



ACCADEMIA NAZIONALE DELLE SCIENZE  
DETTA DEI QUARANTA



ACADEMIA SCIENTIARUM  
ET ARTIUM EUROPAEA

Joint Autumnal Conference on:

# LARGE CONSTRUCTIONS VERSUS SAFETY

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Rendiconti  
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## Opening Remarks

Dear Prof. Unger, dear Italian and European Colleagues,  
Ladies and Gentlemen,

I am very pleased to open, together with your academy, this joint conference on *Large construction versus safety*. I would like to recall that here in Rome, exactly 400 years ago, a young scientist, Federico Cesi, founded the Academy of Lincei, the first scientific academy in the world.

A warm welcome to the authorities present here today and to all of our guests.

Kindly allow me to take this opportunity to express some considerations on the subject of this conference, which are fruit of discussions with my colleague Prof. Cumo, President of the Italian Society for the Advancement of Science and member of our two academies.

The issue of safety, or better safety as much as technically possible, in large engineering constructions has led to the development of a complex and well structured discipline that will be presented today by experts from different sectors. Further improvement of this discipline – which we could call “safety engineering”, of course with limits which will be mentioned, is necessary to guarantee more daring operations that will accompany the development of humanity.

From old and tested safety coefficients to the implementation of deterministic methods which can calculate the extreme consequences of the worst possible environmental situation (earth-quake, hydro-geological landslides, extreme weather conditions, etc.) to a probabilistic analysis which, on the basis of database obtained from previous constructions, carefully monitored, we can foresee various combination of events with related probabilities of happening. Other computer codes can then evaluate the extent of the correlated dangerous consequences and therefore define the overall degree of safety reached, while implicitly suggesting how to increase it.

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The concept of “risk” was traditionally associated with the concept of uncertainty, possibility, unpredictability, loss or damage. In the insurance economy, since the 18<sup>th</sup> century, the word “risk” acquired the meaning of a mathematical expectation or expected value for the monetary equivalent of the damage. More recently, the word “risk” is used beyond the traditional economic context to indicate the negative aspects of technological development with the related economic, sanitary and environmental consequences. Technology constitutes a world of artificial possibilities as well as a world of natural possibilities largely amplified by biotechnology. Technological development is always and directly characterized, from the beginning, by a human decision. There are two main types of decisional process. The synoptic decisional process implies a complete knowledge of the system. In this case, choices are optimised by a careful evaluation of all the possibilities. Another type of process, called sequential, allows an implicit limitation in the knowledge of the system. In this case, the choices can no longer be literally optimal, but are adapted to facts and values which may change and evolve. This second approach is more appropriate in situations characterised by great uncertainty or limited knowledge of the possibilities

The National Academy of Sciences and the European Academy of Sciences and Arts have organised this meeting and gathered many experts for the purpose of elucidating problems, approaches, explanations, criteria, standards, rules and prescriptions on the issue of safety in large engineering constructions.

I thank you for your attention and would like to thank FINTECNA for their hospitality. My warmest wishes to you all for a successful meeting.