Gas turbine blade coatings

Modern industrial gas turbines are manufactured with sophisticated techniques and from exotic materials and as such present considerable problems when considering in-service inspections.

The Problem

Quality of ceramic or metallic (MCrAlY) thermal barrier coatings of industrial gas turbine blades at manufacture or refurbishment can have significant consequences on service life. Varying TBC layer thickness can lead to crack propagation, or poor bonding and may cause premature exposure of blade surfaces to extreme temperatures.

The Challenge

To overcome the inherent physical and scientific difficulties in applying 'traditional' NDT techniques to Industrial GT components in order to evaluate both manufacturing/process quality and estimate remaining useful life of coating/substrate systems.

Our Solution

The utilisation of specialised Eddy Current technology, enabling ceramic coatings to be measured within ± 5 microns and metallic coatings to within 25 microns at critical positions, combined with laboratory analysis of high temperature coating systems. Additional techniques assess the remaining useful life of MCrAlY coatings.

Product

- pre-service QA/QC of blades:
  - coating thickness
  - coating composition
  - type of coating supplied
  - behaviour in service compared to other similar coatings
- replicas of coating systems from various manufacturers available, and used in laboratory for detailed analysis
- in-service assessment of blades and remnant coating life.

Benefits

- significant time/cost savings from assuring coating quality and avoiding premature component failure
- significant time/cost savings from extending plant life (beyond manufacturer recommendations)
- reduced chance of unplanned outage time
- improved insurance profile.

RWE
The energy to lead

RWE Power International
Electron
Windmill Hill Business Park
Whitehill Way, Swindon
Wiltshire, SN5 6PB
United Kingdom

T +44 (0)1793 892900
F +44 (0)1793 892421
E rwepi@rwe.com
I www.rwepi.com