

## INTERNATIONAL ACTIVITIES ON FIRE RESEARCH

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### ABSTRACT

In this paper presented are recent international activities on fire research. After a long history of exchanging ideas in individual international groups, the International Association for Fire Safety Science (IAFSS) was founded in 1985 at its first Symposium, and in 1988, it became a registered charity in England and Wales. The primary objectives of the association are encouraging research in the science of preventing and mitigating the adverse effects of fires and of providing a forum for presenting the results such research. In order to implement the objectives, the Association has held a series of Symposia. At the same time, regional activities have been performed to expand the activities of IAFSS into every individual country. The Asia-Oceania Association for Fire Science and Technology (AOAFST) was founded in 1992 at its first Symposium and the First European Regional IAFSS Symposium was held in Zurich in 1995. Extensive activities in fire research have been performed in Asian and Oceanian countries.

### BEFORE 1985

The history of fire research would start when people have realized need to mitigate the adverse effects of fires. The importance of fire research has increased with increasing property, and for civilized society, fire technology based on knowledge accumulated through fire research has become indispensable.

In the early seventies, the results of fire research, performed by researchers in USA under the leadership of Prof. H. W. Emmons, became to be presented at international meetings[1]. This enhanced collaboration of fire researchers in other countries such as Japan and UK with long history of fire research with those in USA with established scientific and economic circumstances.

The activities of groups, which resulted from the collaboration, became extensive and many researchers joined the groups. Those fire researchers established methodology independent of any other fields of science and technology and realize a new field of science and technology. In spite of the wishes of fire researchers, however, they could have only few opportunities of exchanging ideas and/or discussing issues.

Most of fire researchers have taken part in individual fields of science and technology other than fire science and technology, and individually performed fire research. In such circumstances, there frequently occur such cases that a well-known fact in a field is a novel finding in another field.

Also, fire research is not major in most of the fields to which fire researchers have contributed so that their contribution may not be appreciated. Fire researchers have anticipated foundation of an association for fire science and technology.

## FOUNDATION AND MANAGEMENT OF IAFSS

The International Association for Fire Safety Science (IAFSS) was founded in 1985 at its first Symposium with the primary objectives of encouraging research in the science of preventing and mitigating the adverse effects of fires and of providing a forum for presenting the results such research[2]. Membership is open to all having these interests. In 1988, it became a registered charity in England and Wales. After the First Symposium, four symposia have been organized by the IAFSS; 1998 Tokyo[3,4], 1991 Edinburgh[5], 1994 Ottawa[6], and 1997 Melbourne[7]. Also, the Committee of IAFSS appointed Fire Safety Journal as the official journal of IAFSS at the Ottawa Symposium.

The most important activity of the IAFSS is to give reliable information on fire safety science to its members through the Symposia and Fire Safety Journal. The paper selection for presentation at each Symposium has been performed in careful procedures. The Chair of the Programme Committee for the first three Symposia was Dr. Thomas, the Chair of IAFSS at its foundation and that of the last two was myself. The tasks of the Programme Committee are selection of invited lecturers (except for that for H. W. Emmons Lectureship) and original papers. The selection of invited lecturers starts at more than one year before the Symposium. After several rounds of communication and voting among the members of the Programme Committee, candidates are decided before the deadline of original paper submission.

The selection of original papers is performed based on the following basic policies agreed to in the IAFSS Committee meetings:

1. Selection of original papers should be based on reliable reviews of full papers (not abstracts).
2. At least two reviewers should be provided for each paper.
3. One reviewer should be in the same region of the author(s) and another in another region.
4. The names of reviewers for a specific paper should not be provided to the author(s) of the paper except for the case where the author is a member of the Programme Committee.
5. The members of the Programme Committee should be fair and reliable.

The IAFSS Programme Committee has carefully performed paper selection on the basis of peer reviews and reasonable consideration of regional balance. The ratio of the number of accepted papers to that of total submitted papers is about 0.8 for the First Symposium and about 0.5 for the next four Symposia. It would be surprised that despite of the low rate of acceptance, many papers have been submitted for presentation at the Symposia. This is attributable to the careful selection of papers by the Programme Committee based on reviews by reliable researchers. At the same time, an issue has arisen from the viewpoint that the information available at the Symposia is not new. This is not avoidable if the Programme Committee would select papers with few defects and spend a enough time for paper selection. At the Symposia, the attendees would not find challenging papers which are of new topics or methodology but likely with marked defects. Thus, poster sessions were provided in the Fifth Symposium for improving such a situation.

