In 2013, the power plant owner approached PSM with a challenging new application for the LEC-III® ultra-low emissions combustion system. The proposal was to retrofit their 4 x Fr7B gas turbines with a state of the art combustion system, without any major modifications to the GT structure.

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Field conversion of a low-firing Frame 7B gas turbine power plant to ultra-low emission combustion

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Lower emission combustion systems generally have a higher combustion temperature. Previous retrofit projects of Fr7B GT's had required a complete plant upgrade to the newer Fr7E/EA rating, often including a new turbine casing, turbine rotor, uprated compressor and significantly advanced Hot Gas Path.

Based on PSM’s design and operational experience, a series of Computational Fluid Dynamic (CFD) analyses was carried out to determine how to cool down this flame before it reaches the turbine section through better airflow management.

Conversion duration was aligned to operational requirements and after implementation emissions were reduced by a factor of 12:

NOx: 35ppm → 6ppm

CO: 20-100ppm → <3ppm