



Everest Sciences cooling systems are factory prepackaged and self-contained modular units designed for easy installation.

Go-to-Market Strategy for Inlet Air Cooling

A 2008 technology acquisition based on 10 years of product development, a move from California, U.S.A., to the more central location of Tulsa, Oklahoma, U.S.A., and a team of industry experts in place are key components of a “go to market” strategy that has Everest Sciences poised for growth in the application of inlet cooling technology for the gas turbine market.

Everest Sciences, the innovator of Indirect Evaporative Turbine Inlet Cooling (IE-TIC) has developed the hybrid h^3 system that can combine IE-TIC with refrigeration to achieve inlet air temperatures equal to full chilling systems, yet with significantly less parasitic losses, resulting in greater net power. Everest’s first production model, the ESid-18- h^3 , for applications up to 10 MW, provides inlet air to the gas turbine at temperatures as low as 7.8°C over a wide range of ambient atmospheric conditions. The ESid-38- h^3 — a larger capacity IE-TIC rated for airflow up to 17.2 kg/sec (850 m³/min) for turbines up to 60 MW — uses the same technology as the ESid-18 and is available for delivery in 2009. Everest Sciences also said that they are actively exploring units with even greater capacities.

The Everest Sciences system is unique in its combination of cooling methods built around the proprietary indirect evaporative cooling mechanism that extracts heat from the primary turbine inlet air without introducing moisture to that air stream. The process resembles a refrigeration cycle (sensible cooling) with parasitic power draw similar to that found on conventional evaporative techniques. When the integrated system uses indirect evaporative coupled with direct evaporative air washing, the result is cooler and denser air than conventional evaporative techniques. Everest Sciences also offers systems with a fully integrated mechanical chilling section after the indirect evaporative cycle. In these units the starting point of the refrigeration cycle is substantially cooler than the ambient air (both in dry bulb and wet bulb temperature). The result is fewer required tons of mechanical chilling and corresponding parasitic power draw while delivering equivalent performance to that of a full refrigeration system. This proprietary technology can increase gas turbine hot-day available power by up to 35% while reducing heat rate by up to 10% compared to uncooled gas turbines.

In regard to the application of this

technology, Marcus Bastianen, director of sales and marketing at Everest Sciences said, “Our cooling technology is designed with the retrofit in mind. The technology integrates customizable inlet filtration so that the cooling systems can replace the existing filter house.” A fully integrated system includes inlet air filtration, indirect evaporative and air wash cooling, standard water filtration, optional supplementary chilling that includes a fully integrated refrigeration condensing section, and control logic on each unit.

From the service side, the Everest Sciences cooling units are mechanically streamlined with few moving parts. Great effort went into the selection of industrial-grade components available with short lead times. A key advantage of the Everest Sciences technology is that most maintenance actions can be completed without requiring a shutdown of the turbine. The operational costs of the Everest Sciences system are very competitive. Water used in the indirect evaporative cooling process does not come into contact with the primary turbine inlet air, which allows for a simple water conditioning procedure for the majority of the water used.

Two Everest Sciences installations have been operating successfully since early 2007. Both are installed on Allison 501K turbines used in combined-cycle operations. The first installation is at a major Canadian packaging manufacturer, near Toronto. The second installation is at a food products manufacturing plant near Bakersfield, California. Both sites are meeting operators’ reliability and ROI objectives.

Everest Sciences has two units on-site at its Tulsa facility. One unit is available for theoretical assessments, developments and measurements. A second fully tested, full-scale production model provides customers with the ability to view a complete system, including comprehensive product demonstrations. This second unit in inventory also allows Everest Sciences the ability to offer quick delivery of a system, in special circumstances. ♡

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