
EUROPEAN STRUCTURAL INTEGRITY SOCIETY – PERSPECTIVES

Leslie Banks-Sills

Dreszer Fracture Mechanics Laboratory, School of Mechanical Engineering,
Faculty of Engineering, Tel Aviv University,
Ramat Aviv 69978, Israel - banks@eng.tau.ac.il

The European Structural Integrity Society (ESIS) is generally comprised of over 500 members each year. There are individual members, as well as members who join through their home countries of which there are over 20. ESIS has a Council and an Executive Committee (ExCo). The ExCo meets periodically to assure the smooth running of ESIS and present new ideas for approval at the Council which meets every two years. The Council is made up of delegates from representative countries that have at least 10 members, Technical Committee (TC) Chairs, as well as ESIS post-holders that include the President and Vice Presidents. Every two years, ESIS sponsors the European Conference on Fracture (ECF). In addition, TCs run small conferences and workshops on specific subjects. Following ECF and TC meetings, Special Issues are published in three Elsevier journals: Engineering Failure Analysis, Engineering Fracture Mechanics and International Journal of Fatigue.

1. Introduction

I have been asked to report on the European Structural Integrity Society (ESIS) at the Engineering Structural Integrity Assessment Conference (ESIS12) which took place on May 28 and 29, 2013 and was sponsored by the UK Forum for Engineering Structural Integrity (FESI).

The European Fracture Group (EFG) which had its beginnings in about 1971 in France, is the forerunner to ESIS. EFG held its first meeting in Compiègne, France in 1976 which was organized by Professor Dominique François. There followed meetings every two years. EFG underwent a name change between 1990 and 1992 to ESIS. The early history of EFG and ESIS may be found in Milne [1] and François [2]. Professors Firrao, François and Pineau, who were present in the early days of EFG and continue to be members of ESIS shared with me their memories of EFG and ESIS (Firrao [3], François [4] and Pineau [5]).

In Section 2, a list of the ECF conferences are presented. Each is a major ESIS event. In addition, to the invited and contributed lectures, of late there are poster sessions and interesting cultural events. The TCs are described in Section 3 which constitute an important component of ESIS activities. As a result of ECF conferences and TC conferences and meetings, Special Issues are published in three Elsevier journals which are supported by ESIS. Recent Special Issues are described in Section 4. Recently, ESIS began a blog in which papers from Engineering Fracture Mechanics are reviewed. This is also discussed in Section 4. ESIS Award recipients and Fellows are presented

in Section 5. A summary and conclusions are described in Section 6.

2. ECF conferences

Since 1976, the European Conference of Fracture has been held in various locations in Europe as follows:

ECF 1 Compiègne, France, 1976; st European Colloquium on Fracture

ECF 2 Darmstadt, Germany, October 9-11, 1978; nd European Colloquium on Fracture

ECF 3 London, United Kingdom, September 8-10, 1980; Fracture and Fatigue

ECF 4 Leoben, Austria, September 22-24, 1982; Fracture and the Role of Microstructure

ECF 5 Lisbon, Portugal, September 17-21, 1984; Life Assessment of Dynamically Loaded Materials and Structures

ECF 6 Amsterdam, The Netherlands, June 15-20, 1986; Fracture Control of Engineering Structures

ECF 7 Budapest, Hungary, September 19-23, 1988; Failure Analysis – Theory and Practice

ECF 8 Turin, Italy, October 1-5, 1990; Behavior and Design of Materials and Structures

ECF 9 Varna, Bulgaria, September 21-25, 1992; Reliability and Structural Integrity of Advanced Materials

ECF 10 Berlin, Germany, September 20-23, 1994; Structural Integrity: Experiments, Models and Applications

ECF 11 Poitiers, Futuroscope, France, September 3-6, 1996; Mechanisms and

Mechanics of Damage and Failure of Engineering Materials and Structures

ECF 12 Sheffield, United Kingdom, September 14-18, 1998; Fracture from Defects

ECF 13 San Sebastian, Spain, September 6-9, 2000; Fracture Mechanics: Applications and Challenges

