

Process simulation is the DNA to every project

Why is the digital twin so important for the power industry?

Unlike other industrial processes, power generation is directly linked to the consumers of its product, since electric power cannot be economically stored in the quantities needed to continuously balance supply and demand on the grid. Thus, most power plants must follow the load demand and operate under conditions which are different from their design conditions for most of the time. The growing share of renewable energy in the generation mix that stems from intermittent and highly fluctuating sources has dramatically aggravated this situation.

In order to create an optimal design for a new plant or the modification of an existing plant, the engineer must therefore evaluate proposed designs across the entire range of expected operating conditions.

For an existing plant operating in a deregulated competitive market environment, the accurate prediction of plant capacity and fuel consumption under expected conditions for the next day or week is essential to mitigate the risk of overcommitting plant capacity

and to bid competitive prices sufficiently above actual cost of generation.

What must be considered in the simulation?

While textbook equations can be applied to calculate design heat balances with simple tools such as Excel, the key to an accurate and useful process simulation model is the so-called off-design simulation. Every component of the plant must have a set of equations that represents how its performance will change with changing operating conditions. Heat balance software that inherently includes off-design capabilities which can be easily adjusted to exactly match vendor performance information enables the user to switch from a design input to a detailed simulation model. Such a model will allow for the evaluation of the design over the entire range of operating conditions without making it an excessive academic exercise.

Why is EBSILON®Professional the best solution?

EBSILON®Professional allows for in-depth thermodynamic analysis benefiting from its comprehensive

features, such as:

- individual equipment characteristics in design and off-design mode,
- a full record of all flows of the plant,
- flexibility in equipment arrangement, plant configuration and mix of technologies including renewables,
- control loops by components or scripts,
- a powerful, fast and reliable equation based solver,
- an open architecture to include user-defined models for new technology,
- a user-friendly interface to Excel®,
- a state-of-the art graphical user interface and a wide variety of output options in graphical and tabular formats, and
- an interface to Python as the bridge to advanced data analytics.

ENEXSA cooperates with STEAG Energy Services in the development of EBSILON and offers customized application specific training seminars as well as modelling services for any type of thermal power generation process.

If you want to learn more about EBSILON, please contact ENEXSA!

EBSILON®Professional

time and cost effective analysis

gas engines

extraordinary flexibility

ORC

nuclear solar

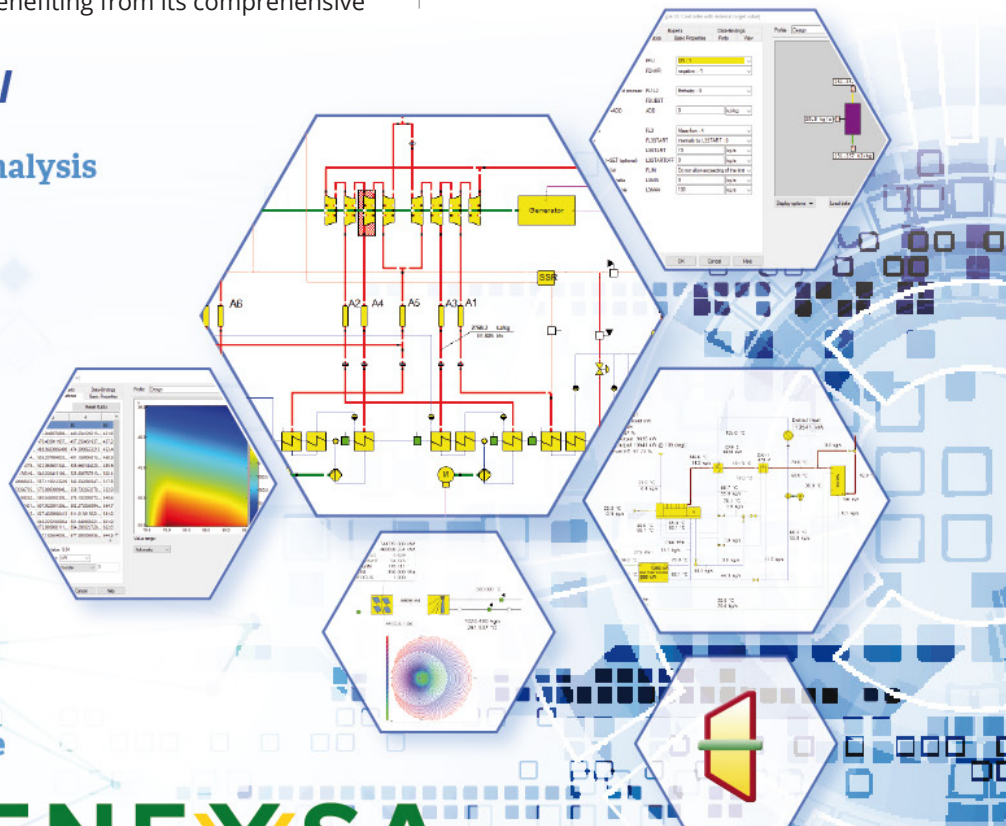
Excel interface

gas turbines

graphical user interface

individual equipment characteristics

off-design simulation



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