

ICF TECHNICAL COMMITTEES

INTERIM REPORT, January 2009

D.P. Thompson

This report summarises the current status of the ICF technical committees, mainly focusing on the ones initiated at the ECerS X Berlin meeting 18 months ago, but including information on new committees which have emerged since that date.

1. **Information/Communications committee** (Chair: Professor K. Uematsu)

The main activities of this committee have focused on the maintenance and updating of the ICF website. Professor Uematsu is anxious to enlarge the membership of his committee – at the moment there is virtually no one from outside Japan. I am in touch with him about this – and we hope to build up a membership of (say) 10 persons.

Action: If any members of ICF Exec Committee have any names to recommend, please pass them on to DPT.

2. **Education committee** (Chair: Prof. W. Fahrenholtz^{*})

The committee held some useful sessions at the ICC2 Verona meeting, and Prof. Fahrenholtz has passed on to me his report of that activity. He makes the following recommendations:

- Hold “face to face” meetings just at ICC symposia. This would mean a frequency of one every 2 years, but it would ensure a good attendance, and hence a good debate of the relevant issues.
- WF now has a good list of European attendees as a result of the ICC2 meeting, which is a useful supplement to his existing list of (mainly US) contacts. He hopes that as a result of the ICC3 meeting (and maybe the Chair of that conference can help to ensure that key academics are informed about the Education committee activity), he will pick up another collection of relevant contacts from Japan, Korea, China and maybe even Australia/New Zealand + more newly emerging south-east asian countries.
- WF has made a series of recommendations as regards the future programme of the Education committee (Appendix 1)

Action: ICF Exec. Cte. consider the recommendations given by Prof. Fahrenholtz, and give feedback either directly to him or to DPT.

3. **Nanoparticle Safety Committee** (Chair: Dr Sylvia Johnson^{*})

As with the Education committee, there was a meeting of the Nanoparticle safety committee at the ICC2 Verona meeting, and the discussions ranged over a wide range of relevant issues. Sylvia has sent me a report for ICF Council as follows:

A half day session on the topic was held at the ICC in Verona. Following the panel discussion, a meeting was held to discuss the next steps. It was decided that the next meeting, at PACRIM in Vancouver, should focus on the development of a sample roadmap, and that the example material should be TiO₂. A session has been organized (primarily by Steve Freiman) at Vancouver. There are invited speakers followed by the discussion. NASA Ames provided some sponsorship money for the overall meeting, and some of this is being used to help the invited speakers. We expect to have a discussion following this meeting to define the next steps.

Action: ICF Exec Cte. approve the report by Dr Sylvia Johnson.

* Will be present in Daytona at the time of the ICF meeting.

4. Nuclear ceramics committee (Chair, Professor William Lee)

Professor Lee supplied a report for the Verona meeting, which because of shortage of time was not considered by the Council. He has sent an updated version of this report (Appendix 2) outlining plans for meetings of his committee at forthcoming international meetings.

Action: ICF Exec. Cte. approve the report by Professor Lee.

5. Ceramics and the environment (Chair, Professor H. Hosono)

In my report for the ICC2 meeting, I mentioned that Professor Hosono had been in touch, and was planning involvement by his committee in the STAC-3 (Science & Technology of Advanced ceramics) meeting in Japan in June. He has now e-mailed me further details:

We are scheduling a special session of Ubiquitous Element Strategy for Innovative Materials at Third International Conference on the Science and Technology for Advanced Ceramics (STAC-3), which is to be held at Yokohama, Japan in this June.

The session is composed of Profs. Komarneni, M. J. Rosseinsky, several invited speakers and contributed papers .

At the conference, we will discuss the symposium for 2010.

Sincerely,

Hideo Hosono

Action: ICF Exec. Cte. note this on-going activity, and pass any feedback to DPT.

6. Novel sintering techniques for ceramics (Chair: Professor N. Ichinose)

In my report for the Verona meeting, I wrote:

At the Berlin meeting, the proposed title of this committee was broadened out from its original focus on Spark Plasma Sintering, to also include consideration of other sintering/firing techniques – the broader topic being important in these days where there is an urgent need to minimise energy consumption. Professor Ichinose will give a brief review of how the committee and its work topics have developed during the last year.

Unfortunately, Professor Ichinose was not able to give his report in Verona, and I have not had any feedback from either him or his other active colleague Dr. Tokita.

Recently I have received the report on Novel Sintering Techniques of ICF Technical committee, and they summarized the major activities relating with Spark Plasma Sintering (SPS) technology as follows;

[1] January 23-25, 2008 APNFM2008 (Advanced Processing for Novel Functional Materials) held at International congress Center in Dresden of Germany. participants approx.300, 25 countries, 12 sessions were provided. 2 of 12 sessions were "Field assisted Sintering and Processing -1 and- 2" as the main session in the APNFM conference, 43 papers were submitted on SPS including oral and poster sessions.

[2] October 6-7, 2008 International Work Shop on Spark Plasma Sintering (SPS WORKSHOP2008) held in Avignon, France.

participants approx.120, 17 countries, oral 28, poster 17= total 45 presentations. more than 80% researchers came from France region.