ECF 14 Krakow, Poland, September 8-13, 2002; Fracture Mechanics Beyond 2000

ECF 15 Stockholm, Sweden, August 11-13, 2004; Advanced Fracture Mechanics for Life and Safety Assessments

ECF 16 Alexandroupolis, Greece, July 3-7, 2006; Failure Analysis of Nano and Engineering Materials and Structures

ECF 17 Brno, Czech Republic, September 2-5, 2008; Multi-level Approach to Fracture of Materials, Components and Structures

ECF 18 Dresden, Germany, August 29 - September 03, 2010; Fracture of Materials and Structures from Micro to Macro Scale

ECF 19 Kazan, Russia, August 26-31, 2012; Fracture Mechanics for Durability, Reliability and Safety

Data on the number of papers presented or participants at ECF meetings is illustrated in Figure 1. Initially there is an increase in papers with over 400 participants at the last 4 meetings showing the continuing interest in structural integrity.

3. ESIS Technical Committees

ESIS currently has 12 Technical Committees (TCs) as described below:

TC1 Elastic Plastic Fracture Mechanics, Professor Uwe Zerbst (Germany), Chairman. A major topic in the past was the development of fracture mechanics test procedures (ESIS P1 and ESIS P2) with specific emphasis on elasto-plastic, R-curve behavior. This task has essentially been completed. Attention is being turned to component assessment and implementation of fracture and damage mechanics methods. Component integrity assessment may be based on the prevention of crack initiation and extension, as well as on the prevention of final fracture. The choice of the assessment methodology in a specific case depends on multiple factors such as the materials involved, design philosophies such as safe life, fail safe or damage tolerance and restrictions in practical implementation.

TC2 Micromechanisms, Professor Jaroslav Pokluda (Czech Republic), Chairman, Professor Otmar Kolednik (Austria), Vice Chairman. After a period of inactivity, this committee was re-established by Professor Jaroslav Pokluda in 2006. Since then, it has organized eight workshops in various European countries; the

last one in Oxford was co-organized with FESI. Based upon these meetings, several special issues in Engineering Fracture Mechanics have been produced. On average, there have been 50 participants at TC2 meetings focusing primarily on the relationship between microstructure and resistance to crack propagation. Recently, there has been growing interest in multi-scale models of deformation and fracture processes. It may be noted, furthermore, that beginning in 2011, the participation of young scientists, particularly from developing countries, has been supported by TC2 resources related to the production of special issues.

TC3 Fatigue of Engineering Materials and Structures, Professors Andrea Carpinteri (Italy) and Les Pook (UK), Co-Chairs, Andrea Spagnoli (Italy), Secretary. Since 2000, this TC has been co-chaired by Professors Andrea Carpinteri and Les Pook. Its main activity is to disseminate the substantial international progress achieved in fatigue and fracture mechanics research, and to illustrate how to apply these results in industrial practice with a view to closing the gap between design and manufacturing. To achieve these objectives TC3 organizes small niche conferences that bring together scientists and engineers from around the world. It holds a Crack Paths (CP) conference in Italy every three years (since 2003, Parma, Italy). The fifth in the series will be held in Ferrara, Italy in 2015. Furthermore, it holds an International Multiaxial Fatigue and Fracture (ICMFF) conference every three years (since 1982, San Francisco, USA). The tenth in the series will be held in Kyoto, Japan in 2013, and the eleventh in the series will be held in Seville, Spain in 2016. In addition to the publication of conference proceedings on a CD, special issues in the ESIS affiliated journals containing extended versions of selected papers are published. Despite increased efforts in the understanding of the crack path process and multiaxial fatigue and fracture behavior, failure assessment procedures are becoming more and more complex. Therefore, a regular review of progress via a committee that includes experimentalists, theoreticians, industrial practitioners and academic experts is essential.

