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Abstract

Title:

“FUTURE-PROOFING” TODAY’S INDUSTRIAL GAS TURBINES: COMBUSTION SYSTEM FUEL FLEXIBILITY IMPROVEMENTS FOR HYDROGEN CONSUMPTION IN A RENEWABLE DOMINATED MARKETPLACE”

Presenter:

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Abstract Text:

Renewable energy has disrupted the energy market place. Fuel is free for renewables, and coupled typically with “must run” governmental requirements, they are the first to dispatch on the power grid. Wind and solar are a function of the weather and can experience rapid swings in load. The result of this type of highly variable power demand is that gas turbine power plants must effectively respond to the load swings and capture periods of profitability. It’s called “chasing renewables” and is highlighting operational limitations of the installed base of gas turbine power plants in a time where reducing maintenance cost are more critical to maintain profitability.

Alternative fuel combustion offers the potential of a low cost energy source for power generation. Some of these fuels, such as those produced as by-products at petrochemical plants and refineries, can be readily available, and absent the ability to ‘flare this gas’, it awaits the implementation of robust gas turbine combustion systems to harness their energy in a meaningful way. Additionally, Hydrogen also has the ability to be a ‘battery fuel’ as excess energy produced by wind and solar can be used to produce hydrogen through electrolysis.

Pertaining to gas turbine combustion, hydrogen is a highly reactive fuel and presents challenges for industry standard dry low NOx combustors to switch between natural gas and hydrogen fuel blends while remaining stable and with NOx emissions always below stringent emission limits. Significant concerns regarding emissions compliance, combustion dynamics and stability must be addressed prior to operation on these fuels.

This presentation will highlight successful retrofit solutions for both E-class and F-class heavy-duty combustion turbines that are in commercial operation today, offering significant benefit to the operator’s profitability and the environment.