The topics of the papers presented at each individual Symposium represent the issues in the field of basic fire science at that time. The number of papers in each category presented at the series of Symposia. is given in Table 1. It is seen that for this thirteen years, there has occurred little change in topics interesting to fire researchers.

The management of Fire Safety Journal is based on almost the same philosophy for the Symposia. The editor Dr. D. D. Drysdale is a Vice Chair of the IAFSS, and regional editors Dr. V. Babrauskas and Prof. Y. Hasemi and most of the members of editorial board are members of the IAFSS. The paper selection procedure for publication is careful and based on peer reviews like those for the

Table 1 Number of papers in each category presented at International Symposia on Fire Safety Science

	First	Second	Third	Fourth	Fifth	Fifth(Posters)
Fire Physics(Total)	18	26	31	31	34	11
Ignition	1	2	3	3	0	1
Flame Spread	5	6	5	9	10	3
Fire Physics (Sub-category)						
Flow in Fire	0	4	8	5	9	3
Modeling	7	8	8	10	8	4
Steady Burning	3	5	4	3	4	0
Review	2	1	3	1	3	0
Fire Chemistry	14	4	12	5	5	1
Smoke Toxicity/Hazard	8	4	3	3	1	3
Statistics/Risk/ System Analysis	13	10	8	10	10	5
Human Behavior/Egress	9	7	5	11	10	2
Detection	8	4	5	7	3	1
Suppression	6	8	4	10	7	7
Structures/Structural Behavior	10	8	6	14	17	3
Specialized Fire Problems	17	6	7	9	7	8
Translation of Research into Practice	9	14	11	14	13	6

#### Symposia.

The IAFSS is governed by the Committee and its officers. At the 5th International Symposium on Fire Safety Science held in Melbourne, the officers and Committee members shown in Table 2 were elected.

The IAFSS has encouraged its members by various activities. The H. W. Emmons Invited Lectureship Award, the Philip Thomas Medal of Excellence for the best paper presented at the previous Symposium, and the Kawagoe Award for a lifelong career achievement in and contributions to fire safety are major awards of the IAFSS. The candidates for the first two are selected by the Symposium Awards Committee chaired by Dr. J. A. Rockett, and that for the last

Table 2 Officers and Committee members of IAFSS

Name (Country) Office	Name (Country)
Prof. T. Hirano (Japan), Chair	Prof. V. K. Bulgakov (Russia)
Dr. D. D. Drysdale (UK), Vice-Chair	Dr. M. R. Curtat (France)
Prof. P. J. Pagni (USA), Vice-Chair	Prof. M. Fontana (Switzerland)
Prof. Y. Uehara (Japan), Vice-Chair	Dr. J. R. Hall (USA)
Dr. P. Beever (Australia), Treasurer	Dr. Y. Hasemi (Japan)
Dr. R. Friedman (USA), Secretary	Dr. T. Kashiwagi (USA)
Prof. G. Cox (UK), Executive member	Dr. M. Kokkala (Finland)
Prof. Fan Weicheng (China), Executive member	Prof. S. E. Magnusson (Sweden)
Prof. J. G. Quintiere (USA), Past-Chair	Mr. H. E. Nelson (USA)
	Dr. C. G. Ramsay (Australia)
	Dr. O. Sugawa (Japan)
	Dr. P. H. Thomas (UK)
	Prof. R. B. Williamson (USA)
	Dr. D. Yung (Canada)

one is selected by the Awards Sub-Committee of the IAFSS chaired by Prof. Pagni. Dr. J. R. Hall serves for the IAFSS as the editor of the IAFSS Newsletters, which are a unique means of communication for fire researchers and engineers not only of the IAFSS members but also for non-members. Also, Prof. S. E. Magnusson serves as the chairman of the IAFSS Education Subcommittee. By the efforts of Prof. Magnusson, a group interested in fire education has been established, which is indispensable to grow up young fire researchers and engineers.

The IAFSS seeks ways to use its resources to promote the exchange of fire research activities throughout the world, and to assist areas and individuals in need in order that they might participate. In 1995, gifts of \$ 8,500 each were bestowed on the fire education programs at the Fire Science Center, University of New Brunswick and at the Department of Chemical Engineering, University of British Columbia, Canada. These gifts were made in recognition of the successful Fourth Symposium held in Ottawa in 1995.

