

Optimizing Oil Production through 30-Inch Pipeline in Abu-Attifel Field

Authors : Ahmed Belgasem, Walid Ben Hussin, Emad Krekshi, Jamal Hashad

Abstract : Waxy crude oil, characterized by its high paraffin wax content, poses significant challenges in the oil & gas industry due to its increased viscosity and semi-solid state at reduced temperatures. The wax formation process, which includes precipitation, crystallization, and deposition, becomes problematic when crude oil temperatures fall below the wax appearance temperature (WAT) or cloud point. Addressing these issues, this paper introduces a technical solution designed to mitigate the wax appearance and enhance the oil production process in Abu-Attifel Field via a 30-inch crude oil pipeline. A comprehensive flow assurance study validates the feasibility and performance of this solution across various production rates, temperatures, and operational scenarios. The study's findings indicate that maintaining the crude oil's temperature above a minimum threshold of 63°C is achievable through the strategic placement of two heating stations along the pipeline route. This approach effectively prevents wax deposition, gelling, and subsequent mobility complications, thereby bolstering the overall efficiency, reliability, safety, and economic viability of the production process. Moreover, this solution significantly curtails the environmental repercussions traditionally associated with wax deposition, which can accumulate up to 7,500kg. The research methodology involves a comprehensive flow assurance study to validate the feasibility and performance of the proposed solution. The study considers various production rates, temperatures, and operational scenarios. It includes crude oil analysis to determine the wax appearance temperature (WAT), as well as the evaluation and comparison of operating options for the heating stations. The study's findings indicate that the proposed solution effectively prevents wax deposition, gelling, and subsequent mobility complications. By maintaining the crude oil's temperature above the specified threshold, the solution improves the overall efficiency, reliability, safety, and economic viability of the oil production process. Additionally, the solution contributes to reducing environmental repercussions associated with wax deposition. The research conclusion presents a technical solution that optimizes oil production in the Abu-Attifel Field by addressing wax formation problems through the strategic placement of two heating stations. The solution effectively prevents wax deposition, improves overall operational efficiency, and contributes to environmental sustainability. Further research is suggested for field data validation and cost-benefit analysis exploration.

Keywords : oil production, wax depositions, solar cells, heating stations

Conference Title : ICEEET 2024 : International Conference on Environment, Energy, Engineering and Technology

Conference Location : Rome, Italy

Conference Dates : March 04-05, 2024