Tokyo, Japan – January 13, 2026

Omega Simulation Co., Ltd.

Omega Simulation Launches Dynamic Digital Twin Platform OmegaLand V4
- Enhancing Collaboration with Control Systems to Support Autonomous Plant Operations -

Omega Simulation Co., Ltd., a subsidiary of Yokogawa Electric Corporation, announces it has revamped its OmegaLand plant operation simulation environment as the OmegaLand V4 dynamic digital twin platform, and is releasing the first version, V4.1, on this day. While OmegaLand has traditionally provided the functionality needed to build operator training simulators, V4 provides greater integration with control systems, enabling users to identify issues in plant operations, develop solutions, and apply and operate them more efficiently in the field.
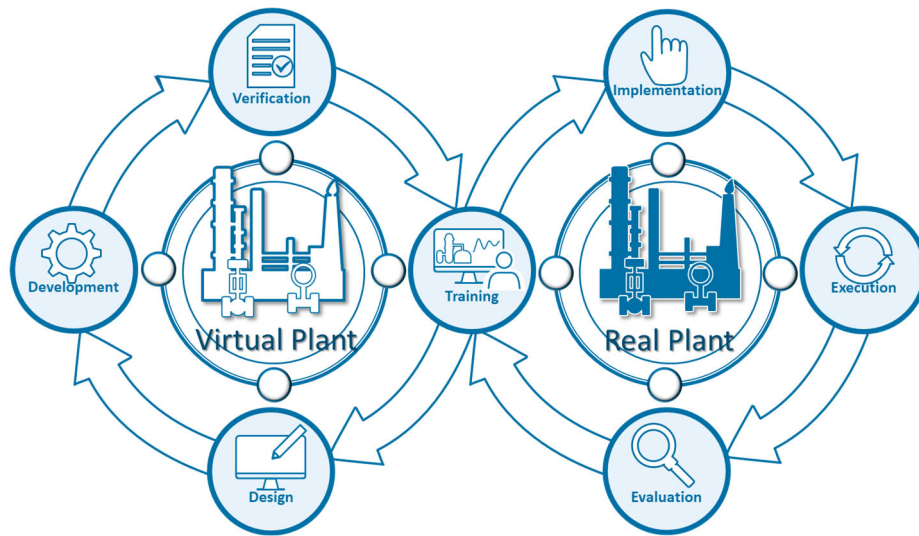
Development Background

The plant operational environment has grown more complex in recent years due to intensified market competition, equipment aging, labor shortages, cybersecurity risks, stricter regulations, and supply chain changes. As industries enter a period of major transformation, expectations are rising that the use of AI and other advanced technologies will lead to autonomous operations. However, this will require the clear identification of issues and a phased transition in which risks are evaluated and optimization is performed. In turn, informed decisions will need to be made on the introduction of new technology.

OmegaLand V4 Concept

OmegaLand V4 is designed as a dynamic digital twin platform that maximizes the return on investment in building dynamic models[*] and supports the autonomous operation of plants. By strengthening integration with Yokogawa's CENTUM VP control system, dynamic simulation technology—traditionally used offline—can now be consistently applied not only to operator training but also to the development, verification, implementation, and evaluation of AI models and other advanced control solutions that contribute to the autonomous operation of plants. Furthermore, even as operational autonomy advances and human intervention decreases, the platform will provide a framework that combines operational risk assessment with a dynamic simulator, enabling the verification of hazardous scenarios and the formulation of countermeasures.

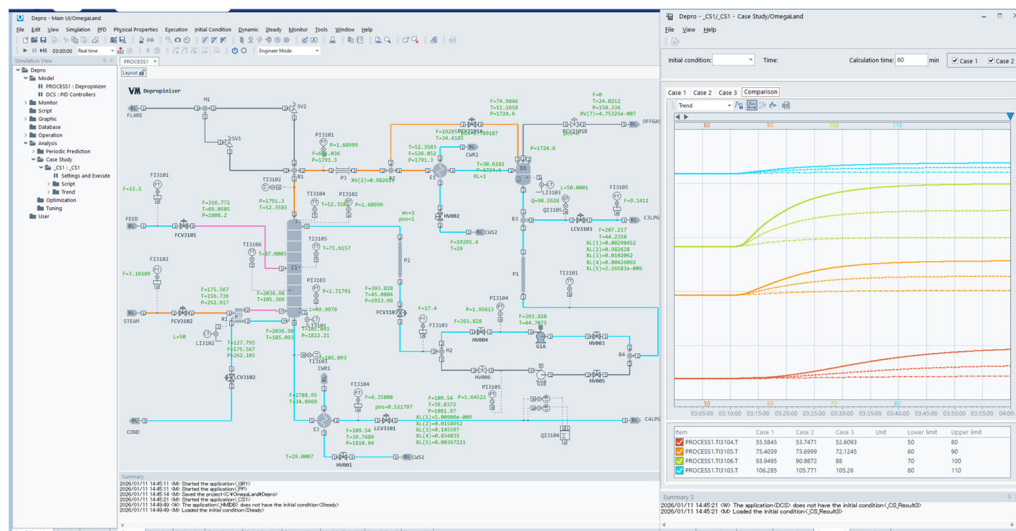Dynamic Digital Twin Platform
OmegaLand V4

