CASE STUDY

Increasing turbine horsepower in a harsh environment

TC Energy, Canada

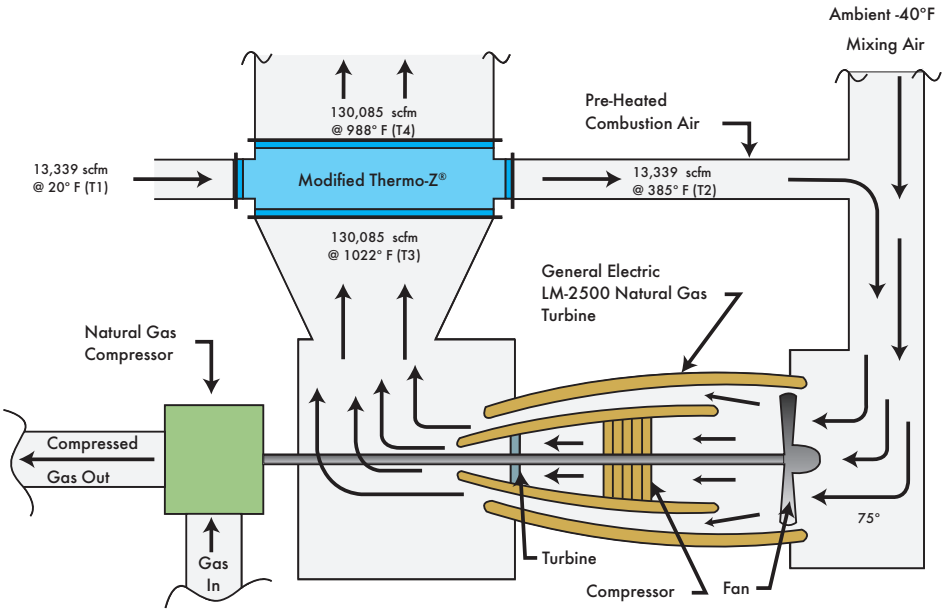
TC Energy pumps natural gas through underground pipelines from production facilities in western Canada to consumers in eastern Canada and the Midwest US. Gas generators drive power turbines, which in turn drive compressors that compress natural gas to transmit it across the country.

Munters Thermo-Z® heat exchanger installed

Pipeline engineers learned long ago that these gas generators run more efficiently when inlet air is above 70ºF. "Once you hit cold weather, you lose efficiency," says Marie Standing, senior mechanical engineer with TC Energy.

To fix poor winter month efficiency, a Munters Thermo-Z heat exchanger was installed on a turbine exhaust at the Saskatchewan compressor station. The heat exchanger recovered heat from the turbine exhaust and used it to preheat a portion of the inlet air to 385ºF. It then mixed with the remaining cold inlet air to bring the entire inlet airstream up to 75ºF, reducing operational horsepower.

TC Energy also learned that turbine operation created a severe environment for heat exchangers because the turbines quickly ramp up to an operating temperature of over 1000ºF. They originally used a heat exchanger from another manufacturer, but it failed after only three months of operation.



Heat exchanger withstands severe conditions

Marie Standing says the quick ramp-up is inherent in turbine operation and hard to control. TC Energy couldn't reduce the startup rate because it would have held back operations for each startup. However, this is not an issue for the custom-designed, high-temperature Thermo-Z because it accommodates rapid thermal expansion.

A heat exchanger that can withstand such severe conditions is uncommon in the industry. TC Energy now uses the heat exchanger for three to five months during the year, and as Marie Standing says, "It may not sound like much, but when you add up the number of days, it's quite a bit." With the success of this trial, the company plans to add a heat exchanger to other compressor station turbines.

Case study

- Air treatment upgrade at TC Energy

Advantages:

- Increased turbine efficiency
- Compact design
- Accommodates rapid temperature ramp
- Utilization of existing "free" heat source
- Low pressure drop

Would you like to find out if Munters has a solution for your company too? If so, please visit our website, www.munters.com

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