

RISK COMM

more than facts

The IAEA Manual for *First Responders to a Radiological Emergency* states “All serious nuclear and radiological emergencies have resulted in the public taking some actions that were inappropriate or unwarranted, and resulted in significant adverse psychological and economic effects. These have been the most severe consequences of many radiological emergencies. These effects have occurred even at emergencies with few or no radiological consequences and resulted primarily because the public was not provided with understandable and consistent information from official sources.”

As dramatic as this statement is, it does not go far enough. Lack of effective communication about radiological risk can cause physical harm as well. Chernobyl prompted unnecessary abortions. In response to the incident in Goiânia, thousands flooded medical facilities asking to be examined, hampering the ability of the medical system to care for the truly sick. Ongoing worry about nuclear radiation, whether after an emergency or just because of general apprehension, is a source of chronic stress, which causes cardiovascular damage, weakens the immune system, contributes to adult onset diabetes, increases the likelihood of clinical depression, and interferes with memory, fertility, and bone growth.

It is therefore incumbent on any agency that manages the risks associated with radiation to recognize that dealing with the becquerels and sieverts is not enough. The risks inherent in how the public responds to the threat of radiation must be taken more seriously. One vital way to address these risks is more effective risk communication as part of overall risk management.

To describe what risk communication is, it is helpful to begin with what it is not. Risk communication

began in the late 1970s with efforts by the nuclear and chemical industries in the United States to counteract widespread public concern about those technologies. It was believed that clear, understandable information was all that was needed to make people see that the risks were lower than many feared. To this day, many still believe risk communication is just a matter of making information understandable. This is particularly true in fields like nuclear technology, strongly influenced by people with scientific and engineering backgrounds.

For decades this approach has failed, and most risk communication experts say it is inadequate. The perception of risk, and the behaviors that result, are a matter of both the facts and our feelings and instincts and personal life circumstances. Communication that offers the facts but fails to account for the affective side of our risk perceptions is simply incomplete.

Risk communication is also commonly thought of as what to say under crisis circumstances. This too is inadequate. While it is certainly true that communication in times of crises is important in managing public response, countless examples have taught that a great deal of the effectiveness of risk communication during a crisis is based on what was done beforehand.

Finally, risk communication is widely thought of as what is said, a matter of which words and messages are delivered. Again, this approach is incomplete. Risk communication is implicit in the actions an agency, industry or company takes. Nowhere could it be more true that “actions speak louder than words” than when people are alert to anything that might threaten their health or survival.

Here, then, is a more complete definition of risk communication:

COMMUNICATION

and feelings

by David Ropeik

*Actions, words, and other interactions that incorporate and **respect** the perceptions of the information recipients, intended to help people make more informed decisions about threats to their health and safety.*

This definition emphasizes that:

- ▀ Risk communication is a matter of what an organization does, not just what it says.
- ▀ Risk communication must account for the affective component in people's perceptions of risk.
- ▀ Risk communication will be more effective if it is thought of as dialogue, not instruction. It will be more successful if the goal is to encourage certain behaviors, not simply to expect that the information recipients will think and do what the communicators want them to.

This approach recognizes findings in the fields of neuroscience and psychology which have established that the perception of risk is a dual process of fact and feeling. We use the information we have and a set of instincts which help us gauge how frightening something feels. Instinctive factors that bear on public concern about radiation include:

- ▀ **Pain and Suffering.** The greater the pain and suffering from a risk, the greater our fear. Radiation is associated with cancer, widely perceived as a particularly painful way to die.
- ▀ **Unknowability.** People are generally more afraid of things they can not detect with their own senses, like ionizing radiation
- ▀ **Is the threat natural or human-made?** A natural risk, like radon, evokes less fear than the same type of ionizing radiation that comes from a human-made source.

▀ **Risk versus Benefit.** The greater the benefit, the less we fear the risk. Many people who willingly subject themselves to medical radiation still fear nuclear waste.

