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Current technologies and prospects of shale gas development in China

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Shale gas in China has realized the great-leap-forward development because of the significant strides of development technique for marine shale resource, becoming the second largest shale gas producer only to USA. At present, a complete technique series for the development of shale resource buried less than 3500 m (<3500 m) has been established by operating technique research and field trial, including five main key techniques of geological evaluation, optimum & fast drilling, multistage hydraulic fracturing, productivity evaluation, and development parameters optimization: (1) The integrated technique of geophysics data interpretation and geological evaluation to identify high-quality shale interval provides a guidance for the target optimization of drilling horizontal well and the mass arrangement of multi-well. (2) Optimum & fast drilling technique is realized by incorporating rotary steerable drilling and factory operating pattern, contributing to shorten single-well drilling cycle by 50%. (3) Volume fracturing technique integrating low-viscosity slick water, low-density proppant, zipper-style fracturing and factory operating pattern, is conducted to enhance fracturing efficiency by 50% and improve testing production rate to $20 \times 10^4 \text{ m}^3/\text{d}$. (4) Productivity evaluation technique incorporating multi-scale fracture network and stochastic simulation is performed to analyze production performance with probabilistic forecasts. (5) A systematic optimization of fracturing parameters and well spacing is established by type curve matching, production performance modeling, and analogy with exploited shale field in North America. At present, shale resource in China has not been fully exploited besides the marine shale resource (<3500 m). It would be the future development trend to enhanced ultimate recovery of shale gas (<3500 m). Moreover, 2/3 recoverable resource is stored in the formation (>3500 m). With the further process of development technique for marine shale, shale gas is expected to the single type of gas reservoir contributing to the highest annual production rate in the near future.

Biography

Dr. Yunsheng Wei began his professional career at RIPED in 2006, having abundant experience in unconventional gas development about 10 years. He has made great contributions to improving reservoir engineering, especially in tight gas and shale gas. He has published more than 30 papers in reputed journals and has been serving as an editorial board member of several gas engineering journals.

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