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## Das Gefährdungspotenzial bei Bauten, Anlagen und Industrieerzeugnissen für den Menschen in der Schweiz: Erkennung und Vermeidung.

### Conclusions

Safety of persons, efficient use of societal resources and the ability to meet the ever increasing demand for competitiveness in the market sector are current issues of concern in Switzerland as well as for many other highly developed countries in the industrialized world.

Due to the given geographical boundary conditions, large mountainous regions with an inherent severe exposure to natural hazards and a lack of major natural resources the continued development of Switzerland necessitates a very high efficiency; in regard to land use as well as excellence and specialization in manufacturing of products and services. As a consequence of this the Swiss society has become rather complex, specialized and highly dependent on the reliable and safe performance of the societal infrastructure.

The adequate performance of the societal infrastructure and the efficiency in maintaining this may be realized to depend on a number of aspects including legislative requirements and regulations, public administration and organization as well as the practices of the private sector. Whereas there seems to be no cause for immediate measures of changing or improving the present situation it is always relevant to assess the potential for improvements as well as to investigate possible new strategies for their implementation.

With this perspective it was decided in a collaboration between ETH (Group on Risk and Safety in Civil Engineering) and BUREAU VERITAS (Switzerland) with the support of an external project manager (Pierre Amiet, Amiet&Partner) to organize and conduct a workshop with the title:

The hazard potential of the built environment and industrial facilities for the safety of persons in Switzerland: identification and mitigation.

The focus of the workshop was to provide a broad overview of how experts representative for the various technical and organizational aspects related to the topic of the workshop assess the situation at present, evaluate the need for improvements and envisage feasible directions for their implementation. During the planning of the workshop it turned out that the Swiss state was in the process of rearranging the present allocation of responsibility and procedures in regard to risk control within the state itself. The potential implications of such changes for the involved state organizations as well as the private industry thus automatically attracted some attention in the final planning.

The workshop was organized such that at first short presentations were given by selected experts on topics which were found of general interest for the topic of the workshop. The following presentations were given at the workshop:

Stand der Sicherheit und Identifikation der Schwachstellen und Schnittstellen

Michael Faber, ETH Institut für Baustatik und Konstruktion, Zürich

Eignung der Baunormen zur Erhöhung der Sicherheit

Markus Gehri, Schweizerischer Ingenieur- und Architekten-Verein, Zürich

Inverkehr bringen und anwenden von Bauprodukten

Mario Fontana, ETH Institut für Baustatik und Konstruktion, Zürich

Sicherheit von Stauanlagen

Remo Baumann, Rätia Energie, Poschiavo

Rolle der Baustoffe bei der Sicherheit von Brücken und Tunnels

Fritz Hunkeler, TFB Technische Forschung und Beratung, Wildegg

Sicherheit der Bauprozesse und der Bauausführung

Felix Schmid, Schweizerischer Baumeisterverband, Zürich

Sicherheitsaufsicht im Aufgabenbereich des Bundesamtes für Energie

Werner Bühlmann, Bundesamt für Energie, Bern

Sicherheitsaufsicht über Sprengstoffe

Claude Muller, Bundesamt für Polizei, Bern

Sicherheit von neuen und bestehenden Aufzügen in der Schweiz

Thomas Goetschi, Goetschi Ingenieurbüro AG, Buchs

Sicherheitsaufsicht über Bergbahnen aus Sicht des Herstellers

Roland Bartholet, Bartholet Metallbau AG, Flums

Verbesserung der Gefahrenprävention und Risikomanagement

Markus Wyss, Winterthur Versicherungen, Winterthur

Eric Bilard, Bureau Veritas Switzerland

The presentations given at the workshop are available from the workshop home-page:

<http://www.ibk.ethz.ch/fa/news/Sicherheitstagung>

During and after the presentations discussions took place and in the end of the workshop it was attempted to summarize the findings of the workshop. These are given in short in the following:

First of all it should be emphasized that the workshop participants in general agreed that there is no need for alarm in regard to the level of safety of persons in Switzerland at the present time. However, the issue remains whether or not it would be possible to achieve and maintain the same level of safety in a more efficient way in the future. To this end it was outlined that the present regulations in regard to risk acceptance as well as present codes and standards in the building sector could be improved significantly by implementing a consistent basis for assessing the relevance of risk reduction as well as the efficiency of risk reduction. Whereas the relevance of risk reduction needs to be assessed in a larger perspective including other sectors of society such as the health and social sectors and thereby necessitates a larger coordinated initiative the assessment of efficiency of risk reduction could be conducted separately for the sectors specifically considered at the workshop. Such initiatives bear much potential.

The presentations in general provided a very useful overview of a broad selection of the aspects influencing the safety and reliability of technical components and systems over their life cycle and the codes and regulations ensuring their sufficient performance. Whereas in general it might be stated that the present situation largely seems satisfactory when individual technical components or systems are considered there seems to be a need for clarifying especially the allocation of responsibilities and management of risks when failure of systems might influence and involve decision making by different societal institutions.

Whether there is a need to and benefit to be gained by allocating the responsibility for control of sufficient safety or risk management for the built environment and industrial facilities to third parties such as certification bodies or independent consulting offices was evaluated as not being evident from a general point of view. However, on a case by case basis or for certain installations it appeared obvious that

independent conformity controls would reduce the risks of using facilities or technical installations. The question remained regarding the need for these controls and their financing. To answer this a general assessment of the present level of technical risks in Switzerland as well as a generally applicable framework for the assessment of risk reduction efficiency and risk acceptance would be required.

Up till the present a profound level of self control has been the tradition in the associated private sector and it is assessed that changes in this regard could have significant negative effects on the competitiveness of the Swiss industry and implicitly negative effects of the safety. In general control procedures, codes and regulations serve as useful tools for guidance in regard to how safety might be achieved, however, they cannot substitute a sound safety culture; an insight which has been gained in various high risk industries over the last decade. Larger projects and facilities are surely to be considered as special cases as is also the case in most instances at present.