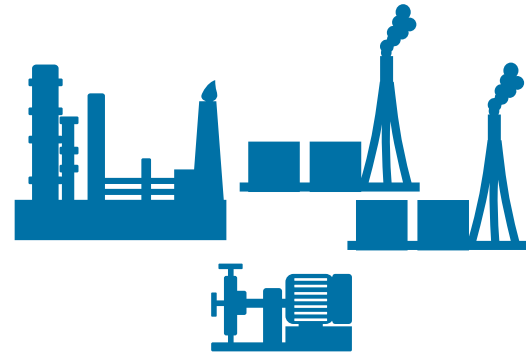


What's BTG Library?

BTG (Boiler-Turbine-Generator) Library is an optional add-on library for Visual Modeler, the plant dynamic simulator at the core of the integrated dynamic simulation environment OmegaLand. The library provides generic unit models for steam generation systems, turbines, generators, and related equipment.

Why do we need BTG library?

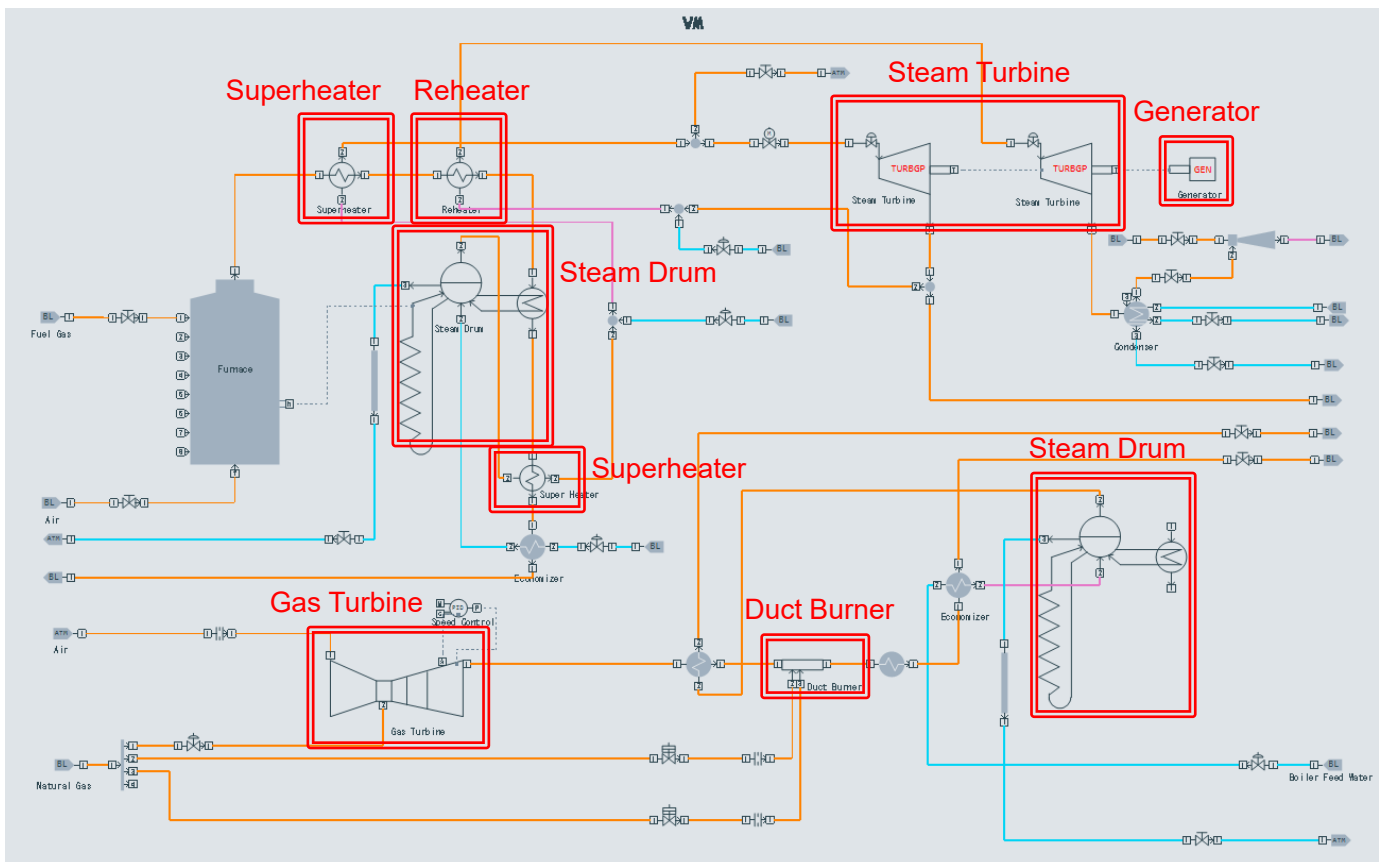
Power and steam generation systems in power plants and chemical plants are typically centered around BTG systems. The BTG Library enables dynamic simulation of fuel consumption, steam generation, turbine operation, and power generation. Furthermore, by combining them with auxiliary facilities created using the standard units of Visual Modeler, it can be used for load change analysis, operator training, and operation planning studies. Developed based on extensive steam and power system modeling expertise and proven through numerous real-world applications, the BTG Library delivers reliable and practical simulation capabilities.



**Supports BTG
Operation Planning
and Training**

Configuration Example

Power Plant Simulator Built Using BTG Library



Units of BTG Library

* Deaerator, feedwater heater, economizer, and condenser are not included in the BTG Library; however, they can be modeled using the standard units provided by Visual Modeler.

Provided unit

The list of units provided as BTG Library is summarized in the table below.

Unit	Description
 Steam Drum	This is a natural-circulation water-tube boiler unit capable of handling conditions up to the subcritical state. It accounts for the horizontal cylindrical drum and the evaporator tube volume. Heat input is supplied by an external unit (e.g., a standard furnace unit), and water heating and evaporation are calculated from the transferred heat. During evaporation, vapor retained in the liquid raises the liquid level by the retained amount.
 Superheater/Reheater	This unit is an improved version of the standard general-purpose heat exchanger unit, with a radiant heat transfer term added to the heat transfer calculation on the high-temperature side. It is intended for use in high-temperature regions such as superheaters/reheaters.
 Gas Turbine	This is a gas turbine unit that integrates an air compressor, combustor, HP turbine, LP turbine, and generator. It calculates the combustion heat, turbine recovered power, air compressor power, generator speed, and other quantities to determine the power output. It also handles operating-state transitions, including startup, acceleration, and load changes.
 Duct Burner	This is a duct burner unit that has two-line combustion systems (pilot and main), which performs ignition, combustion state management, and combustion heat calculation.
 Steam Turbine	This unit represents a single-stage steam turbine. By combining it with other turbine models, it can be used to construct a multi-stage steam turbine. In addition, because the working fluid is limited to steam, the model provides more accurate turbine power calculations than the standard general-purpose turbine unit.
 Generator	This unit represents a generator connected to a steam turbine, used with the Steam Turbine unit of the BTG Library. It has two operating modes: in isolated operation, the rate of change of speed is calculated from the difference between the generator load and the turbine output; in parallel operation, the speed is held constant and the power generation is calculated from the turbine output.

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