

RISK COMMUNICATION

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ABSTRACT

A summary is presented of the National Academy 1989 report Improving Risk Communication. The problems associated with risk communication are outlined, and the committee's conclusions as to fundamental misconceptions are described. The committee's definition of success and advice to federal agencies in the government is presented.

INTRODUCTION

"The most exaggerated current fear is probably that associated with the storage of high level nuclear waste, with deep roots in the unfamiliarity of radiation. Despite the essentially unanimous view of informed scientists and engineers that the risk is grossly overrated, the fear remains." "An egregious example of an overblown risk that has paralyzed our government for years is that associated with the storage of high level radioactive waste." (Technological Risks, HW Lewis, 1990) That is the view of physicist and risk expert Harold Lewis. An alternate view was presented in The New York Times Magazine last November by science writer William Broad: "Yucca Mountain is a barren, flat-topped ridge rising out of the Nevada Desert. Within two decades it could hold the most dangerous nuclear facility in the world." Broad's article was titled "A Mountain of Trouble." Lewis and Broad obviously perceive the hazards of high level waste disposal quite differently.

The population of Nevada apparently sides with Broad. Last year a Las Vegas newspaper (Review Journal) ran a series of articles describing public attitudes and included results of state wide polls. The answers were the following:

"Should the federal government build the nation's first high level nuclear waste facility in Nevada?" Yes, 12 percent, no 77 percent.

"Nevada's political leaders should continue to fight against building the nuclear waste facility." Eighty percent strongly support or support.

"Nevada's political leaders should make a deal with the federal government now and get as much money as possible for letting the waste facility be built in the state." Seventy percent oppose or strongly oppose.

"The federal government will be honest in the scientific research it does to determine if nuclear waste can be safely stored at Yucca Mountain." Sixty eight percent disagree or strongly disagree.

"The nuclear waste facility will be built at Yucca Mountain no matter what the scientific research shows." Fifty-two percent agree or strongly agree.

Obviously risk has been communicated in Nevada, and that risk is the one described by The New York Times writer, not the one described by the risk expert. Risk communication is difficult. And important. And because of its importance, the National Academies of Science and Engineering proposed a study several years ago of risk perception and risk communication. This paper briefly summarizes some of the key points of that study.

An earlier study, on risk assessment and risk management in the federal government, had concluded that risk communication was a key element in risk management. That study concluded that the communication of the assessment and the communication of the actions oft times were more important to the final accomplishment of an agency's mission than were those earlier steps. Poor communication frequently caused the earlier steps to fail.

The Risk Perception and Communication Committee was asked to compile the available information on risk communication and suggest ways to improve riskcommunication. The 19 members represented engineering, natural science, social science, journalism, public policy, decision analysis, industry, medicine, government and law.

Why is risk communication so important? One measure is the number of conferences, seminars, articles and books that have risk communication in the title. This also reflects increased attention by some agencies of the federal government to the tasks of informing the general public about the nature of health, safety, and environmental risks associated with both societal choices and personal choices. This concern about communicating with the public has several motivations, not entirely self-consistent. They include a requirement for the government to inform, or in some cases a desire by the government to inform; a desire by government or industry officials to overcome opposition to decisions; a desire by the government or industry to share power with the public; and a desire to develop alternatives to regulatory control.

Nearly every day there is a new debate about risks: how real are they, how prevalent are they, how big a threat is there to the public? In some cases, the issue is: how big a threat to the public has been hidden? Why has some event

been allowed to happen; what is being done to prevent a tragedy? Risk managers seem to be pitted against local citizens, national public interest groups, and, apparently, pitted against the media. Listening to these risk debates the general public often concludes either the world is a very dangerous place or, and sometimes "and," risk managers either do not know what they are doing or do not understand what they are supposed to be doing.

