Risk Communicating Strategies in English for the Field of Engineering

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Abstract: - It is possible to consider various approaches available for communicating risk information once the stage of a risk management process, the type of risk situation, and the audiences have been identified. Adequate risk communication is an essential element of effective risk assessment, mitigation and management programs. In addition, it aims to increase understanding among target audiences of the rationale underlying risk management decisions. There are various stages in which risk communication plays a key role, as it defines the types of situations faced by risk managers – from dealing with non-controversial to highly controversial issues – and provides guidance for responding to these situations.

Key Words: risk assessment and mitigation, risk management process, communicating risk data, target audience

1 Introduction

Risk communication strategies are directed towards various target audiences such as endangered inhabitants or environment protectors, journalists, workers, employees of certain companies or public authorities, stakeholders, the medical community and the health care providers, as well as members of risk-related organizations. Major issues addressed refer to modalities of:

- providing information to the public about products and their risks (emphasizing the difference between *hazards* and *risks*);
- providing public information on the process of conducting risk assessments and making risk management decisions, including a description of the actors and procedures involved in both tasks;
- organizing effective two-way communication;
- enhancing trust and credibility of all actors in the risk assessment and management process;
- involving stakeholders and resolving conflicts.

Making an adequate decision is not enough; it must be accompanied by choosing approaches best matching the context, the capabilities of the risk communicating organization, the political culture of targeted audiences&the various levels of risk debate.

2 Problem Formulation

Risk communication practice core principles are:

- Critical review of previous performance.
- Integrative risk management and communication program design, ensuring constant contact with the most important stakeholders, including consumers, throughout the management process.
- Communication suitable to the needs of the audience, not the needs of the information source.
- Organized dialogue adjustment for collecting feed-back and sensing changes in values and preferences.

Attributes affecting risk perception	
Involuntary	Involuntary / imposed risks – factories, less acceptable than voluntary–smoking
Beyond control	The inability to control a risk decreases the judgment of its acceptability.
Industrial vs. Natural	Industrial risks (nuclear power) are less acceptable than natural ones (lightning).
Unfamiliar	Exotic/unfamiliar risk (biotechnology), less acceptable than familiar ones.
Memorable	Risks embedded in remarkable events – plane crash, less acceptable than others.
Dreaded	Highly feared risks (cancer), less acceptable than household accidents
Catastrophic	Catastrophic risks (plane crash), less acceptable than diffuse ones-car crashes
Unfair	Risks inequitably/unfairly placed on groups are less acceptable (children).
Untrust-worthy	If the source of the risk is untrust-worthy, the risk is less acceptable.
Uncertain	High uncertainty and unknown risks are less acceptable than others.
Immoral	Unethical/immoral risks, unacceptable

2.1 Specific risk communicating approaches

They are divided into groups according to the main types of audiences (individuals, general public, media, and institutional stakeholders).

The risk communicator should realize that any approach can be used for any situation or audience, depending on particular circumstances, but types of settings and communication formats make the difference. *The settings* refer to the different social situations in which communication occurs (town hall meeting, citizen advisory committee with invited participants, telephone interview with a media representative, press conference, panel discussion with a variety of institutional stakeholders). *The formats* refer to the communications vehicles that can be selected (news release, brochure, website, video).These approaches are the most familiar and widely used, but new ones are being developed, and there are many variations&nuances for each of them.

2.2 Communicating to threatened audiences

Risk communication addresses public expectations&knowledge on the risk under consideration. It must include public preferences on risk reduction measures before dealing with actual management results and before gaining trust. The communicator proves an honest effort to listen to public concerns and to demonstrate that those concerns have been adequately addressed. Two-way communication is clearly a prerequisite for all forms of successful dialogue, but it is often difficult to be flexible and willing to adapt to audience's issues. Forms of two-way communications include:

- public meetings;
- forums or panel discussions;
- written/audio/video materials (with feedback);
- talk shows on TV/Internet;
- exhibitions;
- inspection tours of facilities that generate concern.

All forms of two-way-communication have in common the fact that the risk communicator is in direct contact with the targeted audience and treats them as equal partners in the exchange of arguments, ideas, impressions, evaluations, and statements. The interaction among communication partners follows the pattern of action/reaction, stimulus/response, questions/answers, claims/ counter-claims. The main feature is the constant change of roles between being an active listener and a responsive presenter. Two-way communication succeeds if all partners respect each other and willingly engage in mutual learning.