A dynamic digital twin platform that ensures consistency in the development and verification of solutions and the implementation and evaluation of measures

Main Features of OmegaLand V4.1

In line with the OmegaLand V4 concept, basic functionality and integration with control systems have been strengthened as follows.
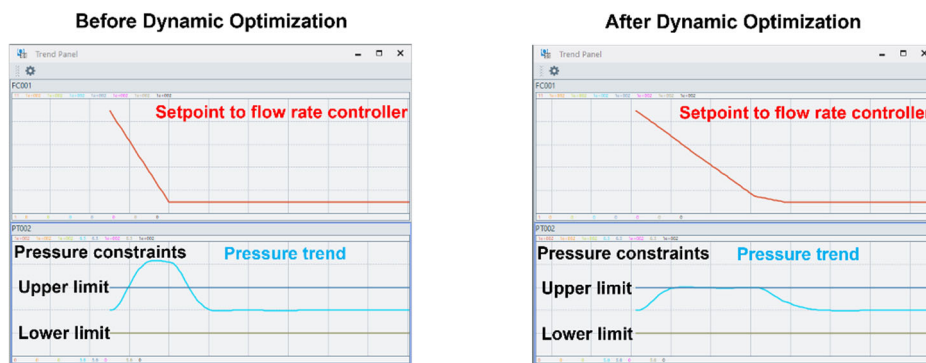
1. Enhanced case study functionality

A case study function has been enhanced that allows users to test "What if" scenarios in a virtual plant environment. For such purposes as saving energy and improving efficiency, users can register up to ten scenarios and simultaneously compare up to three test cases to evaluate changes in operating conditions or control procedures, thereby improving testing efficiency and reducing costs.

Case study function that allows simultaneous comparison of three cases

2. Optimization function for efficient and adaptive operations

Based on conditions such as plant operation control values and product specifications, a function is provided that helps eliminate waste in the use of raw materials and energy by identifying optimal operating conditions. Also, when changes are made in operating conditions, it presents patterns that can reduce the load on equipment and ensure safe and efficient transitions. Rather than optimization at a single point in time (static optimization), sustained optimal operation (dynamic optimization) is achieved by flexibly responding to load fluctuations and changes in the external environment.

Optimization function that identifies efficient operating conditions and transition patterns

3. Enhanced integration with CENTUM VP

OmegaLand Plant Tracker, which visualizes the status of a plant by giving online and real-time access to information such as changes in plant operations and operator inputs, has been added as a new solution. In addition, the simultaneous synchronization of simulations with CENTUM VP improves the accuracy of the simulation environment employed to conduct operator training, risk assessment, and pre-operational reviews.

* Dynamic models that represent the state and movement of systems that change over time are a core element in dynamic simulators that reproduce plant behavior, and are important assets for creating, recording, and accumulating customer plant operation know-how.

Major Target Markets

Oil, gas/LNG, chemicals, electric power, renewable energy, pharmaceuticals, food, pulp and paper, steel, water and wastewater

Applications
- Plant process and operation training simulator for operators and engineers
- Digital twin-based visualization for smart plant operations
- Development and validation of AI models and advanced controls

For More Information

OmegaLand

https://www.omegasim.co.jp/contents_e/product/ol/

About Omega Simulation Co., Ltd.

Omega Simulation Co., Ltd. was established in April 1997, bringing together Yokogawa's plant control system know-how and Mitsui Chemicals' process simulation technology. Yokogawa currently holds 85.1% of the company's stock, with the remainder held by Mitsui Chemicals. Omega Simulation is engaged in the development, sale, and maintenance of plant operation training simulators and software to support plant analysis, operation, and control.

For more information, visit https://www.omegasim.co.jp/index_e.htm.