

# PROGRESS OF FIRE SCIENCE AND TECHNOLOGY IN ASIA-OCEANIA REGION

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## ABSTRACT

In this paper presented are a brief history, past activities, present issues and prospects of future activities of fire researchers in countries in the Asia-Oceania region. The Asia (later Asia-Oceania) Association for Fire Science and Technology was established at its First Symposium at University of Science and Technology of China on October 1992. The purpose of the Association is to improve the level of basic fire science and technology in the Asia-Oceania region. Despite of efforts during this 15 years, the present issues are still of the quality of papers from Asia-Oceania countries. Good papers useful to improve fire science and technology needed in the countries that of the authors are hard to be appropriately evaluated in the world community for fire safety. The members of the Association should realize that fire research should be for their own countries.

**KEYWORDS:** AOAFST, History, Present issues

## BEFORE ESTABLISHMENT OF THE AOSFST

Before we established the Asia-Oceania Association for Fire Science and Technology, various activities for improving the level of basic fire science and technology had been made in the Asia-Ocean region,<sup>1-2</sup> which composed the bases of the Association. Example of those activities were exchanging scientists and/or engineers in fire research between Asia-Oceania 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 researches in Asian and Oceanian countries.

There were several reasons for fire researchers in Asian-Oceania countries to establish an association to provide periodical meetings where they can manage topic setting and paper selection. When the author has been the Secretary of the International Association for Fire Safety Science (IAFSS), he was invited to be a member of the program committee of the International Symposium (ISFSS). During paper selection process, he realized that some papers submitted from countries of Asia-Oceania region are marked in low points although the acceptance ratios of the papers from countries in three regions are not so much different (see Table 1). The author wondered if the evaluation, that some papers submitted from countries of Asia-Oceania region are low in quality, would be true. The fire research would be conducted to solve issues arisen in the country which the researcher belongs.

In general, paper reviews are based on the importance of topics and comprehensibility of description.

**Table 1.** Numbers of accepted and rejected papers submitted for presentation at the Second ISFSS

Region	Number of Accepted Papers	Number of Rejected Papers
Asia-Oceania	30	18
North America	35	17
Europe	22	15

The topics with which fire researchers in the Asia-Oceania countries have to deal would be different from those in North American or European countries because of the difference of issues for fire safety in different countries, and it is hard for Asian researchers to write a comprehensible papers in English. In addition, it is not easy for Asian researchers to present papers by English in meetings other than those managed by IAFSS, where papers could be polished. Few papers concerning original topics in countries of the Asia-Oceania region were accepted for presentation at the International Symposium. If a researcher in an Asian or Oceanian country would wish that his paper is accepted for presentation at the International Symposium, he has likely to conduct a research concerning a topic that the reviewers could understand.

On 1970's, a group of the author had conducted a research on flame spread over paper sheets.<sup>2-7</sup> In the research a number of novel concepts were introduced. Thereafter, researchers in USA have done experimental studies based on the similar concepts of us. Before our research, US researchers have used to use paper sheets for experiments.<sup>8,9</sup> After our research, they changed the material from paper to PMMA.<sup>10-12</sup> The use of PMMA sheets was a good reason for them not to cite our papers even if they conducted studies on the basis of our concepts. PMMA is not a typical combustible material in room fires, while cellulose is a typical material. It seems to the author that the researchers do not like to be led by an Asian research group. Later, most of Asian researchers on flame spread have ignored our achievements on the flame spread. In this case also, Asian researchers would be afraid of rejection of their paper if they did not cite the papers written by US researchers. Asian researchers have behaved like slaves. They could little contribute to fire safety promotion in their own countries.

There were other trivial reasons to likely reject the papers from countries in economic difficulty. Once the programme committee for an international meeting had accepted those papers, the committee should provide various documents including a formal invitation with endorsement for their activities and even expense during their stay for attending the meeting. These troublesome efforts of the programme committee would be another reason of the low acceptance ratio of the papers submitted from those countries.

To overcome the difficulties that Asian and Oceanian researchers, the author and colleagues started to encourage them by providing forums for them. To knowledge of the author, 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 Modeling of Fires" at the Khabarovsk State University of Technology, April, 1990, the main organizer of which was Professor Bulgakov. The next one was the meeting "China-Japan-Russia Joint Meeting on Fire Research" at the University of Science and Technology of China, the main organizer of which was Professor Fan.

