DESIGN OF AERO-ENGINE TEST FRAME

FCL engineers have extensive expertise in the use of finite element stress and thermal analysis techniques, fatigue life prediction methods and defect assessment procedures which can be used to demonstrate component integrity at the design stage, throughout operating life or following abnormal loading conditions.

In one example of such work, FCL were approached by a client in the aerospace industry to determine the integrity of a new mobile aeroengine test frame under engine thrust, torque and wind loads. The need for the work arose because the magnitude of the applied loads was significantly greater than those considered previously on a similar test frame.

FCL's initial work demonstrated that the original proposed frame design was unsuitable for the imposed loading conditions and, based on the findings of the first analyses, a modified design was developed making use of heavier tubular sections in highly stressed regions of the structure. Subsequent work concentrated on proving the modified frame design and included development of beam and solid element finite element models to determine stresses and deflections occurring under worst case static and cyclic loading conditions, evaluation of predicted stresses against suitable assessment criteria, calculations to estimate the frame fatigue life and definition of defect acceptance criteria to be applied to non-destructive testing during manufacture and in-service inspections.

The wisdom of choosing FCL for this work was confirmed by the subsequent satisfactory operation of the frame when it entered service.

Finglow

FINGLOW CONSULTANTS LTD
Beane Bridge House, 34 Chambers Street, Hertford, SG14 1PL, UK
Telephone: +44 (0)1992 585450
Facsimile: +44 (0)1992 585460
e-mail: enquiries@finglowconsultants.co.uk
website: www.finglowconsultants.co.uk