



Infrared Prevents Gas Turbines Intake Filter Icing

Gas turbines require air to operate correctly. This air must be free of dust and other particles and therefore is always filtered. Cold and damp intake air during the winter months can easily lead to the icing of the filters. As a result, the filters allow only a limited amount of air to pass through, and the gas turbine must either be throttled back or shut down – just in the season in which it would be needed most. Infrared systems from Excelitas successfully prevent the freezing of air intake filters of gas power plants and gas compression stations in the cold season. An example of a gas compression station in Germany shows how an efficient and energy-saving infrared module could be integrated into the combined filtration and sound insulation system.

The complete acoustic protection package includes silencing of the gas turbine inlet and exhaust systems and has been designed, installed and project-managed by Mechtool Engineering of Darlington. However, because gas turbines often operate under extremely low ambient temperatures, it is important that intake air filtration systems incorporate a method of preventing ice formation, as icing can seriously affect filtration efficiency.

Various ice-prevention techniques have been tested, including large hot-water radiators utilizing process heat and even directing compressed air from the system onto the filters. In this installation, infrared heating was selected because tests showed that an infrared system uses less power and is easier to install than competing technologies.

Consequently, three systems, each comprising twelve 4.5 kW medium-wave emitters, were specified and installed for various filters. The modules are arranged in three banks of four emitters to provide complete coverage of the filter surface. They are controlled by a thermostat that switches the heaters on when the temperature falls below a set level and switches them off when the temperature rises above a preset level. The use of gold reflectors enhances the proven efficiency of infrared technology for this application, while the rapid response time of the emitters provides further efficiency improvements.

FEATURES

- Nonwoven material filters arranged in arrays of small filters within large filter housings
- Anti-icing systems with infrared emitters
- Infrared heaters use less power and are easier to install than other heating techniques

TECHNICAL DATA

- Medium-wave infrared heaters
- 12 modules, each with 4.5 kW
- M85 modules
- Three banks of four emitters for complete coverage of the filter surface
- Thermostat-controlled operation

