

Introduction

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ABSTRACT: Active and hybrid vibration control of structures has attracted a worldwide growing interest as an innovative technology in earthquake engineering since the Special Theme Session "Seismic response control of structural systems" was proposed at the 9WCEE in 1988. The objectives of this session are to report the research and development in the field of the new technology for the last four years, and to discuss the future scope. After the opening address, the state-of-the arts in the U.S.A. and Japan are reported by the individual representatives. The current problems and the necessity of further research are discussed based on the state-of-the-art reports and the panelists' presentations. The proposal of the establishment of the "International Association for Structural Control" is announced to promote the international corporation through exchange of knowledges and ideas.

1 OPENING ADDRESS (T.Kobori)

Active and hybrid vibration control of structures has attracted a worldwide growing interest as an innovative technology in earthquake engineering since the Special Theme Session "Seismic response control of structural systems" was proposed at the Ninth World Conference on Earthquake Engineering (9WCEE) in Tokyo/Kyoto, Japan, in August 1988. At the preceding conference, the structural response control technique became recognized as one of the brand-new technologies that was expected to produce a revolution in designing the conventional anti-seismic structures. The recognition has been extended to wind engineering as well as mechanical engineering for the last four years, and a great number of research and development issues have been presented all over the world since the 9WCEE. In Japan some of the active response control systems have already been applied to the actual building structures with the great effort, and the effectiveness is confirmed under small or medium earthquake excitations. Furthermore, other response control systems are being planned to be installed in the important structures. In recent years, the occasions for the technical discussion were proposed nationally in the several countries, and there are remarkable examples of the U.S.A. National Workshop in October 1990 and the Japan National Symposium/Workshop in March 1992. Now, at the 10WCEE, approximately seventy papers are presented in the Oral Technical Session "Seismic Isolation (Topic No.7)". As the result of the surprisingly great advance, the interest of the structural response control research achieves the international recognition in earthquake engineering. The new strategy against earthquakes has been growing up to one of the most important research.

The Special Theme Session "Control of Seismic Response of Structures" is held at the 10WCEE for the purpose of responding to such the worldwide attention and necessity. The objectives of this session are to report the research and development for the last four years since the 9WCEE, and to discuss the current problems and the future scope with the specialists all over the world.

The objectives of structural engineers must be to design the structures that are safe even in large earthquakes. The conventional design concept has been to build earthquake-resistant structures against well-assumed and well-prepared aseismic excitations. However, it seems to be impossible to precisely predict the coming earthquakes in the near future in spite of the great advance in seismology, and this severe fact means it is difficult to prove the perfect structural safety by using the conventional design concept. Then, the seismic-response-controlled structures are proposed to get over such a blind alley. The fundamental philosophy of active and hybrid response control systems are to keep structures free from the unpredictable large earthquakes, and to supply human being with the comfortable circumstance.

There are many difficult problems in achieving the ideal controlled structures to be solved with the international great effort in the future. Finally, the proposal of the establishment of the "International Associate for Structural Control (IASC)" is announced. The objective of the Association is to promote the international corporation among scientists and engineers in the field of active and hybrid structural control through exchange of knowledges, ideas, and the results of research and practical experiences, as well as through other collaboration projects.