[3] November 27-28, 2008 The 13th SPS Forum-Japan held in Niigata, Japan

participants approx 80, oral presentations 26, This was the most informative and productive meeting.

Others: In Korea, SPS technical seminar was held in October 30th 2008.

In annual conference of Japan Society of Powder and Powder Metallurgy, the session on Novel processing relating with SPS and Microwave sintering was held in November 5-7, 2008.

NEW COMMITTEES

7. Young researchers forum

At the ICC2 meeting, Dr Babini in collaboration with Lynette Madsen arranged a series of session for students/young researchers. As part of this activity, he passed round an A4 form, asking participants to complete this if they would like to continue involvement in a Technical Committee the role of which would be to provide a forum for exchange of information between young researchers on topics in ceramics of mutual interest in both teaching and research. Unfortunately only 3 completed sheets were returned. After liaising with both Dr Babini and Lynette, the feeling was that despite the low response, we should still try and develop a student-based committee. Of the original three respondees, only one, Mine Taykurt, from Anadolu University Eskisehir, Turkey, was keen to act as Chair for the starting off of this activity. I was pleased to accept this offer, because the head of the Ceramics department in Eskisehir is Prof. Hasan Mandal, who will be the next president of ECerS, and I know he will also take an active interest in the on-going progress of this initiative. In collaboration with Mine (a lady!), we have put together a brief document for approval by ICF.

Action: ICF Exec Cte, give their go-ahead for this committee. Any further feedback would be appreciated by DPT – also, if members can recommend names of other young researchers who would like to join in this activity, that would also be appreciated.

8. Renewable energy / Sustainable energy applications

In the build up before ICC2, there had been a suggestion of setting up a committee entitled “Ceramics for Sustainable Energy Applications”. Dr Louis Winnubst, from the University of Twente (The Netherlands) had expressed an interest in acting as the first Chair of this committee and a brief document summarising proposed activity had been prepared (Appendix 4). In discussions between Messrs, Makishima, Pye and DPT prior to the ICF Council, it was felt we should delay the initiation of this committee. Since then, we have had another suggestion that a committee should be set up in the field of Renewable energy, with a first Chair of Professor Olivia Graeve from Alfred University. There is some synergy between these two topics, and overall (I am still awaiting final feedback from Dr Winnubst) the stronger feeling is to set up a committee covering both these areas.

Action: that ICF Exec.Cte express their opinion on the above discussion. If the answer is to set up a joint committee, that ICF authorise DPT to get back to Messrs Winnubst and Graeve to decide the issue of the Chair (or even act as co-chairs) and also modify the original document in Appendix 4.

APPENDIX 1

4. Suggestions for Future Activities

Now that the first meeting of the ICF Technical Committee on Education has been held, several suggestions can be given to guide future activities.

Near Term

1. The ICF Technical Committee of Education should be formalized and populated. The committee needs to be given a clear mandate and guidelines for expectations.
2. It is suggested that representatives to the committee should be made by the ICF member societies. The representatives should commit to being active participants in the process. Nominations should come from the participating societies with the ICF executive committee approving the nominations and selecting the committee chair. Participation of a member of the ICF council as a counselor or ex-officio member of the committee would lend credibility to the effort.
3. The information exchange at ICC2 was valuable for all of the participants. For the current meeting, most of the participants were from Europe, which turned out to be beneficial. The proximity increased the probability of having representation from the appropriate institutions and allowed the activities to be more focused on just a few schools. For the next ICC, it is recommended that this approach be taken and that the committee focus on activities in Asia (Japan, Korea, China, Australia, etc.).

Long Term

1. The diminishing number of undergraduate and graduate programs focused on ceramic engineering education has created a need for coordination on a larger scale. Because only one or two programs focused on ceramic engineering are left in any country, a larger sampling base is needed to understand what is happening in the remaining programs. The ICF Technical Committee on Education can provide a forum for information exchange among the programs focused on ceramic engineering education. Because a significant fraction of ceramics education occurs in broader materials departments, any education-related effort must include faculty focused on ceramic education and/or research from those groups.
2. The ICF should explore the need to develop certificates for ceramic engineering education at levels including technologist, undergraduate, M.S., and Ph.D.

Uniform criteria will have to be established by consulting with the needs of employers and the current degree requirements of institutions. Differentiation between a specialist (e.g., a ceramic engineer) and a generalist with some experience (e.g., materials engineer with ceramic training) may be needed at all levels. Potential employers should be questioned about the value of a certificate program before any action is taken.
3. The ICF should explore the need to establish additional education consortia. Do other industries need programs like FIRE to train future employees or like the Ceramic Research Centre at Anadolu University to coordinate research efforts for a market segment? The ICF may be able to facilitate partnerships among academic institutions or connect industrial companies with individual or groups of universities. The existing consortia are at the graduate level, but they may be of value at the technologist and undergraduate levels as well.