TC3.1 Subcommittee on Multiaxial Fatigue, Professor Ewald Macha (Poland), Chairman. The latest project being carried out is an energy-based approach to multiaxial fatigue using a critical plane. Within this project new procedures are being developed for the precise determination of the fatigue characteristics of materials with a controlled strain energy density parameter. Until now, the energy fatigue characteristics of materials, expressed by the amplitude of the strain energy density W_a vs. N_f , the number of cycles to failure, has been indirectly determined, i.e. by calculations with the use of parameters of the Manson-Coffin curve (ϵ_a vs. N_f). Only the strain amplitude ϵ_a is

controlled during this test, and it is assumed that the stress amplitude σ_a remains constant. However, for many cyclically unstable materials such as polymers, composites and some metallic alloys, σ_a changes considerably causing imprecision in the fatigue characteristics of material in terms of W_a and N_f . Thus, a more precise and direct determination of the energy characteristics becomes an important task for an energy-based approach to multiaxial fatigue. Other areas of interest include progress of the spectral method for fatigue life assessment for materials under multiaxial random loading in the frequency domain; improvement of failure prediction by means of fatigue damage maps for machine components and structures subjected to multiaxial service loading by calculations using FEM or BEM with spectral methods; development of mechatronic systems of uniaxial and biaxial strength machines controlled by the strain energy density.

TC4 Polymers and Polymer Composites, Professors J. Gordon Williams (UK) and Andrea Pavan (Italy), Co-Chairs, Professor Bamber Blackman (UK), Secretary. This TC has been in existence for more than thirty years. It meets every six months in Les Diablerets, Switzerland and holds a conference in the same village every three years. The seventh in the series will be held in 2014. TC4s main activity is the development of fracture mechanics based standards for polymers, composites and adhesives by the members who engage in round-robin testing exercises to develop protocols which are then submitted to ISO to be adopted as standards. A recent development is a round-robin on the computation of mixed mode fracture in composites and adhesive joints. This is a good example of how experimental activity has generated a computing issue which requires resolution. The enthusiasm and good will in the committee has enabled it to flourish for such a long period and to do valuable work.

TC5 Fracture Dynamics, Professor Hugh MacGillivray (UK), Chairman, Professor Gyongyver Lenkey (Hungary) and Dr. Uwe Mayer (Germany), Co-Vice-Chairs. The main achievements over 20 odd years include: BS 7448 -3 on rapid load fracture; ISO 14556 on Instrumented Charpy V and sub-size Charpy V including several round-robins; close cooperation with ASTM in introducing equivalent US instrumented Charpy standards; high-rate round tensile round-robins and test document (now being included in a new ISO standard); high rate sheet tensile round-robin and test document (now being included in a new ISO standard); impact compression, second round-robin between three laboratories completed in 2012, test document in progress; ESIS 20 published workshop proceedings Evaluating Material Properties by Dynamic Testing, E van Walle ed. (1996); major contributions to be

published in ASTM STP 1380 Pendulum Impact Testing – A Century of Progress; major contributions to Charpy Centenary Conference, Poitiers, France (2000); committee papers at most ECF conferences between 1990 – 2011.

TC6 Ceramics, Professor Ján Duzsa (Slovakia), Chairman, Dr. T. Lube (Austria), Vice-Chairman. During the years 1990-1995, TC 6 was very active under the Chairmanship of Professor Dietrich Munz. During the period when Professor Robert Danzer was Chairman, the main activities focused on a research program for determining a complete set of material properties and data indispensable for design of a commercially available silicon nitride ceramic. The material chosen as the ESIS silicon nitride reference material is a gas pressure sintered silicon nitride containing 3 wt.% Al_2O_3 and 3 wt.% Y_2O_3 . Recently, TC 6 has been active in organizing various symposia and conferences. The next one will be in 2013 in Smolenice, Slovak Republic with a title "Fractography of Advanced Ceramics".

