

*Profile***Dick Wilson: Applying Uncommon Sense to Risks****Michael Greenberg and Karen Lowrie**

Wilson at SRA Annual Meeting, 2006

It is hard to imagine interviewing someone who has more interesting stories than Richard “Dick” Wilson. When we asked Dick about events that piqued his interest in risk, he mentioned two that are difficult to top. “As a teenager, I was having tea on a beautiful summer afternoon in London, when stukas (German World War Two dive bombers that made a terrifying screeching sound) dived on the local airport dropping bombs. One 50 pound bomb landed about a half mile away from us, destroying a house. The stukas were followed by British spitfires who shot some of them down.”

On another occasion, when he was 18 years old, Dick and his brother heard a strange sound, looked up and saw a German V-1 flying bomb heading straight for them. It all happened too fast for them to be scared. Dick had about seven seconds to take cover and fell flat on the ground. The force of the missile hitting nearby caused a window frame to come out of his home. This incident, as Dick put it,

gave him “first-hand experience in the importance of taking precautions!” These war-related experiences from his youth provided Dick with quite an introduction to personal risk analysis and led to a lifetime of interest in examining the destructive capacity of weapons. But this has been only one of many interests that Dick has pursued in his six decades as a scientist and researcher.

1. FROM OXFORD TO HARVARD

Richard Wilson wanted to be a mathematical physicist when he started his undergraduate education at Oxford. In 1944, the Joint Recruiting Board gave him an opportunity to study physics, learn electronics and radar, and become a radar officer in the air force. His doctoral dissertation from Oxford University in 1950 was titled “Photodisintegration of the Deuteron” and had little to do with risk analysis. He came to Harvard University’s Department of Physics in 1955.

In the early 1970s, Dick began teaching a course at Harvard on risk principles that was attended by law, public health, and science students. By 1975, he became involved with energy issues and founded the Energy and Environmental Policy Center to focus on the many risk questions associated with nuclear energy. Wilson’s concept for the Center was that “energy problems are really environmental problems.” His Center was publishing papers about the risks of nuclear energy just as the anti-nuclear movement was gathering steam.

During the next quarter-century, he increasingly began to compare the risks and costs vs. benefits of alternative sources of energy. His 2001 book *Risk-Benefit Analysis* with Edmund Richard Crouch is a valuable reference for the field.⁽¹⁾ A review of the book in the *New England Journal of Medicine* said: “This book is a wide-ranging and readable introduction to risk-benefit analysis that should be a welcome

addition to many bookshelves. It contains many entertaining examples, anecdotes, and excellent cartoons.”⁽²⁾ Wilson later worked with colleagues such as John Graham to create a new Center at Harvard’s School of Public Health that would focus on risk analysis from a different perspective than traditional engineering approaches. Dick remains an affiliate of the Center for Risk Analysis to the present day and serves as Mallinckrodt Professor of Physics (emeritus). Showing few signs of slowing down, Dick plans to teach a course at Harvard in the spring of 2010.

2. EFFORTS IN RISK ANALYSIS

His initial contact with the field we now call risk analysis was explaining the dangers of different kinds of radiation to colleagues, staff, and students. But in the early 1970s, when the mood of the United States changed from a positive consensus for nuclear power to skepticism and fear, he became interested in comparing risks of nuclear power to problems caused by other forms of electric power generation. His 1972 note in *Physics Today* provides comparative deaths per kilowatt hour in the United States.⁽³⁾ Containing 14 comparisons of coal, oil, nuclear, and gas, it shows risks as high as 10^{-9} (black lung disease for coal miners) to much lower risks for many other sources, including nuclear, natural gas, and oil well accidents. Since it was published in a physics journal, the ini-

tial public reaction, according to Dick, was negligible. However, when the word of his study got out, more publicity followed, along with some negative reactions. He recalls receiving anonymous phone calls telling him he was “just a tool of the nuclear industry.”

His interest in the effects of radiation and in nuclear safeguards and security led him into the international arena as well. He was one of the first U.S.-based scientists to draw attention to radiation accidents in the Soviet Union. His involvement in the evaluation of the Chernobyl accident earned him a medal as a “Chernobyl Liquidator” in 1987 (see photo). During the Cold War, at a time when few U.S. scientists were in discussions with Russian scientists, Dick’s work helped to maintain open channels of dialogue. His relationship with Andrey Sakharov led to his co-founding of what is now the International Sakharov Environmental University in Minsk.

3. LEGAL PURSUIT OF RISK ANALYSIS

For the past several decades, Dick Wilson has become involved in legal cases, noting that there is a “tremendous amount of nonsense in the courts.” For example, the Shoreham Nuclear Plant built on Long Island and completed in 1984 was the subject of considerable debate. A great deal of political pressure



Dick Wilson at Chernobyl in April 1987

was brought to stop the plant from operating. Dick purchased 10 shares of Long Island Electric stock so that he could attend the annual meeting. He joined in filing a lawsuit to postpone the vote on closure. On the day of the trial, he was awoken by a 7:30 a.m. telephone call from the lawyer arguing his case that he was dropping out of the case. Dick joined with the Atlantic Legal Foundation, supported by the U.S. Department of Energy, in an effort to force an environmental impact statement that would detail the impacts of the closure, but the case was lost in the New York Supreme Court. In 1989, the multi-billion dollar plant was closed without ever generating electricity.

