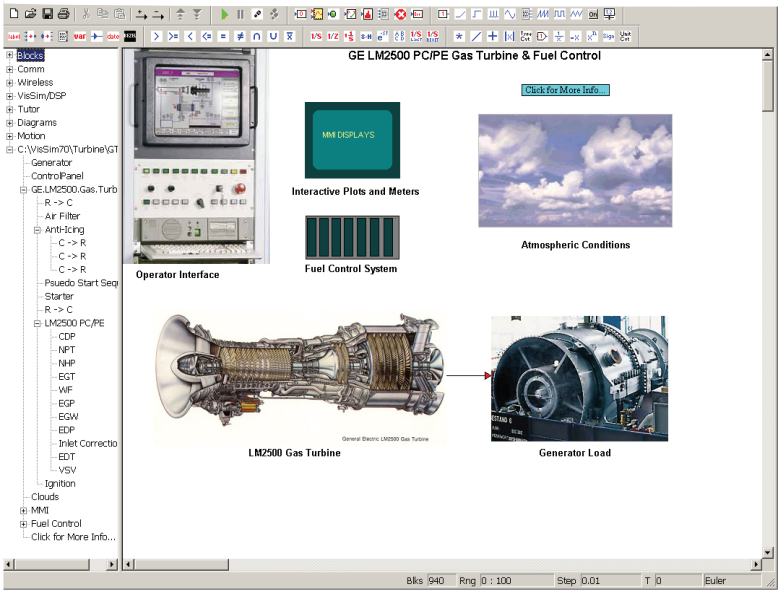
CUSTOMER STORY

Honeywell

GE Gas Turbine Developed with Embed SE



Top level model that simulates nonlinearities of a gas turbine. This 2000+ block diagram simulates the relationship between the turbine and the controller.

"When I was tasked with simulating turbomachinery to test control systems before they left the factory, I chose [Embed SE]. All you need is a logical brain and some knowledge of mathematics. [Embed SE] makes the rest easy."

Mohan Thiagarajah
Application Consultant
Honeywell UK

When Honeywell UK won a contract to retrofit an existing control system on a General Electric LM2500 gas turbine, they required a simulation package that had the power and flexibility to model the nonlinearities of a turbine, as well as evaluate the relationship between the turbine and controller. Based on previous experience, Mohan Thiagarajah, applications consultant at Honeywell, chose Embed (formerly called VisSim) to handle all of their development and testing needs.

Model Development

After only a few weeks, Thiagarajah created a basic model of the gas turbine, including the compressor, combustor, gas generator turbine, and power turbine. Several iterations later, the model would grow to over 2,000 blocks and encompass all the auxiliary units, including fans, pumps, values, and pipes. According to Thiagarajah, features like drag-and-drop block placement and compound blocks streamlined model construction and greatly improved the readability of the diagram.

Model Integration

One of Thiagarajah's prime concerns was integrating existing GE information into the overall model. In particular, Thiagarajah wanted to model the starter motor, ignition system, ventilation fan, and lubrication

Honeywell

INDUSTRY

Energy

CHALLENGE

Retrofit an existing control system on a GE LM2500 gas turbine

SOLUTION

Use Embed SE to build, optimize, test, and validate the control system and integrate legacy data into the overall model

BENEFITS

- Drag-and-drop block placement and hierarchical construction speeds up the design process and improves diagram readability
- Creating and validating control algorithms in the simulation model are less costly to correct

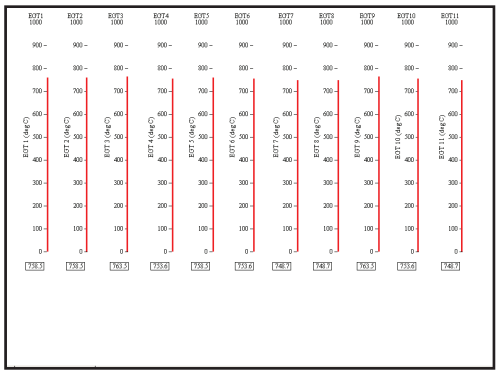
oil pumps based on GE specifications. “The map block provided an easy and reliable way to incorporate this data directly into the simulation,” explained Thiagarajah. “I could perform 1-, 2-, or 3-D table look-ups, depending on how the data was organized.”

Control Validation

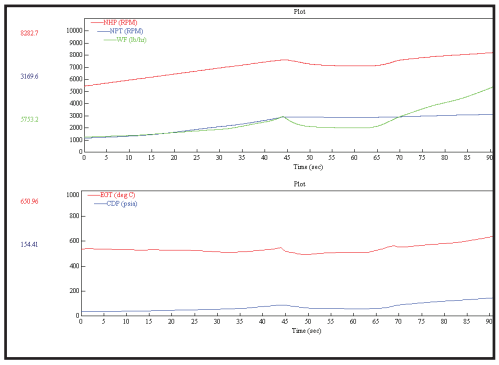
With a fully functioning model, Thiagarajah was able to create and validate complicated control algorithms for start-up sequencing and fuel controls, and simulate both the transient and steady-state behavior of the system. He also had a safe environment in which to test emergency trips and alarms that would be too costly or dangerous to perform on the physical system.

Complete Simulation Environment

In the end, both Honeywell and their customer were extremely satisfied with Thiagarajah’s work. Honeywell found that Embed SE was the most effective and easiest PC-based solution for developing complex simulation models. Honeywell’s customer ended up with an operational system that met all their requirements.



Meter display of output data.



Plot display of output data.