SPE-192044-MS

Advantages, Challenges and Selection Criteria (Queensland Case Study)

A. Mortezapour, A. Bassatt and E. Lean, Weatherford Australia

Abstract

i. Objectives/Scope

Application of reservoir monitoring systems has a great value to understand the reservoir behavior and complexity, efficient production optimization and reservoir management over time. The technology was well accepted by oil and gas pioneers in the last 32 years in different places of the world (Norway, Vietnam, China, Malaysia, Australia and USA). In the past 10 years more than 1000 wells has used reservoir monitoring system to monitor the well and reservoir performance of CSG wells in Queensland. This paper presents technology, reservoir and production engineering analysis and failure mechanism in more than 400 CSG wells in Queensland.

ii. Methods, Procedures, Process

The application of reservoir monitoring systems has 4 major technologies: Quartz, analog, digital and fiber optics gauges. All 4 technologies have been used in Queensland CSG wells. However, every technology has its own benefits and advantages. This paper will initially discuss the operating procedure, accuracy of the data and failure causes of permanent downhole gauges.

The technology application in monitoring groundwater, CSG reservoir, hydraulic fracture and pump performance will be reviewed and finally practical application of the technology in fracture network detection or production optimization in one of CSG field in Queensland will be analyzed.

iii. Results, Observations, and Conclusions

History of lesson learned about the application of technology around the world will be reviewed. Financial model for selection criteria of best reservoir monitoring technology for CSG wells will be presented. In the next step, a workflow for efficient use of reservoir monitoring technology for production optimization and reservoir characterization of CSG wells will be presented.

Finally, the advantage of using reservoir monitoring system to optimize the well intervention and safety in Queensland CSG operation will be addressed.

iv. Novel/Additive Information

Queensland CSG industry is lacking the workflow to choose the best reservoir monitoring technology which maintains the highest reservoir management and production optimization output considering the pricing. This paper will address the best technology selection method backed up with real CSG field case study. Also, this paper will tackle the best practices for operational, reservoir characterization and production optimization output of reservoir monitoring technology.