APPENDIX 2

Progress Report International Ceramics Federation Technical Committee on Nuclear Ceramics.

Bill Lee, Committee Chair, 16 Jan 2009.

Members of Committee

Member	Organisation
Bill Lee (Chair), w.e.lee@imperial.ac.uk	Imperial College London, UK
Neil Chapman neil.chapman@itc-school.org	International Training Centre for Underground Waste Storage and Disposal, Switzerland
Bernd Grambow Bernd.Grambow@subatech.in2p3.fr	Ecoles des Mines de Nantes, France
Rod Swing rodewing@umich.edu	University of Michigan, Ann Arbor, USA
Bruce Begg bruce.begg@anstoinc.com	Australian Nuclear Science and Technology Organisation
Deng Changsheng changsheng@tsinghua.edu.cn	Tsinghua University, Beijing, China.
Toyohoko Yano tyano@nr.titech.ac.jp	Tokyo Institute of Technology, Japan.

Members of the committee in collaboration with the International Commission on Glass Technical Committee on Hazardous and Nuclear Waste Vitrification and the Nuclear and Environmental Technology Division of the American Ceramic Society helped arrange Symposium 19 for the PACRIM meeting in Vancouver May 31-June 5 2009 entitled Glasses and Ceramics for Nuclear and Hazardous Waste Treatment for which 19 abstracts were received. In addition we are helping organise a Symposium for the Materials Science and Technology (MS&T) meeting in Pittsburgh, USA Oct 25-29 2009 entitled Materials for Nuclear Renaissance (Bill Lee and Rod Ewing as co-organisers). This has an abstract deadline of March 15 2009. We plan to meet at the MS&T meeting to plan events for 2010 onwards.

APPENDIX 3

NEW ICF TECHNICAL COMMITTEE

YOUNG CERAMIC RESEARCHERS FORUM

Introduction

ICF has an Education committee which looks at many issues relating to teaching, learning and young researcher issues. However, the perspective is very much from the point of view of older ceramists in the profession, principally those who are themselves either teachers in higher education establishments or research supervisors or both. Clearly, students and young researchers themselves have different perspectives on these issues, especially as regards key topics and the priorities to be attached to these topics, and the aim of this committee is for students/young researchers to initiate dialogues on an international scale on topics they feel are of importance, and then to hold meetings at appropriate international meetings and present informed reports to ICF from time to time.

Scope, value and need

Ceramics education and research is undergoing many changes, for example:

- Decreasing numbers of students in many countries both at undergraduate and post-graduate level
- Changes in procedures for publishing papers
- Often the need to exist under the general umbrella of Materials or other Engineering-oriented disciplines
- Changing opportunities for finding employment
- Transition from education/PhD research completely within a single country to a situation where travel to other laboratories throughout the world is the norm

The needs in different countries are completely different, and there is tremendous value in sharing experiences and problems common to students/young researchers in different countries.

Proposed outcomes

- Promotion of increased collaboration between students in different countries
- Mutual assistance in finding jobs
- Holding seminars at international conferences on topics of significant student/young researcher interest

Possible members

Still to be decided.

Meeting arrangements

Still to be finalised as soon as an increased membership of the group has been established. It is important that further e-mail communications between members should take place to further refine the objectives outlined above.

APPENDIX 4

PROPOSAL FOR A NEW ICF TECHNICAL COMMITTEE:
CERAMICS IN SUSTAINABLE ENERGY APPLICATIONS

Dr Louis Winnubst, University of Twente, Enschede, NL
(a.j.a.winnubst@utwente.nl)

Introduction

Energy issues are becoming increasingly important, partly because of the rapidly (and often erratically) increasing cost of fuel, and also the need to conserve energy because of the dwindling supplies of natural resources. Symposia are being regularly organised in this field (for example the 9th International Symposium on ceramic materials and components for energy and environmental applications, held in Shanghai in November of this year).

Scope, value and need

Ceramics materials are key components of a number of energy-related devices, for example:

- Solar cells
- Solid state batteries
- Membranes
- Hydrogen production
- Fuel cells

Whereas most of the symposia organised in this field have focused on the materials themselves and their fabrication into components with appropriate properties, the aim of the technical committee would be to focus more on aspects relating to sustainability, and ways of minimising energy wastage.

Proposed Outcomes

- Assessment of current documentation on energy saving as applied to ceramics.
- Promoting increase collaboration between ceramicists working in this area in different countries.
- Identification of new business opportunities.
- Production of documentation to inform non-experts entering this field.

Possible members

A committee membership of ~10 is aimed for, covering especially those countries who are key players in this field. Suggestions include:

Prof. K Itatani (Tokyo, Japan)

Dr Bert Hintzen (Eindhoven University of Technology, the Netherlands)

Prof. Jianbao Li (Tsinghua, University China)

Meeting arrangements

A first meeting of this committee could be at the 9th International Symposium on ceramic materials and components for energy and environmental applications, Shanghai November 2008 (or the ECerS XI meeting in Krakow, June 2009).

In the meanwhile, e-mail communications will be used to find additional committee members.