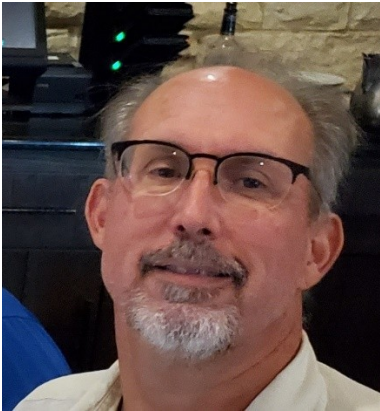


Completions-Induced Casing Deformations in Unconventionals: What We Think We Know About The Geomechanics

Neal Nagel
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Thursday October 28, 2021, 9 a.m. Central Time



Dr. Neal Nagel, Chief Engineer at OilField Geomechanics LLC, will speak on Thursday, October 28, 2021.

The topic is “Completions-Induced Casing Deformations in Unconventionals: What We Think We Know About The Geomechanics.”

Abstract

Casing deformations - and failures - are not new to the oil & gas industry. In fact, the earliest reported cases date back to the early 20th century from places like heavy oil fields around Lake Maracaibo. Nonetheless, the historical cases of casing deformations have tended to be associated with production-induced effects such as compaction, subsidence or fault movement. In Unconventionals, however, there is growing reporting - and increased concern - over the occurrence of casing deformations associated with well stimulations and, perhaps, very early-time production. These reports come from nearly all the major Unconventional plays, with a significant occurrence in the Montney (Canada), Vaca Muerta (Argentina) and Sichuan Basin (China).

The first part of the presentation will cover the historical occurrence and knowledge of casing deformations and failures but, more importantly, focus on the summary findings and conclusions concerning the causes and possible mitigation efforts of the deformations and failures. Following this, the presentation will cover the existing efforts regarding casing deformations in Unconventionals with an emphasis on the ongoing developments and plans within a special workgroup of SPE to address casing deformations.

The last half of the presentation will focus on the possible geomechanics drivers for the casing deformations in Unconventionals including: a) wellbore stress changes; b) Stress Shadows; c) stress anisotropy; d) pressure-induced stress changes; e) potential mechanical properties alterations; and f) the potential significant influence of geometry (e.g., structural orientation versus stress orientation). The presentation will conclude with a summary and discussion of near-term milestones (particularly for the SPE working group).

Biography

Dr. Neal Nagel is Chief Engineer at OilField Geomechanics LLC, an oil& gas and mining geomechanics consulting company he started with his wife, Dr. Marisela Sanchez-Nagel, in 2014. Dr. Nagel has more than 35 years of geomechanics experience having started as a college professor and then with Phillips Petroleum in the 1980s. He has provided geomechanics training since the late 1980s, geomechanics consulting since 2009 and geomechanics expert witness support since 2015. He is a well-known expert in the geomechanics of Unconventionals and has given many invited SPE, AAPG, HGS, SEG, and SPWLA presentations in the last several years as well as teaching both SPE, ARMA and AAPG-sponsored Geomechanics for Unconventionals Training Courses. Nagel has authored or co-authored more than 50 technical papers with more than 20 related to Unconventionals, including several keynote presentations. He is a past SPE Distinguished Lecturer on Compaction & Subsidence in 2004 and Stress Shadows in 2016, served as co-editor of the 2010 SPE Monograph on Solids Injection, was recently co-chair of the SPE Summit on Casing Deformations in Unconventionals earlier in 2021, and also just completed his 3-year term as Chair of the SPE Geomechanics Technical Section.