Here are key points to consider in conducting & participating in two-way communication programs:

- Honesty, completeness, responsiveness in contacts with target audiences are vital for gaining credibility, but they are not rewarded automatically. Dishonesty, on the other hand, generates negative repercussions among the members of the audience, as does withholding relevant information or telling only one side of the story. The goals of honesty and completeness include credibility.It is often assigned by speculating about the true motives of the source, and it is best to address the issues and make clear that such interests do not automatically preclude public interest or the common good. Industries argue that companies with good risk reduction and control programs are more likely to attract better qualified personnel, enhance their corporate reputation and avoid costly litigation. Legislators state that effective regulation helps the agency get better reputation, more resources, and the right to be consulted in major political decisions.
- Personal approaches&dialogues are tailored to the personal experience of the targeted audience, so as to avoid role expectations. Peripherally interested people select information that contains surprises/unexpected insights; hence communicators can attract attention by canceling role stereotypes. It is most effective in face-to-face interactions/panel debates/ talk shows. Without denying affiliation to their own institution, communicators may report on personal feelings when first hearing about the risk source and on the kind of actions they took to protect themselves, showing compassion towards the anxieties and fears of the addressed audience, and respect for their rationality. Success stems from confronting the audience with some cognitive dissonance, which may be resolved by accepting the new message. Being honest is an absolute condition for such an attempt because most people have developed a good sensitivity to acting and displays of fake feelings.
- Competence and empathy in dealing with highly dreaded risks: building trust is particularly difficult with risks associated with unfamiliarity, lack of control or involuntary occurrence. To address such negative characteristics, it is helpful to emphasize competence, independence, and impartiality of the operating and regulating institutions, so that the public should trust the regulators' capability to monitor health impacts, check safety devices, and intervene if consumer safety were jeopardized.
- Caring, but decisive and inspirational talk, aimed at developing a communication climate enabling the audience to fully process the given data. The more a communicator manages to avoid the mask of the institutional spokesperson, the more likely the audience will feel compelled to consider the arguments.
- The best way to elicit trust in the institution is to demonstrate that it has met the goals and objectives assigned to it. Credibility is linked to the evidence of being cost-effective and open to public demands, so these two goals have to be treated as complementary and not as substitutive. Conflicts arise if the com-

municator does not fully share the decisions/policies of the institution, and in this case, lying or defending the position is not an option: either explain that idea mentioning personal different views (yet within the general framework of the institution), or ask a believer to defend it.Over-compliance with company policies results in skepticism regarding message validity and honesty, ruining trust in the long run.

- Sharing technical information, lab results, hazard data or any other relevant product information with the consumer and public interest groups. Companies may send their laboratory data/toxicological results directly to public interest groups and ask for feed-back. The effect of such a policy outweighs by far potential damages caused by probable data misuse.
- Publication of risk-related data in the newspapers read by consumers. Many will not understand the exact meaning of the data, but the mere publication in highly visible journals enhances credibility.
- Very visible labels for hazard information warning people of potential health effects or possibilities of misuse must be comprehensible and placed on a prominent spot on the package. Negative labels do not deter committed customers, but give them valuable data for protecting themselves, thereby demonstrating that the industry/institution is committed to making their product as safe as possible.

3 Problem Solution

Action stages in case of routine/high risks:
Stage 1: Problem identification
Stage 2: Setting up the objectives
Stage 3: Making recommendations
Stage 4: Implement&evaluate the risk mgmt process
Materials used:

- Brochures and written leaflets
- Public presentations and discussions
- Exhibitions, science centers, school visits
- Educational fairs
- Surveys and focus groups
- Press releases
- Round tables
- Pre-test of the material/discourse procedure
- Systematic feedback from the users
- Surveys and polls
- Internet forums

3.1 Brochures and written leaflets

Written materials are the most popular form of communication to audiences on a large scale. The material should be designed in such a way as to correspond to the public's knowledge levels, needs, and concerns. Steps in preparing written statements:

- define the major messages to convey;
- determine the types of audiences to address;
- assess the social and political context of the issue;
- articulate the message to suit both the public needs and the social and political demands;
- devise the whole communication package;
- determine the channel of transmission.

Before sending out information, test statement effectiveness in meeting audience's needs:determine whether all available&necessary data were provided, so that the public could reach their own conclusions about the risk. Modalities of achieving this are:

- pre-tests, exposing the material to small samples of the targeted listeners.
- focus groups (entrepreneurs/bureaucrats as cultural categories): after reading the material, they voice opinions/criticism/impressions in organized contexts
- brochures with reply envelopes
- contests or other forms of incentives.

The most important element is to test message understanding and comprehension of intentions in the communicator's discourse.

