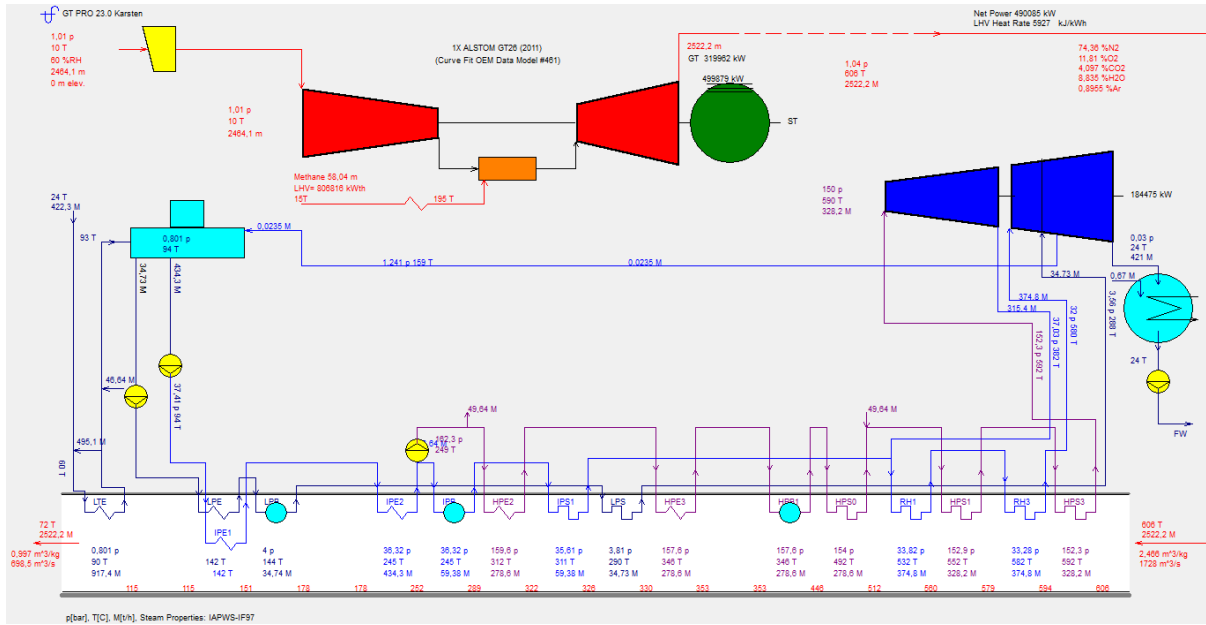


GT & Recip. Engine Combined Cycle Design, Simulation, and Cost Estimation

GT PRO® is an **Expert Program** that automates the process of designing a gas turbine or reciprocating engine based power or cogeneration plant. GT PRO is particularly effective for creating new designs and finding their optimal configuration and design parameters considering technical performance and total plant cost (**techno-economic optimization**).



Cycle Flow Schematic: GTCC, Single-Shaft, 3p-RH

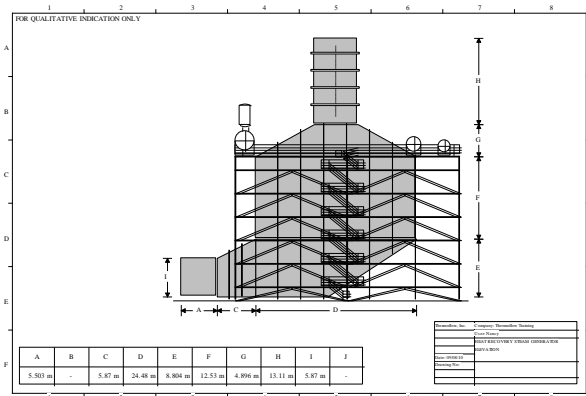


PEACE Output: Site 3D View

Most key inputs are automatically created by intelligent design procedures that help the user identify the best design with minimal time and effort, while allowing the flexibility to make any changes or user-adjustments.

GT PRO is truly easy to use, typically requiring only a few minutes to create a new plant design. It computes a heat balance and simultaneously designs the required equipment and site infrastructure.

GT MASTER® is the Off-Design Simulation companion to GT PRO. GT MASTER computes (steady-state and **transient**) performance for varying ambient conditions, fuel selection, equipment loading, process steam/water flows, hardware degradation levels, etc. The TIME feature (Time Integrated Modeling Economics) computes the project's NPV considering cold/warm starts and shutdowns, various loads and ambient conditions throughout the year.



