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Summing-Up of the IABSE 1986 Symposium in Tokyo, September 4 to 6, 1986

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I regard it a great honour to have been asked to deliver the address of summing-up of the Symposium.

The total number of participants reached 682, of which 180 are from 32 overseas countries and 502 from Japan. The number of accompanying persons is 94.

This Symposium was originally planned to be held in Japan as a joint international conference with the ICOSSAR Group headed by Prof. M. Shinozuka, Columbia University, USA. The ICOSSAR signifies the International Conference on Structural Safety and Reliability, and has been aiming at the development of the application of reliability theory.

There are structural failures which represent nonconformity with the expected functional performance of structures due, in combination or otherwise, to mistakes, oversight, misunderstandings and incompetence on the part of engineers and contractors in the process of design, construction and analysis, and due to errors on the part of operators who control certain functions of structures.

The anticipated deviations of structural behavior resulting from minor incidents involving these causes may be treated in reliability analysis by properly adjusting the load and resistance distributions. However, the gross structural failures arising from the abovementioned causes cannot be avoided by reliability analysis, but can be avoided only by implementing quality assurance and control procedures.

The ICOSSAR Group consists of mainly academic researchers, but IABSE activities are more for engineers than professors. Due to the different approach to structural safety and the different goals of the two organizations, we failed to organize a joint conference with the ICOSSAR. Since then, IABSE has been devoting itself for almost three years to the preparation of the present Symposium.

The Symposium was intended to provide participants with a forum of discussion of the various facets of a systematic engineering approach to the quality assurance of civil engineering structures in terms of safety. It aimed at giving a better insight into what the engineer's task should be, providing suitable tools for analysis, decision-making and implementation in practice.

On the whole, the Symposium has been a success from the point of dissemination of the concept of quality assurance. Discussion in the Symposium has covered crucial points. Particularly, special consideration was given to the important link between planning activities and physical realization for several subjects that used to be dealt with by rather vague and general statements.

In Session A «**Introduction**», Dr. Kersken-Bradley, who is one of the promoters of this Symposium, introduced recorded discussion on quality assurance from the viewpoint of professional ethics, management and common sense for the orientation of the Symposium, followed by the introduction of the general aim and layout of the Symposium.



Mr. Baker introduced the current status of quality assurance mainly referring to the findings of the 1983 IABSE Workshop in Rigi, Switzerland. Prof. Shinozuka, kindly accepting the invitation, presented the State-of-the-Art Report of the contribution of reliability theory to structural safety. Prof. Meseguer discussed differences between the traditional and the present approach in the building process from European experiences.

Opening discussion moderated by Prof. Turkstra dealt with the state of various problems and it provided a good basis for the development of the rest of the Symposium.

The first part of Session B was devoted to the papers of more general and overall character in the sense that they treated **«Projects and/or Decision Making»** in rather general terms or related to large projects. Certainly, Mr. Yamane's paper served as an introduction of the Honshu-Shikoku Bridge project.

In the second part of Session B, three papers were presented more particularly to **«Tendering and Contracting»**, followed by a Panel Discussion with five panelists moderated by Prof. Willenbrock. The present situation in various countries was stated and then the differences were discussed. Mr. Sriskandan concluded that all design and construction should be independently checked to ensure safety and durability of structures.

In the Plenary Session C **«Planning and Design»**, the presentation of Prof. Rackwitz was quite interesting, because it tried to bring a logical and mathematical framework into quality assurance, defining system quality assurance. This might be a challenge to practicing engineers.

In the Lecture Session C, nine papers were presented. It was previously planned to exclude reliability papers from the presentation in case they did not stress quality assurance in depth. However, we were not too rigorous on this point. We expected in the Session to have some discussion of the relation with quality assurance, but I don't think that such discussions took place. Also, many of the questions raised in the Introductory Report, such as safety differentiation, dynamic and stochastic project scheduling, logic trees, role of detailing, etc. were not touched on at all.

The discussions in the Seminar Session C moderated by Dr. Melchers were quite animated, but the subjects were mostly general.

In the Plenary Session D **«Construction and Inspection»**, quality assurance activities in construction were presented by three engineers of construction companies in the UK, Fed. Rep. of Germany and Japan. Mr. Umeda concluded that quality assurance activities in Japan are not something carried out only by quality control departments, but they are company-wide human activities.

The Lecture Session D **«Construction and Inspection»** treated technical solutions of the problems except some papers, for example the presentation of Mr. Hadipriono which was an interesting paper although rather difficult to follow.

In the Seminar Session D, six persons, moderated by Mr. Sriskandan, discussed seven subjects, exchanging experiences from various countries and different backgrounds.

Session E treated **«Human and Organizational Aspects»**. The subjects are most crucial for quality analysis, because the majority of construction accidents occur due to human errors.

In the Plenary Session E, three high-quality papers by experts in human error problems were presented.

In the Lecture Session E, six papers from the USA, Japan, Austria, Thailand and Tanzania were presented, introducing some quite different backgrounds. The papers **«Problems of Safety and Quality Assurance in the Third World»** by Mr. Mtenga and **«Comments on Quality Assurance drawn from Building Collapses»** by Mr. Limsuwan, were of primary interest to me.

In the Seminar Session E, three papers treated the most important problems of the Session theme, followed by lively discussions from the floor.

Finally, the closing discussion was carried out to identify what we have learnt from the Symposium and came to some proposals concerning the necessity for future activities.

Posters are becoming the center of interest in IABSE Congresses or Symposia. This time the Scientific Committee selected posters from the submitted abstracts. Since they were not directly related with quality assurance, the Committee classified the selected posters into two groups: **«Assessment of Existing Structures»** and **«Technical Solutions»**.

During the Symposium, some Japanese engineers asked me: «In Japan, we have traditionally built quality-controlled structures without consciously intending to apply the concept of quality assurance, through mutual trust, group or organizational activity which is not individual, and bottom-up policy». «Why in Japan do we need the specific application of the quality assurance concept?» I am asking the same question to the Japanese participants here.

The technical achievements and proposals in this Symposium will be followed-up by dissemination and intensification through the activities of Working Commissions of the Technical Committee of IABSE or by another international conference.

I wish to express my sincere thanks to all of the members of the Scientific Committee, particularly to Prof. Schneider for his devoted activities and Dr. Kersken-Bradley for her technical leadership. Also, I should not forget to thank Prof. Takanashi, Chairman of the Japanese Programme Committee, and all of the Chairmen, Technical Advisers, Coordinators and Mr. Golay, Executive Director of IABSE, for his effective management and reviewing slides, and finally lady interpreters.

Now, I am going to finish my address inviting all of you to the construction site of the Honshu-Shikoku Bridge Project, proposing further discussion of the Japanese way at the site on the Seto Inland Sea.

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