## **HISTORY OF AOAFST**

The first symposium organized by AAFST (the Asian Association for Fire Science and Technology) was held during the period of 9 to 13 October, 1992 at the State Key Laboratory of Fire Science, the University of Science and Technology of China, for celebrating the start of the State Key Laboratory of Fire Science. The name of the meeting was "Asian Conference on Fire Science and Technology." During the Conference, AAFST was established. At the establishment of AAFST, it was confirmed that the AAFST should make efforts for encouraging fire researchers in Asian countries, in close cooperation with IAFSS, and that the AAFST should organize at least one meeting per year in an Asian country for keeping its activities in a high level. Also, based on successful collaboration with fire scientists and engineers of Oceanian countries, AAFST expanded in its region and changed the name to AOAFST (the Asia-Oceania Association for Fire Science and Technology) at the Second Asia-Oceania Symposium on Fire Science and Technology held during the period of 13-17 September, 1995 at the Khabarovsk State University of Technology.

Main meetings organized by AOAFAST are as follows:

October 9-13,	1992	<b>First Asian Conference on Fire Science and Technology</b> ; State Key Laboratory, University of Science and Technology; Main organizer: Prof. Fan, Dr. Cheng
October 7-9,	1993	'93 Asian Fire Science Seminar; Science University of Tokyo; Main Organizers: Prof. Shigekura, Prof. Kawagoe, Dr. Sugawa
December 5, 6,	1994	'94 Asian Fire Science Seminar, Research Institute of Human Settlements (RIHS), Republic of Indonesia, Bali Branch; Main organizers: Mr. Darmonegoro, Mr. Aksa, Mr. Leander, Mr. Sprapto, Dr. Sugawa
April 12, 13,	1995	'95 Asia-Oceania Fire Science Seminar; Khabarovsk State University of Technology; Main Organizers: Prof. Bulgakov, Dr. Karpov
September 13-16,	1995	<b>Second Asia-Oceania Symposium on Fire Science and Technology</b> ; Khabarovsk State University of Technology; Main organizers: Prof. Bulgakov, Prof. Hirano, Prof. Sugahara, Prof. Fan, Dr. Ramsey, Dr. Karpov
November 4-8	1996	'96 Asia-Oceania Seminar on Fire Science; University of Science and Technology of China; Main Organizers: Prof. Fan, Dr. Jianda
June 10-12,	1998	<b>Third Asia-Oceania Symposium on Fire Science and Technology</b> ; National University of Singapore; Main organizers: Prof. Ching Chi Bun, Prof. Sugahara
May 24-26	2000	<b>Fourth Asia-Oceania Symposium on Fire Science and Technology</b> ; Waseda University; Main organizers: Prof. Sugahara, Prof. Hasemi
December 3-6	2001	<b>Fifth Asia-Oceania Symposium on Fire Science and Technology</b> ; University of Newcastle; Main organizers: Prof. Dulgogorski, Dr. Kenedy
March 17-20	2004	<b>Sixth Asia-Oceania Symposium on Fire Science and Technology</b> ; Korean Institute of Fire Science & Engineering; Main organizers: Mr. Su-Kyung Lee, Dr. Jae-Duck Kim, Prof. Eung-Sik Kim
September 20-22	2007	Seventh Asia-Oceania Symposium on Fire Science and Technology; Hong Kong Polytechnic University; main organizers: Prof. Chow, Prof. Hasemi (This Symposium)

The major actions of the AOAFAST have been supported by IAFSS, so that those should be under the IAFSS's policy on regional meetings as follows:

“Generally, a certain degree of restrictions should be applied to regional meetings, supported or held in the name of the Association. As the number of fire scientists and fire research bodies is rather limited – compared to the situation for more well-established scientific areas – frequently held regional meetings may lead to a lower scientific quality level and less status for the Association Symposia.

A regional meeting in one of the three Association regions – America, Asia/Australia, and Europe – to be supported by the Association shall

- have an objective which is in conformity with the objectives of the Association, i.e., “to promote research into the science of preventing and mitigating the adverse effects of fires and the dissemination of the results of such research”;
- focus on a subject which forms part of the subject area of the Association,
- be approved by one of the three vice-chairmen of the Association,
- be organized by members of the Association in at least two countries within the region,
- be held in English, and

- comprise presentation mainly by researchers from the region – the paper being accepted for presentation after a referee procedure, based on abstracts as minimum, being published by Journals, subject to review of the full paper.”

AOAFST is the most successful branch organization of IAFSS. The Committee members at the start of AOAFST are as follows:

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

The election of the Committee members was performed on the basis of recommendation by main members at the establishment of the Association and contribution to the Association through past meetings or IAFSS activities. Thereafter, the election has been performed according to the Article 12 in the Rules of the Association which are almost the same to those of IAFSS.

The president was transferred to Prof. Fan, then to Prof. Bulgakov. Because of Prof. Bulgakov became ill and during this Symposium we have to elect the next President.

