Risk Communication

Description

Risk communication is a dialogue–an interactive process of information exchange–among the Site Team and the community that discusses the nature of risk and other concerns. This dialogue should be a genuine and sincere conversation that aims to identify mutual solutions and respond to public concerns.

Required Activity?

No. The specific risk communication techniques contained in this tool are suggestions. However, the general process of risk communication is implied by the National Contingency Plan (NCP). For removal actions, the NCP [at 40 CFR § 300.415 (n)(1)] requires that a spokesperson be designated by the lead agency to inform the community of actions taken, respond to inquiries, and provide information concerning the release (i.e., the contamination). For remedial actions, the NCP [at 40 CFR § 300.430(c)(2)(C)] requires that the lead agency provide appropriate opportunities for the community to learn about the release and the affected area (a.k.a., "the site"). Explaining the risk assessment process is an essential component of risk communication and involving communities in the Superfund risk assessment process, as outlined in Risk Assessment Guidance for Superfund (RAGS), Volume 1 - Human Health Evaluation Manual Supplement to Part A: Community Involvement in Superfund Risk Assessments.

Making It Work

Communities are entitled to make decisions about issues that directly affect them, and EPA is committed to promoting participation in the decision-making process by people whose lives are affected by Superfund sites. Effectively communicating information on site-related hazards and risks is a multi-step process that involves:

- Identifying and understanding your audience.
- Defining clear messages that provide the information you want to convey with an understanding of, and respect for, the audience's concerns and perceptions.
- Selecting appropriate communication methods to deliver those messages.

Keep in mind that even an effective risk communication process does not guarantee consensus on the appropriate cleanup approach among all affected parties. **The goal of risk communication is to increase the community's involvement in the cleanup process, the Agency's awareness of the community's perception of site-related risks, and the public's understanding of how the Agency uses risk assessment in decision-making at a site.** All members of the Site Team, including On-Scene Coordinators; Remedial Project Managers; Risk Assessors; Community Involvement Coordinators; state, tribal, and local government partners; and staff from the Agency for Toxic Substances and Disease Registry should be involved in planning and implementing risk communication.

Why is Risk Communication Important?

Risk communication provides an opportunity for the Agency and the community to exchange information, facilitates community participation in the decision-making process, helps the Site Team understand and appreciate the community's perception of risk, and helps establish mutual trust and a productive relationship between EPA and the community.

Community members often have important information that can help improve the accuracy of the site characterization and the baseline human health risk assessment. Local community knowledge can help the site team:

- Better understand the site's history and the type and extent of contamination.
- More accurately characterize exposure pathways due to human behavior.
- Identify unique ways in which the community uses local resources, such as consuming high

quantities of one type of food (e.g., fish from a contaminated river) or incorporating plants grown near the contaminated site into food, medicinal remedies, or traditional practices.
- Develop appropriate exposure scenarios and cleanup approaches by identifying suitable future land uses.
- Become aware of whether certain segments of the community may have a disproportionate burden of exposure or environmental health effects due to race/ethnicity, national origin, or income compared to other nearby communities (i.e., issues related to environmental justice).

When is Risk Communication Used?

Effective risk communication begins early in the Superfund cleanup process. The remedial investigation stage is a good place to initiate risk communication. The community needs to understand how the Agency arrives at the determination of risk, what information is used, how the information is used, which uncertainties are inherent in the process, and how uncertainties are addressed. Members of the Site Team should be prepared to discuss site-related risks at any point in the Superfund cleanup process, such as:

- During the site assessment stage, when residents may be asked to allow EPA to sample on their property.
- During the remedy selection stage, when the Site Team works to help people understand the technical aspects of the cleanup approaches.
- During the construction completion stage, when the discussion may focus on the future of the site and returning it to productive use.

All Site Team members should familiarize themselves with the Superfund human health risk assessment process[1] and how it is used in site decision-making regarding risk management. Knowing these processes will help you answer technical questions from the public more effectively. When discussing site-related risks with the community, it is important for the Site Team to present consistent key risk messages to avoid confusion and maintain credibility and trust with the community.

1 EPA. 2000. Presenter's Manual for: Superfund Risk Assessment and How You Can Help, EPA/540/R-99/013. Found at: http://www.epa.gov/oswer/riskassessment/pdf/vdmanual.pdf.

