

# Risk Management Framework: All Steps

## *RISK COMMUNICATION*

Risk communication is defined as any two-way communication between stakeholders about the existence, nature, form, severity, or acceptability of risks. It is vitally important to understand the basic concepts of risk communication and to ensure that communication among stakeholders is integral to the risk management process. The focus of risk communication has evolved since the mid 1980's, from concern about how best to inform the public about the technical aspects of risk assessments to a process of early and ongoing dialogue among stakeholders. While guidelines for risk communication have been prepared by various agencies, putting principles into practice is a long term process requiring considerable resources, time, and effort.

### **What is Risk Communication?**

The U.S. Presidential/Congressional Commission on Risk Assessment and Risk Management identified the benefits of an open communications dialogue between risk managers and stakeholders for effective risk management:

*A good risk management decision emerges from a decision-making process that elicits the views of those affected by the decision, so that differing technical assessments, public values, knowledge, and perceptions are considered.*

*The Presidential/Congressional Commission on Risk Assessment and Risk Management, 1997*

*In a review and critique of the process of risk characterization and risk communication, the U.S. National Research Council (NRC) described the aim of the risk characterization as follows:*

*“to describe a potentially hazardous situation in as accurate, thorough and decision-relevant a manner as possible, addressing the significant concerns of the interested and affected parties and to make this information understandable and accessible...”*

*NRC. 1996*

Inherent in risk management decisions are uncertainties and value assumptions about the nature and significance of the risk. Stakeholders

may bring information and perspectives to the table that are critical to the decision process. Academics, practitioners and citizen leaders agree that the process by which agencies make decisions is critical, in fact, often more critical than the eventual decision outcome. Ongoing exchange of information and ideas between risk managers and the affected publics is fundamental to the overall risk management process. It is critical to building trust in the decision process and therefore ensuring a successful outcome. Experience increasingly show that decisions made with the involvement of interested and affected parties are more effective and more durable.

The risks associated with ineffective risk communication include irreplaceable loss of management credibility, unnecessary and costly conflicts with government, difficult and expensive approval process for project sites, bitter and protracted debates and conflicts with stakeholders, diversion of management attention from important problems to less important problems, non-supportive and critical employees, and unnecessary human suffering due to high levels of anxiety and fear .

### RISK COMMUNICATION TASKS IN THE RISK MANAGEMENT PROCESS

RISK MANAGEMENT STEP	RISK COMMUNICATION TASK
Initiation	<ul style="list-style-type: none"> <li>• Identify stakeholders</li> <li>• Consult with stakeholders in defining scope of issue</li> </ul>
Preliminary Analysis	<ul style="list-style-type: none"> <li>• Develop stakeholder analysis for ongoing verification and refinement</li> </ul>
Risk Estimation	<ul style="list-style-type: none"> <li>• Discussion of source, exposure issues</li> <li>• Communication of results with stakeholders</li> <li>• Assess changes in knowledge/perception in light of new information</li> </ul>
Risk Evaluation	<ul style="list-style-type: none"> <li>• Elicit stakeholder perceptions of the risks and benefits, and the reasons for these, if possible</li> <li>• Assess stakeholder acceptability of the risk</li> </ul>
Risk Control	<ul style="list-style-type: none"> <li>• Consult with stakeholders to gain input into identifying and evaluating control options</li> <li>• Inform stakeholders of chosen risk control and financing strategies;</li> <li>• Inform stakeholders of benefits, costs, and any new risks associated with proposed control options;</li> <li>• Evaluate acceptance of control options and residual risks;</li> <li>• Determine if risk trade-offs might be possible</li> </ul>
Implementation (Action)	<ul style="list-style-type: none"> <li>• Communication of risk control decision and implementation</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• Ensure implementation of communication strategies</li> <li>• Monitor changes in needs, issues, concerns of existing or new stakeholders</li> </ul>

## Role of Risk Communication in the Risk Management Process

Risk researchers Doug Powell and Bill Leiss have described risk communication as: "...the causeway that links all the organizational elements in a well-functioning risk management process." This view is reflected in the CSA-Q850 risk management framework, where risk communication among stakeholders is deemed integral to all stages of the risk management process. It has been noted that while most firms and agencies in Canada which ought to be implementing good risk communication practices are not yet doing so, the situation is slowly changing as there is a growing awareness that communicating well has benefits for good risk management.

