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Professor Alexander Korsunsky
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Department of Engineering Science
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10th March 2013

Subject: Rolls-Royce support of ISTRESS Project

Dear Alexander,

Thank you for discussing with us the project proposal entitled "Pre-standardization of incremental FIB micro-milling for intrinsic stress evaluation at the sub-micron scale"; in short, ISTRESS.

As a major world leader in energy systems, Rolls-Royce appreciates and supports every effort aimed at the development of a framework for reliable, repeatable, systematic measurement of residual stresses at the micron scale. Although we are currently unable to commit the resources that the project of this magnitude requires, we will be pleased to be closely associated with the consortium, to supply specific samples and to make contributions to the data discussion and interpretation. We intend to commission some direct contract funded work with you in this area in the next six months Where possible, as far as matters such as datum samples and specific validation studies are concerned, we will be happy for you to feed arising results into the ISTRESS programme. Similarly, we can supply advanced engineering materials into ISTRESS as you see fit.

The characterization and control of intrinsic stresses in small material volumes is important to us in many areas of process development and optimization. More specifically, our interests in the aerospace and nuclear sectors concern:

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The role of intergranular stress in important failure mechanisms such as stress corrosion cracking, and the evolution of short length scale stress in fatigue loading. In addition, the role of interfaces in creep fatigue interaction should be studied. This will help us with the understanding required to optimize material systems and processing. In addition it will help in the predictive capability of advanced materials in complex load regimes.

The potential to measure short length scale stress associated with surface damage. In particular, small foreign object damage in fan and compressor aerofoils and the evolution of tensile surface stress from local overheat such as abusive grinding, from spatter impingement, or from electron beam welding or cutting.

In addition to sample provision, we will serve as a consultant, contributing to ongoing discussions and continuous project progress reviews as requested by the partners. We believe that this project will result in improvements in product life cycle costs and predictive capability, ultimately contributing to better competitiveness.

Please do not hesitate to contact me with any further questions.

Yours sincerely
for ROLLS-ROYCE plc

K.S.Day

Professor David Rugg
Rolls-Royce Engineering Fellow – Compressor and Nuclear Materials
Royal Society Industrial Fellow