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**Assessment of Forecast Uncertainty in Mature Reservoirs**

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**Abstract:**

Modern and efficient reservoir management is imperative, given the ever-increasing demand for oil. Making the right decision on reservoir development utilizing all available data in a timely manner is the key to successful operation. For mature reservoirs, this requires high-quality uncertainty assessment of long-term performance forecast estimations. The most difficult component of the total uncertainty in forecast is the one that stems from the implicit uncertainty in the geological and reservoir simulation model. In fact, regardless the amount of reservoir data that we collect, there is no way to define the reservoir model uniquely. This reality suggests that we use an integrated probabilistic framework and incorporate production data into the reservoir model to reduce the associated uncertainty in reservoir characterization and performance forecasting.

The technical challenge is in obtaining probabilistic description of the reservoir models. For mature reservoirs, this implies finding not one, but a large number of reservoir models that are consistent not only with the geological data but also with the production data. Applying smart sampling techniques combined with Monte Carlo simulation within a probabilistic framework, and utilizing available high-performance computing resources, it is feasible to find multiple solutions to the history matching problem. These solutions, in turn, can be used to estimate uncertainty for making management decision in a realistic time frame. This presentation will demonstrate the practical approach to solve this critical problem using field examples.

**Biography:**

Jorge Landa is a senior advisor in reservoir engineering with Chevron Energy Technology Co. in San Ramon, CA. His work experience before joining Chevron includes 15 years with Halliburton. He holds MS and PhD degrees in Petroleum Engineering from Stanford U. and a Mechanical Engineering degree from Universidad de Buenos Aires. He has written 14 papers in the areas of history matching, uncertainty assesment, well testing and data integretation in reservoir characterization