

# What's behind our conflicted feelings on nukes?

March 24 2011, By SETH BORENSTEIN , AP Science Writer

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In this Nov. 21, 1951 file picture, sixth grade students crouch under or beside their desks along with their teacher, Vincent M. Bohan, left, as they act out a scene from the Federal Civil Defense administration film "Duck and Cover" at Public School 152 in the Queens borough of New York City. Even before the March 11 earthquake and resulting tsunami that led to the current Japanese nuclear crisis, Americans were bombarded with contradictory images and messages that frighten even when they try to reassure. It started with the awesome and deadly mushroom cloud rising from the atomic bomb, which led to fallout shelters and school duck-and-cover drills. (AP Photo/Dan Grossi, File)

(AP) -- Nuclear radiation, invisible and insidious, gives us the creeps.

Even before the Japanese nuclear crisis, Americans were bombarded with contradictory images and messages that frighten even when they try

to reassure. It started with the awesome and deadly mushroom cloud rising from the [atomic bomb](#), which led to fallout shelters and school duck-and-cover drills.

On screen, Bert, the ever-alert turtle of the government civil-defense cartoons, told us all we needed to do was shield our eyes when the bomb exploded and duck under our desks. Jane Fonda in "The China Syndrome" told us to be worried about nuclear power accidents, and just days later, Three Mile Island seemed to prove her right. Now bumbling nuclear plant worker Homer Simpson, Blinky, the radiation-mutated, three-eyed fish, and evil nuclear power plant owner Montgomery Burns make us giggle and wince.

The experts tell us to be logical and not to worry, that nuclear power is safer than most technologies we readily accept. Producing and burning coal, oil and gas kill far more people through accidents and pollution each year.

But our perception of nuclear issues isn't about logic. It's about dread, magnified by arrogance in the [nuclear industry](#), experts in risk and nuclear energy say.

"Whereas science is about analysis, risk resides in most of us as a gut feeling," said University of Oregon psychology professor and risk expert Paul Slovic. "Radiation really creates very strong feelings of fear - not really fear, I would say more anxiety and unease."

Some experts contend that when a disaster has potentially profound repercussions, we should pay attention to emotions as much as logic.

Nuclear energy hits all our hot buttons when we judge how risky something is: It's invisible. It's out of our control. It's manmade, high-tech and hard to understand. It's imposed on us, instead of something we

choose. It's associated with major catastrophes, not small problems. And if something goes wrong, it can cause cancer - an illness we fear far more than a bigger killer like heart disease.

Thirty years ago, before the 1986 Chernobyl nuclear disaster, Slovic took four groups of people and asked them to rate 30 risks. Two groups - the League of Women Voters and college students - put nuclear power as the biggest risk, ahead of things that are deadlier, such as cars, handguns and cigarettes. Business club members ranked nuclear power as the eighth risk out of 30. Risk experts put it at 20.

The only fear that Slovic has seen as comparable in his studies to nuclear power is terrorism.

A Pew Research Center poll after the Japanese nuclear crisis found support for increased nuclear power melting down. Last October the American public was evenly split over an expansion of nuclear power; now it's 39 percent in favor and 52 percent opposed.

"Nuclear radiation carries a very powerful stigma. It has automatic negative associations: cancer, bombs, catastrophes," said David Ropeik who teaches risk communications at Harvard University. You can't separate personal feelings from the discussion of actual risks, said Ropeik, author of the book "How Risky Is it, Really?"

But Ropeik, who has consulted for the nuclear industry, said those fears aren't nearly as justified as other public health concerns. He worries that the public will turn to other choices, such as fossil fuels, which are linked to more death and climate change than the nuclear industry is. He cites one government study that says 24,000 Americans die each year from air pollution and another that says fossil fuel power plants are responsible for about one-seventh of that.

At the same time, health researchers have not tied any U.S. deaths to 1979's Three Mile Island accident. United Nations agencies put the death toll from Chernobyl at 4,000 to 9,000, with anti-nuclear groups contending the number is much higher.

Since 2000, more than 1,300 American workers have died in coal, oil and natural gas industry accidents, according to federal records. Radiological accidents have killed no one at U.S. nuclear plants during that time, and nuclear power has one of the lowest industrial accident rates in the country, said Nuclear Energy Institute spokesman Steve Kerekes.