Frequently groups of citizens opposed to particular technological projects have delayed or stymied those projects with lawsuits, with mobilization of Congressional opposition, or public demonstrations. When a government or an industry official has the benefit of extensive scientific study and the opposition seems to disregard that evidence, that official can come to see the public as irrational. Government and industry officials who see the issues that way are likely to define these conflicts as conflicts between the informed and the uninformed or, perhaps even worse, between the rational and the irrational. In those cases, the officials are tempted to look for ways to influence the members of the opposition, either by more actively presenting a straightforward account of the knowledge they have available, or even carefully packaging or distorting the information to get a persuasive effect. The use of information to overcome political opposition makes some notions of risk communication attractive to many proponents of controversial technologies. In fact, to many people, that defines the goal of risk communication: to overcome opposition.

The public, the Congress, state and local officials, perhaps stockholders are upset about the behavior of industry and the federal government. The criticism includes charges of not seeing or of hiding problems and of not informing, or misinforming, the public and local governments. But when the representatives of opposing views meet, issues are seldom resolved. Almost every group that has been involved in these risk debates is unhappy with their interactions. Technical experts tend to be upset at the disbelief and the mistrust they receive from the public. Non-experts in the public are upset by overly technical presentations and by the condescension with which they are often treated by experts. Environmentalists get upset at being required by the government to make their arguments using the language of science rather than that of values. Most everyone has concluded that the country needs better communications about risk.

The relations between competing interests seem to have broken down. Many technologists and large numbers of government and industry officials, believe risk communication is the problem. They believe government and industry have failed to communicate to the public the facts or the justification for the agency's or the industry's positions. They also believe risk communication is the solution, that effective risk communication will resolve the public's con-

cerns. Thus, risk communication is the problem and also the solution. We concluded that both positions are invalid. They are harmful to agencies, the industry, and the public and are based on misconceptions.

MISCONCEPTIONS

The first misconception is that facts will resolve disputes. That belief is central to those trained in technology, science, and medicine. Those people are trained to develop facts, analyze them carefully, and reach conclusions based on those facts. When public disputes arise over risk management, heads of technical agencies and industry officials often ask their staffs to get more facts to buttress the official position and to help the public understand.

The problem with this approach is that it assumes that the public shares the same values as the agency or industry and that the disagreement between the public and the agency or industry is over the facts. That is often incorrect. Many of the disputes are about values. Technologists will stress quantification. The public is often more interested in qualification.

Conflict can be over the distribution of risks and benefits. It can stem from different, but not explicit, goals. Most people believe they have a right not to be subjected by others to unreasonable risks. In a conflict, the public may be saying that it is not enough to determine whether an activity makes people better or worse off, but that it is also important to address whether it is fair, whether the agency has the right to affect other people.

The public usually believes that it is unfair to impose costs involuntarily, and risk is a cost. It is unfair to impose costs on those who oppose and avoid using the product that is related to the hazard, and the public often believes it is unfair to impose disproportionately large burdens on those who benefit little. We see these views in local objections to sites to dispose of hazardous waste that is generated in other locales. For example, the conflict on nuclear waste disposal sites. We see these views in objections to siting plants which generate electricity to be used far from the areas at risk from the plants.

When acid rain was thought to be a natural result of the way the earth system operated, little could be done about it. When warmer summers were thought to be the result of inexorable processes, such as planetary wobble, little thought was given to affecting the future summers. But technology has many results. Some of those results are to make it possible to measure the presence of increasingly small amounts of materials in the environment. What was once thought to be pure water and merely dirty air is now found to be filled with measurable amounts of toxic or carcinogenic substances. Other technological advances en-

able tracing back to the sources of those materials or correlating environmental affects with anthropogenic activity.

Increasingly, technical choices are seen as moral choices. Technical information is important. Clearly, a report from the National Academy of Sciences is not going to say that technical information is unimportant. It is clearly important, and technical understanding should be more widespread. Certainly, technical illiteracy is a growing affliction in the U.S. But we should understand that technical choices are value laden and many disagreements are really about the underlying value choices. The public and an agency often disagree about which harms are most worth avoiding and which benefits are most worth seeking.

