Curtiss-Wright Nuclear Division

Announces New Version Release

PEPSE

Version 87

December 2022

Curtiss-Wright is excited to announce the release of the new version of Scientech's PEPSE in December 2022. The Version 87 release includes many new features and enhancements as requested by our clients and end users. These improvements are designed to enhance PEPSE's user productivity while increasing its thermal analysis capabilities. PEPSE's annual releases sustain its leading role as the most powerful predictive and design analysis tool on the market.

The demand for optimization technology has advanced significantly over the past few years, driven by competitive generation, the environment, and the need to connect critical thermal performance data with end users who contribute to the thermal efficiency of the power plant. PEPSE with its annual upgrades is pushing the envelope and leading the industry with state-of-the-art, optimization technology through accurate modeling, analysis and simulation software to improve the heat rate of generation assets. Accurate models producing a few tenths of one percent heat rate improvement can make a difference of several hundreds of thousands of dollars in fuel reduction costs or in increased generation sales annually for a single unit.

Specifically, PEPSE's best achievable and "What-If" analysis allow performance engineers to establish key performance indicators (KPIs) that produce the lowest cost of production for dispatch operations, e.g., capacity marketing. Additionally, PEPSE allows the evaluation of equipment and process changes required for justification of capital expenditures, e.g, coal to gas fuel conversion. With the release of Version 87, PEPSE continues to be the industry benchmark for optimizing power plants' thermal efficiency and process cycles. This has been proven by the selection of PEPSE by many utilities as their gold standard in its ability to realize improved heat rate and generation goals.

We have listened to our clients and incorporated lessons learned from our technical support and services into our annual PEPSE upgrades. The markets are changing, and Curtiss-Wright is listening and changing our software accordingly.

PEPSE's Version 87 provides engineers with the ability to readily and accurately analyze and optimize a system's efficiency, and plants that employ it derive a number of direct and important benefits. PEPSE is your key to accurately analyzing plant performance and identifying ways to increase generation and reduce heat rate. PEPSE helps to eliminate causes of inefficiency allowing a plant to produce every possible kilowatt and conserve every possible BTU thus providing for reductions in plant emissions and carbon footprint. This also lowers operating costs through higher efficiency, fewer repairs, less downtime, and lower fuel costs.

PEPSE program enhancements have been improved to enhance its ease of use, e.g., speed, reporting capabilities, displays/graphics, data reduction, help functionality, error corrections, and "user friendly" operation. These enhanced features complement its business value for a complete performance improvement program.

PEPSE V87 Enhancement Summary

PEPSE upgrades are implemented to enhance user productivity and introduce the latest calculation standards as provided by the power production industry. Outlined below is a summary of several of the major features of Version 87.

PEPSE Program Enhancements

- Modified PEPSE calculations and results processing to allow multiple models to run simultaneously. This should be especially beneficial to PEPSE-RT where running multiple models in parallel will improve the overall calculation speed.

- Modified PEPSE to use Keylok USB Keys rather than Sentinel for copy protection.

- Expanded/Improved air handling options for turbine inlet air for the gas turbine engine to allow heating/chilling/evaporative cooling.

- Modified the HP and IP steam turbine supercomponents to have an additional extraction at the exhaust.

- Allow radiant heat transfer from duct burners to superheaters.

- Allow user to provide overall compressor efficiency rather than requiring individual stage efficiencies in the combustion gas turbine compressor

On the graphical interface the following enhancements have been made:

- Modified the data selection lists and model data window to have an additional column for enabled/disabled and open/closed status for the items in the lists.

- Allow the sorting of the data selection lists and model data by ID, set and status in forward and reverse directions by clicking on column header.

PEPSE Error Corrections

In the PEPSE thermodynamic analysis program, the following error corrections have been made:

- Fixed a problem with some very large, complicated models running multiple cases that would fail to calculate due to the model size.

- Fixed a problem with gas turbines that were out of service, i.e., had zero fuel flow or had the outlet stream closed. In some cases, the models would fail because the wrong fluid type was detected in one of the streams.

- Fixed processing of the air heater results variables HXXRAT (x-ratio) and EFFPRU (gas-side efficiency).

- Fixed processing of the pump results variable PHEADU (pump head).

- Fixed a problem with processing of the results (.RES) file that could cause PEPSE to hang. If it happened the user would have to kill the running PEPSE.EXE and restart it. In rare instances the process would open a window that required user input but the window was hidden so the user couldn't respond.

On the graphical interface, the following error corrections have been made:

- Fixed engineering unit conversion for SI and metric units in the tooltips property

- Fixed sorting of columns in the data selection dialogs.

- Fixed the Variable Names dialog to show the correct engineering units when multiple models were open.

- Fixed a problem with generator results. If more than 5 generators were in the model, PEPSE would crash when the results were being processed for display.

PEPSE Version 87 will run on Windows 7 and newer operating systems; and Windows Server 2008 and newer operating systems, including 32-bit or 64-bit versions.

We look forward to working with you and continuing to provide the most powerful off-line thermal performance modeling tool available. Upgrading to Version 87 will provide enhanced functionality of the leading performance analysis and simulation tool, PEPSE, and demonstrate a valued return on your investment.

To upgrade to PEPSE Version 87 or to receive more information, contact please contact Josh Bartlett at (208) 497-3547 or jbartlett@curtisswright.com.