### Initiation

During the Initiation step, the risk communication tasks include identifying stakeholders and assessing stakeholder perspectives on the risk issue for the purpose of defining the scope of the issue to be addressed. Stakeholders include groups that are affected or potentially affected by the risk, risk managers, and groups that will be affected by any efforts to manage the source of the risk. Stakeholders may include the decision-maker(s), community groups, local governments, public health agencies, businesses, labor unions, the media, individuals and groups, environmental advice organizations, and provincial and federal government agencies. The appropriate level of stakeholder involvement is situation specific.

The Presidential/Congressional Commission on Risk Assessment and Risk Management (1997) offers the following factors to consider in determining the nature and extent of stakeholder involvement:

- the complexity, uncertainty, impact, and level of controversy associated with the decision to be made
- the urgency with which the problem must be addressed
- the extent to which participants can have a genuine influence on the decision

The NRC (1996) identified four key considerations in designing a deliberation process:

- that the participation is sufficiently broad
- that the selection process is fair and perceived as fair
- that participants who presumably represent interested and affected parties are acceptable to those parties as representative

- that participants bring to the process the kinds of knowledge, experience and perspectives that are needed for the deliberation at hand.

Organizing appropriately broad deliberation presents significant challenges including managing scarce resources, setting realistic expectations, identifying all the parties that should be involved and nurturing the process. The NRC recommends that under situations when the stakes are high and trust in the organization is low, the organization may need to make special efforts to ensure that the interested and affected parties accept key underlying assumptions about the risk-generating processes and risk estimation methods as reasonable. Stakeholders may also be consulted during the Initiation phase of the risk management process to gather information to assist in defining or validating the scope of the risk issue.

### Risk Identification

The risk communication activity of the Risk Identification (or Preliminary Analysis) step of risk management focuses on developing a stakeholder analysis. A stakeholder analysis provides the decision-maker with a profile of potential stakeholders for consideration in decision-making and communication processes. The stakeholder analysis includes the following information for each stakeholder group: needs, issues and concerns and underlying values; risk perceptions; level of interest and knowledge on the issue(s); knowledge gaps and misconceptions; trusted information sources and communication preferences. The profile is verified and updated through dialogue with stakeholders throughout the risk management process (for example through group meetings, focus groups, and telephone interviews).

### Risk Estimation

During the Risk Estimation step of risk management, the frequency and consequences associated with each risk scenario are estimated and communicated with stakeholders. Stakeholders may have important knowledge of sources and patterns of exposure that analysts will need to integrate into a risk assessment. However conflict is most likely to arise at this step as stakeholders are not typically involved in the risk estimation process, and the uncertainties and value assumptions associated with the methods may not be clearly communicated.

During the Risk Estimation stage, stakeholders' knowledge and perceptions are assessed in light of receiving new information resulting from the risk estimates and the stakeholder analysis is updated. Third party review by third party experts and explicit communication of the methods, assumptions and uncertainties will contribute to credibility and trust in the technical analyses.

## Risk Evaluation

Communication is central to the Risk Evaluation step, in which the risks, costs and benefits of the activity are estimated and integrated to determine stakeholder acceptability of the risk associated with the activity. This is where an understanding of stakeholder perceptions of risk and benefits and the influences on these perceptions is critical. The following steps are part of the risk communication process at this stage:

- Discuss with stakeholders the purpose of the risk evaluation step
- Discuss with stakeholders the benefits of the activity, as well as any other information pertinent to their decision-making
- Elicit stakeholder perceptions of the risks, and the reasons for these, if possible
- Assess stakeholder acceptability of the risk