TC8 Numerical Methods, Professor Huang Yuan (Germany), Chairman. The members of TC8 are working on numerical methods, as well as new modeling methods of material damage under different loading conditions. The next action is to start a round-robin with cohesive zone modeling for fracture and fatigue crack propagation. As a result of the absence of suitable experimental data, the action has been delayed. Experimental data is now available and will be issued to TC members in the next few weeks. In the past three years, TC8 has organized an annual meeting in Wuppertal, Paris and Berlin. In July 2013, the annual meeting will take place; the location is not yet defined.

TC9 Concrete, Professor Giuseppe Ferro (Italy), Chairman. TC9 is preparing to consider the application of nanotechnology for increasing the mechanical performance of cementitious materials. In particular, attention will be paid to reinforcement by using Carbon Nanotubes for increasing strength and fracture energy. Another related topic is the use of nanoinerts obtained from carbonization of different materials in order to extend the particle size curve toward sub-micro scale. This will permit an increment in both the strength, as well as the toughness of the material, whereas high performance concretes obtained by adding silica fume appear to be very brittle. Plans for a workshop to discuss these two topics are in progress.

TC10 Environmentally Assisted Cracking (EAC), Professor Jesús Toribio (Spain), Chairman. This TC has been in existence for more than twenty years. The main objective of TC10 was to merge research experience in the areas of fracture mechanics as a method of failure assessment, and of environmental degradation/corrosion of materials. The work

has always been strongly related to the development of fracture mechanics test and evaluation techniques and their application to problems of EAC, with the main emphasis on monotonic loading (i.e. stress corrosion cracking). In the past, the work of TC10 was focused on the development of innovative methods for testing of EAC and on the elaboration of fracture control guidelines for controlling EAC. The work was supported by the European Commission through grants for two research projects which involved more than 30 European laboratories and research groups and led to the introduction of a new ISO standard on accelerated EAC testing. Recently, TC10 has set for itself new EAC related tasks for which the open and versatile structure of the group appears ideally suited. Knowledge Management in the area of environmental degradation of metallic materials and the solution of complex technical problems are new challenges, and the participation in existing networks such as technical associations and Working Parties (Communities of Practice) and the formation of new networks will play an important role in the future. One example is the "Mediterranean Network on Corrosion and Integrity" initiated by TC10 and aimed at connecting scientists and engineers with expertise in corrosion, environmentally assisted cracking and material science to support industry needs in the Mediterranean countries.

TC10.1 Subcommittee on Hydrogen Degradation, Professor Hryhoriy M. Nykyforchyn (Ukraine), Chairman. This Subcommittee was founded in 1995 following an initiative of members of the Karpenko Physico-Mechanical Institute of the National Academy of Sciences of Ukraine. Since then, the TC 10 Committee and the TC10.1 Subcommittee have jointly organised a number of successful technical meetings and workshops with contributions typically addressing material properties under environmental degradation; inspection and control; risk assessment; damage mechanisms and their prevention; as well as, corrosion management.

TC11 High Temperature Mechanical Testing, Dr Hellmuth Klingelhöffer (Germany), Chairman, Mr. Larry Candler (UK), Vice-Chairman, Dr. Peter Barnard (UK), Treasurer, Mr. Malcolm Loveday (UK), Secretary. This TC has been in existence for more than 30 years. The committee works on engineering problems and challenges in high temperature mechanical testing. The main committee consists of approximately twenty European experts. Committee meetings are normally held twice a year in the UK. There are also working groups which consist of: temperature measurement (drift of thermocouples, round-robin for thermocouple calibration); crack growth measurement; and non-standard testing. The TC is a forum for discussion; it produces publications, conference

proceedings and Code's of Practice; it organizes conferences, workshops and seminars on various topics (e.g. TMF-Workshop 2005, 2011, Workshops on Quality Assurance in Mechanical Testing); it initiates research activities, organizes laboratory visits and operates as a European network for technical experts in high temperature mechanical testing. Several committee members also work in national and international standard committees to improve high temperature testing techniques. For more information see www.htmtc.com.

