Making Collaboration a Reality in the Digital Transformation

Alliance aims to democratize technological advances.

Since the proliferation of digital data in the late 1970s and early 1980s, the oil and gas industry has relied heavily on multiple advances in computational, collaborative and automated systems and software technologies to more effectively use that data by improving the decision ecosystems of oil and gas finders and producers. Many of these digital technology surges were enablers for institutionalizing advanced and computationally intensive high-performance computing and worksta-
tion-based applications. They also became enablers for acquiring larger volumes of seismic and borehole data, in turn improving the quality of subsurface images, models and simulations.

The more recent “digital transformation” impacting the oil and gas subsurface sciences and surface opera-
tions will be more transformative but also more chal-
lenging than the previous digital technology surges. This is largely because it incorporates many technological advances, including cloud computing, edge computing, machine learning, open source, open data standards, virtualization and the Internet of Things. This confluence of technologies calls for the highest levels of collaboration between multiple technology suppliers, and between oil and gas operators and technology suppliers, to efficiently connect these subsystems in a cost-effective way.

This digital transformation challenges the industry to build ecosystems that will have a measurable impact on performance, quality and time to result, and will have an impact on all upstream businesses, including geology and geophysics, production, drilling and completions, equipment maintenance and the supply chain. With many moving parts, building a transformative E&P plat-
form requires multiple partnerships and alliances.

Repsol and Emerson are collectively taking on this challenge by forming a technology alliance to “democ-
ratize” a wealth of seismic imaging technology devel-
oped by Repsol with other partners over a multiyear period. Referred to as the Repsol Kaleidoscope technol-
ogy, this rich software suite includes a high-frequency acoustic and elastic Reverse Time Migration (RTM), an acoustic and elastic Full Waveform Inversion (FWI), developed for both onshore and offshore application, velocity modeling enablers to accelerate the develop-
ment of models in the presence of complex subsurface conditions, a post-stack migration and demigration Reverse Time Migration targeted at seismic interpret-
ers, and a subsurface illumination analysis solution also targeted at seismic interpreters.

This alliance has multiple business and technical objectives, including

• **Platform integration.** The collaboration lever-
ages Emerson’s mature E&P data and application platform to host the Repsol Kaleidoscope appli-
cations. This platform connects the Kaleidoscope technology to other Emerson seismic processing and imaging applications, and other Emerson applications in the seismic interpretation and modeling domains.

• **Cloud enablement.** By adopting the Emerson E&P platform, the Kaleidoscope applications are avail-
able for Repsol and other customers on the cloud. This allows companies to take advantage of the wealth of high-performance computing resources available on the cloud and select from a broad diversity of CPU and GPU workstation and cluster configurations to meet project deadlines.

• **Democratization of technology.** Through platform integration, cross-domain integration, cloud enablement and worldwide commercialization of technology to the entire E&P community, the Kaleidoscope technology is no longer confined to a small community of specialists. Instead, the applications will serve a broad range of G&G spe-
cialists within all organizations. Additionally, the applications will be exposed to a broad range of oil field and seismic assets, strengthening their capa-
bilities and usefulness.

• **Accelerating the business cycle.** In a challenging oil and gas economy, operators are looking for mea-
surable cost reductions without compromising quality. This collaboration will be hyper-foc-
cused on workflow efficiency, usability and platform flexibil-
ity to dramatically reduce the time to seismic image, time to prospect, time to well plan, and time to first oil.

This collaboration between multiple technology partners and Repsol will be the first of many that will put the digital transformation to the test, by measuring the business impact of the democratization of high-end seismic imaging technologies. The technology and project will be featured in Emerson’s booth 1433 in Monday’s lunch and learn session.

Emerson is enabling Repsol to accelerate time to first oil using digital transformation technology. (Image courtesy of Emerson)