▀ **Choice.** A risk taken voluntarily, such as when communities offer to host a waste disposal facility or nuclear power plant, is less frightening than the same risk if it is imposed, as the people in Nevada in the U.S.A. feel about Yucca Mountain.

▀ **Control.** The more we feel we can affect events as they occur, the less afraid we will be. (This is not a matter of whether to engage in the risk voluntarily in the first place, but how much actual control we feel over what's happening to us.) Airborne radiation from a radiological dispersal device or nuclear plant accident feels like something we can't do anything about.

▀ **Is the risk Catastrophic or Chronic?** Risks that threaten large numbers at one time evoke more fear than statistically greater causes of injury or death where the victims are spread out geographically and temporally. Images of Hiroshima and Nagasaki and Chernobyl associate safety-related events at nuclear power plants as potentially catastrophic.

▀ **Trust.** We are more afraid when we don't trust the agencies or officials supposed to protect us, or the industries creating the risk. Do we trust their competence? Their honesty? Their motives? Incompetent performance, keeping secrets, and inconsistent information are trust-destroying hallmarks of the way officials have behaved in many nuclear and radiological events.

Consider this example, irradiating food to make it safer. In many places where this process has been approved by the government, it is not widely used because of industry concerns about public appre-

hension. Yet studies have found that effective risk communication can increase consumer acceptance of food irradiation, which directly improves public health.

The risk communication offered to prospective consumers in these studies went beyond clear, understandable language. It included a discussion of both risks and benefits. The communications acknowledged people's apprehensions about radiation, rather than dismissing them by only offering information about how irradiating food poses no risk, or just talking about the benefits. It asked people to say what they would choose, including offering a policy to require labeling to identify irradiated products.

Risk communication is a tool for managing those risks, and should be given much greater emphasis at the most senior levels of any organization concerned with the peaceful applications of nuclear science.


In short, clear and understandable messages were important, but they were not enough. Clear and understandable information is part of any communication. Risk communication also must account for people's affective perceptions, and demonstrate respect for those perceptions in actions as well as words (the policy of labeling).

These same concepts can be applied to many risk communication challenges connected with nuclear issues. Here are some specific suggestions:

- ❶ Nations interested in starting up a nuclear power programme need to:
 - openly acknowledge risks as well as discuss benefits like energy independence from a low-carbon source, and economic growth.
 - establish processes that give people choice, particularly about siting.
 - offer clear, understandable information via sources who are trusted.
 - establish mechanisms for on-going public input, or for answering questions from the public, to create a true dialogue.
- ❷ Responders to emergencies — including events perceived as emergencies by the public, regardless of where they might rank on the INES scale — need to:

- give people a sense of control by telling them what they can do, e.g. shelter-in-place, evacuate, don't go anywhere, seek medical examination, take iodine pills.
- communicate constantly.
- honestly acknowledge uncertainty when it exists.
- avoid keeping secrets (though this is difficult in events involving security and law-enforcement).
- highlight the risks and benefits of certain behaviors, e.g. evacuation, coming to contaminated areas to rescue loved ones, coming to medical facilities depending on likelihood of exposure.
- ❸ Officials responsible for long term storage of nuclear waste should:
 - respect public concerns.
 - establish processes giving people choice, particularly about siting.
 - provide simple information from trusted sources on the nature of the disposed material, the disposal process and disposal facilities.
 - acknowledge uncertainty about long term disposal.
 - note the benefits of reduced disposal of greenhouse gasses — a form of waste — from fossil fuel use, versus the potential risk from disposal of long-live radionuclides produced by nuclear energy.

The IAEA mission statement says the agency "...promotes the achievement and maintenance of high levels of safety in applications of nuclear energy, as well as the protection of human health and the environment against ionizing radiation."

This focuses only on the physical dangers of radiation. But potential radiological harms extend far beyond the direct impacts of flying bits of atoms. The human perception of radiation risk can itself lead to physical, psychological, social, and economic harm, often in excess of the radiological harm itself. Risk communication is a tool for managing those risks, and should be given much greater emphasis at the most senior levels of any organization concerned with the peaceful applications of nuclear science. 

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