

Appendix I—Perception of Risk

A classic definition of Risk Communication is: **Risk = Probability + Consequence**. In other words, what is the chance of something negative happening and what would be the consequence – health, environmental, financial? Two examples on either end of the scale: ONE: A large asteroid strikes the earth and all living things perish—low probability, high consequence; TWO: I'll catch a common cold in the next 5 years—high probability, lower consequence.

Another definition of risk is: **Risk = Stakeholder Perception of the Risk**. Unfortunately, these two equations usually don't end up with the same result. In risk communication, we are usually dealing with perception of risk not based on a lot of probability and consequence data. Instead, people judge risk less on technical information, but more on experience, including what they hear or read. They judge risk on values and on what they feel is fair. So, we need communication skills to understand what is driving these perceptions and communicate with the stakeholder about our views of the risk based on probability and consequence.

The three key factors to accomplish this are:

- Familiarity
- Control
- Benefits

You usually need at least one of these three factors if you are going to improve perception of risk.

Familiarity

Most of us experience reduced fear or concern as we learn more about something. When people are approaching a stranger on the sidewalk, there is natural tendency to glance quickly as you get within 5 to 15 feet of passing each other. If the person smiles and says hello, that small amount of familiarity reduces any perceived concern.

Familiarity means that the stakeholders have some knowledge or understanding of what you are talking about. That could come from their personal experiences or from previous interactions when you have provided them with information, explanations, or responses to their questions.

So you need to find what they are concerned about, then use the best approach. Tours, pictures, models, maps and videos may be helpful. Of course, continuing dialogue must be part of your plan. Getting them to talk to third parties who have knowledge or experience with the subject matter may be helpful.

If you are using **numbers** to explain facts, and the numbers are small concentrations or probabilities,

e.g., one in a million or one in a billion, find a way to frame that number in a way that is familiar to your stakeholders. For example, if you are explaining a safety or environmental risk of one in a million, explain that number relative to something they are **familiar** with such as 1 inch in 16 miles, 1 minute in 2 years, 1 automobile in 3,000 miles of bumper-to-bumper traffic, or one drop of water in...

Control

This second factor is related to familiarity since, as you provide stakeholders with more information, you are in a sense giving them some **control**.

An example of the impact of control on perception of risk: most people don't usually have a fear of driving their cars from point A to point B. Why? They have the wheel. In fact, surveys have shown that the majority of people think they are better than average drivers even though that is statistically impossible.

Meanwhile, many people have some nervousness about flying even though they usually know that they are safer in a plane than in a car. How can this be? Control. They aren't flying the plane.

Ways to give stakeholders control beyond information is to find ways, if possible, for them to have a say or input into decision making. In many instances, this is accomplished by various steps in a regulatory process, with the National Environmental Policy Act (NEPA) program being a good example. NEPA requires stakeholder involvement early and often when federal actions are likely to cause potential environmental impacts.

Benefits

This aspect of risk communication usually involves tradeoffs in the stakeholder's mind. This can be conscious or subconscious. Many stakeholders can rationalize: "Well, I'm taking a risk, but what I'm getting for it is 'Y'".

Most employees who work in a facility or operation that is considered risky by outsiders do not think it is risky. Why? Both **familiarity** and **benefits are factors**. Another example: some communities have agreed to siting "risky" facilities in their community if tax breaks or more jobs are part of the project.

So, find other ways to highlight real benefits that stakeholders are receiving or find ways to provide benefits that currently do not exist: jobs, community services, volunteerism.

Other related factors regarding Perception of Risk

Risk perception can often be determined by characteristics of the risk itself:

- Risks perceived to be voluntary are more acceptable than risks perceived as imposed.
- Risks perceived to be distributed fairly are more acceptable than risks perceived to be unfairly distributed.

- Risks perceived to be natural, e.g., Mother Nature, are more acceptable than risks perceived to be caused by humans.
- Risks perceived to be statistical are more acceptable than risks perceived to be catastrophic.
- Risks perceived to be generated by a trusted source are more acceptable than risks perceived to be generated by a source that is not trusted.
- Risks perceived to affect adults are more acceptable than risks perceived to affect children or the elderly.

Risk comparisons can be another way to explain factual data. A risk comparison is framing the risk they are concerned about with another risk that they are familiar with and to some degree accept. For example, a chest x-ray once a year versus radiation from the dirt in your installation.

Also, recognize that you can frame numbers differently. For example, a chemical in the air can be expressed as tons/year, pounds/day or parts per million. Use the options available that can best frame the risk for stakeholders.

There is a lot of literature on risk comparisons and the literature indicates that many risk comparisons do not work, particularly when you relate a risk to something the stakeholders voluntarily choose to do. For example, telling someone that a risk they are concerned about is less risky than their personal risk of smoking, diet, exercising, wearing seatbelts will usually not work. In fact, it may make them angry thus leading you out of the arena of discussion of facts into the arena of an emotional discussion. Even though your risk comparison facts are correct, their attitude may be one of, "I choose to lead the life I do, but I have no **control** over what you impose on me." In any case, before you decide to use a risk comparison, test it with one, two or three key stakeholders.

Here are some examples of different types of risk comparisons.

a. Comparisons of the same risk at two different times.

"The risk from that is 50% less than it was before we installed the new facilities, equipment, etc."

"With our cleanup plan by this time next year the risk will be cut in half."

b. Comparisons with a standard.

"Exposure of workers to air toxic 'x' is well below the level that the Occupational Safety and Health Administration considers safe."

c. Comparisons of the risk of doing something versus not doing it.

"If we buy the newest most advanced equipment, the risk will be 'x' whereas if we don't buy it, the risk will be 'y'."

d. Comparisons of alternative solutions to the same problem.

“The risk associated with the incinerating of our waste is ‘x’. The risk associated with using a landfill is ‘y’.”

e. Comparisons of risk with cost.

“To reduce the risk by 50% would cost ‘y’ dollars.”

f. Comparisons with other specific causes of the same disease, illness, or injury.

“Air toxic ‘x’ produces far less lung cancer than exposure to natural background levels of geological radon.”

Finally, if you are explaining **cost/benefit ratios**, you must do so accurately, even though doing so can always open up the attitude of: “There is no amount of money that should not be spent to eliminate risk to my...” This is usually a, “No risk is acceptable” attitude.

You need to know how you will respond to this type of situation and recognize that they may not like your response, but at least know you were honest.