Defining Risk and Risk Perception Factors

Any explanation of the risk around a Superfund site must be coupled with a recognition of the issues that are driving the public's perception of risk at the site. **Effective risk communication is based on an understanding that risk means different things to different people.** To a risk assessor, risk might be a quantitative probability that damage to life, health, and/or the environment will occur as a result of a given hazard[2] (i.e., the "probability of a future loss"[3]). However, the general public does not judge risk based on numbers or statistics alone. Instead, risk is both a real and a *perceived* threat of an event occurring. It also is a judgment people make about the likelihood, severity, or importance of a threatening event or condition.[4]

Researchers have identified a set of risk perception factors that contribute to the way the public perceives a risk, which include: voluntariness, controllability, familiarity, fairness, catastrophic potential, reversibility, equity, and effects on children (Attachment 1 contains a comprehensive list of qualitative factors affecting risk perception). For example, a situation that seems to put children specifically at risk will be perceived as having a higher risk than a situation that does not. Similarly, risks arising from a situation that is not familiar to the community, such as leaching of contaminants into groundwater, will be perceived to be higher than risks arising from a familiar situation (e.g., people in mining communities who have lived next to slag piles their entire lives). People use their instincts and life experience to gauge how risky a situation is.[5]

How to Do Effective Risk Communication

Using effective strategies to deliver important risk-communication messages will convey the information the Site Team needs to communicate

2 EPA. 2009. "Risk." Terms of Environment: Glossary, Abbreviations, and Acronyms.
3 Byrd, D. and C. Cothern. 2000. Introduction to Risk Analysis: a Systematic Approach to Science-Based Decision Making. Government Institutes, Rockville, Maryland, USA.
4 EPA. 2007. Risk Communication in Action: The Tools of Message Mapping. U.S. Environmental Protection Agency. EPA-625-R-06-012.
5 From David Ropeik, Risk Communication: More than Facts and Feelings. IAEA Bulletin, Vol. 50-1, International Atomic Energy Association. Found at: http://www.iaea.org/Publications/Magazines/Bulletin/Bull501/Risk_Communication.html.

while addressing the community's needs, concerns, and site-related expectations. Before you begin the risk communication process, consider the type of communication environment you are working in and adjust accordingly. There are essentially four types of communication environments:

Concern ↑		
	High Concern Low Trust (1)	High Concern High Trust (2)
	Low Concern Low Trust (3)	Low Concern High Trust (4)

Trust →

High concern and low trust environments (1) in particular create barriers that can completely impede the flow of information during communication. Gaining the community's trust and building a sense of confidence in the Site Team is of utmost importance. Trust and credibility can be built through communication that considers the audience and the community's perception of risk, provides clear and concise messages that carry positive information, and uses an effective delivery mechanism (as described in the following sections).

The key to effective risk communication is preparation. Once risk perception factors have been identified, use the following three steps to help you communicate risk to the community: (1) identify the audience and their questions/concerns; (2) develop risk messages; (3) deliver your messages.

Step 1 - Identify the Audience and their Questions/Concerns

Risk communication is more effective if the type, content, and distribution of outreach products are specifically tailored to the target audience. The community's response to the messages you convey can be driven by risk perception factors or other site-specific concerns or fears, such as their health and the health of their family, property values, liability, and damage to the environment.

As you would do when developing a *Communication Strategy*, start by looking at a wide range of interested parties. The target audience may include the general public, landowners, local businesses, schools, developers, activist groups, community groups, or the *Media*. To help identify your audience, ask yourself questions such as:

- Who is the current landowner?
- Have there been recent instances of public concern about other local issues? If so, then

As you interact with the community and prepare your risk communication strategy for the site, remember the *Seven Cardinal Rules of Risk Communication*[1]:

1. **Accept and involve the public as a legitimate partner** through early involvement of the community and all other parties that have an interest in the issue.
2. **Plan carefully and evaluate your efforts.** Successful risk communication planning involves having clear objectives, being attentive to the needs and interests of various groups, training staff in communication skills, rehearsing and testing your message, and assessing efforts and lessons learned.
3. **Listen to the public's specific concerns** by taking the time to find out what people know, think, or want, and recognizing their feelings.
4. **Be honest, frank, and open.** Try to share more information with the community, not less; otherwise, people may think you are hiding something.
5. **Coordinate and collaborate with other credible sources.** Take the time to coordinate with other organizations and credible sources and jointly communicate the issue.
6. **Meet the needs of the media** by being open with and accessible to reporters. Establish long-term relationships of trust with specific editors and reporters.
7. **Speak clearly and with compassion.** Communicate on a personal level by using vivid, concrete images or examples and anecdotes that make technical risk data come alive. Acknowledge and respond with the words and emotions that people express–anxiety, fear, anger, outrage, and helplessness.