TC12 Probabilistic Interpretation of Mechanical Property Data, Dr. Robert Moskovic (UK), Chairman, Dr. P.L. Windle (UK), Secretary. Past activities in this area include meetings to examine failure data generated by fracture toughness, tensile, fatigue and creep testing for both metallic and non-metallic materials. This was combined with presentations on physical mechanisms involved in deformation, fracture and modeling of these processes. The structure of test data was discussed in relation to building probability models and presentations made on implementation of this approach. In addition, training seminars were held about probability modeling. TC 12 applied to the European commission for funding under one of the frameworks but the application was not successful. Following retirement of some of the key participants, the activities of TC12 have declined.

TC24 Integrity of Railway Structures, Professors Stefano Beretta (Italy), Chairman. The problems of the early days of railway technology were overcome long ago. However, more recent innovations, such as high-speed traffic and higher axle loads, have given rise to new challenges regarding almost every railway component. In order to avoid incalculable risks, the application of damage tolerance concepts based on fracture mechanics is increasingly becoming an essential aspect of structural integrity of rails as well as of rolling stock. TC24 was established in 2004 under the chair of Professor Karl-Heinz Schwalbe, after an initial series of successful meetings. From 2006 to 2010, the chairmen were then Professors Roderick Smith and Prof. Uwe Zerbst. From 2010 until 2013, the chairmen were Professors Stefano Beretta and Roderick Smith. TC24 has organized a series of successful workshops and meetings, which have led to the preparation of three Special Issues: Application of Fracture Mechanics to Railway Components, edited by U. Zerbst and K. Madler, *Engineering Fracture Mechanics*, Vol. 72 (2005); Fatigue and Damage Tolerance of Railway Rails, edited by U. Zerbst, R. Heyder and L. Girardi, *Engineering Fracture Mechanics*, Vol. 76 (2009); and one published in 2011 listed in Section 4. Two meetings were held in 2012: the first one (Milan, March 2012) was an opportunity to discuss the results of an Italian-German project about burnishing of

railway axles, while the second (Cambridge, October 2012) was devoted to discussing the latest results about the corrosion-fatigue of axles. The minutes and presentations of the meetings are available at:

<http://esistc24.mecc.polimi.it/>

The next meeting will be held in Fall 2013.

Many of the TCs hold small meetings biannually. Some hold larger meetings once a year or biennially. These meetings allow for intimate discussions and networking in specific areas of structural integrity. TCs may be initiated on new topics by contacting the ESIS President.

4. Elsevier Affiliated Journals

ESIS and Elsevier have an agreement since 2004 in which there are three journals affiliated with ESIS. These include Engineering Failure Analysis, Engineering Fracture Mechanics and International Journal of Fracture. ESIS actively encourages its members to publish in the Elsevier affiliated journals. Our members are active on the editorial boards of the journals, and, of course, our members are also active as regular reviewers for the journals.

As a result of TC and ECF meetings, special issues are published in these journals. During the last two years these have included:

Carpinteri, L. Pook and C.M. Sonsino (eds.) *Multiaxial Fatigue Models (ICMFF9 Multiaxial Fatigue)*, International Journal of Fatigue, Vol. 33, Issue 8 (2011).

Carpinteri, L. Pook and A. Spagnoli (eds.) *Multiaxial Fracture (ICMFF9 Multiaxial Fatigue)*, Engineering Fracture Mechanics, Vol. 78, Issue 8 (2011).

H. Yuan (ed.) *Meso-mechanical Modelling of Fatigue and Fracture (TC8)*, Engineering Fracture Mechanics, Vol. 78, Issue 3 (2011).

S. Beretta and U. Zerbst (eds.) *Damage Tolerance of Railway Axles (TC24)*, Engineering Fracture Mechanics, Vol. 78, Issue 5 (2011).