## Risk Control

The purpose of risk communication during the Risk Control step is to evaluate the proposed risk control options and assess stakeholder acceptability of the residual risk. The risk communication tasks are as follows:

- Consult with stakeholders to gain their input into identifying and evaluating feasible control options for reducing risk
- Inform stakeholders of chosen risk control and financing strategies
- Inform stakeholders of benefits, costs, and any new risks associated with proposed control options
- Identify as a result of implementing control measure, any new stakeholders, or new issues
- Evaluate acceptance of control options;
- Evaluate acceptance of residual risks; and
- Determine if risk trade-offs might be possible

## Implementation and Monitoring

The risk communication tasks of the Action step are associated with stakeholder outreach to communicate the risk control decision and its implementation involving contacts developed through the risk management process. The Monitoring program includes ensuring

implementation of the communication strategies, and monitoring for changes in the needs, issues and concerns of existing or new stakeholders.

## Factors Affecting Risk Acceptability

Surveys show that technical experts and the public differ in their assessments of which risks are most important. Risk perception research shows that experts often define risk in a narrow, technical way while public judgement of risk is influenced by a variety of psychological, social, institutional and cultural factors.

Risk perception scholars have spent years studying the characteristics of risk that are known to influence risk perception. The following list identifies some of the characteristics other than mortality that factor into how risks are perceived:

### *Voluntariness:*

In general, a voluntary risk (e.g. smoking) is more acceptable to people than an involuntary risk (e.g. exposure to air or water pollutants).

### *Control:*

Risks not under personal control (e.g. passenger in a vehicle) are perceived as more risky than those under one's own control (e.g. driving a car). When prevention and mitigation are in the hands of the individual, the risk is perceived as lower than when risk control is the hands of a government agency.

### *Fairness:*

People who must endure greater risks than their neighbours, without access to greater benefits, are naturally outraged.

### *Process:*

Does the agency come across as trustworthy or dishonest, concerned or arrogant? Does it communicate with the community before decisions are made? Does it listen and respond to community concerns? The factors which citizens use to evaluate the credibility of an organization or individual are: perceived caring and empathy (most important factor, decided within the first 30 seconds), competence and expertise (determines 15-20 % of credibility), honest and openness (determines 15-20% of credibility), and dedication and commitment (determines 15-20% of credibility).

### *Familiarity:*

Exotic, high-tech facilities provoke more outrage than familiar risks (e.g. risks in the home, driving).

### *Memorability:*

A memorable accident-Love Canal, Bhopal, makes the risk easier to imagine, and therefore seem more risky.

*Dread:*

Some risks (e.g. nuclear accidents) are more dreaded than others.

*Diffusion in space and time:*

Rare events such as nuclear accidents, are seen as far riskier than common ones (e.g. road traffic accidents)

*Morality:*

What is perceived as risky is seen as attacking core interests and values—often children, health, home, security, property, the future, certainty.

Sandman notes that equity and control issues often underlie risk controversies. Interviews with members of a

community chosen by the government to ‘host’ a hazardous waste incinerator indicate that control issues tend to overshadow the risk assessment. The gravest problems of risk communication tend to arise when citizens determine that the issue is important, that the authorities cannot be trusted, and that they themselves are powerless.

**DIMENSIONS OF TRUST** (Kasperson, 1992)

<b>Commitment</b>	<b>Caring</b>
<ul style="list-style-type: none"> <li>• risk managers are judged to be uncompromisingly committed to achieving shared goals</li> <li>• includes providing accurate information and adhering to objective and fair decision-making processes</li> </ul>	<ul style="list-style-type: none"> <li>• risk managers are judged to behave in a manner that shows concern for members of the public</li> <li>• includes ability to listen, ability to see issues from the perspective of the other</li> </ul>
<b>Competence</b>	<b>Openness/Honesty</b>
<ul style="list-style-type: none"> <li>• risk managers demonstrate technical competence over time in their area of responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• risk managers demonstrate truthfulness, candidness, objectivity, sincerity</li> </ul>

When citizens participate in a risk management decision they are more likely to accept it for three reasons:

1. they have instituted changes that make it objectively more acceptable
2. they have got past the process issue of control and mastered the technical data on risk; that is, they have learned why the experts consider it acceptable; and
3. they have been heard and not excluded, and so can appreciate the legitimacy of the decision even if they continue to dislike the decision itself

Communities and agencies often have very different notions of what level of public participation is appropriate. The “Ladder of Citizen Participation” describes the various levels of public participation in decision-making. The authors note that in many cases the agency errs by giving too little power to the public, essentially placing interactions with the community at lower levels on the ladder than might be appropriate. Interactions with communities are more likely to be

successful if the agency proposes a higher level of interaction from the outset. It is important that agencies clearly define early in the process the public's role in the decision-making process.

*Ladder of Citizen Participation (Hance, Chess, Sandman, 1988)*

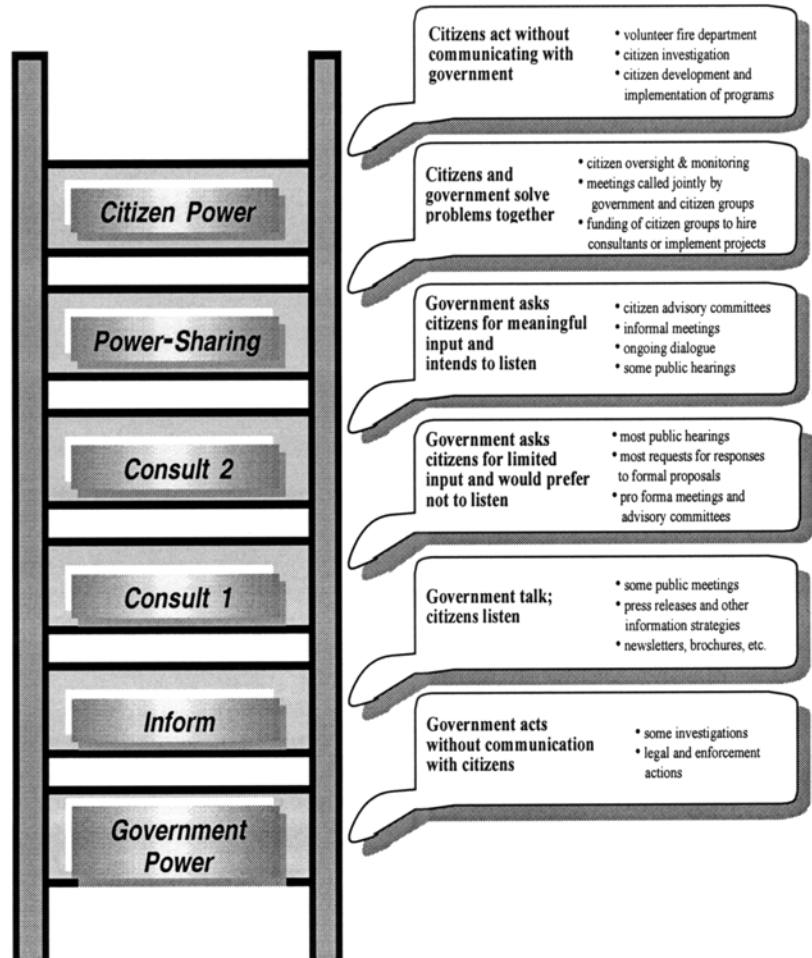
### Ladder of Citizen Participation

Several possible approaches and techniques are available for communicating with stakeholders (interviews, focus groups, public meetings, open houses, community advisory group, and workshops). The selection of techniques for involving the public should be based on the size and diversity of the community, level of interest expressed by community members, geography of the site and community, preferences of community members and resources and time available.

