Editorial

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Biographical notes: Eirik Bjorheim Abrahamsen is a Professor in Risk Management at the University of Stavanger and at the Centre for Risk Management and Societal Safety (SEROS). He received his PhD in Risk Management in 2006. In addition, he has a Master's degree in Offshore Technology with specialisation in offshore safety, as well as a Master's degree in Industrial Economics with specialisation in project management. His research focuses on economic analysis in risk management as well as foundational issues in risk analysis and risk management.

Frank Asche is a Professor of Economics at the University of Florida and Adjunct Professor at the University of Stavanger. He received his PhD in Economics in 1996 and also holds a Master's degree in Economics from the University of Bergen. His research focus is on management of natural resource industries, management of risk in the production, supply chains and markets for the associated products.

Among experts and in various disciplines there are different perspectives on how to find the right balance between safety for personnel and economic values. Many economists prefer to use a traditional cost-benefit analysis as basis for such decisions. All attributes are then transformed into one comparable unit, a countries currency, and decisions are made based on a calculated expected net present value E(NPV). Among safety experts, traditional cost-benefit analyses are often rejected, as they find that there are too many

weaknesses and limitations with this approach. Moreover, they are often unwilling to transform all units into a common value allowing the use of a consistent but inflexible decision rule. In addition, safety experts also often argue for stronger weight to the cautionary principle than what is made through expected values.

With reference to the different views on how to balance between economic values and safety and on how much weight that should be given to the uncertainties, a seminar on "Integrating economic and safety perspectives in risk management: a necessity for success?", was held in Stavanger, Norway on the 31 October 2016. This special issue includes eight articles based on contributions to this seminar. All papers have gone through a double-blind peer review process.

The first article in this special issue, by Aven, provides some reflections on the use of cost-benefit analysis in a risk management context, with special focus on situations having a potential for extreme consequences. The paper summarises current ideas about risk and questions how these affect the understanding and use of cost-benefit analyses in such a context. The need for seeing beyond the cost-benefit type of analysis based on expected values is broadly acknowledged in this literature, but the argumentation is not straightforward and can be further refined. The paper aims at contributing to this end by reviewing and discussing some recent work on these issues. Implications for risk management are also discussed.

Next, Elvik asks whether valuation research provide a credible basis for cost-benefit analysis of safety measures. A cost-benefit analysis is credible if its results cannot be criticised by reference to the valuation studies forming its basis. Elvik argues that a credible basis for cost-benefit analysis in this sense does not exist. The monetary valuations of a statistical life vary substantially. This diversity in values is increasingly accepted by researchers working in the field as inevitable and consistent with individual utility maximisation, and thus not necessarily anomalous. Some recent contributions argue that the value of a statistical life ought to vary depending on, for example income. Such reformulations of the theory underlying valuation studies mean that the choice of a particular value of a statistical life within the huge range of such values is not necessarily more justified than the choice of a different value.

The third paper, by Abrahamsen et al. discusses the implications for safety management of using the 'layered approach' to implement the ALARP principle. The layered approach is a simple approach following a decision logic diagram consisting of three steps to guide the implementation, i.e. a crude analysis, a more detailed analysis and an assessment of other issues, including uncertainties. The authors show that the weight given to risk reduction and uncertainties largely depends on how this layered approach is interpreted. There are different ways to interpret it. For example, the approach may be interpreted in a way where the ALARP principle gives strong weight to the uncertainties for all decision-making contexts. A very different interpretation, which leads to a more dynamic approach, is that the ALARP principle may range from one extreme, where decisions are made with reference to an expected value with limited or no weight on the cautionary principle for some decision contexts, to another, in which the cautionary principle is adopted without any reference to cost-benefit (cost-effectiveness) analyses for others.

In the fourth paper titled "Risk attitude chain: safety climate, risk attitude and risk decisions", Engemann and Engemann explore safety climate, risk attitude, and risk decisions through a new paradigm – the risk attitude chain. Decision making regarding the selection of risk strategies is complicated due to many factors including uncertainty

and lack of knowledge. The authors discuss how risk decisions are influenced by risk attitude, and relate how a decision model may incorporate this to evaluate risk strategies, utilising attitudinal measures.

In the fifth paper titled "Valuing safety: principal limitations of the J-value model", Jones-Lee and Chilton offer a criticism of the underpinnings of the 'J-value' model for appraisal of safety projects. The authors argue that the underlying model is simplistic, focusing only on a few key parameters and valuing only the marginal increase in life expectancy, and so not suitable for practical application.

The sixth paper by Abrahamsen et al. adopts the Economist's Safe City Index to investigate whether different dimensions of safety is correlated as measured by an aggregate index and indexes for four thematic categories: digital security; health security; infrastructure safety; and personal safety. The results indicate that there is positive correlation between all the indicators, but this is not always high. Hence, different cities appear to prioritise different aspects of safety differently. There is a clear tendency that wealthier cities are safer, which also helps explain why North American and European cities are the safest and that city in the Middle East is least safe.

In the seventh paper titled "An index decomposition of factors impacting safety on the job site", Gordon provides a contribution to occupational safety and health (OHS) and safety regulators on job sites. Using a set of industries and several risk factors, the author is able to evaluate the importance and impact of safety interventions. Moreover, the author manages to identify key industries regarding OHS and finds argument for further regulation and control to improve on-site safety.

In the last paper, Demichela and Baldissone show some applications of the methodology called integrated dynamic decision analysis, highlighting the benefits of integrating the logical-probabilistic modelling and the phenomenological behaviour of a system for the risk-based decision-making in process plants. In particular, three applications of the techniques to support risk-based decision-making are described.

Finally, we would like to thank all of the authors for their contributions to this special issue and the reviewers for their commitment in helping the authors to develop their articles. We also wish to express our gratitude to the Editor, Professor Kurt Engemann, and to the entire editorial team who have worked on the publication of this special issue.