

Plant Assessment for Combined Cycle Power Plants



Delivering service solutions that enhance the reliability and operational flexibility of power plant assets.

Power Plant Assessment

The competitive power generation market compels operators to enhance output, improve heat rate, and reduce operational costs. To achieve these goals, operators typically upgrade and enhance original design equipment. When considering performance upgrades, it's crucial to view the power plant as an integrated system.



GOLDEN PASS LNG IN TEXAS

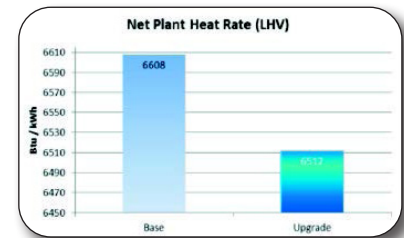
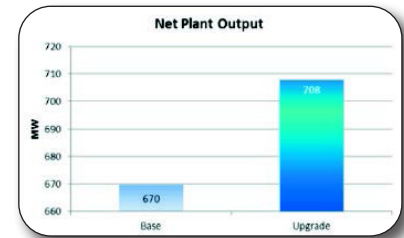
Why is a Plant Assessment Necessary for Your Assets?

Equipment upgrades can significantly impact various power plant assets, including:

- + Gas turbines
- + Steam turbines
- + Generators
- + Heat recovery steam generators
- + Emission control systems
- + Balance of plant equipment

An integrated assessment of critical power plant components and systems offers:

1. Comparison between design and upgraded performance
2. Insight into equipment limitations and solutions
3. Guidance for operational improvements
4. Evaluation of emissions compliance and other regulatory concerns



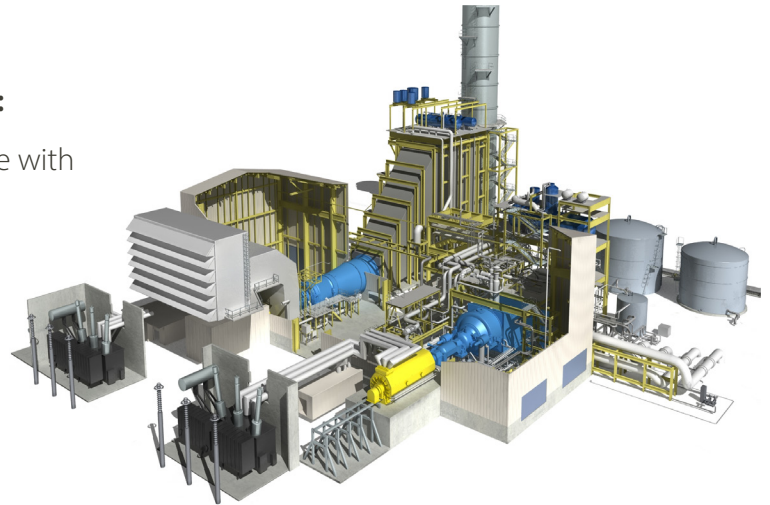
Plant Assessment for Comined Cycle Power Plants

In the current competitive power generation market, plant operators are driven to enhance output, boost efficiency, and reduce operational expenses. They often implement improvements and upgrades to the original equipment design to achieve these objectives. When considering investments in performance enhancements, it is crucial to view the power plant as an integrated system.

Benefits

A PSM Plant Assessment offers valuable insights to:

- + Confirm that equipment and systems are compatible with proposed upgrades
- + Optimize asset potential
- + Evaluate real-time conditions and performance
- + Enhance operational flexibility
- + Project life expectancy
- + Control emissions profile



Component Evaluation

Gas Turbine

- + PSM enhancement options
- + Performance and efficiency improvements
- + Exhaust characteristics

Heat Recovery Steam Generator

- + Design constraints for pressure components
- + Areas prone to accelerated corrosion due to flow
- + Capacity of temperature control systems

Steam Turbine

- + Steam pathway examination
- + Thermal and mechanical stress boundaries
- + Performance and efficiency improvements

