Tuesday, December 16, 2014

Hyatt North Houston (former Crowne Plaza Hotel – Greenspoint)

Social 11:15 AM, Luncheon 11:30 AM

Cost: $45 Preregistered members; $50 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

Patricia F. DuBois
J. Brandon Rogers

Correlation of High Hydrogen Sulfide Concentration to Deep Features in Eagle Ford Shale Wells, McMullen County, Texas

Early development of the Eagle Ford Shale (EFS) indicated the petroleum in the reservoir was relatively sweet, typically being produced with hydrogen sulfide (H_2S) gas in low concentrations. However in McMullen Co. TX, wells with high concentrations (>1%) are found. Mapping raw untreated H_2S gas shows a direct correlation to salt domes and subsequent deep faulting. The enigma has been the occurrence of high H_2S wells offset by low H_2S wells, not associated with salt domes or faulting. However, micro-seismic and in some cases re-processed seismic data revealed that deep faults do intersect these high H_2S wellbores. The additional data correlates deep faulting into the Edwards to high H_2S EFS wells. Deep faulting likely creates a conduit for H_2S to enter the EFS.

Building on that correlation, deep features were used to predict high H_2S wells and high H_2S was used to predict and locate deep features not previously identified. Mapping of these deep features allows for the prediction of areas with high H_2S and has led to a change in drilling and completion strategies by avoiding features associated with high H_2S.

Initially, long range plans were made with sweet EFS oil in mind. Encountering wells with large concentrations of H_2S in an otherwise sweet field has the potential to lead to operating inefficiencies, and higher OPEX and CAPEX as treatment solutions are brought into place after the fact. The best solutions take time to implement, and advance warning of high H_2S is critical in minimizing the financial impact.

A model was generated, based on the expected H_2S concentration and production forecast, that is capable of directing long term drilling and completions strategy, as well as to provide expectations for use in the construction of facilities and selection of H_2S treatment options. Drilling and completion strategies minimized the amount of H_2S that will be encountered, and the optimization of facilities reduces operating inefficiencies and OPEX and CAPEX outlays. ■

Biographical Sketch

J. Brandon Rogers currently works as a project engineer at Murphy Exploration and Production Company. He holds a degree in Chemical Engineering from Brigham Young University where he studied reservoir engineering. He co-authored *Applied Petroleum Reservoir Engineering* Third Edition with Dr. Ron Terry from BYU.