## REGIONAL ACTIVITIES AND AOAFST

The IAFSS has taken steps to secure its operations and extend its activities. Several regional activities have been performed with great success. The earliest regional activities after the foundation of the IAFSS started in Asian and Oceanian countries[8]. The details of the activities in Asian and Oceanian countries will be presented later in this section. Their activities would stimulate the fire researchers in other regions. The First International Seminar on Fire and Explosion Hazards of Substances and the Venting of Deflagrations was held in the Cosmos Hotels of Moscow, Russia on July 1995[9]. Also, the First European Regional IAFSS Symposium was held at the Eidgenossische Technische Hochschule in Zurich, Switzerland on August of the same year. The successes of these meetings should be attributed to the Organizing Committees represented by Profs. Korolchenko and Fontana.

The IAFSS is attempting to take care of individual countries' activities. Last year, Prof. Quintiere, the Chair of the IAFSS at that time, visited to the University of Sao Paulo, attending a conference on fire safety, and discussing with them plans concerning the development of educational programs in fire safety. The IAFSS looks forward to its colleagues in South America joining in the activities of the IAFSS.

Before the researchers in Asian and Oceanian countries started their activities for improving the level of basic fire science and technology in Asian and Oceanian countries, there had been various activities which composed the bases of theirs. Examples of those activities were exchanging scientist(s) and/or engineer(s) in fire research between Asian and Oceanian countries and inviting a few well-known specialists in fire research from an Asian or Oceanian country to a meeting in another Asian or Oceanian country. Through those activities, we were ready to arrange international meetings for scientists and engineers dealing with fire research in Asian and Oceanian countries.

To my knowledge, the first meeting for Asian fire researchers to which participants from more than three Asian countries attended was the seminar "Research on the Processes of Combustion, Explosions and Modelling of Fires" at Khabarovsk Polytechnical Institute, April, 1991. Thereafter, a series of international meetings for Asian and Oceanian fire researchers has been held as follows:

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|---------------|---|
| 1991 April    | Seminar of "Research on the Processes of Combustion and Modelling of Fires"; Khabarovsk Polytechnical Institute; Main Organizers: Prof. Bulgakov, Dr. Karpov. |
| 1991 November | China-Japan-Russia Joint Meeting on Fire Research; University   |

1992 October	of Science and Technology of China; Main Organizer: Prof. Fan. First Asian Conference on Fire Science and Technology; University of Science and Technology of China; Main Organizers: Prof. Fan, Dr. Cheng.
1993 October	'93 Asian Fire Science Seminar; Science University of Tokyo; Main Organizers: Prof. Shigekura, Prof. Kawagoe, Dr. Sugawa.
1994 December	'94 Asian Fire Science Seminar; Research Institute of Human Settlements(RIHS), Republic of Indonesia; Grand Bali Beach; Main Organizers: Mr. Darmonegoro, Mr. Aksa, Mr. Leander, Mr. Suprpto, Dr. Sugawa.
1995 April	'95 Asia-Oceania Fire Science Seminar; Khabarovsk State University of Technology; Main Organizers: Prof. Bulgakov, Dr. Karpov.
1995 September	Second Asia-Oceania Symposium on Fire Science and Technology; Khabarovsk State University of Technology; Main Organizers: Prof. Bulgakov, Prof. Hirano, Prof. Sugahara, Prof. Fan, Dr. Ramsey, Dr. Karpov.
1996 November	'96 Asia-Oceania Seminar on Fire Science; University of Science and Technology of China; Main Organizers: Prof. Fan; Dr. Jianda.

The Asian Association for Fire Science and Technology (AAFST) was founded in October, 1992 during the First Asian Conference on Fire Science and Technology [8]. At foundation of AAFST, it was confirmed that the AAFST should make efforts for encouraging fire researchers in Asian countries, in close cooperation with IAFSS. Also, the AAFST decided to organize at least one meeting per year in an Asian country for keeping its activities in a high level. Based on recent successful collaboration with fire researchers of Oceanian countries, AAFST expanded in its region and changed in its name to the Asia-Oceania Association for Fire Science and Technology (AOAFST). This change was approved at a general meeting in the Second Asia-Oceanian Symposium on Fire Science and Technology [10].

Constitution and Rules of the Association are composed of 17 articles. The drafts of the Constitution and Rules were prepared and discussed at Committee meetings held during the '93 and '94 Fire Science Seminars. The corrections suggested by Committee members have been made. The Constitution and Rules was approved at the general meeting in the Second Asia-Oceanian Symposium on Fire Science and Technology.

So far the AOAFST has had several Committee meetings. The first meeting was held at the First Asian Conference for Fire Science and Technology. At that time, an ad hoc committee was organized and decided the foundation of the AAFST. An election of a president and two vice-presidents was performed and the procedure to formalize the AOAFST was discussed. Based on the results of the discussion, the formalization of the AOAFST started.

