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U.S. House of Representatives
House Committee on Resources
Subcommittee on Energy and Mineral Resources
February 4, 2004

Chairman Cubin, members of the Committee, thank you for the opportunity to appear before you today. I am George M. Gray, Ph.D., Executive Director of the Harvard Center for Risk Analysis. You can learn more about our Center, its mission, research and funding, at our website (http://www.hcra.harvard.edu/). My comments today are based upon my research and experience as a scientist, risk analyst, and public health professional. These comments are my own and should not be attributed to the Harvard Center for Risk Analysis or Harvard School of Public Health.

I commend this subcommittee for holding a hearing on the impact of science on public policy. You will hear a great deal from my colleagues on these panels about the importance of open, fair and careful consideration of scientific evidence. However, I want to focus on the importance of sound analysis[1].

Risk analysis is the way in which individual acts of science are brought together to help inform policy decisions. This process comprehensively and quantitatively considers information from many disciplines to shed light on a policy questions that no one study addresses directly. Risk analysis also often weighs the benefits and costs of various risk reduction/health-improving strategies. For each, it may consider the number of lives saved, diseases prevented, and quality of life protected--and the cost of each strategy. The goal is to provide information to decision makers about society's limited resources can do the most good. Risk analysis is widely practiced by government agencies and plays a key role in many important decisions, yet these analyses are rarely subject to the same level of scrutiny as the scientific studies upon which they are built.

The science done and used by most agencies is routinely peer-reviewed and of high quality. It is the interpretation and use of this science in the risk analysis process that is the focus of my comments. As a practioner of, and believer in, risk analysis, my goal is ensuring the credibility of these studies and confidence in the scrupulousness of their conduct.

I have concerns about both the perception and the reality of the quality of analyses conducted by federal agencies. I believe this is a widely held concern in the field of risk analysis. A very telling example of this concern is an address by Professor M. Granger Morgan[2] to the Society of Risk Analysis on the occasion of his receiving the Society's Distinguished Contribution Award in 1995. Although these comments were made several years ago, I believe they are still relevant. Dr. Morgan decided to grade the field of risk analysis for the quality and rigor of its practice. However, he decided he needed two categories, best practice and typical practice, which he defined as "my assessment of how things typically get done by federal risk management agencies and their contractors." The need for this distinction immediately points out an obvious shortcoming – the analyses conducted by federal risk management agencies do not reflect the best practice of the field.

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[1] These remarks draw significantly on comments I submitted to the Office of Information and Regulatory Affairs, within the Office of Management and Budget, in response to their proposed Peer Review and Information Quality guidelines.

[2] Lord Chair Professor in Engineering; Professor and Department Head, Engineering and Public Policy; Professor, Electrical and Computer Engineering and The H. John Heinz III School of Public Policy and Management

Professor Morgan evaluated eight specific attributes of analysis (for a more detail on his address see: http://www.riskworld.com/Profsoci/sra/newsltrs/96Q2/ps6ae201.htm). His overall grade for best practice in the field of risk analysis was a B. More disturbing, when evaluating typical agency practice he gave four of the eight areas a D or D- and an overall grade of D+. We need to strengthen the analyses that support important policy choices made by government agencies both to improve information available for decision-making and to increase the quality and credibility of agency analyses.

I believe that there are two specific steps that can be taken to improve these studies. First, we need to make sure that analyses are conducted using best practices in the field. An excellent guide to good analysis has recently been issued by the government as Circular A-4 from the Office of Management and Budget. These guidelines for good regulatory analysis provide a sound framework for the use of scientific information to inform policy (available at: http://www.whitehouse.gov/omb/circulars/a004/a-4.html). This document can assist agency analysts by providing guidance for characterizing the purpose of an analysis, describing the uncertainty in the analysis and the influence of alternative choices and assumptions, and ensuring transparency and reproducibility of the study. Federal agencies should be required to apply these guidelines to all analyses, not just those subject to OMB review under Executive Order 12866. I have included a copy of this circular as an appendix to my testimony.

Second, agency analyses should be subject to peer review. Peer review by outside experts will help ensure that analyses use appropriate methods, are transparent and reproducible, and are scientifically objective in key assumptions and choices. Peer review of science should include the analytic sciences too. Reviewers should be asked to judge broadly the appropriateness of approaches, assumptions, choices and transparency of an analysis.

To help ensure credibility and trust in the peer-review process, the contents of peer-reviews should be publicly available and as should the agency's responses to all peer-review comments. Choosing peer reviewers is a critical component of a credible process. Expertise should be the primary consideration in these choices but it must be recognized that other factors must be weighed. Care must be taken to avoid conflicts of interest both financial and professional. Reviewers with a professional stake in an issue, illustrated by advocacy for a particular view of an issue or agency funding on the topic subject to peer review, should be very carefully evaluated. Disclosure of potential conflicts of interest, including work as an expert witness and institutional funding, will allow interested parties to make judgments about the appropriateness of reviewers.

The risk analysis process is an important and valuable contribution to the use of science in public policy. The two simple steps that I have discussed today, ensuring best technical practice in these studies followed by serious peer-review, will increase our confidence in the information developed and the credibility of our policy decisions. Thank you for your efforts to look forward and help provide our country with the sound scientific information necessary to ensure wise policy decisions in the future.