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BRINGING NEW TECHNOLOGY TO OLD WELLS

Executive Vice President, Geoscience Product Management of Paradigm

Q: What main elements of your software allowed to reduce the time between seismic acquisition and first oil by nearly 40%?
A: Paradigm developed this solution for its software and support licensing arrangement with COMESA, which includes software updates and maintenance services. This arrangement is strengthened by a collaborative relationship where we prioritize and deliver enhancements that improve COMESA’s productivity and the solutions that are relevant to its customers and assets. The Paradigm seismic processing and imaging solution is a field tested solution that incorporates continuous improvements, enhancements, and innovations reflecting the requirements of a large global customer base. This solution, which led to the aforementioned time reduction of 40%, combines the best of high performance computing with high levels of interactivity, interpretation, and modeling, significantly reducing the time to results even for the most challenging projects. The comprehensive footprint of this solution means the customer does not have to leave the solution, avoiding costly time losses going in and out of third-party applications. It is a good match for the COMESA geoscientists who need to deliver quality results in challenging project timelines. Moreover, the solution is optimized for the latest hardware, compilers, and operating systems so that COMESA can predict and plan these project schedules more easily.

Q: What type of demand are you seeing from PEMEX to reprocess and reappraise some of its legacy data?
A: It is important to understand that Paradigm is not a seismic acquisition or oil field services company. Consequently, the opportunity for taking legacy seismic and borehole data, upgrading it, and exposing it to new technologies and workflows can bring substantial returns and cost savings for operators like PEMEX. Paradigm provides an oil field independent solution with best-in-class science to ensure a successful outcome for its operators.

In this area, we have brought many innovative contributions to the seismic processing and imaging market, including an innovative broadband seismic deghosting solution, a full azimuth imaging and characterization system, geologically constrained velocity models, and software to develop challenging anisotropic velocity models in deepwater and onshore shale basins. These technologies have had a major impact on the quality and resolution of both 2D and 3D seismic acquisitions. We have a rich portfolio of seismic imaging applications that include Kirchhoff operators, reverse time migration propagators, and local angle domain operators that can be adapted to different subsurface conditions. Our “diffraction imaging” extracts discontinuous subsurface features not observable with conventional seismic methods. Our full azimuth imaging solutions are ideal for both deepwater and shale resource plays for deriving anisotropic models and carrying out inversions for fracture intensities and orientations.

Q: As operators move from appraisals to beginning to plan their drilling phase, what can Paradigm’s technologies and software do to reduce uncertainty, and translate that into increased productivity?
A: One of the activities that we do quite well is to reduce exploration and development risk is to carry out projects, not only with borehole and seismic data, but also with knowledge of the stratigraphy and structure of the subsurface. Many of the projects that we execute synchronize the geological and geophysical model, which is something many traditional seismic contractors are not able to do routinely because they do not have access to the subsurface geological modelling technology. We use the geology to guide and constrain our geophysical operations while ensuring that both data sets are consistent with each other. The end result is a seismic image volume that is consistent with both seismic and geologic invariants, such as travel times and well markers, and a higher resolution velocity model constrained with azimuthal measurements. Additionally, our subsurface models are generated in chrono-stratigraphic (depositional) space, accommodating any level of structural and stratigraphic complexity, and providing a platform for velocity, structural, stratigraphic, facies, and reservoir property modeling. All of these not only drive a better seismic imaging workflow, but also drive a better quantitative interpretation solution with seismic inversion procedures.