

**FINAL REPORT**  
U.S. Department of Energy

Title of Project: Low Dose Risk, Decisions, and Risk Communication

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## **3. Executive Summary**

The research project conducted basic research on how people receive, evaluate, and form positions in response to scientific information and its relationship to low-dose radiation exposure. Three major areas of study were addressed in our research program. First was the development of theories, frameworks and concepts essential to guiding data collection and analysis. Second was a development of experimental studies on risk perception, evaluation of science information, the structure of individual positions regarding low-dose exposures, and the potential for identifying and conducting tradeoff conditions for programs and policies addressing low dose radiation exposures. This involves the study of existing knowledge and the evaluation of science information presented within a variety of formats — as educational information, news media stories, and alternative communication methods (personal contact, small group interaction, etc.). Third was the study of communities adjacent to existing nuclear industrial sites to examine how social conditions influence the development of attitudes and opinions about low-dose exposures, the available management options, control of radiation risks, and preferences for program and policy goals. The results of these efforts are presented in thirteen technical reports that are included in the Appendix below (Item 15).

## **4. Research Objectives**

The overall research objective was to establish new levels of information about how people, groups, and communities respond to low dose radiation exposure. This is basic research into the social psychology of individual, group, and community responses to

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radiation exposures. The results of this research are directed to improving risk communication and public participation in management of environmental problems resulting from low dose radiation.

### **5. Methods and Results**

The methods utilized for the several studies done during this project are described in detail in the various final reports attached in the appendix below. Experimental studies followed the standards of social psychology. Community case studies were conducted within the methodological standards of Sociology, Anthropology, Social Geography, and Political Science. The survey work followed the recommendations and standards of the American Association for Public Opinion Research.

### **6. Relevance, Impact and Technology Transfer**

Improvements in risk communication have been identified as essential to reconcile expert judgments of the effects of low dose radiation exposure to humans and the environment. The biological research program entrusted to the DOE Low Dose Radiation Research Program is expected to produce new information on low dose effects. In order for these scientific advances to be of use to program and policy managers, they must be communicated to the public in such a way that they can be used to adjust exposure standards. These standards, in turn, have a direct effect on the time and cost of safely managing nuclear facilities producing low dose radiation. The current baseline of social science knowledge is not sufficient to support the outcome mission of the Low Dose Radiation Research Program. This risk communication research directed its attention to expanding the knowledge base about individuals, groups, and communities so that new and more informed communication efforts could be designed. The findings of this research project are transmitted to interested parties in presentations and talks, in reports made available through print and electronic venues, and through the development of publishable manuscripts. The impact of this work remains to be determined since the results of this research are in the early stages of dissemination.

### **7. Project Productivity**

The principle investigator has directed many complex and large scale social science research efforts over the past 25 years. Based on that experience, he believes this was a very successful and productive project. Objective measures of productivity are somewhat difficult to provide. The extensive written reports and the number of presentations are one measure that is recorded in other sections of this Final Report. Beyond this, we expect

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that the future reception of the findings of this research by the social science communities and by risk communicators at all levels of radiation risk management will provide a better evaluation of the project productivity than can be shown at the time this report is being written.

### **8. Personnel Supported**

Principle Investigator: James Flynn, Ph.D.

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Donald MacGregor, Ph.D., Decision Research

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England Graduate School

Graduate Research Assistant, Jasmine Tanguay, Clark University

Graduate Research Assistant, Jennifer Wilhoit, Antioch New England Graduate School

Graduate Research Assistant, Josh Levin, Ph.D. University of Colorado

Carrie Goodwin, Research Assistant, Decision Research

### **9. Publications**

Flynn, J. and MacGregor, D. (in press). Commentary on Hormesis and Public Risk Communication: Is there a basis for public discussions? *BELLE Newsletter* with subsequent publication in *Human and Experimental Toxicology* (journal of the British Society for Toxicology).

Flynn, J. (in press). Nuclear Stigma. Chapter 13 in N. Pidgeon, R. Kasperson, & P. Slovic (eds.), *The Social Amplification of Risk*. London: Cambridge University Press.

Flynn, J. (in press). Entry for "Nuclear Energy/Nuclear Waste/Plutonium". *International Encyclopedia of Environmental Politics*. London: Routledge.

Flynn, J., Slovic, P., and Kunreuther, H. (eds.) (2001). *Risk, Media, and Stigma*. London: EarthScan.

