OGiC Project Case Study: Tendeka with the University of Strathclyde

Autonomous Inflow Control Device (AICD)

Tendeka is a leading provider of completions systems and services to the upstream oil and gas industry. A founding member of Well Performance Network (WPN), Tendeka delivers reliable production from developments with complex wells and mature reservoirs, blending innovative technology and collaborative insight and expertise.

Tendeka identified an opportunity to perform a computational investigation of the performance of the Autonomous Inflow Control Device (AICD), which is used as a valve for oil production applications. The AICD dynamically controls the inflow depending on the fluid properties. Specifically, the inflow is regulated by the position of a disk that is located next to the inlet and is free to move towards or away from it. The closer the disk is to the inlet, the more restricted the flow is. Tendeka wished to develop a Computational Fluid Dynamics (CFD) model for AICD. This model could improve the performance on existing well by retrofit AICD and enhance oil recovery in oil rim reservoirs. Similarly, the model would lead to more effective reservoir drainage by reducing unwanted fluid production such as water and gas, which would in turn reduce the impact to environments.

Having completed the research project, Tendeka now aims to use the knowledge gained in an internal NPD process to develop a commercial AICD with improved gas and water control performance.

“The collaboration with the university provides a vast knowledge and opportunity to discover the physics behind the working principle and be able to perform simulations of the flow through the device, assess its performance, and guide the design of AICD optimised variants. This collaboration has enhanced Tendeka’s capability to improve the valve design and remain as a market leader in the technology.”

Ismarullizam Mohd Ismail, Tendeka

“The research group has extensive expertise in CFD across a range of methods and applications, and has implemented these methods in a variety of multi-phase flows pertinent to Tendeka’s interests. The CFD studies performed by Strathclyde shed light on the multi-phase flow phenomena occurring in AICD and will guide the design of future design variants.”

Professor Dimitris Drikakis, University of Strathclyde

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