

ES6004 Inlet cooling system

Restore power and efficiency lost to the effects of ambient temperature

energy

Engineered solution purpose

In applications where high ambient temperatures prevail, inlet cooling can be used to increase the power output.

Applicability

All packages with Rolls-Royce gas turbines.

Technical description

Three inlet cooling options are available:

1. [Evaporative](#) 2. [Fogging](#) 3. [Chilling](#)

The particular method selected is based on the amount of cooling required to achieve the desired power in consideration with the site ambient conditions and available utilities. All solutions require electric power.

1. [Evaporative system:](#)

Air passes through a water saturated media that cools the air. This method can provide up to 25 degrees Fahrenheit cooling of the compressor inlet air. This system requires a portable water supply.

2. [Inlet Fogging:](#)

The fogging system consists of a pump unit with dispensing nozzles located in the combustion air inlet duct downstream of the air filter that provides up to 14 degrees Centigrade cooling effect. This requires a demineralised water supply and a water treatment skid is available as an option.



3. [Mechanical chiller:](#)

A chilled water coil is integrated into the inlet air system, typically using a motor driven compressor refrigeration system. This system can provide from 20 to 40 degrees Fahrenheit of inlet air cooling.

Benefits

At higher ambient conditions, power can be increased by 20% and heat rate can be improved by up to 5%. By lowering the firing temperature, nitrous oxide emissions will be reduced. In lower ambient temperatures, turbine component life is extended by virtue of the reduced operating temperature.

Experience

PGT BAJA (Evaporative) 501KC
DPC (Fogging) RB211 offshore
AEC (Chilling) 501KB, Avon 1533
Gulfstream (Evaporative) RB211-DLE

Scope of work

Add inlet cooling in the form of chilling, evaporative cooling or fogging system to the gas generator air inlet system.

Bill of materials

Mods to Filter housing and Intake duct as required.

1. EVAP coolers with Aux systems
 2. Water skid nozzles and piping
 3. Mechanical chiller unit with coil to be mounted in intake plus all auxiliaries, piping, cooling system etc.
- Controls modification/upgrade

Undertaken

At site

Bundling opportunities

Inlet air filtration system [\[ES6003\]](#)
Compressor re-aero [\[ES5001\]](#)