The second misconception is that risk comparisons will provide an answer to what is an acceptable level of risk. However, comparison with other risks cannot itself establish acceptability. Comparisons are not helpful when the risks are perceived as being qualitatively different in such characteristics as "dread" and "unknown." Technologists tend to scoff at such characteristics, but the public uses them.

Comparisons are often given in terms of fatalities from a variety of causes. Peoples' ratings of risks, however, are functions not only of the average annual fatalities, but also of attributes and benefits associated with the risks. For most people, all deaths and injuries are not equal. Simply giving the numbers of deaths ignores psychological and actuarial differences. Reduction in life expectancy will value the young over the old. Counting fatalities gives no weight to youth and treats immediate deaths as equivalent to those after long and painful illnesses. Counting the numbers of deaths treats those due to voluntary actions equivalent to those due to involuntary actions and treats those who benefit from the death-causing activity equal to those who do not. These issues must be understood to do a useful risk comparison.

Another common pitfall is that risk comparisons can give the appearance that the risk communicator is using the comparisons to trivialize the risk in question. Risk comparisons often use a risk ladder, which is in the shape of a vertical list of risks. As you go up or go down the column or the ladder, you see various activities listed. The risk ladder gives a visual as well as a numerical comparison. Many risk ladders have been constructed to lead the observer to the conclusion that the risk in controversy is insignificant in comparison to risks regularly accepted. Unfortunately, and the public perceives this, often the ladder is constructed by those who have a strong incentive to convince the public to accept the risk at issue. Therefore, frequently the ladders do not compare strictly similar risks.

A third misconception is that the public wants simple answers. Assuming simple answers will resolve the public

disputes represents little progress beyond a discredited argument of, "Trust me, I know best." It is a mistake to treat the public as homogeneous and therefore one simple answer will address all the issues. Many times risk managers will use anecdotal information to make confident statements about public opinion and what the public wants and uses. But the level of interest, and therefore the level of desire for information, really varies. We agree that most people have difficulty understanding low probabilities. That is a problem with which we in the nuclear area have constantly wrestled. Talking about probabilities is difficult. Most people categorize events as either possible or effectively impossible.

The public sometimes does want yes or no answers. You may recall several years ago the public simply wanted to know is it safe to eat the grapes. A yes or no answer was requested. In general, the public wants much more, including proof that the source of the information has listened to the public's concerns and is accurately presenting all of the known information, including the uncertainties. So long as the sources of the messages have an interest in the outcomes of the decision, the recipients will want to know, "How is that message developed? How did you get that information? Have you really pulled all the information together? Are we getting all that you know?"

A fourth misconception is that journalists and the media in general are always a major part of the problem. This is a common misconception by many people in technology. The Committee concluded journalists are intermediaries. They transmit information to the public. Most technologists have worked with transmission circuits and understand the concept that when you work with a coupling device, you have to live with its characteristics, impedance matching and so forth. You have to make sure that when you are transmitting into the circuit, that you understand how that circuit works.

However, all too often, technologists do not believe it worthwhile to make any effort to work with the media, to listen carefully to a journalist's questions, and to try to answer in a way that the public will get accurate and important information. It also seems not to have occurred to many technologists and government officials, that when a journalist asks questions about issues other than the ones that you want to discuss, it could be that the journalist understands what the public wants to know. We should listen carefully what questions are asked.

Journalists are not educators. They are after news. They often are not technically trained, but are trying to obtain the best information quickly on those issues that are newsworthy, newsworthy in either their or their editor's views. Most journalists do care about accuracy and objectivity, but often their operational definition of objectivity is balance, and they will try for balance. But frequently the way

they do that is to get the two extreme points of view and conclude they have now got balance.

I have found some journalists who do not report accurately and some who are only interested in a catchy quote to assist them to get a byline in a story. But they are the exception. The norm is an overworked person trying hard to understand material outside his or her area of education; a person who has very little time to read up on the subject because it is only one of many they have to cover; a person who, unless they have special access due to friendship or themselves being well known, has great difficulty finding people to talk to who know about the issue; and a person who knows that many of the sources that are ready to provide information are biased and want to give only a one-sided picture. But the journalist who is pressed for time has to have something ready for the air, the page, or the screen.