1 Covello, V. and F. Allen. 1988. Seven Cardinal Rules of Risk Communication. U.S. Environmental Protection Agency, Office of Policy Analysis, Washington, D.C.

local action groups or local media may be the existing stakeholders.
- Are any schools, colleges, or nursery facilities located in the vicinity?
- Are healthcare facilities (e.g., doctor offices, urgent care centers, hospitals) located in the vicinity?
- Any there religious/sacred buildings or tribal sacred/cultural landmarks nearby?
- What are the appropriate regulatory bodies for both human health and environmental considerations?

Review the site's *Community Involvement Plan* (CIP) to better understand the characteristics of the community, as well as the community's needs, concerns, and site-related expectations. If a CIP is not available or out of date, developing a new *Community Profile* that describes the affected community is a good idea.

After identifying your audience, prepare a list of key questions and concerns for each major group of stakeholders (See *Attachment 2, Frequently Asked Questions at Superfund, Environmental Cleanup, and Hazardous Waste Sites*). These questions generally fall into three broad categories:

- Overarching questions that are broad in topic and focus on the general status of a situation.
- Informational questions that ask about a specific aspect of the situation.
- Challenging questions that tend to be hostile or tense in tone.

Analyze the answers to these questions to identify the underlying concern.

Step 2 - Develop Risk Messages

After identifying your potential audiences, define the key risk messages you want to convey. Use a message map to help you. A message map is a detailed description of hierarchically organized answers to anticipated questions and concerns from stakeholders in the event of a disaster, crisis, or alarming situation. Creating a message map allows you to think through tough questions and deliver consistent messages for multiple stakeholders and communication outlets. A message map should bring focus and clarity to potentially high-stress, high-concern, or emotionally charged situations.

A message map has three main components, or tiers:

- **Tier 1** identifies the audience and the question being addressed.
- **Tier 2** consists of the key messages pertaining to the situation. Consider the information that you want to convey and the main information your community wants and needs to know. Identify **three** key messages to deliver to your audience, keeping each key message to nine words or less. Your three key messages together should be about 27 words.
- **Tier 3** provides supporting information for the three key messages. Like your key messages, supporting information should consist of details the community wants and needs to know about the situation. Supporting information should address the audience's perception of risk. For example, you may want to acknowledge that the situation is unfamiliar to the community or that the situation may specifically pose risks to children.

Use the following template to help you develop your message map (*Attachment 3* also contains a blank message map that can be used as a template). Note that message maps are a way to guide you in delivering risk information to the public. They are not meant to be read verbatim. Their purpose is to provide consistency throughout all venues of communication between the Site Team and the public, thereby increasing the credibility of the Agency and building trust in the community.

Message Map Template

QUESTION
Audience/Stakeholder: "Core" Concern:
Key Message #1 (most important) ▪ Supporting information ▪ Supporting information ▪ Supporting information
Key Message #2 ▪ Supporting information ▪ Supporting information ▪ Supporting information
Key Message #3 ▪ Supporting information ▪ Supporting information ▪ Supporting information

Step 3 - Deliver Your Messages

Effectively deliver the risk message by selecting appropriate communication methods, addressing communication barriers, and managing difficult situations. Again, the key is preparation. Use the *Communication Strategies Tool*, which provides a thorough discussion on selecting appropriate communication methods, as well as the site's CIP, which outlines a site-specific communication plan with preferred communication delivery mechanisms.

Risk messages can be delivered via interactive forums such as public meetings, workshops, and one-on-one discussions, as well as through indirect means such as media appearances and publications (e.g., pamphlets, fact sheets, handbooks, etc.). Messages delivered through indirect means must include information about how EPA plans to collect and respond to community feedback, questions, and concerns. Partner with local community or cultural institutions to assist in conveying risks in appropriate cultural and trusted ways (for example, on fish consumption advisories).

Additional Considerations for Explaining Risk

Help the community to interpret risk information and put risk-related data into perspective. This can be accomplished by the following:

Explain the Superfund risk assessment process. This is a critical component of risk communication and is best done early and often. Consider holding a risk assessment workshop to explain the risk assessment process *before* the risk assessment is started. Reviewing the process can help demonstrate that the risk numbers are not derived from a "black box." A 40-minute video–*Superfund Risk Assessment and How You Can Help*–helps explain in plain terms the Superfund human health risk assessment process and how communities can be involved. The video, along with a short 10-minute overview should be available through your Regional Community Involvement Manager. The accompanying *Presenter's Manual* highlights the key messages described in the video and other issues that audiences might raise.

