Introduction to the theme

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Einführung zum Thema

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The main object of this seminar is to outline the evolution in big bridge engineering over the past ten years and to discuss possible trends for the coming decade.

Changes have of course been brought about in order to keep up with the economic situation, but one of the main causes of the evolution in bridge engineering has been the rapidly increasing demands of road and rail traffic. The intensive motorway infrastructure construction, carried out in numerous countries over the last few decades, has led to a new generation of bridges which are distinguished by their ever increasing size (average span and deck width) and the ever increasing loads they are required to carry. These tendencies have in turn motivated improvements and innovations in design, in the use of materials and in fabrication and erection techniques.

In order to make full use of their respective merits, the traditional bridge building materials, steel and concrete, have been extensively used together. Prestressed concrete, composite construction and cable staying are just some of the methods and techniques that have been developed and put into widespread application. More recent materials such as lightweight concrete, epoxy resins and adhesives are also starting to be used and show interesting possibilities for the future.

As with the bridge itself, erection techniques and equipment have had to cope with heavier loads and larger spans. Ingenious and often spectacular solutions have been found, such as incremental cantilevering, launching and slip-decking, to mention but a few. Prefabrication and standardization, for concrete as well as for steel, have been put to good advantage and have improved the quality and speed of certain operations, while reducing their cost.

The above-cited developments could not have been brought about without the considerable theoretical and experimental research that has accompanied them. Our improved knowledge of the behaviour of materials has, for instance, enabled us to tackle such problems as welding of high strength steels and other fabrication and construction techniques. Let us also mention the important role the computer has played in developing structural analysis and design methods, without which a lot of today's big bridges could not have been built.

The main them "Trends in Big Bridge Engineering" is divided into the three following subthemes:

- Concept and Design

- Fabrication

- Erection and Maintenance

Although there is inevitably a certain amount of overlapping and interaction between these subthemes, papers should keep within their proposed subtheme as far as possible.