

Fire Safety & Industrial Development: Fire Research Strategies for Asia in the First Decade of the 21st Century

Workshop Report

YUJI HASEMI

School of Science and Engineering, Waseda University
Okubo 3-4-1, Shinjuku-ku, Tokyo 169-8555, Japan

INTRODUCTION

During the last decade of the 20th Century, we have seen significant increase of fire and other disasters in buildings and other human environments in many Asian countries. Earthquake disasters in big cities in Japan(1995), Turkey(1999) and Taiwan(1999), frequent multiple-death fires in Thailand, Korea, Mainland China and Taiwan, and significant increase of building- and industrial- fires reported in the Korean statistics are among such notable changes in the safety situation in Asia. This trend may continue in the 21st century unless effective safety measures are introduced into our society. Moreover, aging of the society which is becoming visible in the developed parts of Asia-Oceania can be a new background for causing new types of safety problems. Since the majority of deaths and injuries by fire and other accidents are aged people, aging, or increase of aged population, should imply increase of victims by accidents: Japan's accident statistics throughout the 1990's already demonstrates notable increase of household accidents, especially of drowning, of aged people. Many Asian countries and districts may share interest and experience of safety problems as most of such new safety problems seem to reflect common social backgrounds such as the rapid industrialization, growth of economy and concentration of population in urban districts. However, exchange of information on the current status of fire losses and government's and research activities in respective districts have been limited.

Since the opening of the symposium had been scheduled to be followed by the 50th anniversary ceremony of the Japan Association of Fire Science and Engineering(JAFSE) held at the same place, that day had been originally considered as a valuable chance for the communication between experts from Asia-Oceania and Japan. This workshop was proposed and sponsored by the Accident and Disaster Information Center (ADIC), a recently established nonprofit organization maintaining and offering application services of a database of fire and other disasters. The workshop was planned to deliver the latest situation of fire losses in Asian countries and to exchange ideas and information among the symposium participants and Japanese experts. Also free participation was offered for unregistered students, fire experts and citizens interested in fire and disasters in Asia. In order to activate discussions, simultaneous interpretation between English and Japanese was provided during this workshop. There were approximately 250 participants in this workshop. Around two thirds of the audience were unregistered citizens and students, and approximately one third of them offered written opinions and thoughts after the workshop.

PRESENTATIONS AND DISCUSSIONS

The following speakers were invited to this workshop:

Prof. Fan Weicheng, University of Science and Technology of China

Prof. Liang-Chun Chen, National Taiwan University

Mr. Eui-pyeong Lee, Fire Assistant Chief, Kwangju Fire Department, Korea

Mr. Kogaku Komamiya, Director, Accident and Disaster Information Center, Japan

Prof. Fan is a top leader of fire research in China and was the Chairperson of the Asia-Oceania Association for Fire Science and Technology until the Fourth Asia-Oceania Symposium. Prof. Chen is a leader in the urban safety research in Taiwan and led the post-earthquake investigation and technical correspondence at the Chi-Chi Earthquake in 1999. At the occasion of the symposium, Mr. Lee was analyzing the Korean fire fighting strategies at the Graduate School of Yokohama National University. By then, he had published several articles and papers on the Korean fire protection measures in Japanese fire journals. Mr. Komamiya has a long experience of investigation and analysis of industrial fires, and is respected as a "living dictionary" of the post World War II Japanese fires and accidents. Each speaker delivered a paper, which is attached to this workshop report. Readers are suggested to read these papers for the detail of their presentations. Prof. Fan and Mr. Lee reported recent fire situations in respective countries, while Prof. Chen reported the impact of the Chi-Chi Earthquake to the society and economy of Taiwan. Mr. Komamiya reviewed post World War II industrial disasters in Japan and Asia with reference to the ADIC database.