The Committee meetings have been held during Symposia and Seminars. Main subjects talked at the Committee meetings were

Committee Meeting (October 9, 1993)

- \* Nomination of the Committee members
- \* Constitutions and Rules
- \* Awards
- \* Future Activities of AAFST (the Second Symposium; Seminar)
- \* Cooperation with IAFSS

- \* Cooperation with Oceania fire scientists and engineers
- \* Topics to submit to IAFSS Newsletter No. 6
- Committee Meeting (December 6, 1994)
- \* Constitution and Rules
- \* Additional Nomination of the Committee Members and Officers
- \* Second Asia-Oceania Symposium on Fire Science and Technology
- \* '96 Asia-Oceania Fire Science Seminar
- \* Topics for the next issues of the IAFSS Newsletter
- \* Other business
- Committee Meeting (April 13, 1995)
- \* Constitution and Rules
- \* Additional Nomination of the Committee Members and Officers
- \* Second Asia-Oceania Symposium on Fire Science and Technology
- \* Committee Meetings at the Symposium
- \* Business Meeting at the Symposium
- \* Other business
- Committee Meeting (September 16, 1995)
- \* Committee Members and Officers
- \* Third Asia-Oceania Symposium on Fire Science and Technology
- \* '96 Asia-Oceania Fire Science Seminar

Table 3 Officers and Committee members of AOFST

Name (Country) Office	Name (Country)
Fan, W-C. (China) President	Karpov, A. (Russia)
Bulgakov, V. (Russia) Vice-President	Khishigbaatar, D. (Mongolia)
Ramsay, C. (Australia) Vice-President	Korolchenko, A. Y. (Russia)
Uehara, Y. (Japan) Vice-President	Leander, V. (Indonesia)
Sugawa, O. (Japan) Treasurer	Li, Y-Q. (China)
Yao, J-D (China) Secretary	Lipanov, A. M. (Russia)
Beck, V. (Australia)	Mok, Y. S. (Korea)
Bi, Z-Z. (China)	Morita, M. (Japan)
Buchanan, A. (New Zealand)	Nakaya, I. (Japan)
Chew, L-T. (Singapore)	Ohtani, H. (Japan)
Chin, C. B. (Singapore)	Sekizawa, A. (Japan)
Chow, W-K. (Hong Kong)	Sharma, T. B. (India)
Du, L-P. (China)	Sugahara, S. (Japan)
Green, T. (Australia)	Du, L-P. (China)
Grishin, A. M. (Russia)	Suprpto (Indonesia)
Hasemi, Y. (Japan)	Terai, T. (Japan)
Hirano, T. (Japan) Honorary President	Telitsyn, H. P. (Russia)
Huang, Z-X. (China)	Than, C. F. (Malaysia)
Ishii, T. (Japan)	Wu, Z-Z. (China)
Jiang, F-H. (China)	Zhang, W-Y. (China)
Kaminski, A. I. (Russia)	

- \* Policy and Future Activities of AOAFST
- \* Topics for the Next Issue of the IAFSS Newsletter
- \* Awards
- \* Summary of the Second Symposium
- \* Other Business

#### Committee Meeting (November 6, 1996)

- \* Singapore Symposium (3<sup>rd</sup> AOSFST)
- \* Other Conference in Asia-Oceania Region in the Future
- \* Other Business

The election of the Committee members has been performed on the basis of recommendation by main members at the establishment of the AOAFST and contribution to the AOAFST through past meetings or IAFSS activities. After the Constitution and Rules of Association was approved, the election has been performed according to the Article 12 in the Rules. Table 3 shows the present officers and Committee members of the AOAFST.

The primary objectives of AOAFST are to promote research in Asian and Oceanian countries into the science and technology for preventing and mitigating the adverse effects of fires and to provide a forum for presenting the results of such research. Our future activities should be based on this objective and we will continue to encourage fire scientists and engineers in Asian and Oceanian countries.

#### CONCLUDING REMARKS

Indeed, the level of fire science and technology is based on the levels of individual researchers. I believe the encouragement of individual researchers is indispensable for improvement of the overall level of fire science and technology. The future activities of the IAFSS should be for contribution to fire science and technology. The activities of the AOFST, which encourage the researchers in Asian and Oceanian countries, should be for contribution to fire science and technology in Asian and Oceanian countries but at the same time for contribution in countries in other regions of the world.

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