3. 2 Internet website materials

In addition to the normal written information, new channels of multimedia presentations (videos, web) are used as a means to communicate with the consumer. Additional requirements to consider:

- fast and brief response, as these new media rely on speed and intuitive comprehensibility. Clients expect updated information, good graphical design, little accompanying text. Longer texts are for downloads, with data clearly separated from the key message. As search engines list sites according to last change date, frequent update enhances message visibility.
- date/update/keywords/special page – strategies for registering in search engines: important risk data on both the normal homepage and a separate page for this purpose only, adding keywords at the beginning.
- enough links to other organizations&information sources on the same issue, for viewers to get another opinion or more details. Prove fairness&openness by including links to those with different points of view
- opportunity for viewers to respond (e-mail address to voice opinions).Clarify if there are answers to all feedback (resource consuming, but with insights for establishing productive dialogues with the public).

3.3 Public presentations and discussions

Personal contact is far more convincing than anonymously written information. Lectures allow the audience to associate a face with the message; therefore it is essential that the two should match. Most audiences have developed a fine sensitivity for people who role-play or try to sell them something. Formal training in speech and rhetorical skills is certainly helpful, and being sincere, honest, open-minded, caring for the concerns of the audience, and responsive to people's questions & comments makes it more likely that the listeners should consider the speaker's message, rather than being elaborate, well-spoken, and smooth. Specific traits of the discourse:

• Explaining the rationale of risk analysis and its role in risk management options prepares the public to acknowledge the basic principles of the decisions. The message should include the past record of the institution, so as to help people assign competence to and get clear understanding of the suggested trade-offs. Evidence of competence, fairness towards other viewpoints, and references to commonly shared values and beliefs may make the audience more open to the message. At the same time, it could help to address the centrally and peripherally interested audience, without claiming superiority. Conveying probabilistic information is a challenge, but can be done in reference to everyday experience of budget constraints. Furthermore, demonstrating successful use of risk analyses in hazard management can help define the role and limitations of risk analysis in improving public health and the environment.

• Use visual aids in technical presentations. Psychological research shows that most people:

➢ will not follow a talk for more than 20 minutes
➢ will not read a graph exceeding 20 words
➢ will not absorb more than 7 central messages

The most effective lectures have one focal message that is explained and illustrated throughout the talk.

• Allow sufficient time for discussion. If addressing fewer than 50 people, spend half of the total time on questions and answers, meeting the demands of the audience and not reciting probably irrelevant data. Motivation to learn and develop personal points of view can be enhanced if the lecture is organized in the form of a dialogue, with people voicing their concerns. With larger audiences, discussions often become mere rituals of window dressing, performed by representatives of interest groups. In this case, it may be better to organize small discussion groups of ten or less and have spokespersons of each group pose the questions later in a plenary session.

• Be available after the lecture for further requests or inquiries, and distribute a handout after the talk, as many people need some time to digest what they have heard and to articulate questions/doubts about the content. A one-page leaflet is normally sufficient if it contains sources of further information/websites. The presentation ends with a slide with opportunities for additional data and an e-mail contact address.

3.4 Exhibitions, education fairs, participation in science centers, visits to schools

Being involved in educational efforts is a long-term strategy to improve risk literacy among the population. However, it is ineffective if meant to get timely messages on a certain risk to the consumers. Students do not absorb all they are given, but instead select what they find interesting, forget what seems boring, and evaluate information according to their own sets of values and beliefs. Nevertheless, being involved in educational programs has the advantage that basic knowledge in applied sciences and basic understanding of probabilistic reasoning can become the target of communication efforts. Sponsoring education is expensive and requires commitment:

• Develop educational programs and projects with professionals in the field since lots of money can be wasted relying on anecdotal teaching wisdom.

• Co-operate with institutions specialized in training and education. Almost all countries have a broad infrastructure of schools, training centers, evening schools, universities, colleges, and science centers, museums, community centers or health clinics, all offering facilities and access to different audiences.

• Focus on interactive, life/world-related learning programs. Effective knowledge acquisition depends on interactive exchange of arguments/observations/ideas: artifacts in science centers provide interaction via experimentation & observation, too. People must get involved in the materials presented to them, by intensive talks on received messages, by associations with every-day life, or by linking education, written sources, lectures, and Internet presentations.