## **REGIONAL BALANCE IN THE ACTIVITIES OF IAFSS**

IAFSS was founded in 1985 at its first Symposium with primary objective to encourage research into the science of preventing and mitigating the adverse effects of fires and to provide a forum for presenting the results of such research. Membership is open to all having these interests. The activities should not be for people of a specific region or country.

In order to reasonably manage IASFF of the above characteristics, the officers of IAFSS were from various countries. The first Chairman, Dr. Phil Thomas, was from UK, and the second, Prof. Jim Quintiere, was from USA, the third, the author, from Japan, the fourth Prof. D. D. Drysdale, from UK, and the fifth, Dr Beyler, from USA. Also, the Symposia have been held in various sites over the world, the first Symposium was held at Gaithersburg (1985), USA, the second at Tokyo (1988), Japan, the third at Edinburgh (1991), UK, the fourth, at Ottawa (1994), Canada, the fifth Melbourne (1997), Australia, the sixth Poitiers (1999), France, the seventh Worcester (2002), USA, the eighth Beijing (2005), China.

Despite of careful management of the IAFSS, it seemed hard to elevate the level of the papers submitted from Asian countries to that appropriate to be accepted in the ratio equal to that of the papers submitted from North American or European countries. In order to encourage researchers of Asian countries various efforts have been made including the establishment of the AOAFST and awards for best papers presented in AOSFST, and special policies in management of IAFSS. In the instruction for reviewers, it was used to put a sentence meaning that the paper selection should not be based on the quality of English. Another example can be seen on the item 3 of the basic policies for paper selection as follows:

1. Selection of original papers should be based on reliable reviews of full papers.
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.

Unfortunately, some of the Programme Committee members and reviewers ignored these policies and recommended to reject many excellent papers, the contents of which are meaningful for the countries of the author(s). They would not understand what are important for fire safety in other countries than their own. Thus, the regional balance in IAFSS activities is still not favorable.

## **PRESENT ISSUES OF FIRE RESEARCHERS IN ASIA-OCEANIA REGION**

What fire researchers are expected by people would be their contribution to the promotion of fire safety in their own country. Their own country has provided money for fire researchers with the above expectation. It is the duty of fire researchers to contribute to the fire safety of their own country. The topics useful for one country are, in general, different from those for other countries. If a Japanese fire researcher would work in USA on the support of USA government, his effort should be not for Japan but for USA. It is not appropriate that the Japanese fire researchers having worked in USA would accuse the sense of topic selection of Japanese researchers. If the Japanese fire researchers living in Japan have performed researches meaningless for the promotion of fire safety in Japan, they should be accused.

If a reviewer is not a researcher working for the country of the author(s), he would not be able to evaluate the appropriateness of the topic selection. Reviewers should be of a mind in favorable balance. The items 3 and 5 of the basic policies of ISFSS paper selection are important for IAFSS. As mentioned previously, one of the primary objectives of IAFSS is to encourage research into the

science of preventing and mitigating the adverse effects of fires. The “fires” in this sentence should mean the fires to prevent in the country of researchers. This situation has been understood by the leaders of IAFSS at its early stage. Nevertheless, in the process not only for the ISFSS but also for AOSFST, it has been ignored.

It would not be hard to establish a situation favorable for encouraging researchers who contribute to promotion of fire safety in their own countries. In the process of paper selection, review should be made by researchers who could understand the issues on fire safety of the countries of the authors. Of course, originalities of papers are necessary, so that reviewers should be with ability to understand originalities. The researchers who likely ignore the issues on fire safety of the countries of the authors or published papers with less originality are not appropriate as reviewers. The programme committee should eliminate the names of the reviewers not appropriate as reviewers from the list of reviewers.

In recent communication with researchers of Asian and Oceanian countries, the author has realized that they do not have appropriate knowledge on the achievement made by their colleagues in Asia-Oceania region. They have likely ignored studies conducted in Asia-Oceania region and have not cited the papers described the results of those studies. This trend is distinct for researchers who have not performed any appreciable original studies. They cannot evaluate originality because they are not with ability to perform original studies. They have given up conducting original studies useful for their own countries but conducted studies of topics important in USA, Canada or European countries, and their papers would be easily accepted for presenting at international meetings or publishing in journals for papers written by English.

The author has realized that motivations of some studies are based only on information learned in journals or proceedings. Such researchers would not understand the purposes of fire researches. Fire researches should be for promotion of fire safety of their own country. Even if those are basic researches useful for promotion of fire safety of many countries, the results necessarily are useful for promotion of fire safety of their own country.

The spectrum of topics of the papers presented at domestic meetings is a good measure for evaluation of the situation of a country in world fire research community (see Table 2).