As an important feature of the recent fire loss in China, Prof. Fan pointed out significance of fires caused by small industries, which are becoming very common in China, while there is not strong increase of overall fire loss in China. Many of the recent industrial fires in China are attributed to violation of safety standards by such small industries. Some Japanese participants pointed out its similarity to the Japanese industry in the 1950's to the early 1960's; many of the serious industrial fires and explosions in that time in Japan were attributed to crude management of industrial facilities. There is a belief that such accidents and disasters were overcome by the improvement of quality control in the Japanese industry since the 1960's which, on the other hand, promoted competitiveness of Japanese industrial products in the international market. This suggests that more involvement of China in the international market in the future may improve industrial safety as a by-product. However, since the cost reduction is one of the most important keys for achieving the competitiveness in the current international market, especially in Asia, Mr. Komamiya pointed out that improvement of the competitiveness in the current industrial context may not simply result in the reduction of industrial accidents. Needs of inspection by third party and continuous efforts for campaign, education on safety rules, and introduction of qualification of safety-related experts for preventing such violations of safety rules were pointed out by Japanese participants in the fire fighting sector. A Japanese fire officer pointed out that the attribution of the ultimate responsibility of fire deaths in public buildings to those who gain the economical benefit of that building in most of the criminal actions since the 1980's in Japan has

led to the significant improvement of fire safety in amusement and tourist facilities. Prof. Fan also reported significance of large-loss fires (conflagrations). Prof. Chen and Japanese students discussed on the needs of strategic city planning to prevent large fires. The discussions included an opinion that "fire- and earthquake-safe" city planning tends to lead to a simple combination of high-rise concrete buildings and wide streets, which however may depress the activity of local community as an important part of the potential capability of a society to fight against disasters.

Prof. Chen's presentation was perhaps the first report on the social influence of the Chi-Chi Earthquake to the international society, and reported interesting aspects of the social reaction to the Chi-Chi Earthquake. Taiwan had experienced a severe earthquake in 1930 during the Japanese governance, but the Chi-Chi Earthquake was the first significant earthquake after the World War II. Since the experience of the previous earthquake was rather forgotten in Taiwan, introduction of regulations for anti-seismic structures was delayed until the Kobe Earthquake. He also pointed out significant contributions by voluntary activities to the post earthquake recovery. A Japanese participant who had visited damaged sites both in Kobe and in Taiwan pointed out the post-earthquake correspondence in Taiwan, including design of evacuees' temporary residences, notably improved from the Kobe Earthquake. Prof. Chen also discussed on the economic impact by the Chi-Chi Earthquake. While the earthquake did not cause significant impact to the Taiwan's whole domestic economy, the damage to the local economy in the damaged district was significant and its recovery seems to take still long time. There had not been a good success in breaking the vicious circle between the delay of the reconstruction of tourist facilities and the delay of the recovery of the local economy. It should suggest a need of comprehensive post- regional disaster program for the recovery of local economy and community. Importance of research and development in this area not only in Taiwan but also in other Asian countries was pointed out in the written opinions by a number of the participants. From Prof. Chen's presentation and successive discussions, it seemed that Taiwan had learnt valuable lessons from the Kobe Earthquake. This is probably because there is large population of residents with Chinese background in Kobe and also in Taiwan there are many who understand the written Japanese. This suggests importance of international sharing of disaster information through exchange of information and experts.

The presentation by Mr. Lee is believed to be the first delivery of the detailed fire statistics and its trends for decades in Korea to the international fire research community. The dramatic increase of fire damage in Korea during the last two decades, especially since around 1989 may symbolize the safety implication of economic growth in the new comers in the industrial world. In many aspects, his report pointed out numbers of fire problems that Prof. Fan raised from the Chinese statistics. A question was raised if the fire statistics have been taken in consistent way throughout the studied period. Since fire departments are generally "modernized" during the industrialization of a society, in many countries fire statistics tends to become more and more precise as the economy grows; this generally results in the increase of "reports" of fires although actual number of fires may not be changed significantly. In relation to this question, Mr. Komamiya pointed out importance of fire investigations. Investigation of fires is important not only for clarifying the responsibility and the causes, but also for fire fighters and scientists to learn how real fires are.

