

ICF: The International Congress on Fracture

CEO Report

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ICF President Emeritus/Chief Executive Officer

(1) This Report is presented to ExCo for ICF Council approval via the Quadrennial Report of the Secretary-General at ICF14, The Fourteenth International Conference on Fracture, Rhodes, Greece June 18-23 2017. Insofar as I have announced my retirement as CEO following ICF14 this Report additionally addresses my work within ICF since 1969 when I was first elected to ICF Council at ICF2 as the Founding Council Member (voting) representing Canada. This Report is also presented to NomCo in addressing NomCo deliberations in 2016, through to ICF14. This Report should be kindly logged on ICFweb.org & ICF14.org for accessibility.

(2) During this half century ICF has evolved from simply organizing Quadrennial International Conferences as a "Great Meeting Place" to become the *de facto* premier world association for work on fracture mechanics, structural integrity and safer engineering. Many view ICF as now possessing the global standing and remit at our half-century 1965-2015 of a World Academy in Safer Engineering, Structural Integrity & Fracture Mechanics as the 1969 "Yokobori-Statutes" foreshadow. This Report is assembled at this juncture in December 2015 so that the 2013-2017 ExCo & NomCo can the better discuss the way forward for ICF following ICF14 - via a new leadership cadre.

(3) Alan Griffith (1893-1963) in the 1920's published his famous seminal paper on brittle fracture in the Transactions of the UK Royal Society and at the Delft IUTAM Conference. Griffith represents our fundamental beginnings - perhaps most cogently for ICF (as an affiliate of IUTAM) via that pioneering IUTAM Conference in the 1920's. George Irwin (1907-1998) some 25 years later in the 1940's defined the fundamental concept of a critical stress intensity factor (KIC). In the peace following WWII there was a pioneering Fracture Conference organized by ASM in 1948 at which Irwin presented his ground-breaking theory. During those years and in the 1950's & 1960's others like Orowan, Zener, Paris, Cottrell, Yokobori, Wells, Eshelby, Bilby, Friedel, Rice were very active in our burgeoning engineering realm. Irwin was involved with Paris in several ASTM committees during the 1950's which organized various fracture conferences. From all this engineering foment & research in various

countries arose the idea for ICF. At what we now view as "ICF0" Benjamin Averbach (1919-1992) of MIT organized a micro/macro Fracture Conference in 1959 at Swampscott USA. Following various discussion meetings therefrom, including a key meeting of an embryonic ICF Committee at MIT in November 1961, Takeo Yokobori organized what became "ICF1" in Sendai, Japan in 1965. ICF was indeed formally established at what was billed as "ICF2" organized in Brighton, England in 1969 by Roy Nichols. At ICF2 Yokobori became the first ICF President 1969-1973.

(4) On a personal note, in 1967 I had been appointed an Associate Professor of Mechanical Engineering at the wildly ambitious University of Waterloo and I presented a paper on creep fracture at ICF2. (In those far-off days I travelled by ship (SS Bremen) from New York to Southampton to ICF2). It had been suggested to me by the innovative UW Dean of Engineering, Archibald Sherbourne, and by my ambitious young HoD, Tom Brzustowski, that UW Professors needed to not simply present key papers at International Conferences but should bring such important World Events to the green fields of Waterloo.

(5) Accordingly at ICF3 in Munich, Germany 1973 I made a "rookie" bid for ICF4 to be hosted and funded by UW, Canada in 1977. The competition was the mighty MIT, USA led by Benjamin Averbach now the second ICF President (1973-1977). However brash Waterloo, Canada won and I was elected ICF4 Executive Chairman and as an ICF Director on ExCo. Being only 33 years old and but recently promoted as a Full Professor at UW I sought advice from similarly young "rookie" friends like John Knott, Ronald Armstrong, Michael Ashby, Jim Rice, David Embury, Bill Tyson, Brian Dyson, Palle Rama Rao, Michael Lewis, Dominique Francois, Tony Evans, Jerry Swedlow, Alan Tetelman - seeking new ideas for both ICF4 - and indeed for ICF generally. Thereby we set a new benchmark at ICF4. This included the first Opening and Closing ICF Honour Lectures (by Michael Ashby & Bruce Bilby); extra focus on non-metallics (via for example Tony Evans & Mike Lewis) and composites (via Michael Piggott); entirely new realms (e.g. biomaterials and biomechanics via Kon Piekarski); Fracture, Politics, Society and Education (e.g. via Alan Cottrell & a team from the UK Open University); Full Archival Proceedings published prior to the Conference & Internationally (Pergamon: six volumes); and a balanced and integrated micro/macro academia/industry vision for the common good.

(6) At ICF4 there was a competition between France and the USSR to host ICF5 and Dominique Francois won for Cannes. At ICF4 Roy Nichols became the third ICF President.

