

— SUMMING RISK —

An International Workshop and Its Results

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Abstract

In February of 2005, a two-day Risk Summing Workshop was conducted in Huntsville, AL under sponsorship of the US Army Aviation and Missile Command. Nearly thirty attendees from two continents participated, and more than a dozen made formal presentations on the workshop topic. The need for risk summation methods to augment or to replace partial risk assessments based on line-item inventory methods was recognized as having increasing importance. Summing techniques of 14 kinds were described. At the conclusion, workshop participants reached consensus views on eight fundamental points related to risk summing. Among them: Risk acceptance decision makers should be provided information characterizing total system risk rather than, or in addition to, partial risks of line items in a system risk inventory as is customary today; risks of individual hazards should be judged not on the basis of “worst consequence,” but on the basis of “worst risk”; the source-mechanism-outcome model should be adopted universally in expressing hazard descriptions.

The Background

A milestone event in the annals of system safety occurred over a two-day period in Huntsville, Alabama last February. Under sponsorship by the Army Aviation and Missile Command, and hosted by APT Research, Inc., some thirty senior-level system safety practitioners and managers from the US and abroad convened to participate in a sleeves-up Workshop on Summing Risk. Some 15 presentations were made in which attendees spoke of the need for summing partial risks in system safety practice and described a variety of methods for accomplishing such summations.

The purpose here is to summarize briefly the principal substance of selected contributions to the workshop.

The Risk Summing Need

Opening workshop presentations by Tom Pfitzer and P.L. Clemens spoke of the need for practical risk summing methods. The need is based on the observation that in majority-case field practice of system safety, the use of line-item inventory methods predominates. Preliminary Hazard Analysis, Functional Hazard Analysis, and Failure Modes and Effects Analysis are examples. These methods recognize system hazards and make assessments of their risks individually. Risks are assessed using risk assessment matrices. If risk for each discretely recognized item in the system inventory of hazards falls below a specified threshold of tolerance, then risk for the system is judged to be acceptable. In reality, actual total risk for the system approaches the sum of these individual partial risks. Too rarely is that sum explored. As a consequence, risk managers and risk acceptance authorities must make critical decisions without knowledge of true, overall system risk. It is ironic that those who must manage risk are denied



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