mexico have allowed an efficient field reactivation, resulting in **an increase in production between 30-60% and cost reduction between 15-20%** during the first two years of operations.

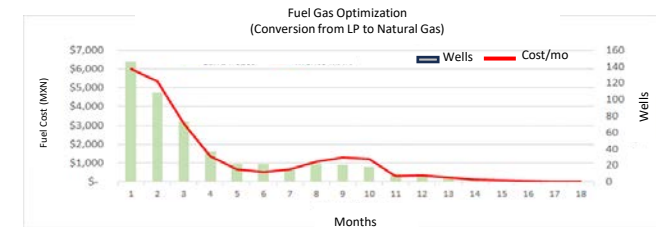


▲ Field Reactivation

↑
Production



↓
Costs



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