

## How to Supplement Risk Regulations to Avoid Industrial Catastrophes

**ABSTRACT** - Risk regulations/constraints in various engineering areas are based on Probability of Exceedance (POE). E.g., in Material Design, it is the probability that the load will exceed the material strength; in Nuclear Safety, it is probability that release of radioactive materials exceeds some threshold; and in Finance, the probability that liabilities will exceed assets. Although POE is quite popular, it has a significant conceptual drawback: it does not take into account magnitude of outcomes exceeding the threshold. Therefore, large industrial catastrophes, such as Fukushima nuclear accident, do not lead to a violation of safety regulations. Recently developed risk function, called Buffered Probability of Exceedance (bPOE) takes into account the magnitude of tail outcomes of the distribution. The presentation explains how to design safety regulations/constraints with bPOE to control large low probability outcomes. (Stan Uryasev and Giorgi Pertaiia).



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**SPEAKER BIO** - Stan Uryasev is George & Rolande Willis Endowed Professor, director of the Risk Management and Financial Engineering Lab at the University of Florida. His research is focused on efficient computer modeling and optimization techniques and their applications in finance and DOD projects. He published three books (monograph and two edited volumes) and more than 130 research papers. He is a co-inventor of the Conditional Value-at-Risk and the Conditional Drawdown-at-Risk optimization methodologies. He is developing optimization software in risk management area: VaR, CVaR, Default Probability, Drawdown, Credit Risk minimization.

Stan Uryasev is a frequent speaker at academic and professional conferences. He has delivered seminars on the topics of risk management and stochastic optimization. He is on the editorial board of a number of research journals and is Editor Emeritus and Chairman of the Editorial Board of the Journal of Risk.