Contribution ID: **115** Type: **Poster Presentation**

Numerical simulation and completion design optimization of sand production in depressurization exploitation of natural gas hydrate in South China Sea

Wednesday, 15 May 2024 09:25 (1h 30m)

Natural gas hydrate has large reserves and a high level of heat value, which is the strategic commanding point of global energy development. The hydrate reservoirs in the South China Sea are shallowly buried and have low cementation strength. In the process of exploitation for the hydrate reservoirs, workers often face problems such as large sand production, formation instability, and low efficiency of exploitation. In order to further study the production capacity and sand production during the process of exploitation, this study focuses on the characteristics of hydrate reservoirs in the Shenhu area of the South China Sea. Based on the CMG-STARS platform, a numerical model, coupled with thermos-hydro-chemistry processes, was established to explore the effects of completion horizon, completion length and production pressure on reservoir productivity and sand production law in vertical well depressurization mining. The results show that: The well completion in the middle of the reservoir is 21% and 15% higher than that at the top and bottom respectively, and the cumulative gas-to-water ratio is higher and the development effect is better, while the sand production problem at the top and middle of the reservoir is more serious. Under the current simulation conditions, considering the production capacity and sand production, the exploitation effect is the best when the completion length is 10m. Continue to increase the completion length, the production increase is reduced, only 19% increase, and the sand production increases sharply. The lower the production pressure is, the better the productivity is, and the more serious the sand production is. When the production pressure continues to decrease, the yield increase effect decreases, while the sand production still increases significantly. This study can provide a theoretical basis for the development of natural gas hydrate in the South China Sea.

Acceptance of the Terms & Conditions

Click here to agree

Student Awards

Country

China

Porous Media & Biology Focused Abstracts

References

Primary authors: QIN, Yu (China University of Petroleum(Beijing)); Prof. ZHANG, Yiqun (China University of Petroleum(Beijing)); Dr WU, Xiaoya (China University of Petroleum(Beijing)); Mr AN, Youkeren (China University of Petroleum(Beijing))

Presenter: QIN, Yu (China University of Petroleum(Beijing))

Session Classification: Poster

Track Classification: (MS17) Complex fluid and Fluid-Solid-Thermal coupled process in porous media: Modeling and Experiment