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Why Well Testing Is More Valuable To You Today

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Well testing has been a core technology in the oil industry for decades because it provides in-situ measurements of dynamic well and reservoir data. Traditional results of pressure transient analysis included the average formation permeability and pressure, and the well skin and deliverability. As technology advanced over the years, better interpretation methods, more accurate testing tools with sophisticated features and substantially improved computers and software became available to help petroleum engineers design and analyze transient tests and manage their fields. With the increased use of reliable permanent downhole pressure gauges and multiphase flow meters, long-term continuous monitoring has become the norm in reservoir surveillance. Additionally, the developments in communication increased the amount of data and information that can be shared, as well as the speed of accessing them. Simultaneously, advanced technology in reservoir modeling have been developed and incorporated into transient analysis software and numerical reservoir simulators. The workflow for managing reservoirs has also improved with better planning, multidiscipline teamwork, as well as execution and evaluation procedures. The collective impact of these advances made it possible to obtain more information about the reservoir and well system from well tests than the few values that were traditionally obtained. Steady progress to seamlessly integrate information from well tests into numerical reservoir simulation models also increased the use of transient testing results in the characterization and performance predictions of oil and gas fields. In this presentation, field examples are used to illustrate the use of advanced technologies in transient data measurements (such as permanent downhole gauges, real-time data transmission and downhole shut-in tools) and data interpretation methods (such as numerical well testing, multiphase test analysis, multilayer test analysis and production data analysis). We will demonstrate what has been achieved so far and why well testing is now more valuable to petroleum engineers as a mean to improve management of oil and gas fields.

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She joined Chevron in 1999. Her experience includes well testing, production data analysis and data integration in numerical reservoir models, as well as training Chevron engineers in these areas of technology. Pan has worked on projects for oil and gas fields in Africa, Asia, Australia, Europe, and North and South America. The author of several SPE papers and publications, she is the chairperson of SPE Well Testing Technical Interest Group (TIG) responsible for vetting all submissions in this area of technology before they are posted on spe.org. Pan served as the Program Chairperson for the Golden Gate Section of SPE in 2002 and received the SPE Western North America Regional Formation Evaluation Award in 2010. She received a BS degree in engineering mechanics from Tsinghua University, China, and MS and PhD degrees in petroleum engineering from Stanford University, Callifornia, USA.