Explain the significance of exposure pathways (i.e., routes of exposure). Frequently, the issue is not whether a dangerous contaminant exists in relatively high quantities, but whether exposure to the contaminant puts people at risk. Help the community understand that for a risk to exist, the following three factors must be present: 1) contamination; 2) pathways for that contaminant to reach surrounding populations; and 3) populations that may be exposed to the contaminant. If any of these factors are missing, little or no risk is present. If all three factors are present, explain the exposure pathways (the course a substance takes from its source to contact with people) as well as the exposure route (means of entry of the substance into the body).

Involve the community in the risk assessment process. A good opportunity for community involvement in the risk assessment process is during the exposure assessment step. Exposure information may be gathered from the public during *Community Interviews* or through a *Workshop*.

Apply indexing or color-coding to explain sampling data. "Indexing" is a data interpretation tool that expresses one or more quantitative measurements as part of a scale, such as "poor" to "excellent." Indexing requires the development of weighting factors where important variables are assigned more weight than less important factors to combine the relevant data into an index scale (*Attachment 4* provides a series of steps that can help in developing an index). Complex data may be difficult to categorize and summarize.

Color coding is a type of indexing that works well with maps, graphs, icons, and other risk communication tools. Appropriate choices of colors (and ranges of colors) can enhance a viewer's understanding. However, keep in mind that some individuals may be color blind. In addition, color printing may not be readily available in all locations. As with indexing, the biggest challenge with color coding is reaching a consensus of where the "green" ends and the "yellow" begins.

Color Coding Example

At the XXX Superfund site, color-coding can help homeowners interpret results of lead screening in their yards and explain EPA's planned course of action for their properties.

RANGE (mg/kg LEAD)	COLOR	GUIDANCE TO HOMEOWNER	NECESSARY ACTIONS
0-399	No Color (Clear)	Below Levels of Concern	No action planned
400-799	Yellow	Homeowners should practice caution when handling soil. Small children (0-7) years of age) should be monitored closely when allowed in the area specifically in regard to putting hands to face. Bare soils should be covered with several inches of clean material and off limits to playing children.	Further evaluation of the area is necessary. Actions to address the area is likely by the remedial program.
800 and Up	Red	Small children (0-7) years of age) should be discouraged from playing in the area. Homeowners should practice caution when handling soil. Bare soil should be covered with at least 3 inches of clean material (mulch for example) or have grass established (or sod applied).	Excavation of the area is pending.

Use visuals to describe complex scientific concepts. Data visualization tools present information primarily through images like maps, icons, and pie charts, rather than through words, enabling you to communicate results to a broader audience. Here are some examples of visuals:

- **Diagrams** can be useful to show exposure pathways of contaminants in a groundwater plume.
- **Maps** can display the current contamination and predicted paths of migration, as well as illustrate "receptors" of the contamination (see the *Maps and Aerial Photographs* tool for more information).
- **Graphs** can be used to show the decrease of contamination over time.
- **Geographic information systems** (GIS), e.g., Google Earth, can be used to display multiple "layers" of information at a Superfund site, such as population demographics, water resources, roads, and other features of the area.
- **3-D data visualization tools** create realistic simulations and display environmental information in a three-dimensional space, which can help the community better understand site conditions, depth of contamination, and other environmental data.

Use risk comparisons effectively and cautiously. Risk comparisons can be an effective strategy to provide context for a situation and help individuals put site-related risks in perspective. However, an inappropriate comparison can have disastrous results for the credibility and efforts of the communicator. Below is a list of some acceptable and unacceptable uses of risk comparisons:

4-3 +1 -3

4 data Rows
Workers
Address
x contact

Acceptable Risk Comparisons	Example
Comparing risk level of the solution to risk from lack of action	Informing the community that if PCBs are allowed to remain in the sediment and fish continue to be exposed to the contaminants, this would make the risks far greater than those that would be incurred by removing the contaminant and disposing of it in a landfill.
Before and after comparisons	The community is concerned about the safety of a remedial or removal action at the site. It is acceptable to tell them that by removing contaminated sediment, the risk of eating fish from the river will be lowered tenfold.
Comparing site contaminant levels to regulatory standard levels for that contaminant *Note: When using this approach, it is important to explain what regulatory standard levels are being used and how they are derived; some contaminants, such as lead, do not have a safe or acceptable level.*	Informing the community that the concentration of copper in their water is half the Agency's Maximum Contaminant Level drinking water standard for the nation.
*No matter how small the risk, never present any level of risk as "acceptable." Community members should make their own determinations about what they consider safe.	
Unacceptable Risk Comparisons	**Example**
Comparing voluntary risks to involuntary risks	Comparing health risks from smoking or driving to health risks from groundwater contamination.
Trivializing risk	Stating that one has a greater chance of developing cancer from a contaminant in peanut butter than from living near a Superfund site.

