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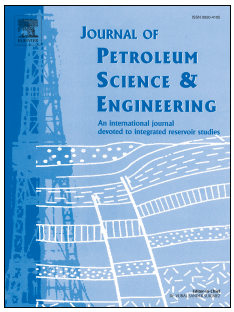

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Well Completion Issues for Underground Gas Storage in Oil and Gas Reservoirs in China

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Abstract

Underground Gas Storage (UGS) is considered a strategic method to balance the supply-demand chain of the energy required throughout a year and shave the peak demands during the winter time. This paper highlights international UGS distributions including ongoing UGS facilities in China, followed by a review of integrity issues such as fault reactivation and well integrity. As guidance for well design during UGS construction, the fundamental requirements for UGS well completion in an oil and gas reservoir in China are listed including those for newly drilled wells and the use of old wells. The technical and regulatory demands for newly drilled injection wells need to consider the mechanical and chemical effects. For example, the corrosion problem of downhole equipment is a major challenge. By re-completing the old wells with OHGP (Open-Hole Gravel Packs) the well's performance could be improved significantly. The development of well completion technology for UGS in China are illustrated by comparing three well completion schemes in Dagang, Guxinzhuang, and Shuang 6 which are constructed in different time. It is found that the key technology including tubing selection, lost circulation control, subsurface safety valve, retrievable downhole packer, and formation damage prevention are some cutting-edge technologies that are matured enough compared to cement slurry selection in special formations, and the use of welded casing technology are still not quite developed.

Keywords: underground gas storage; well integrity; well completion; completion string