### Past Risk Communication Efforts: Lessons Learned

In their insightful 1997 book "Mad Cows and Mothers' Milk", Powell and Leiss reviewed recent examples of risk communication failures, including the case of communicating on the risks of PCBs in breast milk, mad cow disease, and silicone breast implants, to arrive at ten lessons for risk management communicators. The lessons, briefly stated, are as follows:

1. A risk information vacuum is a primary factor in the social amplification of risk.
2. Regulators are responsible for effective risk communication
3. Industry is responsible for effective risk communication.
4. If you are responsible, act early and often.
5. There is always more to a risk issue than what science says.
6. Always put the science in a policy context.





7. “Educating the public” about science is no substitute for good risk communication practice.
8. Banish “no risk” messages.
9. Risk messages should address directly the ‘contest of opinion’ in society.
10. Communicating well has benefits for good risk management.

Powell and Leiss note that there are no quick fixes to the inherent difficulties in communicating about risks and there is a need for long-term institutional commitment to the development and application of good risk communication practice.

#### ADDITIONAL RISK COMMUNICATION RESOURCES

*Agency for Toxic Substances and Disease Registry. U.S. Department of Health and Human Services. A Primer on Health Risk Communication Principles and Practices.* This Primer provides a framework of principles and approaches for the communication of health risk information to diverse audiences. It is intended for ATSDR staff and personnel from other government agencies and private organizations who must respond to public concerns about exposure to hazardous substances in the environment. The Primer discusses the importance of local community involvement in the health risk communication and issues and guiding principles for communicating health risk. Specific suggestions for presenting information to the public and for interacting effectively with the media are provided. Available on-line at <http://www.atsdr.cdc.gov/HEC/primer.html>.

*Hance, B.J., Chess C. & Sandman, P.M. 1990. Industry Risk Communication Manual: Improving Dialogue with Communities. Boca Raton, FL: Lewis Publishers.* This manual is written in a clear, concise manner and addresses many unanswered questions about communication and the community. It reveals how to be a better communicator, how to explain technical information in lay terms, and how to find ways to reach out to the community. This book provides easy-to-follow guidelines, checklists, and examples for plant managers, public information specialists, technical staff, executives, and managers who need to deal with the public regarding how their company’s business relates to environmental risk issues. Contact: <http://www.crcpress.com/www/index.htm>.

Hance, B. J., Chess, C., & Sandman, P. 1988. *Improving Dialogue with Communities: A Risk Communication Manual for Government.* New Jersey Department of Environmental Protection. Environmental Communication Research Program, New Brunswick, NJ. This manual provides guidelines for planning and undertaking effective environmental health risk communication. The manual was based on extensive interviewing with risk communicators in government agencies, industry, academia and citizen groups and a review of the research literature. It summarizes practical lessons learned from successful as well as unsuccessful efforts to generate two-way communication with affected publics. Contact: Tel: (732)932-8795; FAX: (732)932-7815; email: [cec@aesop.rutgers.edu](mailto:cec@aesop.rutgers.edu); web: <http://aesop.rutgers.edu/~cec/>

*Leiss, W. (Ed). 1989. Prospects and Problems in Risk Communication. Institute for Risk Research, University of Waterloo, Waterloo, Ontario.* The articles in this book cover a wide range of current issues in risk communication. These include: a comprehensive review of the obstacles that have been encountered in communicating risk management controversies in North America; analyses of the distinction between technical risk and perceived risk; reviews of communication case studies, controversies, and practices involving Canadian government departments; studies on the place of quantitative risk assessment results in effective risk communication practices; and recommendations for improving current policies and practices. The contributors are from various professions - the media, industry, government departments, consultants, and academic fields. Contact: Tel: (519) 888-4567 ext. 5900 or [irr@mail.eng.uwaterloo.ca](mailto:irr@mail.eng.uwaterloo.ca).

Lundgren, R. 1994. *Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks*, Ohio, Battelle Press. 186p. This book's style and practical advice will help scientists, engineers, and writers communicate about environmental, safety and health risks more effectively. Whether you're new to the field of risk communications, or have been practicing for years, you'll appreciate the comprehensive approach to risk communication this book takes. It provides practical information to help you more effectively perform one of the most important communication tasks. Contact: NTIS sales desk at 1-800-553-6847 or (703)-605-6000 or fax at (703) 605-6900.

