

Risk General Terminology

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General Terminology

Cost of Consequences	A measure of the impact of a hazard on potential receptors, obtained as a sum of various components such as direct costs, replacement costs, indirect costs (loss of business etc.), social costs, political costs, public reaction costs etc.
Public Relations (PR)	A management function that helps to define organizational objectives and philosophies, and facilitates organizational change. Public relations practitioners communicate with all relevant internal and external public in an effort to create consistency between organizational goals and societal expectations. More specifically, PR can be used in risk communication and crisis management.
Problem	A doubtful or difficult matter requiring a solution; sudden deviation from an expected performance or the existence of a permanent deviation from an expected performance.
Accident	An event that is without apparent causes or is unexpected. Generally an unfortunate event, possibly causing physical harm or damage brought about unintentionally.
Incident	An event or occurrence that attracts general attention or that is otherwise noteworthy in some way.
Emergency	An unforeseen combination of circumstances or the resulting state that calls for immediate action. An urgent need for assistance or relief "the governor declared a state of emergency after the flood".
Catastrophe or Disaster	A great and usually sudden disruption of the human ecology which exceeds the capacity of the community to function normally, unless disaster preparedness and mitigatory measures are in place.
Mitigation	Measures and activities implemented with the goal of reducing the hazard (probability of occurrence). To reduce the consequences, the system has to be altered.



Risk-related Terminology	
Risk (Downside)	The product (multiplication) of the probability of occurrence of a hazard by the cost of the undesirable consequences resulting from the occurrence of the hazard. In some cases, the product is not expressed, and probability of occurrence p and cost of consequences C may be plotted as points on a p - C graph.
Risk Management (RM)	The complete process of risk assessment and risk control, i.e. the result of a rational approach to risk analysis and evaluation, and the periodic monitoring of its effectiveness using the results of Risk Assessments (RA) as one input.
Risk Estimation	May be based on historical data, logical models (fault and event trees), or mathematical models. Probabilities can be assigned subjectively or objectively if an historical database is available. Risk estimation helps answer the questions, What is the likelihood of the hazard, what will happen, and what areas will be affected?
Risk Evaluation	The process of determining acceptable risk. There are upper and lower limits (or thresholds) to risk that need to be defined before risk control can take place. These thresholds are often influenced by society's level of accepted risk.
Risk Control	The process of deciding on measures to control risks and monitoring the results of implementation. Decision theory can be used as a tool here. Risk control can answer the question, what can be done to reduce the risk?
Risk Communication	The US National Research Council defines risk communication as “an interactive process of exchange of information and opinion among individuals, groups, and institutions”. Risk Communication is part of the RM/CM process and, in a way, risk mitigation at the non-technical level. Stakeholder analysis has to be performed to prepare a risk communication campaign.
Hazard-related Terminology	
Hazard	A condition with the potential to cause undesirable consequences. The term hazard is often used to mean source of a given magnitude (for example, volume of sliding mass).
Hazard Management (HM)	The set of techniques used to define hazards and to rate them in terms of likelihood or magnitude.
Hazard Identification (HI)	Identifies the hazards and potential damages. Hazard identification answers the question, “What can go wrong?”



Crisis-related Terminology	
Crisis	A decisive moment, particularly in times of danger or difficulty.
Crisis Management (CM)	A set of techniques that manage the public relations and media relations implications of crisis situations that have the potential to damage or destroy the image and/or function of an organization. Crisis management is also an organizational discipline involving logistics experts, security managers and technical communications experts.
Issue Management (IM)	A relatively new discipline that identifies and manages issues related to an organization. The tools are research (issue identification phase) and a variety of techniques designed to develop effective communication channels between the organization and its stakeholders. Issue management manages issues that are potentially detrimental to an organization's reputation or operations in such a way that the issues do not lead to crises.
Crisis Management Plan	A CM Plan is the compass in the middle of the fog, i.e. a crisis. A CM Plan encompasses several components.
Media Training	The media are an important stakeholder in a crisis and are often a key link to the public and other stakeholders. The development of key messages that reflect the knowledge that is acquired in the RM process and other important factors in a crisis (for example, compassion) is an important step in media training.
Probability- and statistics-related Terminology	
Statistics	The set of mathematical interpretative techniques to be applied to phenomena that cannot be studied deterministically because of the number and complexity of their parameters. An example of such a phenomenon would be the duration of a flu-related sick leave. There are dozens of driving parameters, including physical and mental fitness of the sick person, the environment and so on. There is certainly no deterministic magic formula to determine the duration of the required leave. As a result, it is possible to say only that a flu-related sick leave lasts from three to ten days, with an average of five and a standard deviation of one.
Probabilities (concept)	The set of mathematical rules used to evaluate the stochastic (uncertain, possible) character of an occurrence by evaluating the number of chances of the occurrence of the phenomenon over a total number of possible occurrences. In De Natura Deorum, Cicero wrote that probabilities direct the conduct of the wise man. Evaluating chances, studying their consequences and opting for various courses