We want the journalist to understand our complex world, the limitations of our work, the uncertainties, the subtleties of our assumptions, the limitations of our models and our data. The Committee concluded that we should try to understand the complexities of the journalist's world.

Finally, the fifth misconception is that good risk communication always will help resolve disputes. In this imperfect world, good risk communication will clarify the issues, but it will not necessarily resolve them.

SUCCESSFUL RISK COMMUNICATION

Risk communication often means that a technical expert develops a message addressed to non-experts to enlighten or persuade an uninformed and passive public. If you use that definition, successful risk communication is that which convinces the recipient to agree with you. But risk communication is more than one way transmission of information. It is more than transmission of expert knowledge to the uninformed. Expert knowledge is necessary, but it is not sufficient.

Our report endorses a concept stated by Thomas Jefferson, who understood the basic tenets of our democratic system reasonably well. He wrote, "I know of no safe repository of the ultimate powers of society but the people themselves, and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them but to inform their discretion."

We concluded that risk communication is successful if it raises the level of understanding. If risk communication raises the level of understanding, but the dispute is really about values and not facts, this good risk communication will in many cases solidify the opposition, because they will now be confident that they understand the facts. If the heart of the issue is that their values are different than the agency's

values, risk communication is not going to resolve the dispute, but will solidify it. However, in the democratic society in which we live, we concluded that is the right approach.

Frequently, industry and government view risk communication as one way: from the officials to the public. The decision maker generates the information, gives it to a public relations person, who then transmits the information. It is received by the media, the public, and other organizations. We see this as a faulty model. Our definition requires a two-way interchange of information. It requires listening to what the public or the local governments are concerned about. The government or industry representatives must be able to transmit back what the public is concerned about and what are the state and local government people concerned about. This model of effective risk communication is critical. In the absence of that, one is not going to be able to resolve many of the disputes or even move them forward.

We saw risk communication as an iterative process. We defined success: "We consider risk communication in a setting of public debate successful to the extent that it raises the level of understanding of relevant issues or actions among the affected and interested parties and those involved are satisfied that they are adequately informed within the limits of available knowledge."

This is a challenge. It is a challenge to the agency staff, to make sure that decision makers get complete information. "Risk communication is successful only if it adequately informs the decision maker." We emphasized that a successful risk communication process is different from a risk message that is unsuccessful from the standpoint of its source. It is the same kind of fault if an agency is not transmitting the information to the public that they need to make their decisions. This is true both in the societal sense and an individual sense. We concluded risk communication in the setting of personal choice is successful only if it adequately informs the individual for making a choice among alternatives.

These are difficult tasks. Organizations which communicate about risks should ensure there is an effective dialogue with the potentially affected public. This dialogue must begin early, well before the final decision is made. Risk communication should use language and concepts the recipients already understand. Agencies must put effort into trying to recognize not only what the local concerns are, but what is the level of understanding. Agency communication has to be done on that basis. It should exhibit a spirit of open exchange; that is why "early" is important. A communicator has to be a listener. Rather than this one-way transfer of information, risk communication becomes two-way.

This places a greater burden on the communicator. If the presenter of information to the public only has to pres-

ent information, then that person has to understand what your message is. The person does not have to understand the content or the issues because they do not answer questions. But in the two-way dialogue, the presenter has to be receptive to questions. The public must conclude the person who is in front of them representing the agency understands the question. If the agency spokesperson does not understand, it is very easy for a sharp public interest representative, or a sharp reporter to ask questions that clearly will show this ignorance. That will discredit the message and will antagonize the public. The public will get the impression, it might even be a right impression, that the agency really does not care what the public thinks. If the agency sends someone out to talk to the public who cannot demonstrate he or she understands what the public is talking about, then the public recognizes that person is unlikely to be able to go back to the agency and represent the public's views. The two-way process requires educated and sensitive people.

