

Power & Process Products and Services

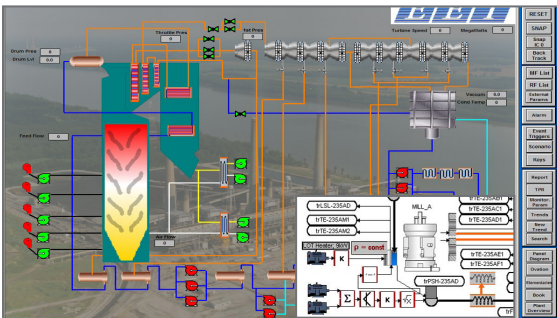


WSC, a legacy brand of Curtiss-Wright's Simulation Group, headquartered in Frederick, MD, is a global simulation and services company. Acquired by Curtiss-Wright in 2024, WSC is recognized for the quality and efficiency of their products and flexible team-oriented approach to serving its customers.

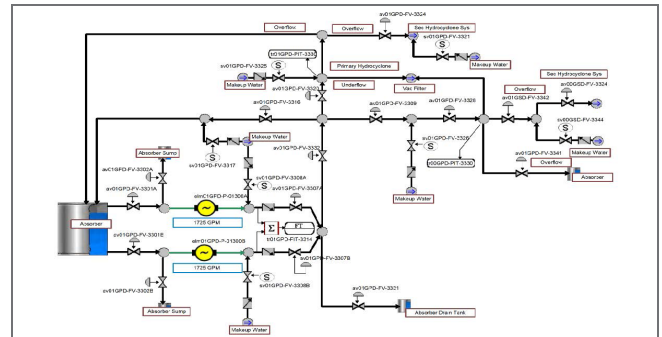
Fossil Plants

Our Simulation Group has extensive experience delivering simulation solutions for almost every type of fossil power plant configuration. Using the Fuel and Combustion Modeling Tool and the Flow Network Modeling Tool, virtually any boiler configuration can be modeled, e.g., super-critical, drum, once-through, and other designs. Fuel types include coal, gas, and oil. Turbine-Generators from multiple manufacturers have been simulated. Plant-specific BOP and electrical distribution networks have been modeled for each project using the modeling tools. Numerous Distributed Control Systems (DCS) have been emulated and 3KEYMASTER™'s open architecture allows easy integration of both simulated systems and the porting of "virtual" DCS models.

Curtiss-Wright's approach to fossil power plant simulation can be applied to any plant in operation or under construction, or extended to new plant designs.



Boiler and Coal Mill Example



FGD Absorber Bleed Pumps Model

Simple and Combined Cycle Plants

We have provided over 40 custom full-scope replica Combined Cycle Gas Turbine (CCGT) and simple cycle Gas Turbine (GT) Simulators using our modeling expertise and our 3KEYMASTER™ software.

A unique challenge to Combined Cycle Simulators are the multiple Distributed Control Systems (DCS) that may be needed to control the plant. Most CCGT power plants have, at a minimum, two DCS systems in one power plant. DCS systems have been applied to training simulators through multiple approaches such as stimulation, hybrid, virtual, and emulation.

Although the replica simulators are the most effective solution to meet individual plant training needs, has also provided partially customized and generic versions of simulators for plants that wish to minimize their initial simulator investment. These simulators may be upgraded at a later time to become plant-specific simulators. Our website, www.ws-corp.com, has a questionnaire that helps us formulate the optimal simulator solution for your training needs. Clients may request a demonstration that provides a full-scope high fidelity simulator with an emulated DCS, which would allow a user to explore the power of our simulators.

3KEYMASTER™ Fossil & CCGT Plants

Applications for Fossil, Simple, and Combined Cycle Plants

Why Use 3KEYMASTER™?

Simulation involves model development, integration, execution, test, visualization, and analysis. The 3KEYMASTER™ environment, developed by Curtiss-Wright's Simulation Group, provides everything needed to accomplish these tasks, with time-saving efficiency and engineering rigor, in a single, integrated environment.