Alan Kolaczowski, a retired nuclear engineer, consulted with the Nuclear Regulatory Commission on specific probabilities of accidents at nuclear plants. He estimates the risk of a disaster at a given plant at 1 in 100,000 - about the same as your chance of being killed by lightning over your lifetime. For comparison, an American's odds of dying in a car crash are 1 in 88; being shot to death, 1 in 306; and dying from bee stings, 1 in 71,623, according to the National Safety Council. The council couldn't come up with the odds of dying from radiation because it lists zero people dying in the United States from radiation in 2007, the most recent year for which these cause-of-death figures are available.

Ropeik calls this mismatch between statistics and feelings "a classic example of how public policy gets made - not about the numbers alone, but how we feel about them, and it ends up doing us more harm."

Kolaczowski faulted his own industry.

"Those in the industry believe it is so complex it cannot be explained to the general public, so as a result, the industry has a trust-me attitude and that only goes so far," he said. "We're all afraid of the unknown, the ghosts under the bed."

David Lochbaum of the Union of Concerned Scientists, a group that presses for safer nuclear plants, is a former plant engineer. He likens the public's fears to unjustified worries about shark attacks: The risks and deaths are small, but the attention and fears are big.

"It may be an irrational fear, but I don't think it's one that can be educated away," Lochbaum said.

However, calling these fears irrational isn't justified, said Georgetown University law professor and former Environmental Protection Agency associate administrator Lisa Heinzerling. She said people's concerns have been unjustly trivialized.

People have been trained to think about and prepare for low-probability, catastrophic events like the earthquake and tsunami that caused the Japanese nuclear disaster, Heinzerling said. She pointed to homeowner's insurance. Most people won't have a fire that destroys their home, but "we worry about really big things even if they are improbable because we will be wiped out."

Americans also have long had an ambivalence toward new technology, going back to worries about the introduction of electric lights in homes 130 years ago, said University of Detroit Mercy history professor John Staudenmaier,

"Americans overreact with adulation and awe, then overreact with fear and anxiety," said Staudenmaier, editor emeritus of the academic journal *Technology and Culture*.

Trying to explain the fears, nuclear industry spokesman Kerekes said, "There's a perception gap that exists." But he adds: "Other industries haven't had to do deal with an animated cartoon series that lasted, what, 25 years?"

That would be "The Simpsons." Producer Al Jean said the show, which has been on the air since 1989, reflects America's real feelings.

"There is something that taps into people's view of big business, and in particular, nuclear power, which is giving profit-minded people complete control over life and death. It is a scary thought, and I think that is a topic for satire," Jean said.

Jean recognizes that nuclear plant workers aren't really like Homer Simpson and radiation doesn't "put a cute third eye on a fish." But he thinks his show is accurate with its portrayal of the greedy, conniving nuclear power plant owner Montgomery Burns: "Mr. Burns may be representative of some people in the nuclear industry - not just nuclear, but all industries - who seem like they're more interested in getting the money rather than doing what's safe. I think that's what resonates in the public."

Yet, Jean takes pride in noting that the Springfield [nuclear power plant](#) has never blown up.

The lack of transparency in the nuclear industry- including Tokyo Electric Power Co. - has caused some of the problems, said Baruch Fischhoff, a professor of decision sciences at Carnegie Mellon University. It is a charge Kerekes disputes.

"The nuclear industry has behaved in a way that is untrustworthy, both in the sense of not telling people the truth and not having the competence to manage their own affairs," Fischhoff said. He added that industry is too quick to brush off people's fears: "Telling the public that they are idiots is certainly not a way of making friends."

**More information:**

Paul Slovic's Decision Research: <http://www.decisionresearch.org/>

The Nuclear Energy Institute: <http://www.nei.org/>

The Union of Concerned Scientists: <http://www.ucsusa.org/nuclear-power/>

[www.ucsusa.org/nuclear-power/](http://www.ucsusa.org/nuclear-power/) target=-blank>

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Citation: What's behind our conflicted feelings on nukes? (2011, March 24) retrieved 25 April 2024 from <https://phys.org/news/2011-03-conflicted-nukes.html>

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