



Pall® Liquid/Gas (L/G) Coalescer Protects Burners

June 2003

Case History

A Middle East oil and gas production company operates three gas turbine generators for power production and four gas turbine driven injection compressors for gas reinjection on its offshore platforms

Problem

Gas Turbine Generators

Gas from a knock-out drum (with demister) was fed through a duty standby fuel gas filter to each gas turbine. The filters were designed to remove solids. The only liquid removal device installed was the knock-out drum.

The operating company suspected liquids were passing the knock-out drum and filters and entering the gas turbine, due to operating issues at the turbines.

Gas Turbine Gas Injection Compressors

The gas turbine generators took fuel gas from knock-out drums (with demisters) to a fuel gas header. "Non-Pall" vertical filter coalescers were installed after the header, at the inlet, to each of the four turbines to remove 3 micron solids and liquids from the fuel gas.

Liquids were suspected to enter the combustion chamber because the 3 micron removal rating was incapable of removing fine aerosols from the fuel gas.

The operating company also suspected that the vessels were undersized, adding to the liquid carry-over problem.

With both of the above fuel gas systems, liquid carry over caused:

- 1) Operating problems
- 2) High exhaust temperature scatter
- 3) Burner tips fouling.

As a result:

- Regular, costly unplanned maintenance - burner tips cleaning and replacement
- Reduction of equipment availability during these unplanned shut downs.



*An Energy Company in the Southern Hemisphere
Power Station Gas Turbine Protection
Pall SeptraSol™ L/G Coalescer - 80 x CC3LGA7H13*

Pall Solution

In 1998 Pall made a visit to the offshore platforms, a study was made, and a solution to the problem was presented. This solution consisted of installing high-efficiency L/G coalescers on the fuel gas supply to each turbine generator.

At first, one gas turbine generator was fitted with an L/G coalescer to remove all liquid and solid contaminants, including fine sub-micron aerosols.

Operating Feedback

The performance of the three gas turbines was monitored for one year. After installing the Pall coalescer:

- 1) Gas turbine fitted with the Pall coalescer did not suffer over temperature scatter
- 2) Burners remained clean
- 3) Gas turbine ran smoothly.

The other two gas turbines, with non-Pall filters, suffered tripping and the burners required cleaning.

In 2001, the remaining two gas generators were equipped with Pall L/G coalescers.

In 2003, an additional four Pall L/G coalescers were installed on fuel gas supplies to four additional gas turbines, which drove gas injection compressors. This made a total of seven Pall L/G coalescers protecting seven gas turbines.

Benefits

By removing solids and liquids from the gas turbine fuel gas, Pall L/G coalescers have provided:

- 1) Complete protection of the gas turbines
- 2) Stable turbine operation of the gas turbines.

This meant:

- Reduction of maintenance workload
- Reduction of maintenance costs
- Increase in equipment availability
- Availability of gas injection for oil recovery.

Conclusion

Knock-out vessels and demisters, and commodity glass fiber coalescers cannot remove fine aerosols from gas streams.

Pall worked closely with the operating company to fully understand the process, and operating problems. This enabled Pall to provide a solution, using correctly sized and designed high-efficiency L/G coalescers. The Pall coalescers removed all liquid and solid contaminants, including fine sub-micron aerosols from the fuel gas, enabling the gas turbines to run smoothly. The end result: savings in maintenance costs, reduction in unplanned shutdowns, and improved equipment availability.



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