

GENERAL SECRETARY'S REVIEW

on the activities of the

INTERNATIONAL COMMITTEE ON AERONAUTICAL FATIGUE (ICAF)

during the period June 2009 to April 2011

31st ICAF MEETING IN Rotterdam, The Netherlands

The 31st ICAF meeting was held in Rotterdam, The Netherlands, and was organized by the Dutch National Delegate: Mr Marcel J. Bos of the National Aerospace Laboratory (NLR). The meeting started with the two day 31st ICAF Conference (May 25-26) followed by the 25th ICAF Symposium (May 27-29).

The Conference began with the General Secretary's Review followed by the presentation of the 14 National Reviews. All presented National Reviews were compiled in the Minutes of the Conference, issued by the NLR, in CD-format as ICAF Document No. 2422. The ICAF Symposium Proceedings, ICAF Document No. 2420, were printed in a hard cover volume by Springer. Both this volume and a CD containing the Conference Minutes were distributed to all conference attendees.

The Symposium, with the theme "Bridging the gap between theory and operational practice" opened, as has become tradition ever since 1967, with the invited Plantema Memorial Lecture in memory of the founding father of ICAF, Dr. Frederick J. Plantema. This lecture with the title "Fatigue and Damage-Tolerance Evaluation of Aircraft Structures – The Composite Materials Response" was presented by Jean Rouchon, former ICAF National Delegate for France and recently retired as the head of the Technical Centre for Materials and Structures of the Centre d'Essais Aeronautiques de Toulouse, CEAT. At the conclusion of his lecture, Jean Rouchon was presented with the Plantema Memorial Lecture Medal.

The 25th ICAF Symposium consisted of 40 presented papers plus an additional number of papers in poster format. All available 76 papers are published in the Proceedings of the Symposium entitled "ICAF 2009, Bridging the Gap between Theory and Operational Practice", edited by Marcel J. Bos, the Dutch National Delegate. The Proceedings were printed in a hard cover volume by Springer.

The 31st ICAF meeting was, like previous meetings, a great success in terms of the quality of the technical presentations. Also enjoyed were a number of noteworthy social events, including a memorable dinner held on a canal ship. Marcel Bos and his organizing team also lived up to the high standards of previous meetings in terms of all the details that make for a great meeting.

ICAF STATUS

The International Committee on Aeronautical Fatigue (ICAF) is an informal organization that deals with all aspects of aircraft fatigue related problems as the common basis for its activities. The committee consists of one General Secretary and a number (currently 14) of National Delegates, each representing a member country.

The objectives of ICAF are:

- to stimulate personal contacts between persons actively engaged in aircraft fatigue problems, and
- to exchange information, experience, opinions and ideas concerning aircraft fatigue problems.

These objectives are pursued by regular meetings and by exchange of ICAF documents (technical reports, publications and other documents) before those get available by other means. Due to the relative ease that information now is shared using the internet, the distribution of such documents has diminished significantly. However, certain national conference proceedings that are deemed of interest, and not easily otherwise obtainable, are still distributed to the other ICAF member nations.

SOME REFLECTIONS

The rather drastic cuts in military funding over the last one or two decades has led to significantly less new fighter aircraft projects in the western world. In most countries concerned, the civil aircraft industry cannot match earlier military projects in terms of funding for research and development. This has led to less activities than before in traditional aeronautical topics like aerodynamics, structures and materials, flight mechanics and so on. Yet, there are many reasons why basic work is still needed in the field of aeronautical fatigue. These include the following:

1. The civil fleet, as well as many military fleets in the world, is getting older such that many aircraft today are flying well beyond their original design lives. Although there was a huge effort in the so-called aging aircraft issue a decade ago or so, the implications are not yet fully understood. Wide spread fatigue damage is understood in terms of the basic mechanisms involved, and developments in advanced fracture mechanics methodologies have made it possible to accurately analyse the interaction of multiple flaw growth. Yet, the simultaneous crack growth interactions with corrosion mechanisms are only partially understood and models to analyse the behaviour of several interacting cracks under corrosive influence are of micromechanics type, and therefore not independent of planar geometry. Unless massive efforts are directed into this problem, the risk that the world will see more failures due to fatigue of aging aircraft cannot be neglected.
2. In newly developed aircraft, civil or military, the introduction of new materials, new aircraft concepts, and new manufacturing techniques, together with the continued aim at reducing noise and emission, whilst maintaining risk levels at acceptably low levels, all at a competitive price, means that structural fatigue issues must continue to be a primary design driver. Hence, the need and motivation for ICAF feels as relevant today as it did in 1951, the year when ICAF was founded.

Anders F. Blom
General Secretary of ICAF