	<p>of conduct are indeed the basic steps of modern Risk Management and risk-based decision making. As such, statistics are a descriptive discipline whereas probabilities are an evaluative discipline. If the flu example given above is addressed in terms of probabilities, for example, it may be seen that probabilities can be used to evaluate the chances that an ill person will still be on leave in two days time.</p>
<p>Probabilities (numerical)</p>	<p>A measure of the likelihood of an event, expressed with numerical values ranging from 0 to 1, where 0 represents impossibility and 1 certainty. Probability is often interpreted as a subjective degree of belief (opinion, subjective interpretation). Many assessment methods rely on subjective probabilities. These probabilities are determined by employing the expert opinion of an individual or a consensus of highly qualified professionals. The personalist (subjectivist) or Bayesian view considers the probability of a phenomenon's occurrence as the degree of belief that the event will occur, given the level of knowledge presently available. In this view, estimates are considered "first or a priori" estimates, to be perfected with updates whenever further information becomes available. This vision of probability is generally used throughout this book's examples, even though in some cases an alternative approach based on observed information is presented. The reason for this apparent break in logic is that often times observed information is generally incomplete or deficient, and, therefore, probabilities estimated in this manner remain "a priori" estimates. The frequency interpretation of probability, in which probabilities are understood as mathematically convenient approximations of long-run relative frequencies, can also be used. In the frequentist view of probabilities, the probability of an event is defined as the frequency with which it occurs in a long sequence of similar trials. For example, in the toss of a coin, the frequentist approach says that the probability of a head is 0.5, i.e. that the long run frequency converges towards 0.5 when the number of tosses increases. In the case of a coin toss, few would question this definition, but if the analysis focuses on, for example, estimation of the occurrence of a unique event (a terrorist attack against a facility), the long-run aspect of this approach is clearly non-applicable.</p>
<p>Frequency</p>	<p>Frequency or relative frequency is a proportion measuring how often or how frequently something occurs in a sequence of observations. This concept can better be explained with an example related to railroad Track Occupancy Frequencies (TOF): these can be defined for various types of traffic on a given stretch of track. Required data are: a) daily number of trains of a given type, b) train speed, and, c) train length. TOF are defined as the time during which any portion of a train is physically present in the considered sector. Let's assume</p>



	<p>traffic of 25 freight-trains of 100 cars per day, at 20Mph (32kph) speed for a one-mile (1.6km) stretch of track. One hundred cars cover a length of appx. 1.61km, thus:</p> <ul style="list-style-type: none"> • time of occupancy per train tt: $(1.61+1.6)/32 = 0.10\text{hrs/train}$ • track occupancy per day to: $0.10*25 = 2.51\text{hrs/day}$ • track occupancy frequency TOF: $2.51/24 = 0.10/d$
Monte-Carlo Method	<p>The Monte Carlo method is a way of solving problems using statistical methods; stochastic technique (which means using random numbers) and probability. It is generally applied using commercial soft wares. One of the major limitations of the Monte Carlo method is that it requires the user to define the probability distribution for each variable: as most users either do not know how or do not have enough data to reliably define the distributions, it can be shown that the methods generates more uncertainty than other simpler “distribution free” methods such as for example the Rosenblueth Point Estimate Method.</p>
Root Cause Analysis	<p>Encompasses methods aimed at identifying the root causes of problems or events. RCA users believe that problems are best solved by attempting to correct or eliminate root causes, as opposed to addressing the symptoms. By directing corrective measures at root causes, it is hoped that the likelihood of problem recurrence will be minimized. RCA is often considered to be an iterative process, and is frequently viewed as a tool of continuous improvement.</p>
Entreprise Risk Management (ERM)	<p>Enterprise risk management (ERM) includes the methods and processes used by organizations to manage upside or downside risks. ERM provides a framework for risk management, which typically involves identifying particular events or circumstances relevant to the organization's objectives (risks and opportunities), assessing them in terms of likelihood and cost of consequences, determining a response strategy, and monitoring progress. By identifying and proactively addressing risks and opportunities, business enterprises protect and create value for all their stakeholders. See ERM's excellence criteria</p>
Decision Trees, Event Trees	<p>(or tree diagram) is a decision support tool that uses a graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. A decision tree is used to prioritize strategies. A common use of trees is for calculating conditional probabilities.</p>

