Case study: Mature field optimization, Mexico

Integrated Mature Assets Solutions, Leucipa team's digital platform helps extend mature field production life

An operator of a mature field required a digitally enabled platform to better monitor, manage, and optimize its field surveillance and production enhancement activities.

As part of its existing service contract with the field, the Baker Hughes Mature Assets Solutions (MAS) group was asked to develop a digital platform that met the operator's production and financial objectives.

Collaborating on an integrated solution MAS collaborated with the **Leucipa™ automated field production solutions** team to design and implement a digital solution leveraging the Leucipa platform.

The deployment plan would be executed in phases, with Phase 1 focusing on creating a structured production and well information database. This phase also called for streamlining the data flow to feed the database and implementing well monitoring, surveillance, and opportunity tracking modules.

The integrated MAS and Leucipa team designed and implemented a data loader management tool comprising standard templates. These templates incorporate standard databases containing relevant information to run field management tasks, including a well master table and information related to operations, production, well events, and fluid delivery. The tool also included audit and log reports to ensure the correct tracking of data loading and management.

With the data structurally incorporated into the platform, the following Leucipa modules were then deployed in the tool:

- Well Data Book (WDB), a digital well file dashboard integrating multiple data sources.
- Multi-Well Data Book (MWDB), a data analysis tool for multi-well / multi-variable environments.
- Well Opportunity Ranking System (WOMS), a collaborative environment and automatic job ranking platform.
- Well Review Meeting (WRM), a module for centralizing and standardizing well review sessions and tracking KPIs.
- Surveillance by Exception (SBE), an alert detection system based on configurable business rules.
- Decline Curve Analysis (DCA), an analysis tool based on Arps.
- Gas Balance and Delivery LACT, tools for monitoring field level gas balance and fluid delivery.

Implementing the solution in weeks
Phase 1 of the data loader tool development, including integration of all databases and Leucipa modules, was completed in six weeks.

The new platform quickly proved its flexibility and alignment with operational needs, enabling engineers to respond more quickly to abnormal well behavior or key events. This accelerated response time helped prevent damage to production equipment and avoid unnecessary downtime.

Challenges

- Boost production rates and enhance recovery in mature oil field
- Reduce manual well monitoring and data analysis activities to free up field crews for other optimization opportunities
- Develop a flexible, low-footprint digital platform for seamless, remote, and automated field surveillance and production enhancement

Results

- Improved working hour efficiency to redistribute 140 hours per month on well issues and optimization opportunities to extend asset life and maximize returns
- Avoided IT complexity and shortened development time through a flexible, low-footprint data loader aligned with operational needs
- Optimized well activities to prevent artificial lift failures and rank well intervention opportunities faster
- Added an incremental 3.3% to the monthly production rates for a net sale increase of $50,000 USD
- Provided collaboration opportunities with other Baker Hughes units to enhance productivity and increase recovery factor in mature field
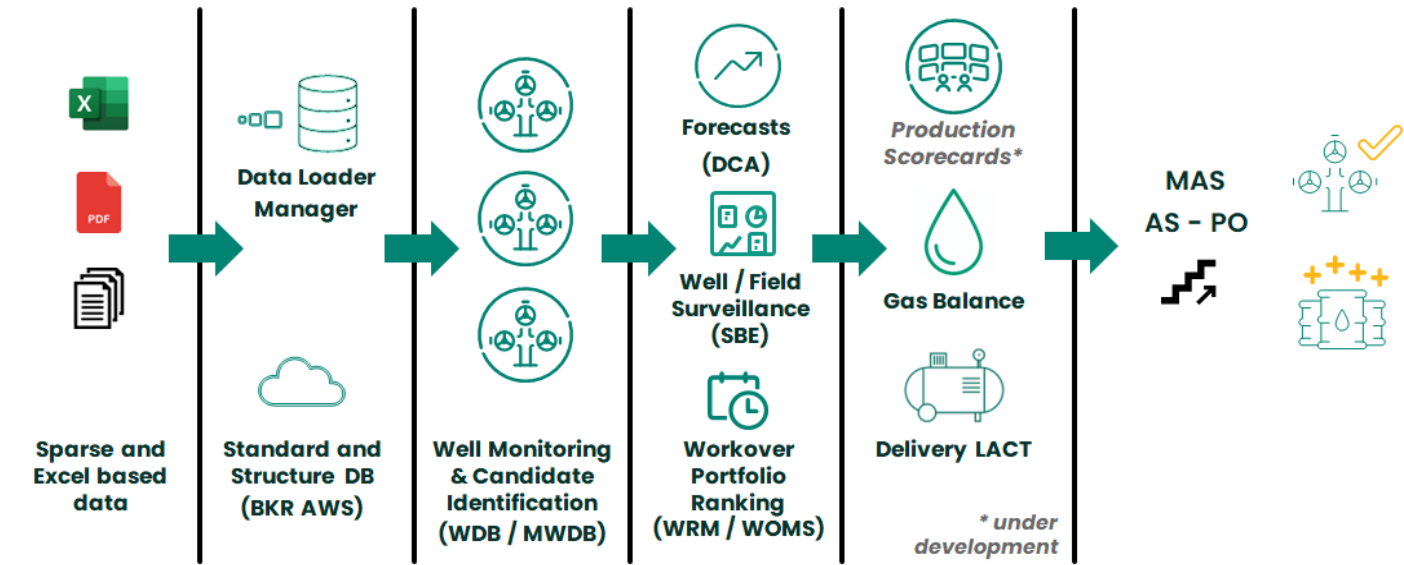
The platform also improved the process of assessing the complexity and practicality of proposed well-optimization solutions. It efficiently evaluated each solution's production benefits and automated the opportunity ranking process, thus reducing the operations team's required time and effort.

The centralized data management solution helped redistribute approximately 140 working hours per month, which was used to address well issues, identify opportunities to extend asset life, and increase revenues.

The streamlined processes for optimization activities helped improve artificial lift operations and rank well intervention opportunities faster. These activities boosted monthly production rates by 3.3 %, resulting in a net revenue increase of $50,000 USD for the project.

The digital platform's flexibility and functionality prompted further collaborations between MAS and Baker Hughes business units, including GaffneyCline energy advisory, Oilfield & Industrial Chemicals, and Pressure Pumping. These collaborations, which include improved formation damage analysis and tailor-made production chemical solutions, promise to enhance productivity and increase the mature field's recovery factor.

The successful implementation of Leucipa modules established the basis for using Leucipa in future MAS projects. The integrated MAS/ Leucipa team is developing a Phase 2 plan that incorporates additional modules, including enhanced scorecards, deferred production analysis, and advanced well surveillance functionalities.

Sparse and Excel based data → Data Loader Manager / Standard and Structure DB (BKR AWS) → Well Monitoring & Candidate Identification (WDB / MWDB) → Forecasts (DCA) / Well / Field Surveillance (SBE) / Workover Portfolio Ranking (WRM / WOMS) → Production Scorecards* / Gas Balance / Delivery LACT / * under development → MAS AS - PO

*Asset surveillance & intervention, and production optimization.
The Phase 1 MAS/Leucipa implementation of the data loader management tool was successfully executed in just six weeks.

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