Mulligan, J., McCoy, E., and A. Griffiths. 1998. *Principles of Communicating Risks. Working Paper #4. The Macleod Institute for Environmental Analysis, Calgary, Alberta*. This report provides an overview of risk communication theory, organizational barriers and solutions and case studies from the Canadian petroleum industry to assist organizations in integrating risk communication with environmental management practice. Contact: Tel: (403) 220-5271 or macleodi@acs.ucalgary.ca.

National Research Council. 1996. *Understanding Risk. Informing Decisions in a Democratic Society*. Washington, DC: National Academy Press. This book reviews traditional definitions of risk characterization, looks at risk characterization in the context of the entire decision-making process, and presents new conceptual and practical approaches. Contact: <http://books.nap.edu/catalog/>

National Research Council. 1989. *Improving Risk Communication*. Washington, DC: National Academy Press. This volume offers an approach to better quality in risk communication. The combined insight of experts from government, business, and universities, *Improving Risk Communication* draws on the most current academic and practical information and analysis. Issues addressed include why risk communication has become more difficult in recent decades, what the major problems are, and how common misconceptions often hamper communication campaigns. Aimed at top decisionmakers in government and industry, the book emphasizes that solving the problems of risk communication is as much about improving procedures as improving the content of risk messages. Specific recommendations for change include a Risk Message Checklist and a call for developing a consumer's guide to risk. Appendices provide additional details. Contact: <http://books.nap.edu/catalog/1189.html>.

Powell, D. & W. Leiss (1997). *Mad Cows and Mother's Milk. The Perils of Poor Risk Communication*. McGill-Queen's University Press, Montreal. This book uses a series of detailed case studies (mad cow disease, E. Coli outbreaks, and silicone breast implants) to outline the importance of risk communication in effective risk management. The book provides a set of lessons for risk managers and communicators. Contact: <http://www.mcgill.ca/mqup/powell.htm>.

## *SUGGESTED READINGS*

Canadian Standards Association. (1997). *CAN/CSA-Q850-97. Risk Management: Guideline for Decision-Makers*. Etobicoke (Toronto), Canada: Canadian Standards Association.

Covello, V.T. (1995). Risk perception and communication [editorial]. *Can J Public Health* 86:78-82.

Hance, B., Chess, C., Sandman, P. (1988). *Improving Dialogue with Communities: A Risk Communication Manual for Government*. New Brunswick NJ: New Jersey Dept of Environmental Protection, Environmental Communication Research Program.

Harrison, K., Hoberg, G. (1994). *Risk, Science, and Politics: Regulating Toxic Substances in Canada and the United States*. Montreal: McGill-Queen's University Press.

Kasperson, R.E. (1992). Social distrust as a factor in siting hazardous facilities and communication risks. *Journal of Social Issues*, 48(4): 161-187.

Leiss, W. (1998). Preface. In *Principles of Communication Risks*. Working Paper #4. Macleod Institute for Environmental Analysis. p. xii-xiii.

Leiss, W., Chociolko, C. (1994). *Risk and Responsibility*. Montreal: McGill-Queen's University Press.

Leiss, W., Krewski, D. (1989). Risk Communication: Theory and Practice. In *Prospects and Problems in Risk Communication*, ed. W. Leiss, pp. 89-112. Waterloo, ON: University of Waterloo Press.

National Research Council. (1996). *Understanding Risk. Informing Decisions in a Democratic Society*. Washington, DC: National Academy Press.

Powell, D., Leiss, W. (1997). *Mad Cows and Mother's Milk: The Perils of Poor Risk Communication*. Montreal: McGill-Queen's University Press.

Presidential/Congressional Commission on Risk Assessment and Risk Management (1997). *Risk Assessment and Risk Management in Regulatory Decision-Making*. Final Report. Volume 2. Washington DC.

Slovic, P. (1986). Informing and educating the public about risk. *Risk Anal* 6:403-15.

Slovic, P. (1992). Public perception of risk. *Risk Management* 39: 54-58.