Key Components

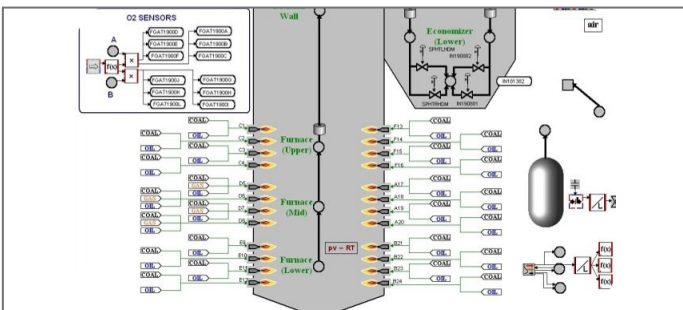
- Graphical Engineering Station (GES) with extensive run-time simulation controls and data visualization
- Powerful executive to run your models
- Versatile integration platform for Real-time I/O, third-party systems and code
- Complete suite of engineering-grade modeling tools and components library

Why Choose 3KEYMASTER™?

3KEYMASTER™ is the first simulation environment developed ground-up for the Microsoft Windows® operating system. Its open architecture, fully object-oriented approach, support for flexible human interface design, and leveraging of the Windows environment, offers distinct advantages in speed and usability.

To support fossil power plant simulation, our Simulation Group developed a Fuel and Combustion Modeling Tool specifically for fossil/CCGT simulation. This Tool is designed to simulate raw coal pulverization and transport, as well as gas/oil/coal fuel combustion. The Tool incorporates modeling objects to simulate most of the components involved in the pulverization, delivery, and combustion processes, including feeders, pulverizer mills, and burners. With Curtiss-Wright's other modeling tools and DCS solutions, a complete power or process plant simulation can be created.

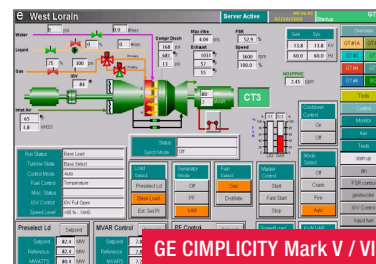
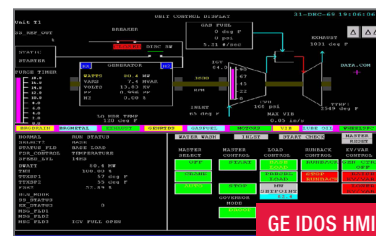
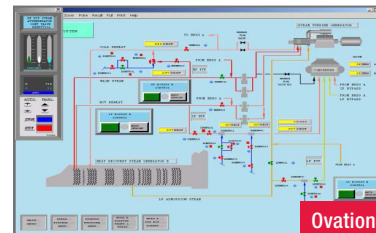
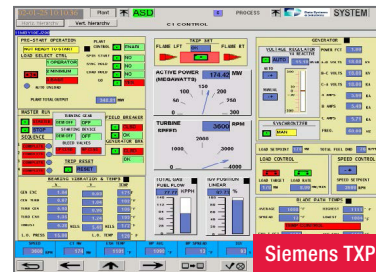
Plant developers and owners are taking a fresh look at simulation technology, and examining how its convergence with their internal processes for engineering, development, operations and maintenance, will reduce development life-cycles, improve quality, promote efficiency, and reduce risk. As a result of their assessments, leading engineering companies have adopted 3KEYMASTER™ as the core of their engineering practice. See the Simulation Assisted Engineering (SAE) brochure for additional information.



3KEYMASTER™ Advantage

- Fast, efficient, and cost-effective object-oriented technology with graphics-based model construction, test, and deployment - see the 3KEYMASTER™ Product Sheet
- Modeling suite provides comprehensive, high-fidelity coverage of systems. Knowledge of physical principles and equation solution methods are embedded in the tools - see the Modeling Tools Product Sheet
- DCS and logic systems emulation, DCS stimulation, and “virtual” control systems integration - see the DCS Solutions Brochure
- Re-hosting or porting of legacy or custom code (FORTRAN, C, C++); preserves your existing investments
- Easy integration with third-party software, hardware, I/O systems, and panels
- Extendable - easy to add new modeling objects and code to provide complete simulation of complex systems, including unit operations for process industry

CCGT Examples with DCS Emulation



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