

FlameSheet™ A Revolution in Combustion Technology for Power Generation Gas Turbines

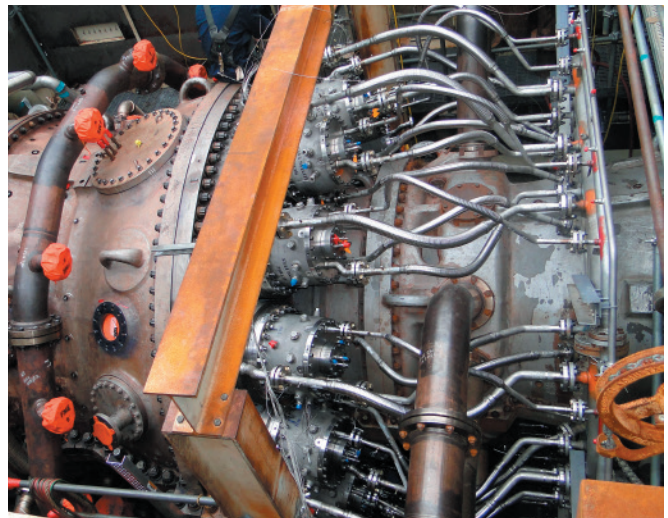
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Superior Turndown, Fuel Flexibility, and Emissions Capability

Power generation market dynamics require Gas Turbine (GT) power plants to operate in increasingly flexible operating windows. Factors such as natural gas price have lowered GT plant operating costs, making flexibility a key differentiator to market utilization. At the same time, fracked natural gas, now widely available, cannot be successfully burned without potentially damaging GT equipment due to its wider variation in heating value. Flaring restrictions require chemical plants and refineries to look for ways to burn as much hydrogen or other off-gases as possible in the GT. Finally, the abundant installation of “must-take” renewable generation sources has reduced the attractiveness of base load GT plant operations. These market conditions are forcing highly cyclic GT generation, which requires operating load range expansion, from base to very-low loads, while maintaining emission requirements and stable, safe operation. PSM FlameSheet™ combustion systems are available for implementation in E & F-Class GTs with characteristics aligned to these changing market needs.

FlameSheet™ Benefits

- + Up to a 30% increase in GT operating load range with single digit NOx and CO
- + Optional low load HRSG protection setting
- + Superior Fuel Flex
 - 30% Modified Wobbe Index (MWI) variation
 - Ideally suited for alternate fuel operation, including hydrogen, ethane, and propane
- + NOx as low as 5ppm
- + Peaking power at constant NOx emissions
- + Dual fuel capable
- + Up to 32K / 1250 start inspection intervals
- + Compatible with plant's existing GT controller and fuel skids

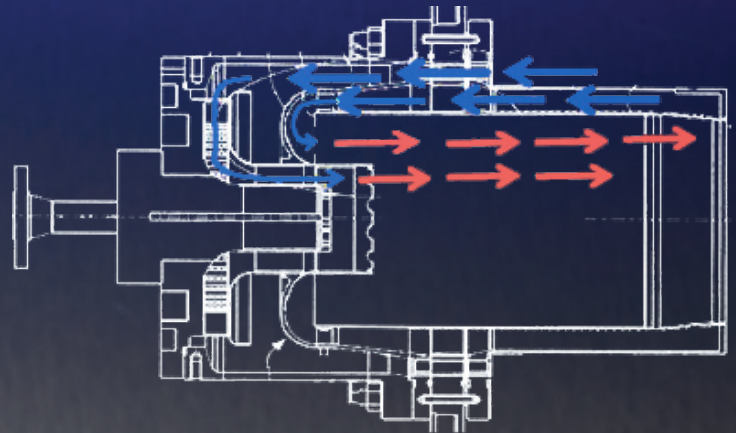


F-Class FlameSheet™ Installation

The **Proven** Alternative

HOW IT WORKS

- + Aerodynamic trapped vortex to ensure wide stability margin
- + Flame isolation – Combustor within Combustor to allow extended turndown operation
- + High pre-mixer exit velocities for tolerance to highly reactive fuels
- + Robust mixing techniques for improved fuel flexibility and tolerance to fuel Wobbe index variation



FlameSheet™ = TWO Combustors in ONE

FlameSheet™ employs a simple, two-stage radially-inflow “combustor-within-a-combustor” concept that allows the staged operation of each at various load conditions. While at high loads, both combustors are used, with the outer combustor flame structure looking like an annular “sheet of flame” around the inner combustor. At low loads, the outer combustor is predominantly used. Leveraging trapped vortex stabilization aerodynamics, the outer combustor operates with excellent stability & remains sufficiently hot at very low loads to consume CO (CO typically limits low load operation).



FlameSheet™ combustion systems are available now for E & F Class GT's, including the 7E, 9E, 6F, 7F, 9F, 501F, and 701F frames.

Contact your PSM Sales Representative for more information.
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