# Prof. Stan Uryasev

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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.

## How to Supplement Safety Requirements to Prevent Major Technological Catastrophes?

This paper discusses a new probabilistic characteristic called Buffered Probability of Exceedance (bPOE) for evaluation of tails of probabilistic distributions. bPOE equals a tail probability with known mean of the tail (i.e., it is a probability of the tail such that the mean of the tail equals some specified value). The objective of the paper is to show how to upgrade with bPOE safety requirements based on Probability of Exceedance (POE).
Let us explain definition of bPOE with a simple example. For instance, 4% of land-falling hurricanes in US have cumulative damage exceeding $50 billion (i.e., POE = 0.04 for threshold=$50 billion). It is estimated, that the average damage from the worst 10% of hurricanes is $50 billion. In terms of bPOE, we say bPOE=0.1 for the threshold=$50 billion. bPOE shows that the largest damages having magnitude around $50 billion have frequency 10%. bPOE can be considered as an important supplement to POE.
The paper considers two application areas: 1) Materials strength regulations (A-basis, B-basis); 2) Ratings of Financial Companies (such as AAA, AA, ...). We demonstrate that these safety requirements can be efficiently managed/optimized with convex and linear programming algorithms. In particular, we discuss how to formulate and solve a Collateralized Debt Obligations (CDOs) structuring problem.