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A hot idea for RR 250 could cut fuel burn by 40%

by Harry Weisberger

Savings of up to 40 percent on jet fuel for the Rolls-Royce 250 turbine-engine family? That is the prospect offered by Frontline Aerospace, said company CEO Ryan Wood in describing an emerging aviation technology called gas turbine recuperation.

Frontline's patent-pending product, MicroFire, extracts waste heat from turbine-engine exhaust gases and injects it into air passing from compressor to combustor. The result of hotter air entering the combustion process is greater energy release per unit of fuel burned. Wood explained that until now turbine recuperators, though proven in land-based applications like power generation plants,



Frontline's innovative foil-laminate heat-exchanger technology recycles waste exhaust heat.

have been too heavy and bulky for aviation use. MicroFire, he said, solves those problems with new heat-exchanger technology, materials and design. Compact enough to reside within exhaust ducts of the larger R-R 250 engines, the MicroFire system weighs less than 50 pounds.

An increase of from 21 percent to 30 percent in combustion thermal efficiency translates to 40 percent less fuel consumption across the Model 250 series, Wood explained. He noted that the geometry of the Rolls-Royce turboshaft engines is optimum for a recuperator because it maximizes heat exchanger efficiency. Operators of those engines can expect to recover the cost of a MicroFire installation through fuel savings in from two to four years, depending on fuel prices.

The Frontline CEO cited innovative foil laminate technology as a major source of MicroFire's high heat-exchanger efficiency. The unit can be installed in less than a day by helicopter mechanics and will require a simple solvent rinse every 3,000 hours. He said MicroFire will not only improve engine performance and specific fuel consumption but also reduce hydrocarbon emissions per flight hour.

Frontline plans to seek supplemental type certification for specific MicroFire Model 250 installations. StandardAero has agreed to do proof-of-concept testing of the recuperator prototype. □