Material inspection of gas turbines

Advice on material degradation and reconditioning

Recondition or replace?

The components in the hot gas path of a gas turbine require special care. This is particularly true for the rotor blades in the first turbine stages: not only are they exposed to high temperatures (in excess of 1000°C), but they are also exposed to high stresses. The life expectancy of these components is therefore limited. After time they will degrade and corrosion and wear will occur. At that point you will be faced with a difficult choice. Are the components fit for reconditioning? Or would it be better to replace them immediately? Obviously, reconditioning is cheaper, but how can you tell if it will be successful?

Material inspection guarantees the right decision

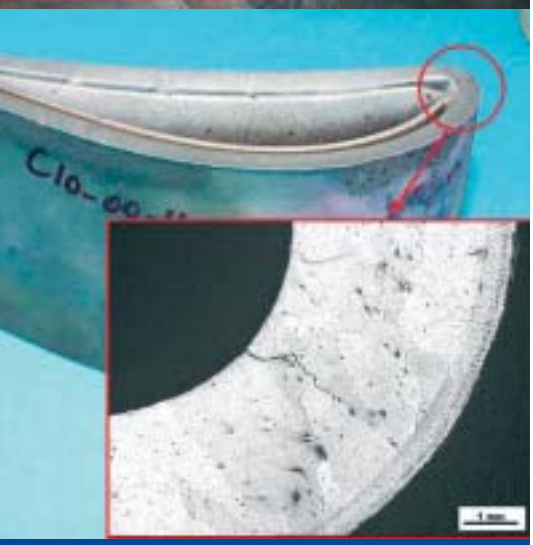
Certainly, the manufacturers of gas turbines have a vested interest in recommending the replacement of old components for new ones. Then again, the reconditioning firms, who are independent of the manufacturers, argue the opposite choice. Only a neutral and expert material inspection will determine whether the components can be reconditioned 'as new'. An inspection of this type should ideally combine non-destructive and destructive techniques. This will enable a thorough investigation of the ageing of the coating and the base material. Our Laborelec experts have developed an extensive knowledge of this type of material inspection.

Monitoring the reconditioning process

If you decide to go ahead and recondition, it is highly recommended that you have the reconditioning process monitored by an independent expert. This will guarantee that it runs as planned and that you won't have to replace the components anyway, after a short while. Our Laborelec experts can monitor this process for you too.

LABORELEC

The technical Competence Center
in energy processes and energy use.
From innovation to operational assistance.



We will gladly help you to maximise the residual life of your plants and installations and minimise the cost of maintenance.

An expert partner

■ Recondition or replace?
A material inspection

A material inspection of the HGP components (Hot Gas Path), involves the following steps:

- Visual inspection
- Non-destructive examination (sweat test, ultrasound, Eddy Currents, etc.)
- Destructive material inspection. One component (e.g. a blade or liner) is sacrificed and examined with an optical microscope and a scanning electron microscope.

All of the results are analysed in fine detail. On the basis of this analysis we provide a clear and well-documented report, and our conclusion offers recommendations on the feasibility of reconditioning, as well as a residual life assessment, if required.

■ Hi-tech equipment

Alongside the traditional destructive and non-destructive material inspection tools we use a scanning electron microscope with a sophisticated analysis system. This system enables us to conduct a quick and efficient, semi-quantitative chemical analysis over a large area, which is particularly useful for a chemical analysis of coatings.

■ Reconditioning advice

As soon as you decide to go ahead with reconditioning, we can assist you in the following ways too.

- We recommend which steps to take in the reconditioning process.
- We perform interim inspections during reconditioning to ensure that everything is going to plan.
- We carry out a stringent quality control of the end result. Were the correct procedures followed? Is the report well documented? Is the result as planned?

AIDA/5 UK 2002 - Responsible editor : Paul Lemmens

VCA**

Five reasons for you to choose Laborelec:

- you have one-stop shopping for your energy needs;
- you get access to more than 40 years of experience;
- you get rapid service with reliable solutions;
- you increase the profitability of your installations;
- you benefit independent and confidential advice.

Rodestraat 125
B-1630 Linkebeek

Assets Intelligent Diagnosis and Advice
Hans De Rouck
Tél : + 32 2 382 04 48
Fax : + 32 2 382 02 41
hans.derouck@Laborelec.com

Sigrid Gijbels
Tél : + 32 2 382 05 25
Fax : + 32 2 382 02 41
sigrid.gijbels@laborelec.com

www.laborelec.com