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A New Era in Process Simulation: Innovative Modeling with OpreX Data Model Broker

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Oil & Gas industry is increasingly adopting process simulations for multiple purposes throughout the plant lifecycle. This provides benefits, including identify engineering risks, reduce start-up times, improve safety, and increase operating efficiency. On the other hand, despite the increasing scope of process simulation, simulation modeling is still carried out manually, with increased man-hours and human error being major challenges. If these problems can be significantly reduced by innovative modeling, studies using process simulations can be completed more quickly and efficiently, making their adoption even more attractive. Against this background, Yokogawa has developed "OpreX Data Model Broker" (DMB), an innovative application that automatically generates process simulation models based on digital P&ID input data and can immediately perform steady-state and dynamic simulation studies. In this article, we will introduce a proof of technology project (POT) for DMB conducted by Yokogawa and JGC.

Yokogawa has developed DMB application, which combines plant design data with engineering applications to automate various engineering activities, as data integration and updates in the plant lifecycle. Yokogawa has applied this to Petro-SIM (Process Simulator for steady-state and dynamic simulations), and developed DMB using semantic data model based on contextualization, which automates modeling without manual intervention based on digital P&ID.

JGC considered that DMB had the potential to reduce modeling time and effort significantly and make simulation studies more efficient. JGC therefore decided to participate in the POT with Yokogawa. The goal of the POT was to verify the functionality of DMB, to improve usability and functionality through feedback by JGC, to verify that the models generated could be applied without difficulty as dynamic simulation models.

Through the POT, DMB was able to:

1) Integrate digital P&ID and Equipment data which are created by JGC as mock BOG Compressor process
2) Generate Process Simulation model for study a BOG compressor, which could be used with minor manual tuning
3) Update model input data to maintain consistency when design inputs were updated

JGC finally evaluated DMB as follows

- -DMB can reduce modeling time, allowing engineer to conduct simulation studies more quickly and efficiently
- -DMB is useful to maintain consistency between model input data and design inputs, when design inputs were being continuously updated
- -Various functions of DMB can be used to improve the efficiency of JGC's design work

DMB will continue to be updated and will be applied to more plants (e.g. LNG). JGC will continue to support this development through application of DMB during, and feedback from, actual projects. Eventually, EPC contractors and Plant Owners will use DMB for digitalization by creating digital twin models of existing or new plant efficiently, and by integrating with other system (e.g. AI) to improve plant efficiency.

To view the full technical programme, visit https://lng2026.com/technical-programme

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