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## **OVERVIEW:**

This special issue of **Risk Analysis: An International Journal** focuses on the challenges and opportunities of communicating during normal conditions and especially, during risk-related incidents. This issue provides DOE administrators, managers, contractors, and others with some basic information needed to communicate to a range of stakeholders, from governmental agency people to Tribal governments and members, regulators, Citizens Advisory Boards, public groups, and individuals who are interested and affected. The issue features 31 research articles and perspectives. To the best of our knowledge unique feature is 19 essays that capture the recommendations of experts who have communicated with the public, elected officials, and the media about a wide range of risk-related topics, such as nuclear power and waste, climate change, cancer clusters, COVID-19 and many other challenging risk-related topics. It also features papers by academics focusing on the theoretical and practical aspects of risk communication, such as survey methodology, social norms, social media, and fact checking.

## **BASIC BACKGROUND INFORMATION FOR COMMUNICATION**

The first papers dealt with risk communication from the viewpoint of the communication (M. Greenberg) and the second paper dealt with risk communication from the viewpoint of the individuals and communities who are part of the communication process (J. Burger). These papers were followed by information needed to communicate about risk to human health (M. Harkema, M. Mayer, S. Krahn) and ecological resources (J. Burger). Finally, S. Krahn focuses on the evolution of a regulatory structure over 50 years, including the shifts in stakeholder involvement and risk communication within and among DOE and other federal agencies, and eventually the public.

## **19 PRACTITIONERS AT THE FRONT LINE OF RISK COMMUNICATION**

The people interviewed for the second section of the special issue have varied experiences. The range and diversity of people interviewed provides relevant examples for technical scientists, managers, and communicators alike. Some of the interviewees are academically trained communicators; some are trained in media and communications; and others are regulators, health professionals, risk analysts, environmental scientists, ecologists, and other trained experts. Many came to communication because of their technical expertise, bureaucratic position, commitment to a particular environmental issue, or a combination of these. Some who regularly communicate have a richness of experience and yet may never write about it. We chose to interview a broad selection of individuals, partly to illustrate the diversity of issues that have commonalities of communication lessons. Together they have incredibly diverse experiences with issues ranging from the Yucca Mountain Nuclear Waste Depository, chemical and nuclear cleanup, chemical exposures, wildfires, fish consumption, fisheries laws, and global climate change; many of these issues are intertwined with Native American Treaty rights and exposures, other indigenous peoples, environmental justice, and citizen advisory boards. All contribute to our understanding of what makes or interferes with effective communication (See Table 1). Readers are directed to the issue for essays on each of the 19 interviews. Every interviewee mentioned the importance of providing credible information, developing trust, and tailoring the message to the audience.

**Table 1: Practitioners Interviewed, Main Context or Issues and Risk Communication Messages. There is an essay included in the Risk Analysis issue about each of these people.**

<b>Practitioner (position at time of interview)</b>	<b>Main Risk Communication Context or Issue</b>	<b>Main Take-away (Title of the essay)</b>	<b>Additional Key Messages</b>
Monica Regalbuto (Director, Nuclear Fuel Cycle Strategy at Idaho National laboratory)	Department of Energy (DOE) and private sector; fuel cycle, environmental cleanup	Respect, sincerity, and concern for workers is essential	<ul style="list-style-type: none"> <li>• Be sincere, transparent, available, and treat people fairly?</li> <li>• Listen and visit workers in their workplace.</li> </ul>
Myrna Espinosa Redfield (Pres/CEO at Four Rivers Nuclear Partnership, Paducah)	Department of Energy	Being familiar with all the stakeholders is critical	<ul style="list-style-type: none"> <li>• Have a clear message and tailor to audience.</li> <li>• Answer questions that stakeholders need answered.</li> </ul>
Mark Gilbertson (Assoc. Principal Deputy Assistant Secretary, Office of Environmental Management, U.S. DOE) <sup>a</sup>	Department of Energy, environmental cleanup and management	Keep track of the long-term mission	<ul style="list-style-type: none"> <li>• Need the right person to deliver the message.</li> <li>• Don't push too hard.</li> </ul>
Tom Burke (Prof. and Chair, Health Risk and Society at Johns Hopkins University)	Environmental Protection Agency (EPA), environmental cleanups	Listen to the community	<ul style="list-style-type: none"> <li>• Need strong science, not misinformation.</li> </ul>
Bernard Goldstein (Emeritus Dean and Prof. at Univ. of Pittsburgh)	Environmental Protection Agency (EPA) environmental and public health	Risk communication as an essential component of public health practice	<ul style="list-style-type: none"> <li>• Sound science is critical; risk communication is situational.</li> </ul>
Andrew Orrell (Senior Technical Consultant at Idaho National Laboratory)	International Atomic Energy Agency (IAEA), and Idaho National Laboratory; nuclear waste management	Be the honest broker	<ul style="list-style-type: none"> <li>• Engage and empower the public.</li> <li>• Probabilities are incomprehensible to some.</li> </ul>
Timothy Fields (Senior Vice President, MDB, Inc.)	EPA, National Brownfields	Building networks for success	<ul style="list-style-type: none"> <li>• Use approaches and people to communicate that are like the community.</li> </ul>
Richard Jackson	Centers for Disease Control, birth defects, pesticides	Be empathetic, humble, and clear	<ul style="list-style-type: none"> <li>• Be prepared for questions you don't want to answer.</li> </ul>