(Note: The research data obtained during this project were completed mid-way through 2002. We expect a number of manuscripts for publication will be written and submitted

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over the next year or so. Information on these publications will be forwarded to DOE as they are put into print.)

### **10. Interactions**

The following list of dates, places, and subjects describe the main interactions resulting from this project.

#### **10.1 Decision Research/ DOE Risk Communication Workshop June 12-14, 2000, Hilton Hotel, Eugene, Oregon**

Subject: A review of existing risk communication studies, critique of work completed during the first six months of the project, and development of recommendations for continuing research by the study team.

Attendees from Decision Research: James Flynn, Donald MacGregor, Paul Slovic, Ellen Peters, Terre Satterfield, Robin Gregory, CK Mertz, Carrie Goodwin.

Other Attendees: Tony Brooks, Washington State University & DOE, Roger Kasperson, Clark University, Jeanne Kasperson, Clark University, Seth Tuler, Social and Environmental Research Institute & Clark University, William Freudenburg, University of Wisconsin, Sharon Friedman, Leigh University, Bryon Wynn, Lancaster University, UK, Nick Pidgeon, University of East Anglia, UK, Ellen Omohundro, Steve Johnson, University of Oregon,

#### **Other Interactions: Presentations**

- 10.2. James Flynn and Donald MacGregor, U.S. Department of Energy, Low-Dose Radiation Research Program, Office of Science, Contractor's Conference. "Low Dose Radiation, Risk, Decisions and Risk Communication," Rockville, MD, March 2002.
- 10.3. James Flynn, National Research Council/National Academy of Sciences, Workshop on Principles and Operational Strategies for Staged Repository Systems, "Public Interaction and Acceptance Issues," Washington, DC, September 5, 2001.
- 10.4. James Flynn and Donald MacGregor, U.S. Department of Energy, Low-Dose Radiation Research Program, Office of Science, Contractor's Conference. "The Design and Implementation of a Risk Communication Research Program," Arlington, VA, June 2001.

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- 10.5. James Flynn, American Chemical Society, Radiation, Health & Safety Symposium, "The Social Context for Communication about Radiation Risk," San Diego, CA, April 2001.
- 10.6. James Flynn, U.S. Department of Energy, Low-Dose Radiation Research Program, Office of Science, Workshop on Risk Communication. "The Confusing Context of Risk Communication," Arlington, VA, March 2001.
- 10.7. James Flynn, Gordon Conference, "Radiation Risk, Decisions, and Risk Communication," Sawyer-Colby College, New London, NH, July 2000.
- 10.8. James Flynn, International Conference on Trust, "Trust and Risk Management Communications," Western Washington State University, Bellingham, WA, June 2000.
- 10.9. James Flynn, Donald MacGregor and Paul Slovic, U.S. Department of Energy, Environmental Management, "The Social Geography of Risk Communication," Atlanta, GA, April 2000.
- 10.10. James Flynn, National Cancer Institute/Center for Disease Control, Workshop on I-131 fallout from Nevada Test Site, "The Social Context for Risk Communication," Rockville, MD, January 2000.
- 10.11. James Flynn, Society for Risk Analysis, "The Role of Risk Communication in Response to Technological Stigma," Atlanta, GA., December 1999.
- 10.12. Board on Radioactive Waste Management, National Research Council, "The Role of Stigmatization in Public Risk Perceptions of High-Level Radioactive Wastes," Irvine, CA, November 1999.
- 10.13. James Flynn, Social Amplification of Risk Workshop, UK Health and Safety Executive, "Nuclear Stigma," London, UK, September 1999.

## **11. Transitions**

We expect that the results of this research and the publication of the findings will be applied within the field of risk communication over time. However, we cannot at this time describe those future uses.

## **12. Patents**

No patents resulted from this project.

## **13. Literature cited**

Each of the technical reports and the publications contains the appropriate bibliographies.

## **14. Feedback**

Feedback to DOE on the progress and results of the research were made in annual written reports and in presentations at three contractor's meetings listed in item 10 above.

## **15. Appendices**

Reports: Thirteen final reports resulted from the work performed during the 36-month project (September 1999 to September 2002). They are attached in electronic format. Each report has been uploaded to [https://www.osti.gov/mlink/index\\_2413.html](https://www.osti.gov/mlink/index_2413.html) with a completed copy of DOE F 241.3 and versions of these reports have been sent under separate cover to the three parties listed in Amendment A000, Part IV, and page 3 of our Agreement.

## **16. Quantities/Packaging**

N/A