Credibility is at stake. Credibility is easily lost. It is almost impossible to recover by an agency, or by the individual, who loses it. One way to maintain credibility is to be on the alert to warped messages. When a government organization has been proven to lie, it is not surprising that people do not trust the agency. Even the slightest indication of less than complete candor or honesty will probably lead many people to reject whatever position the agency takes. We must recognize that different standards are applied to government agencies than to non-government agencies. We may get upset that certain groups with which we deal will present information in a way that we think is misleading, and we wonder why doesn't the public get as upset about them as they do about our agency. One reason is federal agencies are viewed as representatives of the public and are held to a higher standard.

The toughest problem our Committee wrestled with was what standard should the government use in moving beyond informing. We concluded it was always appropriate for the government to inform, and never appropriate for the government to lie. But there is a large range in between, persuasion, for example. Is it legitimate for the government to persuade? A communicator can massage the message. You can frame the message: present certain information first, downplay other information. You can highlight some facts or some issues and just leave out others. All are marketing techniques used in advertising. Is it appropriate for the government to use them?

We could not reach a consensus view on, in the legal term, any bright line that is going to be able to separate the techniques. We did conclude that it is always appropriate to inform and that persuasion should be legitimated by the democratic process. For example, when the Health and Human Services Department tries to convince the public

not to smoke, that is legitimate because the Congress has approved the HHS action. If an agency wants to do more than inform, then the federal agency should have that action legitimated by the democratic process.

I recently spoke to people at the Food and Drug Administration. This was a very hard concept to get across. Their argument was, "We know what is best for the public. We're interested in the public health. We know what they ought to be doing." The Committee disagreed that is the role of a federal agency. A federal agency's role is to get out the best information as possible to inform the public. But shifting over to trying to persuade the public what to do ought to be legitimated by the political process, with all its weaknesses.

Many of you involved in technological issues, particularly program managers, question whether the committee's recommendations would be effective. In particular, you may question whether there are any success cases. Unfortunately, we found few. We do give one example in the report of the siting of a hazardous waste facility in the U.S. Southeast. Failures are far easier to find.

A recent study done of a campaign in Taiwan, in which the Taiwanese nuclear power company attempted to use extensive public discussion to change the negative attitudes of the public, demonstrates several of our report's findings. It demonstrates the conclusion that explaining the facts clearly does not necessarily resolve the dispute. In a recent paper, an analyst of the results said about the process: "... it appears to have increased the typical respondent's perceptions of the risk from nuclear power plants and therefore has the potential for further reducing support of the plant over time." ("Risk Communication and Attitude Change: Taiwan's National Debate Over Nuclear Power", J.T. Liu and V.K. Smith, *Journal of Risk and Uncertainty*, Volume III, 340)(1990).

A former state official, who had been heavily involved in many risk debates, recently wrote me commenting upon the report and said: "... An issue I think should have been addressed is how individuals' personal agendas affect how they address risk communication. Proponents and opponents take actions and make statements that are influenced by their personal ambitions and desires. The involved bureaucrat (government or corporate) does not want to draw unfavorable attention or be blamed for problems that could diminish chances for promotion or even survival. The environmentalist or "anti" wants to please the constituency, i.e., tell his or her followers what they want to hear. These personal agendas, particularly those of individuals belonging to organizations proposing a controversial project or action, can be significantly different from their employer's goals." This official also noted "it is often easier to know what to do than to pay for it."

I cannot say that following our recommendations will resolve risk disputes. We stressed repeatedly that in a democratic society the wishes of the federal government should not override the wishes of the public, even if the public is thought to be uninformed. Therein lies the wisdom of Jefferson's policy: one must work harder on information.

Let me summarize. Many disputes are about values. Effective risk communication is a two way process. Risk

communication is successful based upon adequate information. It is not successful when you convince the people to agree with you. Therefore, if you have a good risk communication system, it is not always going to reduce the conflict. When is it allowable for a government official or agency to persuade or worse? Our conclusion was: almost never. Finally, credibility is easily lost and so honesty really is the best policy.