Written opinions by several participants suggested that fighting against fires is not the single function of fire department, and pointed out importance of the promotion of the inspection by fire department at the design and completion of a public building and continuation of surprise inspections after the completion of the building. Promotion of fire safety science with special emphasis on the consideration of local circumstances in building technology, climate and human behaviors, and its penetration to such practitioners such as building regulators, designers and fire fighters should be also an important subject in such countries suffering from rapid increase of fire disasters. In relation to the presentations by Prof. Fan and Mr. Lee, a Thailand diplomat who joined the workshop pointed out need of the transfer of experience and knowledge on the management of building and safety regulations from western world to the newly industrialized countries and districts. He suggests that although many Asian countries have already introduced building and regulations, they do not seem to function so well probably for the lack of experience. Some written comments emphasized needs of the promotion of international communication of fire experts in Asia since the community of science-oriented fire experts in each Asian country is generally too small to cover all aspects of fire safety which is becoming more and more complicated.

In relation to the safety problem raised by Prof. Fan, Mr. Komamiya further pointed out recent notable increase of small to medium scale industrial accidents in Japan. He attributes this increase to the paralysis of people's sensitivity toward danger after one generation since the Japan's high economy growth in the 1960's, which he anticipates as a cause for new types of accidents and disasters in a developed industrial society. Certainly Japanese journalism reports recent increase of significant accidents in medical facilities, which is generally taken as a sign of the paralysis of safety management in the medical world. He also pointed out possible influence of the recent restructuring in industries on the safety management. It is said that some of the recent important industrial disasters including the Japan's first nuclear pollution in 1999 occurred slightly after reduction and/or significant reshuffle of management staffs. There was some consensus in that "cost destruction" in the post cold-war capitalism is likely to generally weaken the social basis for the industrial and urban safety. Technical development in safety management can be essential while it does not have drawn interest of fire scientists.

CONCLUDING REMARKS

Presentations and discussions during this workshop seem to reveal several new areas for fire research and its relation with society especially in Asian countries. The following are among such important subjects for the promotion of fire safety and research in Asia.

- (1) Promotion of investigation of actual fire disasters by fire experts and researchers
- (2) Promotion of fire reports and statistics
- (3) Promotion of research in social aspects of fires and other disasters
- (4) Promotion of international exchange of information and ideas for fire safety

Sound scientific fire investigations and statistics are believed to be important not only for local fire experts but also as a valuable window for international fire community to learn what are the central problems in respective countries if they are delivered in international conferences or journals. Transfer of experiences of preceding countries in fire investigation and statistics should be promoted for the development of fire investigations and fire statistics in newly industrialized countries and districts.

Current Status of Fire Safety and Scope of Fire Safety Measures and Research in China

FAN WEICHENG

State Key Laboratory of Fire Science, University of Science and Technology of China
Hefei Anhui, 230026 P.R. China

ABSTRACT

In this paper, the fire statistical data of China from 1986-1995 are analyzed in order to reveal the new features for the fire safety situation along with the China economy growing. The measures taken to improve the fire safety in China are reviewed, and the emphases of the fire researches in the next years are suggested.

KEYWORDS: China, Fire Safety, Fire Research

1 INTRODUCTION

The triplet of safety, environment and energy, being closely related to everyday life of people, has been proven to be a major concern of the world civilization. Today fire is still and also would be in the foreseeable future one of the major disasters threatening the life and industrial safety.

Since the policy of reform and opening to the outside world, China has been a developing country with the economy booming fast, and meanwhile the situation of fire safety has been severe during the past decade. In recent years, the increasing fire disasters in China are calling nationwide and even world-wide attention. In 1999, China reported 18,000 fires, resulting in direct property losses of 1440 million yuans, 2744 deaths and 4572 injuries. Compared with the data of 1998, the death due to fires increased by 14.9%, and the direct property losses increased by 26.4%.

The combination of better understanding fire phenomena and new technology for fire