E. Macha and D. Rozumek (eds.) *Physical and Phenomenological Approaches to Fatigue Damage (TC3)*, International Journal of Fatigue, Vol. 39 (2012).

W. Brocks and H. Yuan (eds.) *Cracks in Microstructures and Engineering Components (ECF 18)*, Engineering Fracture Mechanics, Vol. 95 (2012).

In addition, the following special issues are at different stages of preparation for publication in 2013 and 2014:

H.J. Christ (ed.), *Recent Progress in the Understanding of Fatigue Crack Propagation (ECF 18)*, International Journal of Fatigue.

B.R.K. Blackman and J.G. Williams (eds.), *Fracture of Polymers, Composites and Adhesives (6th International ESIS TC 4 Conference)*, Engineering Fracture Mechanics.

H. Klingelhöffer (ed.), *Thermomechanical Fatigue (2nd International Workshop on Thermomechanical Fatigue TC 11)*, International Journal of Fatigue.

R. Brighenti, A. Carpinteri, F. Iacoviello and L.P. Pook (eds.), *Crack Paths (CP 2012 TC3)*, Engineering Fracture Mechanics.

Carpinteri, L.P. Pook and L. Susmel (eds.), *Fatigue Crack Paths (CP 2012 TC3)*, International Journal of Fatigue.

J. Pokluda and T.J. Marrow (eds.), *Micromechanisms of Deformation and Fracture (7th and 8th ESIS TC2 Conferences)*, Engineering Fracture Mechanics.

Furthermore, following the successful ECF19 meeting in Kazan, Professor Robert Goldstein is working on several special issues for each of the affiliated journals.

The ESIS journal blog was started on February 12, 2011, in which Professor Wolfgang Brocks reviews papers (currently from Engineering Fracture Mechanics, but we plan to extend this). The blog can be reached through our web site at www.structuralintegrity.eu or from <http://www.imechanica.org/blog/23810>. To date, he has reviewed five papers and there have been following discussions with over 10,000 hits to these reviews.

5. ESIS Award recipients and Fellows

Over the years, ESIS has presented awards to worthy members of the structural integrity community. These awards include:

The Griffith Medal

The Wöhler Medal

The Award of Merit

Honorary Membership

The **Griffith Medal** is dedicated to researchers who have performed outstanding research in the area of fracture; this includes classical fracture mechanics, as well as numerical analyses and simulations. For example, the work to be selected could deal with new methods of analysis or experiments, including effects of environment and temperature; or with application of existing methods to new problems, such as novel materials/material systems and others.

The **Wöhler Medal** is dedicated to researchers who have performed outstanding research in the area of fatigue. For example, the achievements to be chosen may deal with micromechanisms of fatigue, including novel experimental approaches and modeling; predictive tools for fatigue life and others.

Recipients of the foregoing awards are preferentially members of ESIS; exceptions require special justification.

The **Award of Merit** honors members of ESIS who have contributed outstandingly to the success of the Society; as an example, possible candidates could have performed successful long-term work in Technical Committees.

Candidates for **Honorary Membership** are not necessarily members of ESIS; they are leading experts in structural integrity.

Candidates for an Award: In addition to the above requirements, no member of the Executive Committee shall receive an award. Every ESIS member may submit a proposal to the Awards Committee for a candidate from another country; the proposal has to be seconded by another ESIS member, however, from a country other than that of the proposer nor of the candidate. The proposal shall include a detailed justification of the candidate, usually covering one to two pages. It shall also include a detailed CV of the candidate and a list of his/her five most important publications. Deadline for submitting a proposal is six months prior to the respective ECF.

