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Energy - Oil and Gas Research; Researchers from Louisiana State University Describe Findings in Oil and Gas Research (Orientation Prediction of Fracture Initiation From Perforated Horizontal Wells: Application In Shale Reservoirs)

522 words
2 October 2020
Energy Weekly News
ENRGWK
1043
English

2020 OCT 9 (VerticalNews) -- By a News Reporter-Staff News Editor at Energy Weekly News -- Investigators publish new report on Energy - Oil and Gas Research. According to news reporting originating from Baton Rouge, Louisiana, by VerticalNews correspondents, research stated, "For maximum productivity enhancement when targeting low permeability formations, horizontal wells must be made to induce multiple transverse fractures. An orientation criterion for fracture initiation is developed using analytically-derived approximations for the longitudinal and transverse fracturing stresses for perforated wellbores from the literature."

Funders for this research include Fracture Research and Application Consortium (FRAC) of the Department of Petroleum and Geosystems Engineering, **Bureau of Economic Geology** of The University of Texas at Austin.

Our news editors obtained a quote from the research from Louisiana State University, "The validity of the criterion is assessed numerically and is found to overestimate transverse fracture initiation, which occurs under a narrow range of conditions; pertaining to low breakdown pressure and low formation tensile strength. A three-dimensional numerical model shows that contrary to existing approximations, the transverse fracturing stress from perforated horizontal wells becomes more compressive as wellbore pressure increases. This shrinks the 'breakdown pressure window,' which is the range of wellbore pressures over which transverse fracture initiation takes place. This creates a second constraint for transverse fracture initiation, which is the 'critical tensile strength' value. This determines the maximum formation tensile strength at which transverse fracture initiation is possible for a given in-situ stress state and perforation direction. Sensitivity analyses are performed based on data from seven unconventional shale reservoirs (Barnett, Bakken, Fayetteville, Haynesville, Niobrara, Marcellus and Vaca Muerta) for horizontal wells drilled parallel to S-hmin. The frequent longitudinal fracture initiation occurrence indicated suggests fracture reorientation in the near-wellbore region to be a common event, through which the propagating fractures become aligned with the preferred fracture plane (perpendicular to the least compressive principal stress)."

According to the news editors, the research concluded: "This induces near-wellbore fluid tortuosity, which in turn can lead to completions and production-related problems, such as early screenouts and poststimulation well underperformance."

For more information on this research see: Orientation Prediction of Fracture Initiation From Perforated Horizontal Wells: Application In Shale Reservoirs. Journal of Petroleum Science and Engineering, 2020;193():. Journal of Petroleum Science and Engineering can be contacted at: Elsevier, Radarweg 29, 1043 Nx Amsterdam, Netherlands. (Elsevier - www.elsevier.com; Journal of Petroleum Science and Engineering - www.journals.elsevier.com/journal-of-petroleum-science-and-engineering/)

The news editors report that additional information may be obtained by contacting Andreas Michael, Louisiana State University, Craft & Hawkins Dept. of Petroleum Engineering, Baton Rouge, LA 70803, United States. Additional authors for this research include Jon E. Olson and Matthew T. Balhoff.

Keywords for this news article include: Baton Rouge, Louisiana, United States, North and Central America, Oil and Gas Research, Energy, Louisiana State University.

Document ENRGWK0020201002ega2000kx