Tips

- **Earn trust and establish credibility.** A credible person is accurate, keeps promises (and makes sure others do the same), listens to the community, and appreciates their concerns. Trust and credibility are difficult to earn; once lost, they are extremely difficult to regain.
- **Inform the public of Superfund's mandate** to address human health and environmental threats from site-related hazardous waste, rather than achieving zero-risk or to return waste sites to their best use.
- **Develop a risk communication strategy** to plan all risk communication carefully by integrating the risk assessment and management activities with other community involvement activities.
- **Make use of outside experts**, but continue to serve as the lead contact person for the communication of technical risk information.
- **Coordinate all communication**, including risk communication, with the Site Team. Do not act alone.
- **Select your messages with care.** Problems often arise when either too much or too little information is provided.
- **Be transparent.** Do not withhold information unless there is a plausible reason for doing so and that reason is communicated to the community.
- **React honestly and admit to mistakes and past problems.** Let the community know that EPA is trying to do better, and acknowledge how difficult it is for experts to remember that most people need more background information to understand some concepts.
- **Be patient and compassionate.** The Site Team needs to empathize with the community. Remember, every new audience is hearing this information for the first time and many people must hear information more than once. Show the audience that you are listening to their position and concerns (See *Attachment 5* for a list of helpful phrases in non-judgmental language). Remember that people often do not care what you know until they know how much you care.
- **Return telephone calls or e-mails within 24 hours.** If the answer to a question is not ready, explain what is being done to investigate and when an answer will be available.
- **Use the Seven Cardinal Rules of Risk Communication as a guide.**

Related Tools

- Communication Strategies
- Community Groups
- Community Interviews
- Community Involvement Plans
- Community Profile
- Computer-Based Resources
- Cross-Cultural Communication
- Exhibits
- Fact Sheets
- Focus Groups
- Maps and Aerial Photographs
- Media
- Presentations
- Public Availabilities/Poster Sessions
- Public Meetings
- Public Notices
- Technical Assistance For Communities
- Telephone
- Translation Services
- Videos
- Workshops

Other Sources of Information

1. *U.S. EPA Community Involvement Handbook* http://www.epa.gov/superfund/community/cag/pdfs/ci_handbook.pdf
2. *U.S. EPA Community Involvement Toolkit* http://www.epa.gov/superfund/community/toolkit.htm
3. *Program Evaluation: An Internal Review of Procedures for Community Involvement in Superfund Risk Assessment.* U.S. EPA, Office of Solid Waste and Emergency Response. http://www.epa.gov/evaluate/pdf/waste/internal-review-procedures-community-involvement-superfund-risk-assessments.pdf
4. *Presenter's Manual for: "Superfund Risk Assessment and How You Can Help."* U.S. EPA, Office of Solid Waste and Emergency Response. http://www.epa.gov/oswer/riskassessment/pdf/vdmanual.pdf.
5. *Risk Communication in Action: Environmental Case Studies.* U.S. EPA, Office of Research and Development. EPA/625/R-02/011: http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=30004IX9.txt
6. *Risk Communication in Action: The Tools for Message Mapping.* U.S. EPA, Office of Research and Development. EPA/625/R-06/012: http://www.epa.gov/nrmrl/pubs/625r06012.html
7. *77 Questions Commonly Asked by Journalists During an Emergency or Crisis.* From Covello, V.T. "Keeping Your Head in a Crisis: Responding to Communication Challenges Posted by Bioterrorism and Emerging Infectious Diseases." http://riskcomm.org/new/wp-content/uploads/2012/03/Questions-Commonly-Asked-by-Journalists-Buring-an-Emerency-Crisis.doc

Attachments

- Attachment 1: Qualitative Factors Affecting Risk Perception
- Attachment 2: Frequently Asked Questions at Superfund, Environmental Cleanup, and Hazardous Waste Sites
- Attachment 3: Blank Message Map; Example Message Map
- Attachment 4: The Four Steps to Indexing
- Attachment 5: Non-Judgmental Language – Helpful Phrases
- Attachment 6: Useful Terms and Definitions for Explaining Risk