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## General Survey on the Theme and the Seminar Procedure

C. BØE  
Dr. Eng.  
Det Norske Veritas  
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Meine Damen und Herren,

I am sorry that I shall not be able to proceed in the language of our host country, but I ask our hosts to forgive me as I continue in English. To have such language problems is a practical detail which has to be coped with in a large international conference. I know our host has sorted this out admirably.

However, in this session we have another language problem, if you like. That is - or rather was - the selection of the title of theme for the safety session. The final title is - as you know quite well - Safety Concepts. The theme could however, quite easily have been entitled: Safety methods, Safety formats, Safety measures, or Safety codes. Now, you will at once recognize that the alternative titles may be more specific, precise, or concrete. Perhaps, you will say, even more to the point than the chosen one when viewed from the stark realities of practical life.

On the other hand you may recognize that the alternative titles are more narrow in scope. And that is precisely the point: In organizing the session we would like to look into the problem in a very wide context. So - that is the reason for the title of this session, and let us bear in mind this wish of the organizers, when we hear the various papers being presented, and when we enter into the discussion later today. Let us in this session deal with safety in the widest possible context.

A look at the fundamental elements of safety concepts in this wide context may give us some key-words for a formal structuring:

- The goals, or objectives.
- The process of realization, or the safety measures and how they are deployed.
- The organizational and structural codes.

You will find these three key-words in the three introductory reports which I hope all of you have read carefully. There is some overlap, of course, but on the whole we will find that this is one way of phrasing the cornerstones of safety concepts. Let us now take a closer look.

Safety is always at the mercy of economy. I have not yet seen any cases or any

areas where this is not true. I do not, however, say that there is a constant conflict between safety and economy. It is more like a constant problem of trade-off between demands for safety and demands for economy. This is clearly implicit in the papers you are going to hear in this session today. And this is where the objectives are important. Left unconsciously to the driving forces behind all business enterprises, safety comes last - if at all. The clear statement and analysis of objectives assist us in deciding what is our practical aim. This gives safety a fair chance in the constant trade-off with economy, because in advance we can decide on priorities in situations, where it is difficult to remember ambiguous public demands and high level safety requirements.

Having decided on - or more likely, at least analyzed - the safety objectives, we face the difficult task of realizing our goals. And, believe me Ladies and Gentlemen, few things are more difficult than realizing complex goals, and safety goals are always complex in practice.

Please also believe me when I say that it is equally difficult to breathe life into innocuous statements of high level safety goals, especially political ones. To interpret such goals can be simple, though normally they are not. In this respect, we are faced with the management of risks, and as you will see from the papers, in particular with the prevention of human error.

We can set up quality control or even quality assurance systems. We can define responsibilities quite unambiguously. We can describe the competence and duties of all people involved in the whole building process. We can use the latest scientific knowledge in the dimensioning of structures. We can impose control on data. We can supervise the whole building process. But tell me: Who supervises the supervisor? Who can control greed and laziness? Who can at all times guarantee vigilance, alertness, patience and common sense?

The realization of safety is a fight all the way, especially against human error. We have papers in this session which deal with this problem, but are we on the right track?

I gave you codes as the third key-word. Codes are very important because they are mostly based on law. They are legally based requirements which can be enforced onesidedly. Codes are therefore very important as limits of safety - or rather -limits of risk, which can not be overridden in the trade-off between safety and economy. Codes make up the basis from which safety can stand up to economy.

What then is the basic problem we are facing in this seminar on Safety Concepts? Without knowing the answer each one of you will give to my question, I shall hazard my own.

There seems to be a lack of an overall model for safety concepts which can be used in practical life. An overall model where we can focus the research work done in various places around the world, and in the various areas of our profession. In my introductory report, I have tried to envision such a model. It is certainly not good enough, I know of far better ones. MORT - the Management Oversight and Risk Tree, developed in the USA, is one in particular. But it is very complicated both to show here, and to learn. Furthermore, it is developed in quite another context than this congress covers. Still it is an alternative which is worth while looking into.

Perhaps the main objective of this seminar of Safety Concepts could be to initiate work on such an overall model.

Before I give the word back to the Chairman, allow me to say just a few words on the selection of the papers and their arrangement in this session.

There has been a conscious policy behind the selection of papers in that the contributions that did not fit into the rather broad theme were rejected. This has nothing to do with the quality of the papers. The organizers were very lucky in that as much as 24 papers were received. Obviously, the schedule for the seminar could not accommodate so many papers. A decision was therefore made to reject 8 papers for the reason I have already given. It was not easy to do, because the papers were of good quality, and in a restricted sense, very interesting. Unfortunately, two authors had to resign from presentation of their contributions, due to different reasons.

In arranging the sequence of the selected contributions, it has been attempted to follow some kind of logical train of thought. Firstly, we have the papers more or less dedicated to goals, followed by contributions related to safety measures, the planning of safety and related problems. Finally, we have the papers dealing with design problems in a narrower sense. Please forgive us, if a paper has been placed in a wrong section.

I know that Professor Jörg Schneider, the coordinator for this seminar, has had some difficulties in allocating the contributions to the areas of the introductory reports prepared by Mr. Knoll and myself. It just shows you how difficult safety concepts can be sometimes. As a consequence, the concluding remarks from Mr. Knoll and myself, have both been scheduled to the very end of the formal presentations. We shall then be treating the same contributions, but from our respective personal points of view.

Well now, Ladies and Gentlemen, all that is left for me to say, is to express the wish that we shall have a lively discussion, especially when the free discussion period comes in the afternoon. I am confident that the presentations and, last but not least, you, the audience, will ensure a good discussion.

Thank you for your kind attention. Thank you Mr. Chairman!

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