Dick Wilson remains on the Science Advisory Board of Atlantic Legal Foundation, an organization that submits briefs drafted, pro bono, by eminent scientists where an understanding of science is important to the facts of the case. Among well-known cases where the U.S. Supreme Court was influenced by such briefs submitted by ALF were the trilogy (*Daubert v. Merrell Dow Pharmaceuticals*; *General Electric s. Joiner*; and *Kumho Tire v. Carmichael*). These three led to the so-called *Daubert* standard, which sets a standard for the admissibility of expert witness testimony. In the *Covalt* case (*San Diego Gas & Electric v. Covalt*) that focused on electromagnetic fields and cancer risk, the California Supreme Court ruled that the toxic tort arguments were not supported by evidence. Wilson says the *Covalt* case “stopped the avalanche of lawsuits claiming that power lines cause cancer.” Dick cites the legal briefs that he drafted for these cases as his most influential work because it helped to change the way science is looked at in the courtroom.

4. A HALF-CENTURY OF INVOLVEMENT

Dr. Wilson has authored more than 900 papers, been a consultant to dozens of governmental agencies and academic institutes, and lectured around the world on energy, risk, and environmental policy. He has been awarded many honors in his distinguished career. He was a founding member of the Society for Risk Analysis and in 1993 won the SRA’s Distinguished Achievement Award. Former SRA president and Harvard faculty member Kim Thompson told us that she “appreciate(s) Dick’s boundless work ethic, his on-going commitment to the Society and to promoting excellence in the field, and his efforts to make risk-benefit analysis part of daily life for everyone.”

In recent years, he has been awarded the Ettore Majorana (Erice) Prize Science for Peace, the Dixy Lee Ray Award of the American Society for Mechanical Engineers, and a Presidential Citation from the American Nuclear Society. The 2008 ANS award honored Dick for “mentoring students for over 50 years in nuclear science, engineering and technology and his tireless efforts promoting peaceful application of nuclear power . . . Through over 900 papers and publications and myriad lectures . . . Professor Wilson’s distinguished career is an inspiration.”

Robert Budnitz of Lawrence Berkeley Laboratories, who received his Ph.D. in particle physics under Dick’s mentorship, notes that Dick is “very special” because he has contributed new intellectual ideas in five or six different fields of endeavor and advanced each of those fields. His “remarkable record” in the diverse fields of reactor safety, arsenic toxicology, asbestos risk analysis, particle physics, and public policies on nuclear safeguards is even more remarkable, says Budnitz, considering that at age 83, Wilson continues to be in the forefront of intellectual contributors in several of these fields.

5. LESSONS LEARNED AND TO BE LEARNED FROM RISK ANALYSIS AND MANAGEMENT

Dick Wilson was one of the earliest scientists suggesting that there is likely to be low dose linearity for all pollutants and not just for radiation or for “genotoxic” carcinogens. Wilson gave talks displaying this on a graph, and many people, including experts in the field, thought he was “crazy.” Wilson’s assertion that “everything is carcinogenic, it just depends on the potency” is now accepted by most who were initially unconvinced. He recalls discussing this in depth with Arthur Upton (see Arthur Upton profile in December 2008 issue).⁽⁴⁾

According to friend and colleague Bob Budnitz, Dick is “unlike many scientists” in that he is unabashed about intervening in the public arena to contribute a scientific perspective to complicated risk issues. Wilson feels that the U.S. government’s efforts to apply risk assessment and risk management principles to current energy debates are woefully inadequate. He notes that “if one takes any discount rate more than 0.1% per year, we are spending already far too much on nuclear waste. The cost of regulation is not included in most of the discussions.”⁽⁵⁾ With regard to the carbon tax, he recommends that

the United States should tax carbon as it is taken out of the ground in order to fund the tremendous costs of investing in sustainable forms of energy like solar. “You need to tax the things you don’t want in order to fund the things you do want.”

Dick’s advice to people just coming into the risk analysis field is to always go back to fundamentals and make sure that the logic is correct. In particular, he says, “don’t use statistical theorems without understanding them from first principles.” He also cautions that people entering the field of risk sometimes have limited experience in using statistics, and misleading findings can result. It is critical to do science correctly and to document errors and uncertainty. For example, he is concerned about the risks associated with nanotechnology, observing that we “don’t even know the questions yet.” He is cautious about a rush to judgment.

Many of us may aspire to live a life as interesting as Dick Wilson’s, but few of us will succeed. Throughout his lifetime of intellectual inquiry and

contributions to better understanding and better solutions for many pressing issues, Dick has remained, at heart, a warm and engaging individual. Thompson points to his “insight, wit, vision and willingness to listen to ideas” as his notable and valued qualities.

Dick hopes that his life’s work has contributed a measure of sense to public debates on risk issues. He tells the story of an early opponent of formal risk analysis who once said that one just needs to apply common sense. Yes, Dick replied “but common sense is very uncommon.”

SELECTED CITATIONS

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4. Greenberg M, Lowrie K, Arthur C. Upton: Let the evidence speak. *Risk Analysis*, 2008; 29(6):1492.
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