

# Anti-Icing Systems

## Power Market

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## Innovative Anti-Icing

### TURBINE PROTECTION

Prevent ice formation damage using an anti-icing system that recovers heat from the exhaust and transfers it to the inlet to raise the air temperature conditions out of the icing risk range. Innova's unique design provides low-cost operation and high-performance protection for any gas turbine model.

#### Benefits

- › Negligible pressure drop
- › No reduction in engine efficiency
- › Low cost operation & maintenance
- › Activation at any time during operation
- › No environmental concerns
- › No additional silencing required
- › Can be used for inlet heating applications

#### Example

- › 1" wg pressure drop reduction = 0.355% power output gain
- › A 50 MW GT will yield an additional 177KW of power
- › Over 4 months of use at \$0.10/KWh, revenue will increase \$50,000.00

## Features

- » Heat exchanger that captures heat from the exhaust and transfers it to preheat the ambient air entering the filter house
- » Unique inlet air distribution design to provide even hot air flow injection to protect the entire filter face
- » Allows for less expensive barrier filters
- » No glycol or other chemical used
- » Modulating control dampers

## Add-on Products

- » Auxiliary heaters for start-up
- » Inlet filter house or silencing
- » Acoustical buildings, barriers and enclosures
- » Higgott-Kane™ silencing system

## Engineering Competencies

- » Thermal performance analysis
- » Low frequency and vibration analysis
- » Noise measurements

## How it works

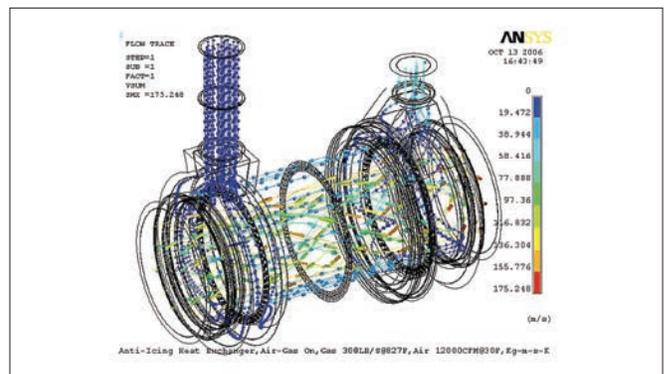
- » A blower forces ambient air into offset arrays of circular tubes just inside the exhaust duct shell.
- » Air flows through the heat exchanger counter to the exhaust gas path, warming as it travels.
- » The heated air is then transported through ducting to distribution rakes at the filter house inlet, where the air flows evenly across its face.
- » The warm air is introduced upstream from the first stage of the inlet filter, raising the overall temperature of combustion airflow by a minimum of 100°F (60°C) above ambient air temperature, shifting air conditions out of the icing risk range.



ANTI-ICING SYSTEM FOR A GE LM6000



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COMPLETE HEAT EXCHANGER CFD ANALYSIS

## Leverage our Experience

Based on hundreds of hours of Computational Fluid Dynamics and Finite Element Analysis modeling and more than 100 active units in use, we have a proven anti-icing system that is low maintenance, low-cost operation and a high performance solution to combustion turbine icing.

Innova has provided more than 100 anti-icing units to the gas turbine industry with inlet air temperature rises from 10°F to 59°F.



Balance Without Compromise™

## DESIGN SOFTWARE TOOLBOX

- Finite Element Analysis (FEA)
- Computational Fluid Dynamic Analysis (CFD)

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