**TABLE 2.** Topics and number of papers presented at three different meetings <sup>13-15</sup>

8 <sup>th</sup> ISFSS		6 <sup>th</sup> AOSFST		JAFSE Annual Symp. '07	
Fire Physics	14	Fire Physics	7	Fire Physics	9
Fire Chemistry	4	Fire Chemistry	6		
Fire Dynamics	22	Fire Dynamics	16	Fire Dynamics	10
Combustion & Explosions	11	Combustions & Explosions	7	Explosions	4
Struct. Fire Perform.	13	Struct. Fire Perform.	3	Struct. Fire Perform.	22
		Perform. Based Design	4	Perform. Based Design	3
H. B. & Evacuation	10	H.B. &Evacuation	11	H.B. &Evacuation	14
Smoke	2	Smoke	5	Smoke	2
Toxicity	8	Toxicity	2		
		Simulation	10	Simulation	5
Risk Assessment	5	Risk Assessment	6	Risk Assessment	10
Suppression	11	Suppression	11	Suppression	12
Detection	7	Detection	1	Detection	6
Probability & Statistics	4	Case Studies	8	Case Studies	11
		Regulation & Strategy	12	Regulation & Strategy	10
				Special Fire Issues	5
Measurement Methods	4			Instruments	4
<b>Total 117 papers</b>		<b>Total 108 papers</b>		<b>Total 117 papers</b>	

If the spectrum is almost the same with that of the papers submitted from a specific country and accepted for presentation at the international meetings, the researches conducted in the country can be assumed to lead those of the world. It is seen in the Table 2 that the spectra of the papers submitted from Asian and Oceanian countries and accepted for presentation at international meetings are quite different from the spectrum of the papers presented at the domestic JAFSE annual Symposium '07. This fact implies that some researches have described the papers presented at international meetings not for promotion of fire safety of their own countries, although solving problems in fire safety is a main purpose of fire researches.

It seems to the author that the situation of researchers of Asian and Oceanian countries still remains not easy. The establishment of AOAFST was to improve the situation, but the situation becomes worse. All the attendees of this meeting should realize this fact and make efforts to improve it although more tens years would be needed.

The followings are my recommendations to reconstruct the fire research community of Asia-Oceania Region.

1. Paper reviewers for international meetings including IASFS and AOSFST should be reconsidered.
2. Programme committees for international meetings have to understand the fact that authors wish to provide papers to be accepted for presentation.
3. Members of the programme committee should understand the present unfair situation at the paper selection process.
4. Researchers of the countries in Asia-Oceania region should realize the purpose of fire researches in their own countries.
5. The most important action for appropriate encouragement of fire researchers in the countries in Asia-Oceania region would be selection of reviewers.
  - 5-1 If a fire researcher does not understand the purpose of fire research, he should not be a reviewer.
  - 5-2 The reviewer should be nominated on the basis not on the number of papers but on his will to contribute to the fire safety.
  - 5-3 The reviewers have to have abilities to understand originalities which are the most important of original papers.
  - 5-4 The reviewers should be fair.

For the researchers who have performed copy researches or researches based on advises by other researchers, originality of papers have not been needed. In fact, only originalities could contribute to the progress of science and technology of a specific field. The purpose of peer review is not to recommend apparent beautiful papers but to reveal papers without originalities.

Unfortunately, comments of reviewers for recent international meetings seem not to meet basic requirements for the reviewers. This trend could be realized by viewing the papers accepted for presentation at the international meetings. For the progress of fire researches, the papers describing the results of numerical calculation using commercial computer file packages, those based on the topics in other countries than that the author(s) belong (These papers in general follow the results of other papers and of originality at low level.) nor copying previous papers are not necessary.

The AOSFST is a meeting for fire researchers in Asia-Oceania region. It is natural to appropriately evaluate the originalities by the fire researchers in Asia-Oceania region. Since most reviewers from Asia-Oceania region at present do not understand the situation of themselves. Thus my recommendation is to reconsider the reviews.

## CONCLUDING REMARKS

Already 15 years has passed after the establishment of the AOAFST. Unfortunately, the objective of the AOAFST at its establishment has not yet become effective. The researchers should avoid behaving as slaves. For overcoming this situation, more several decades would be needed. Even if long duration of time would be needed, we should not stop our efforts. The author strongly recommends the revision of the reviewers' list for international meetings. The trend of the papers to be accepted for presentation is not for the countries of Asia-Oceania region, although the fire researches should be performed for promotion of fire safety of their own countries.

The reviewers should understand the purpose of fire research. Accordingly, the reviewers should be nominated on the basis not on the number of papers but on his will to contribute to the fire safety. Also, fire researches should be based on science, so that the reviewers have to have abilities to understand originalities which are the most important of original papers. Of course, the reviewers should be fair.

Cooperation is needed to get appropriate evaluation of papers written by fire researchers in Asia-Oceania region. What the attendees can do is to fairly evaluate the achievements of their colleagues.

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