(7) At ICF5 there was an interesting competition between myself, Dominique and Janne Carlsson of KTH Sweden to be ICF President which I won and thus became the fourth ICF President. This election was based on the mandate of an "ICF Strategy" presentation I made to Council. ICF6 was won by Palle Rama Rao for India.

(8) At ICF6 in New Delhi Dominique Francois became the fifth ICF President in competition with Hal Liebowitz famous for his hugely influential Fracture Series & International Journals. I became ICF Treasurer and thereafter *de facto* ICF Chief Executive Officer (CEO) working closely with Dominique whom I had first met at Stanford in July 1967 via Oleg Sherby/Alan Tetelman - a position to which I have been re-elected by each ICF Council at the seven subsequent quadrennial conferences working in close accord with eight ICF Presidents. Now I am 76yrs and it is surely time to pass the baton to someone else with fresh new ideas. This has been an exciting half century for ICF 1965-2015 with various major triumphs and some historic difficulties overcome. The twelve years following ICF14 embracing ICF15, ICF16 & ICF17 2017-2029 provide enormous opportunities for ICF and a new leadership of ICF.

(9) NomCo (the ICF Nominations Committee) via Rob Ritchie (NomCo Chair) and Tony Kinloch (NomCo Deputy Chair) have issued a Call for Nominations for ExCo (the ICF Executive Committee) 2017-2021. There are likely to be at least some multiple nominations for the various posts. Accordingly there are likely to be competitive elections at ICF Council in Rhodes, Greece at ICF14 in June 2017 for some ExCo posts 2017-2021. ICF has benefited from such competitive, democratic elections in the past for key posts and indeed for our Quadrennials.

(10) There are just two *ongoing* posts by Statute: Secretary-General & Treasurer. All other posts are limited by Statute to a single quadrennial term. Toshimitsu Yokobori is very likely to continue as Secretary-General 2017-2021 with Sendai, Japan being the ICF Registered Office. I have indicated that I will retire as Treasurer (*de facto* CEO) at ICF14 in 2017. Since ICF6 a major part of the work of ICF has been conducted by the Treasurer/CEO. Therefore it seems useful at this juncture to address the nature of the role of the Treasurer/CEO in considering the way forward for 2017-2021 and beyond.

(11) As in any organization the CEO acts in a principal leadership capacity and primary spokesperson (in harmonious concert with the Secretary-General, President & ExCo). This is a proactive, creative task in enhancing the evolution of ICF as the world premier organization in our discipline of fracture mechanics, structural integrity and safer engineering.

(12) As CEO there is additionally the macro-management task of ensuring the smooth and effective workings of the various ICF Committees including ICF Council, ExCo, AwardCo (Awards Committee), WebCo (Website & Publications Committee), NomCo, IQCo (Interquadrennials/Regional Committee), QuadCo (Quadrennials Conference Committee). And responsibilities regarding finance as in the Statutes. There is quite a bit of travel for meetings of various sorts. Altogether the workload involves some 300hours/year, *pro bono* with a strong primary commitment to ICF.

(13) One of various policies that I set forth as ICF President from 1981 to enhance the world standing of ICF (subject always to Council endorsement) was that ICF Quadrennials ought to be hosted by the four big super-powers: India, China, USSR, USA - and to develop an Interquadrennials programme for balance and wider opportunity.

(14) The first step in this regard was to organize the very first ICF Interquadrennial Conference in Beijing, China in November 1983 (I chaired the International Steering Committee as ICF President). Nai-Yong Tang of Tsinghua University was an important early catalyst in ICF/China developments with Hwang Keh-Chi and Shouwen Yu - as well as, later, Wei Zhou of NTU Singapore. This first ICF Interquadrennial was a very great success not too long after the "Cultural Revolution" and ICF-IQ Beijing 1983 was published in a handsome enduring volume of Proceedings.

(15) The second step in this regard was the organization of ICF6 in New Delhi, India via Palle Rama Rao. This was at an historical time for India. Rama Rao created an extraordinarily successful quadrennial in complex circumstances.

(16) At ICF6 there was a fierce competition USA v Australia for ICF7 (Houston vs Melbourne). In the event via a close democratic vote of ICF Council the third policy step was accomplished via ICF7 being organized in Houston, Texas, USA in 1989 very successfully via Kamel Salama & Ravi-Chandar.

(17) At ICF7 Rama Rao became the sixth ICF President 1989-1993. In Houston there was a forthright debate on ICF8 which was won by USSR with ICF8 to be in Moscow in 1993. This was the fourth step. In the event via internal USSR discussions ICF8 was organized in Kiev, Ukraine in 1993 via Volodymir Panasyuk following the historic break-up of the USSR. John Knott became seventh ICF President 1993-1997.

(18) At ICF8 Australia mounted another bid (this time successfully) for ICF9 in Sydney in 1997 via Bhushan Karihaloo & Yiu-Wing Mai. There was competition in Sydney for ICF10 including from Japan & USA and innovatively ICF10 was organized in Honolulu in 2001 via Rob Ritchie, Ravi-Chandar, Teruo Kishi & Toshimitsu Yokobori.

