

Press release, 1st November 2011

Whittle Reactionaries Prize 2011 awarded to STS staff members for innovative developments in self-sensing coatings

On 9th November the Aerospace Division of the Institute of Mechanical Engineers will award the Whittle Reactionaries Prize 2011 to two members of staff at Southside Thermal Sciences (STS): Christopher Pilgrim and Stéphane Berthier. The aim of the award is to stimulate innovative solutions to aerospace propulsion problems – to help uncover the engineers who are contributing to the next great leap.

The two award winners receive the prize for the paper entitled **“Non-destructive evaluation of thermal barrier coating erosion using photoluminescence”**. The technology - developed and commercialised by STS - combines the advances observed in the development of today’s high temperature protective coatings as they are found in gas turbines with the luminescence properties of ceramics used in TV screens or in energy efficient light bulbs. When illuminating the novel coating with UV light the coating starts phosphorescing and this phosphorescence can be used both to read temperature, detect evidence of ageing in the coating or to evaluate erosion of the coatings.

In certain operating regimes of gas turbines, particularly in environments with contaminated intake air, degradation of the coating can occur by gradual thinning from the surface leading to complete failure. Current inspection routines cannot identify these gradual degradation mechanisms. The paper describes a method based on luminescent thermal barrier coatings for the in-situ detection of gradual erosion of coatings through smart imaging technology using off-the-shelf equipment.

Dr Jörg Feist, Managing Director at STS says: ‘The entire team is extremely pleased by the success of Chris and Stéphane. This prestigious award recognises the truly innovative and cutting edge technology we are working on here at STS, but furthermore shows the high quality research to which our staff is committed’.

More recently STS discovered the phenomenon that past temperature exposure can be read out when the coated component is back to room temperature. The new **‘Thermal History Coating’** is now the subject of an international development programme and development partners are currently being gathered. For more information please go to www.stscience.com and click on **‘Thermal History Coating User Club’**.