Generator

- + Functioning at peak output
- + Operational limits and cooling constraints
- + Magnetic field saturation thresholds

Balance of Plant

- + Effectiveness of environmental control measures
- + Capacity of control valves, pumps, heat exchangers, and safety valves

Modeling & Analysis

PSM conducts a comprehensive power plant analysis for various operational and environmental conditions, considering:

- + Original and enhanced heat balance designs
- + Model adjustment to current equipment state
- + OEM and model-based upgrade potential for key components
- + Capability of auxiliary systems and components

Plant Assessment Report

The assessment report provides:

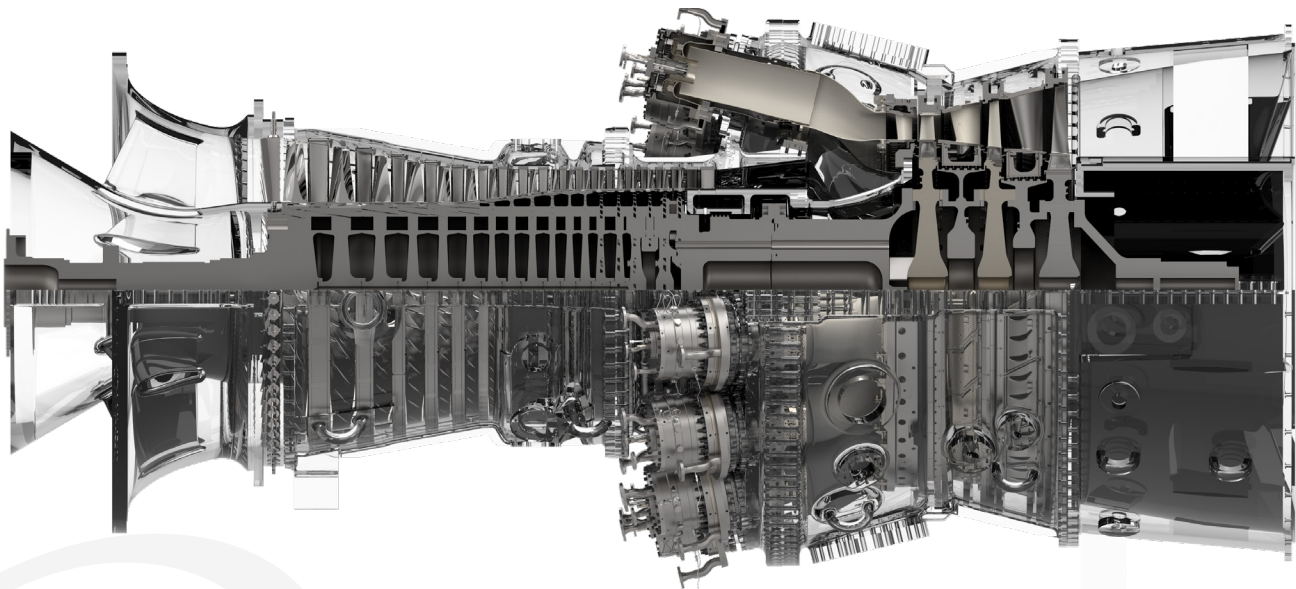
- + Current and upgraded plant thermal performance comparison
- + Emissions overview and environmental effects
- + Equipment and operational constraints and suggestions
- + Support for business case development

PSM - A Hanwha Company

The growing interest in the hydrogen economy is driven by the need to address climate change and transition to sustainable energy sources. However, challenges remain, including high production and storage costs, and extensive infrastructure requirements for distribution and transportation.

As a Hanwha subsidiary, PSM is uniquely positioned to leverage the expertise and resources of the Hanwha family to accelerate hydrogen development and adoption as a clean energy source. Hanwha's global presence and diverse business interests in areas like solar energy and defense provide PSM access to a wide array of technologies, markets, and partnerships.

Collaboration with Hanwha Q CELLS, a leader in large-scale solar projects, enables PSM to integrate hydrogen production with solar energy systems, fostering more sustainable and efficient energy solutions.



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