

Industrial impact of high-fidelity simulations of Low- and High-Pressure Turbines

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Gas turbines (GT) are, and will continue to be, the backbone of propulsion and power generation systems. Given the very large world installed base, any GT efficiency increase has significant potential to reduce fuel burn and environmental impact. As an example, General Electric GT installed base alone burns \$150B/yr in oil and gas. Every percentage point increase in combined cycle efficiency would reduce GE turbine fuel costs by \$1.5B/yr and reduce CO₂ emissions per MW by 1.5%.

Although GT performance has improved considerably, it is now becoming increasingly difficult to make further advances with current design tools. In this talk we will discuss the industrial impact of understanding the unsteady physics that occur in the high-turbulence environment of a GT using high fidelity Computational Fluid Dynamics.