The Griffith's medal has been awarded to Professors Frank McClintock (USA), André Pineau (France), Bruce Bilby (UK), Volodynyr V. Panasyuk (Ukraine), Wolfgang Brocks (Germany), Hans A. Richard (Germany), Bhushan Karihaloo (UK), Alberto Carpinteri (Italy), Emmanuel Gdoutos (Greece). The Wöhler medal has been awarded to Professors Yukitaka Murakami (Japan), Keith Miller (UK), Jean Petit (France), Darrell F. Socie (USA), Michael W. Brown (UK), Leslie P. Pook (UK), Robert O. Ritchie (USA), C. Morris Sonsino (Germany), Ashok Saxena (USA). The Award of Merit has been received by Professors Jaap Schijve (the Netherlands), Karl-Heinz Schwalbe (Germany), Lars Hannes Larsson (Italy), Dr. Ian Milne (UK), Dietrich Munz (Germany), Keith Miller (UK), Andrzej Neimitz (Poland), Emmanuel Gdoutos (Greece), Jaroslav Pokluda (Czech Republic). Recipients of Honorary Membership include Stanislaw Kocanda (Poland), Gordon Williams (UK), Dominique François (France), Manuel Elices Calafat (Spain), Viggo Tvergaard (Denmark), Ad Bakker (the Netherlands), Leslie Banks-Sills (Israel), Robert A. Ainsworth (UK), Robert Goldstein (Russia).

In addition to the Awards described above, a Young Scientist Award has been given in the past to Professors Alfredo Navarro-Robles (Spain) and Gilles Perrin (France). The last time it was awarded was in 2000. The ExCo has decided to reactivate it at ECF20 in Trondheim in 2014. The Young Scientist Award is dedicated to best contributions at ECFs, as selected by the Awards Committee. Young scientists who have not reached the age of 37 years on the first day of the ECF meeting may apply for this award.

They should submit their application including the paper for the conference and a CV to the conference Chair Person who will then distribute this material to the Awards Committee. The material must be submitted with the conference paper according to the submission date for papers. It should be noted that to receive the award, the researcher must make a presentation at the European Conference of Fracture. He/she must be the first author of the paper. In the case of co-authors, the application should include a signed agreement of all the co-authors supporting the nomination of the Applicant for the Award. There may be as many as two awards. This award is being given as an encouragement to younger researchers and in support of their careers. The award will include a certificate and 1000 € for first place and 500€ for second place.

Since 2008, Fellows have been elected to ESIS. Fellows are persons who have been members of ESIS for at least five years and who have distinguished themselves through contributions to the Society and to the art, science, teaching, or practice of structural integrity. Elections for this distinction are made by the Fellows Committee. The Fellows include Robert A. Ainsworth (UK), Ad Bakker (the Netherlands), Leslie Banks-Sills (Israel), Bruce Bilby (UK), Wolfgang Brocks (Germany), Michael W. Brown (UK), Alberto Carpinteri (Italy), Andrea Carpinteri (Italy), Manuel Elices Calafat (Spain), Dominique François (France), Emmanuel Gdoutos (Greece), Robert Goldstein (Russia), S. Kocanda (Poland), Bhushan Karihaloo (UK), Otmar Kolednik (Austria), Meinhard Kuna (Germany), Lars Hannes Larsson (Italy), Frank McClintock (USA), Keith Miller (UK), Ian Milne (UK), Dietrich Munz (Germany), Yukitaka Murakami (Japan), Andrzej Neimitz (Poland), Hryhoriy M. Nykyforchyn (Ukraine), Volodynyr V. Panasyuk (Ukraine), Jean Petit (France), André Pineau (France), Jaroslav Pokluda (Czech Republic), Leslie P. Pook (UK), Hans A. Richard (Germany), Robert O. Ritchie (USA), Jaap Schijve (the Netherlands), Karl-Heinz Schwalbe (Germany), Darrell F. Socie (USA), C. Morris Sonsino (Germany), Viggo Tvergaard (Denmark), J. Gordon Williams (UK).