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(retired, formerly Director of Environmental Health at CDC)			
Jennifer Salisbury (CRESP <sup>b</sup> , Vanderbilt Univ.)	Waste Isolation Pilot Plant, nuclear repository legal issues	Be persistent, consistent, and trustworthy	<ul style="list-style-type: none"> <li>• Go with a clear science-backed position.</li> <li>• Be persistent and listen.</li> </ul>
Neil Weber (Intergovernmental Liaison between New Mexico and Tribal governments)	DOE, state, Pueblo de San Ildefonso, PCBs and other exposers	Be truthful, proactive, humorous, concerned, and provide solutions	<ul style="list-style-type: none"> <li>• Take time to develop friendships that lead to trust.</li> <li>• Allow Tribes to provide information on their timeline.</li> </ul>
Michelle Lohmann (Board Member, Oak Ridge Site Specific Advisory Board, TN)	Citizens Advisory Board Nuclear waste cleanup	Challenge the status quo	<ul style="list-style-type: none"> <li>• Always show up.</li> <li>• Emphasize new media and information.</li> </ul>
David Kosson (Professor at Vanderbilt Univ., PI for CRESP <sup>b</sup> )	Waste management and remediation	Be trustworthy, transparent, approachable, credible and not an advocate	<ul style="list-style-type: none"> <li>• Recognize technical data may not be the only driver.</li> <li>• Provide alternatives.</li> </ul>
Kathryn Higley (Professor at Oregon State Univ., CRESP <sup>b</sup> )	Transport and fate of radionuclides, radioecology; IAEA.	Build trust through repeated engagement as an honest expert	<ul style="list-style-type: none"> <li>• Listen and answer their questions.</li> <li>• Use multiple ways to communicate.</li> </ul>
Michael Greenberg (Professor at Rutgers Univ., CRESP <sup>b</sup> ) <sup>a</sup>	Chemical weapons, brownfields, cancer clusters, ports.	Talking to media requires clear, concise, relatable messages. Can't communicate your way out of everything.	<ul style="list-style-type: none"> <li>• Always respond quickly to reporters with messages you want to impart.</li> </ul>
James Johnson (Prof. Emeritus at Howard Univ.)	Nuclear legacy, STEM, engineering solutions to environmental problems	Listen and listen again, find commonalities	<ul style="list-style-type: none"> <li>• Slow down, take time to listen.</li> <li>• Don't be defensive or judgmental.</li> </ul>
Amanda Boyd (Assoc. Prof. at Washington State Univ.)	Native American and Alaska Native issues; country foods	Respect local knowledge, communications, and traditions	<ul style="list-style-type: none"> <li>• Tailor message to each community.</li> <li>• Understand their culture and collaborate.</li> </ul>

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Melanie Lemiere (Assoc. Prof. at Laval Univ. and Researcher at Quebec Univ.)	Indigenous people of Amazon and Canada; wild foods, food security, mercury and other contaminants	Be honest, transparent, culturally-relevant, and take time, and then more time.	<ul style="list-style-type: none"> <li>• Trust takes a long time to develop.</li> <li>• Learn how to collaborate, share knowledge.</li> </ul>
Carl Safina (Prof., Director and Founder at Safina Center at Stony Brook Univ.)	Fisheries and marine organism survival	Meet your audience with information they care about	<ul style="list-style-type: none"> <li>• Focus on what audience wants to know, not what you know.</li> <li>• Listen and validate their concerns.</li> </ul>
Ken Berlin (Pres. and CEO at Climate Reality Project) <sup>c</sup>	Climate change	Risk and solutions must be communicated together	<ul style="list-style-type: none"> <li>• Provide information and approaches to the converted.</li> <li>• Benefits should be clear.</li> </ul>

Univ. = university, Prof. = professor, Assoc. = associate.

- a. Now retired
- b. CRESP = Consortium for Risk Evaluation with Stakeholder Participation
- c. Presently Senior Fellow at Atlantic Council Global Energy Center

The 19 interviews in the special issue of *Risk Analysis* entitled “Risk Communication during Crises and Chronic Exposures” provide a wealth of information and advice on risk communication in different situations, for different audiences, and over different time frames. Key to all the interviews was that information presented had to be accurate, up-to-date, relevant to the situation, and important to the audience. Also, key was the need to develop and then maintain trust and to always take into account the knowledge base of the audience and the kind of communication required (e.g., immediate health or safety risks in a crisis event; longer-term risks from chemicals in fish, climate change, or polluted water). Developing trust and rapport was also a main message of all the interviews. Since remediation and restoration activities, particularly at contaminated legacy sites remaining from World War II, the Cold War, and industrialization, pose both long-term chronic risks and the possibility of acute events impacting nearby communities and varied stakeholders, the need for effective risk communication will remain paramount. These insights from people who have faced risk communication challenges for years or even decades create a body of useful advice for those facing these challenges for years to come.