PEACE Output: HRSG Elevation 2D View

Project Cost Summary	Reference Cost	Estimated Cost	
Power Plant:			
I Specialized Equipment	285,374,000	299,643,000	USD
II Other Equipment	15,826,000	15,777,000	USD
III Civil	28,620,000	33,182,000	USD
IV Mechanical	37,273,000	43,811,000	USD
V Electrical Assembly & Wiring	7,806,000	9,136,000	USD
VI Buildings & Structures	11,821,000	13,595,000	USD
VII Engineering & Plant Startup	18,638,000	18,616,000	USD
Gasification Plant	NA	NA	
Desalination Plant	NA	NA	
CO2 Capture Plant	NA	NA	
Subtotal - Contractor's Internal Cost	404,558,000	433,738,000	USD
VIII Contractor's Soft & Miscellaneous Costs	84,511,000	93,694,000	USD
Contractor's Price	489,069,000	527,433,000	USD
IX Owner's Soft & Miscellaneous Costs	44,016,000	47,463,000	USD
Total - Owner's Cost (1 USD per US Dollar)	533,085,000	574,897,000	USD
Nameplate Net Plant Output	804	804	MW
Cost per kW - Contractor's	608.3	656	USD per kW
Cost per kW - Owner's	663.1	715.1	USD per kW

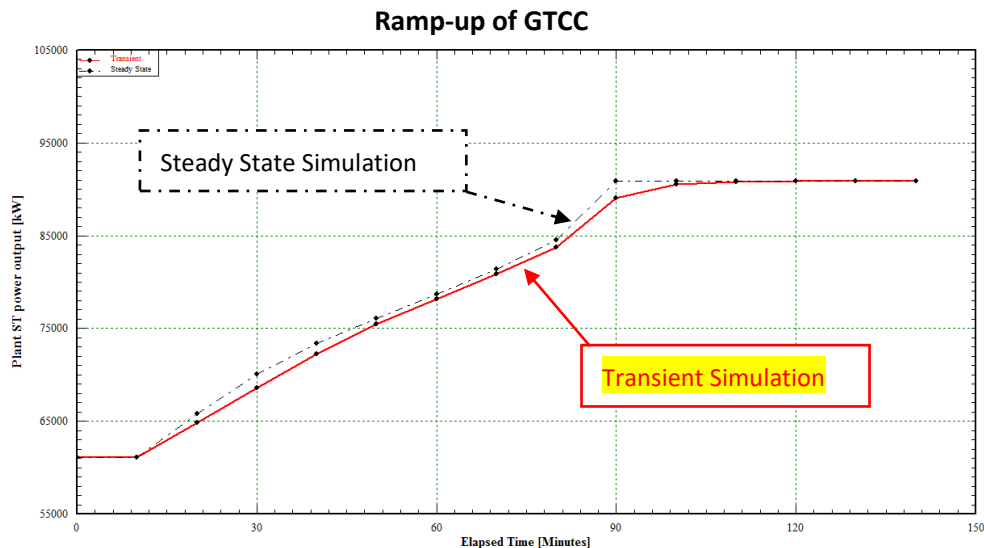
PEACE Output: HRSG Elevation 2D View

When run in conjunction with the optional **PEACE®** (Plant Engineering And Cost Estimator) module, the programs provide extensive engineering and **hardware specifications** such as weight and dimensions, plant and equipment **cost estimation**, and site details.

GT PRO and **GT MASTER** include a built-in library of **over 800 gas turbine and reciprocating engine specifications**, Integrated Gasification Combined Cycles (**IGCC**), Desalination Plants (**RO, MSF, MED**), and chemical / physical **CO₂ Capture and Sequestration (CCS)** plants.

A bi-directional Link to MS-EXCEL (**ELINK™**) is available, which allows plant models to be run from within MS EXCEL by specifying inputs and receiving outputs in EXCEL cells. ELINK makes it easy to produce Thermal Heat Rate curves, integrated Annual Simulation results, etc.

A built-in scripting language in GT PRO and GT MASTER allows to add own logical blocks to models, or to call an external DLL/EXE, so GT PRO and GT MASTER models can run together with other programs.



GT MASTER: Transient Simulation of GTCC Ramp-Up and comparison to Steady-State Simulation