6. Summary and Conclusions

The activities of ESIS have been described in the preceding sections. They include a list of ECF meetings showing a general increase in the number of participants between the first at Compiègne in France in 1976 and the last in Kazan, Russia in 2012. The TCs were described showing an active organization devoted to various subjects of structural integrity. As a result of these activities, members of ESIS are actively producing special issues for our affiliated Elsevier journals. To outstanding people in the field of structural integrity, awards are given and fellows are elected.

Not mentioned in this paper are the many active local groups which carry on activities within their own countries. These include fracture and structural integrity groups in Austria, Bulgaria, the Czech Republic, Germany, Israel, Italy, Poland, Romania, Russia, Serbia, Spain, Sweden, Ukraine and the United Kingdom. Our members are from these countries, other countries in Europe, as well as countries from around the world. ESIS is currently weighing the possibility of creating an Associate Membership status for Societies in other countries.

Finally, it is an honor and a pleasure to be the President of ESIS which is a vibrant and active organization dealing with the important problems of structural integrity and reliability. Our members are committed to dealing with important issues which lead to the savings of lives and money. I look forward to a continuation of these activities in the decades ahead.

Acknowledgement

I would like to thank the members of the ExCo for their continuing efforts for ESIS. They

include: Stefano Beretta, Vice-President, Jaroslav Pokluda, Vice-President, James Marrow, Secretary, Guisepe Ferro, Treasurer, Wolfgang Brocks, Publications Manager, Dietmar Klingbeil, Liaison, Zhiliang Zhang, Chair ECF20 and Francesco Iacoviello, Chair ECF21. In addition, the TC-Chairs have been doing excellent work in investigating structural integrity problems in a wide range of fields. They, as well as the ECF Chairs, have worked on special issues for ESIS. Finally, many of the National Representatives head groups in their home countries which also sponsor structural integrity events. I am grateful to all of them for their effort.

Reference list

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2. François, D., Mater. Sci., Vol. 32, 1996, pp. 531-536.
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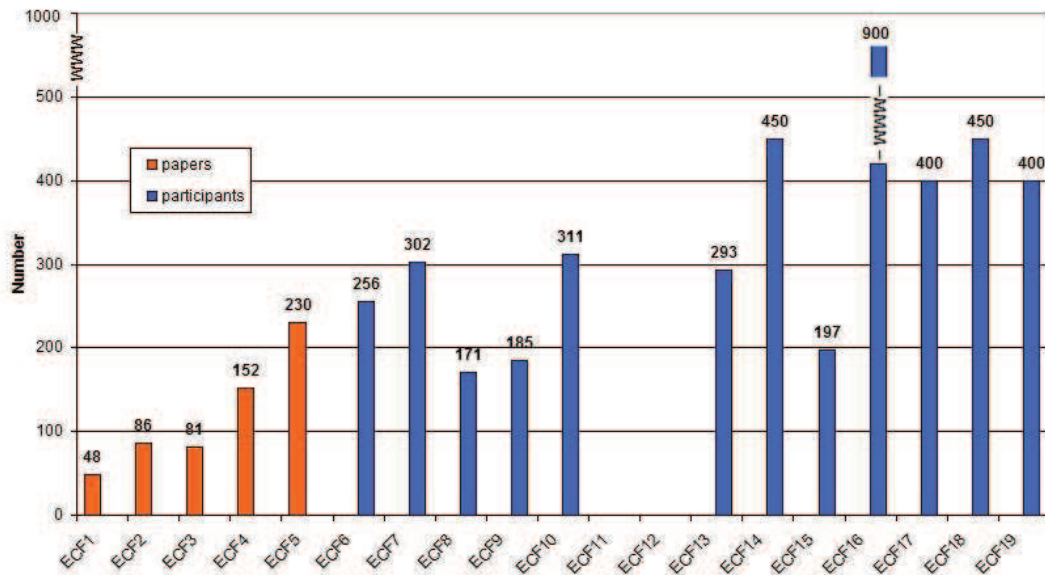


FIGURE: 1 – Number of papers presented or participants at ECF meetings.