3.5 Surveys and focus groups

Surveys of the general or special groups of the public are excellent but expensive approaches to explore the audience's concerns and worries. However, they do no inform on possible resolutions, but describe initial positions before conflicts unfold. Focus groups go further by exposing arguments to counter-arguments in the setting of a small-group discussion, giving data on people's views&concerns, also measuring the strength and social resonance of arguments/counter-arguments. Both instruments are useful in understanding context & expectations, but do not assist risk managers in solving pressing issues

3.6Citizen advisory committees (ombudsman, neighborhood associations, citizen boards)

Citizen Advisory Committees in the framework of the Responsible Care Program have been long used, being feasible only if companies/agencies would like to involve their ultimate consumers in the risk management process. The problem is selection: either inviting stakeholder representatives (consumer associations), or trying to sample relevant consumers of the products under review. Both approaches have their merits and drawbacks. Stakeholder groups are often distant from the members they are supposed to represent. On the other hand, consumers form a heterogeneous group, and, in most countries, do not belong to consumers associations. A representative sample of clients is difficult to obtain and it is questionable whether such a sample can speak in the interest of all consumers. In spite of these difficulties, such advisory committees can be very effective in detecting potential conflicts (early warning function) and getting concerns heard. In addition, the creation of citizen advisory committees is fairly inexpensive and easy to do.

3.7 Citizen consensus conferences

The Danish Board of Technology introduced a new form of citizen involvement called *consensus conferencing*. Six to ten citizens are invited to study a risk issue in detail and provide the legal decision-maker or an agency with a recommendation at the end of the process. An equal amount of women and men are required, as well as a cross-section of the population in terms of age, social class, and political preferences. This team receives a substantial amount of material before convening for the first time and, during the meeting, shares ideas with regulators or decision-makers (Parliament members). Finally, the team meets behind closed doors and makes recommendations, which are presented to the decision-makers who then have an opportunity to give further comments. At the end, the team writes the final draft of the recommendations and presents this to the media at the end of the third day. The advantage of consensus conferencing is the transposition of a major conflict to a small team of lay-people, which are educated about the subject and are asked to make suggestions, based on their knowledge and personal values. The main disadvantage is the small number of people who are assigned such an important task. The restricted number of 6-10 participants has been the main issue of criticism. Consensus conferences appear to yield a compelling legitimacy effect within small countries that choose consensus over conflict. Successful trials were reported in Denmark, Norway, and Switzerland. Results in more adversarial states, such as the U.K, France, and Germany, were less encouraging: the deliberations were not widely published in the media, the decision-makers were unwilling to allot time to small teams of lay-people, and the administrators paid lip-service to conference statements. There are expert consensus conferences where experts gather in workshops to discuss options and decide on a general standard that should be applied in comparable cases around the world. Workshops are organized into group sessions, to prepare common standards, and in plenary sessions, to reach an agreement. Consensus conferences in the risk area are destined to the purpose of setting and articulating common conventions for risk assessment and evaluation.

3.8 Planning cells, citizen panels and juries

They are groups of randomly selected citizens asked to compose a set of policy recommendations on a specific issue. The objective is to give citizens the opportunity to learn about the technical&political aspects of risk management options, and allow them to discuss and evaluate options/likely consequences according to their own set of values and preferences. The panels are conducted in seminar form over 3-5 consecutive days. All participants get a standardized program of information (hearings, lectures, panel discussions, videos, field tours). Every individual in the affected population has an equal opportunity to participate in the process, but only 5-40% choose to become active. In contrast to consensus conferences, however, the number of participants (in panels of 20-25 with identical evaluative tasks and educational program) is limited only by available resources and time. If similar conclusions emerge in most panels, then this is the will of the informed public. Planning cells require large investments (time & money) but are not suitable for all types of problems & contexts: highly technical issues, narrowly restricted decision options, or not enough room to allow trade-offs on decision criteria. In more adversarial and corporate settings, where organized stakeholders and elected officials claim to represent the public interest, citizen panels could be legitimate consultants for the policy makers. There are different cultural settings for the regulatory styles, and in corporate, consensual or fiduciary cultures, they have produced valuable, creative, and well-balanced solutions to problems of ambiguity. The idea behind stakeholder involvement is to find a common understanding of the goals and visions for future development. Consumer protection is one element in this larger framework of social concerns ranging from social justice to societal responsibility for personal growth and well being. Regulatory agencies and industrial representatives are expected to participate in such debates, as this is part of the legitimizing efforts of social forces in a plural society. At the same time, issues of ambiguity in risk management demand that all views should be taken into account in order to provide sufficient incentives for reaching common ground/consensus.

