Digital Well Program™

APPLYING THE O&G DIGITAL TWIN

OVERVIEW
In recent years, as oil and gas (O&G) companies have experienced cost constraints and shrinking margins, the need for productivity and efficiency improvements has come to the forefront. Operators want to increase well quality at lower construction costs, which requires real-time information to drive faster decisions with a higher level of accuracy. The Digital Well Program™ solution digitally transforms how wells are constructed and delivered by combining the digitalized well design process with industry-leading engineering models on one single platform. The orchestrated design process and engineering models can be configured to each customer’s needs, and applied to key well construction steps through microservices. With its built-in integration and process management capability, data is automatically assimilated to help accelerate Business Process Management and generate a fully validated and engineering-consistent well program.

Today’s reality in a manual re-planning cycle time requires O&G companies and teams to review their well construction process and discover how to integrate and collaborate better across well construction projects. The Digital Well Program solution enables continuous optimization of Planning, Design and Execution of the well construction process by leveraging the integrated O&G Digital Twin. The integrated O&G Digital Twin provides a digital construct of the well construction process which is used to optimize well construction in planning, design and execution.

KEY VALUE
» Increased automation and integration with digital well construction applications
» Orchestrate well construction workflow to increase well program reliability
» Utilize a smart and connected oilfield to attack inefficiencies

A fully validated well program is demonstrated here.
BENEFITS

Reduce Cost and 80 Percent of Time in Well Program Design
Disparate applications and visualization tools, time-costly team communications, and manual AFE reports can cause ineffective well program designs within well construction processes. The Digital Well Program solution answers this problem by digitalizing your well program process. It is the first digital solution that consolidates the design process with industry-leading Engineer’s Desktop (EDT) software onto an open platform – the iEnergy® cloud platform. It also delivers Software as Services to enable automated well program generation and accelerated business process management by empowering a customizable and flexible well program workflow. This workflow is tailored to each customer’s unique well program workflow process through data integration and micro-services.

Increase Well Feasibility Analysis
The Digital Well Program solution within the DecisionSpace® Well Construction 365 enables oil and gas companies to create well programs with a clear vision of the correct engineering design. Using an offset well analysis from the operator’s historical well designs and execution, the current well design can refine critical technical limits and operator parameters while optimizing cost and health, safety, and environmental (HSE) concerns. This investment in upfront analysis enables additional optimization of key operational objectives to avoid nonproductive time (NPT) and invisible lost time (ILT) issues. The Digital Well Program solution extends the capability of Landmark’s Engineer’s Desktop™ (EDT) software and the DecisionSpace® platform for the engineering design phase in order to produce a fully validated and engineering-consistent well program. The well program not only covers the engineering parameters, but also includes cost and risk parameters to ensure that the well program can be delivered with reliable and consistent data to share among the operator, service companies, and vendors. Any change during the process of the well program will be immediately updated and shared on the integrated platform, and everyone involved will be notified so that inconsistent data and missed objectives of the well program can be avoided. More efficient change notification also reduces the risks and timing associated with costly reviews and sign-offs of Well Program updates for oil and gas operators.

Perform Fully Connected Well Operations
As companies strategize to reduce cost and optimize productivity, the Digital Well Program solution helps improve the overall well construction processes by allowing fast and more accurate decisions in real time. During the execution phase of well construction, sensors and models collect provide data from all drilling systems to keep the digital twin of the well up to date. Integration with the predictive capabilities of the digital twin drive intelligent analytics (through microservices) to anticipate complex issues and problems beyond the capabilities of common alarm-based controls. Any deviation or hazard predicted by the digital twin will trigger alarms, advisory services, or automation that result in actions that will either prevent the problem from occurring, or automatically help the operator return to the plan. Further, all operational data captured during drilling and workover activities is stored to be utilized by the Digital Well Program for future well designs. This utilization of historical and real-time data improves lessons learned, along with guidance to achieve the optimal well design for future plans.
FEATURES

Applying O&G Digital Twin
The Digital Well Program employs the O&G Digital Twin concept, a revolutionary framework that digitally replicates and models physical oil and gas assets, leverages data and inputs from modeling and real-world upstream operations, and creates a continuous feedback loop between the physical and digital worlds. The feasibility of the O&G Digital Twin is created from a proven scientific basis, and enhanced by historical data; the Digital Well Program solution enables the operator to access and utilize their historical engineering and operational data to develop and refine a reliable digital twin that leverages predictive intelligence and optimization. This allows the creation of new, and integration with existing, hi-fidelity models that continuously update with real-time data from sensors and processes on the rig during the execution phase.

Well Feasibility Analysis
During the feasibility phase of well design, designers can incorporate offset well data and apply Engineer’s Desktop™ (EDT) into micro-services to automate some steps of the design. Offset wells and operations data are used to supplement the current design to enable a consistent workflow and produce a more reliable well program. All personnel on the team can participate in the cloud-enabled Digital Well Program user environment to reduce manual processes, receive assignment updates, and collaborate rather than rely on ad-hoc meetings and email. Once the well program is completed, the approval process is also accelerated by enabling announcements to vendors and supply chain participants. Engineers and managers can quickly be notified of any changes to the well program, so approval processes of the well program can be optimized and accelerated.

Well Construction Optimizer Advisory
The well construction optimizer in the Digital Well Program enables optimized design steps and also optimized execution through the advisory system. The Well Construction Optimizer can have a number of objectives integrated with micro-services that have been configured to perform additional optimization during any design step. During design, users can choose to optimize key design features depending on the objective configured. Further, anticipated drilling set points can be associated with specific optimization objectives, such as ROP and MSE. The operator can easily determine the best design and execution scenarios to optimize within the Digital Well Program. Once the Digital Well Program integrates with a real-time solution, the digital twin of the well is then updated with the current drilling conditions.

Unified Visualization
Effective dashboard interface enables better decisions with better process visualization in real time. The deviation can easily identify with the visualization and unified visualization available for all personnel. Well delivery team can connect and collaborate through unified visualization to avoid an outdated model or operation process. With reliable process visualization, a better decision can be made to reduce risk, decrease delays in decision making, and any change made can be tracked and approved easily.

By applying O&G Digital Twin with Digital Well Program™, continuous optimization of the technical and economic well can be delivered to reduce inefficiencies in today’s O&G industry operations.

Landmark offers solutions to help you deliver on your business strategies. For questions or to contact your Landmark representative, visit us at www.landmark.solutions.