(19) At ICF9 Rob Ritchie became the eighth ICF President. China did not bid for ICF9, nor for ICF10, nor for ICF11. ICF11 was won competitively for Turin, Italy via Alberto Carpinteri.

(20) At ICF10 Yiu-Wing Mai became the ninth ICF President. At ICF11 China did bid for ICF12 but Canada won ICF12 via Bill Tyson & Mimoun Elboujdaini for Ottawa in 2009 and Ravi-Chandar became the tenth ICF President. Extraordinarily at this stage a special dispensation was then decided upon by ICF Council whereby from ICF11 Council would decide on the location of the Quadrennial eight years ahead rather than four years ahead.

(21) At ICF11 it was decided by Council to host ICF13 in Beijing, China in 2013 via Shouwen Yu. This was the fifth and final step. This completed one of my ICF Presidential policies of 1981 supported by Council that the ICF Quadrennials should be organized in India, USA, USSR, China as the four world super-powers with also the launch of the Interquadrennials Programme. We now need to address South/Latin America and a quadrennial in Brazil and in Africa. But we have a long reach and a long-range strategy for all ICF Regions and National organizations via Interquadrennials led by Mimoun Elboujdaini.

(22) At ICF12 in Canada it was decided by Council that ICF14 would be hosted by Rhodes Greece in 2017 with Emmanuel Gdoutos as ICF14 Executive Chairman. Alberto Carpinteri became the eleventh ICF President 2009-2013. NomCo via Chair Yiu-Wing Mai and Council approval ICF named for orderly progression Yu Shouwen as Senior Vice-President 2009-2013 and President-Designate 2013-2017 instituting a new policy via Council decision.

(23) At ICF13 in Beijing Shouwen Yu became the twelfth ICF President with Emmanuel Gdoutos as Senior Vice-President and ICF Council decided that ICF15 would be hosted by Vancouver, Canada with Ashok Saxena as ICF15 Executive Chair.

(24) At ICF12 in Canada via the AwardCo Chair Ashok Saxena a major new ICF policy was introduced regarding world renowned ICF Gold Medals and other Awards to enhance the world-premier prestige of ICF. This built on the ICF Honour Lecture Programme whereby Mike Ashby gave the Opening ICF Honour Lecture at ICF4 and Bruce Bilby gave the Closing ICF Honour Lecture at ICF4 with prestigious ICF Honour Lectures thereafter by Jim Rice, Roy Nichols, John Hutchinson, John Knott, Tony Evans, Rob Ritchie, Alberto Carpinteri, Yiu-Wing Mai, Subra Suresh for example - and now an enormously worthy cadre of ICF Gold & Silver Medallists. Ashok continued this enormously important AwardCo work at ICF13 with truly world figures receiving our ICF Gold Medals. And Alberto Carpinteri is continuing the AwardCo work of Ashok towards ICF14.

(25) At ICF12 was introduced the major development of the ICFweb.org website led via Francesco Iacoviello currently President of the Italian Group on Fracture (IGF).

(26) At ICF11 in Turin the system of an ICF Quadrennial MoU was introduced by Canada (Laurier Forget) for ICF12. This has been successful for now ICF12, ICF13, ICF14 and will be progressed for ICF15 and ICF16 at ICF14. ICF now has a wide range of MoU's with national groups such as DVM, ASTM, IGF, CSTAM. We hope to build on this Regional Development for all the 50+ national ICF Groups.

(27) Highlights of the 2013-2017 Quadrennium include: An enlarged ExCo with now ten ExCo Directors representatively and thus altogether sixteen voting members of ExCo; ICF Mid-Term ExCo in Anaheim May 2015; Official ICF Nominations for the Queen Elizabeth II Engineering Prize and the Japan Prize; Potential bids mooted for ICF16, 2025 by Bangalore, India; Berlin, Germany; Melbourne, Australia; Paris, France for decision by ICF Council at ICF14; Addressing complications regarding ICF15, 2021; Various Interquadrennials in Africa & Asia especially with plans for South America & variously; New Regional Groups (India, Egypt and others). Most importantly work on ICF14 in Greece.

(28) Self-evidently ICF is in a very healthy state at the half-century stage 1965-2015 looking towards new and adventurous strategies for our second half-century. ICF has evolved from the vision of being a "Great

Meeting Place" quadrennially to as foreshadowed to become a premier World Association. The key next step involves the work of NomCo towards the election by Council of a new ExCo and a potentially adventurous new era for ICF with an exciting new team.

(29) I send with this brief Report *Seasonal Greetings* and wishing everyone in our amiable ICF global community a *Very Happy & Prosperous New Year 2016*. With very special *Sto Lat* salutations to our Revered Founder President Professor Takeo Yokobori!

Vancouver, Canada

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