4 Conclusion

Risk communication is an integral part of risk management. Advertisement and message packaging should be part of, and can help improve, risk communication, but they alone are not sufficient for overcoming the problem of public distrust in risk management institutions. Nor are they sufficient at coping with consumers' complacency, concerns, or worries. The ultimate goal of a risk communication program is to enable audiences and stakeholders to process risk information and form a well-balanced judgment based on factual evidence, their own interests/preferences, and the arguments of different parties. Not everyone readily accepts and believes all information given; therefore, a risk communication program must provide the necessary information to all participants and empower them to become equal partners in making decisions about risk. The specific circumstances of the risk-related situation, equity issues, catastrophic potential, and other qualitative aspects of risk deserve the same attention in the communication package as the calculation of numerical probabilities and consequences. Thus, risk communication must incorporate a broad conception on risk, and operate with the realization of the fact that communication is a process in which all participants have something to offer and to learn.

References:

1. *http://www.bgvv.de/publikationen/sonstige/index.*

2.Atman, C., *Communicating risk to the public,* Environmental Science and Technology, 1992, 26 (11), pp. 2049-2056.

3.Chemical Manufacturers' Association *Crisis Management Planning Manual for Manufacturing Industries,* CMA, Washington, D.C., 1991 pp. 82.

4.Cismas, SC, *Scientific writing for environment engineering students in the Polytechnic University of Bucharest,* in *Proceedings of the 5th International Conference on Energy&Environment, University of Cambridge UK,* WSEAS Press, 2010, pp. 356 – 361

5.Cismas, SC, *English language patterns for environment protection presentations* in *Proceedings of the 5th IASME/WSEAS International Conference on Energy&Environment, University of Cambridge UK,* WSEAS Press, 2010, pp. 373 – 378

6.Chess, C. *Encouraging Effective Risk Communication: Suggestions for Agency Management,* Environmental Communication Research Program, Rutgers University, New Brunswick, New Jersey, 1988, p. 9

7.Chess, C., Hance, B.J., Sandman, P.M., *Improving Dialogue with Communities: Guide for Government Risk Communication,*Environmental Communication Research Program, Rutgers University, New Brunswick, New Jersey, 1988 p. 30

8.Covello, V.T., Allen, F.W., *Seven Cardinal Rules of Risk Communication,* US Environmental Protection Agency, Washington, D.C. 2006

9. Covello, V.T., Sandman, M, *Risk Communication, Risk Statistics and Risk Comparisons: A Manual for Plant Managers.* CMA, Washington, 2008, p. 75

10. Douglas, M., Wildavsky, A., *Risk and Culture,* Berkeley, University of California Press, 2002

11.Fearn-Banks,K.*Crisis Communications* Lawrence Erlbaum Associates, New Jersey, 2006, p. 330

12. Gray, P., Stern, M., Biocca, M., *Communicating about Risks to Environment and Health in Europe*, KluwerAcademicPublishers, Dordrecht, 2003, p.409

13. Gutteling, J. Wiegman, O., *Exploring Risk Communication,*KluwerAcademicPublishers,2006, p. 221

14.Hance, B.J., Chess, C., Sandman, P.M., *Improving Dialogue with Communities: A Risk Communication Manual for Government,* Rutgers University, New Brunswick, New Jersey, 2008 p. 91

15. Kasperson, R.E., Renn, O., Slovic, P. *The social amplification of risk: a conceptual framework,* Risk Analysis, Vol. 8 (2), 1988, pp 177-187.

16. Leiss, W., *Understanding Risk Controversies,* Montréal, McGill-Queen's University Press, 2001

17. Leiss, W., *Prospects and Problems in Risk Communication,* University of Waterloo Press, 1989

18. Mitroff, I., Pearson, C., *Risk Management: A Diagnostic Guide for Improving Organization's Crisis-Preparedness,* Jossey-Bass Publishers, San Francisco, 1993, p. 139

19.Mulligan, J., McCoy, E., Griffiths, A. *Principles of Communicating Risks,* The Macleod Institute for Environmental Analysis, University of Calgary, Alberta, 1998, p. 57

20. Stern, P.C., Fineberg, H.V., *Understanding Risk: Informed Decisions in a Democratic Society,* National Research Council Committee on Risk Characterization, National Academy Press, Washington D.C., 1996, p. 249

21. Powell, D., Leiss, W., *The Perils of Poor Risk Communication,* McGill-Queen's University Press, Montréal,1997

22. Sadar, A.J., Shull, M.D. *Environmental Risk Communication. Principles and Practices for Industry*, Boca Raton, Lewis Publishers, 2000

23.UK Department of Health, *Communicating about Risks: Pointers to Good Practice,* UK, Department of Health, London, (1998). pp. 30

24. Wogalter, M.S., DeJoy, D.M., Laughery, K.R, *Warnings and Risk Communication,* Taylor and Francis, London/ Philadelphia, 1999, p. 365