

Startling Revelations about Three Mile Island Disaster Raise Doubts Over Nuke Safety

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It was April Fool's Day, 1979 — 30 years ago this week — when Randall Thompson first set foot inside the Three Mile Island nuclear power plant near Middletown, Pa. Just four days earlier, in the early morning hours of March 28, a relatively minor problem in the plant's Unit 2 reactor sparked a series of mishaps that led to the meltdown of almost half the uranium fuel and uncontrolled releases of radiation into the air and surrounding Susquehanna River.

It was the single worst disaster ever to befall the U.S. nuclear power industry, and Thompson was hired as a health physics technician to go inside the plant and find out how dangerous the situation was. He spent 28 days monitoring radiation releases.

Today, his story about what he witnessed at Three Mile Island is being brought to the public in detail for the first time — and his version of what happened during that time, supported by a growing body of other scientific evidence, contradicts the official U.S. government story that the Three Mile Island accident posed no threat to the public.

"What happened at TMI was a whole lot worse than what has been reported," Randall Thompson told Facing South. "Hundreds of times worse."

Thompson and his wife, Joy, a nuclear health physicist who also worked at TMI in the disaster's aftermath, claim that what they witnessed there was a public health tragedy. The Thompsons also warn that the government's failure to acknowledge the full scope of the disaster is leading officials to underestimate the risks posed by a new generation of nuclear power plants.

While new reactor construction ground to a halt after the 1979 incident, state leaders and energy executives today are pushing for a nuclear energy revival that's centered in the South, where 12 of the 17 facilities seeking new reactors are located.

Fundamental to the industry's case for expansion is the claim that history proves nuclear power is clean and safe — a claim on which the Thompsons and others, bolstered by startling new evidence, are casting doubt.

An unlikely critic

Randall Thompson could never be accused of being a knee-jerk anti-nuclear alarmist. A

veteran of the U.S. Navy's nuclear submarine program, he is a self-described "nuclear geek" who after finishing military service jumped at the chance to work for commercial nuclear power companies.

He worked for a time at the Peach Bottom nuclear plant south of Three Mile Island in Pennsylvania's York County, but quit the industry six months before the TMI disaster over concerns that nuclear companies were cutting corners for higher profits, with potentially dangerous results. Instead, he began publishing a skateboarding magazine with his wife Joy.

But the moment the Thompsons heard about the TMI incident, they wanted to get inside the plant and see what was happening first-hand. That didn't prove difficult: Plant operator Metropolitan Edison's in-house health physics staff fled after the incident began, so responsibility for monitoring radioactive emissions went to a private contractor called Rad Services.

The company immediately hired Randall Thompson to serve as the health physics technician in charge of monitoring radioactive emissions, while Joy Thompson got a job monitoring radiation doses to TMI workers.

"I had other health physicists from around the country calling me saying, 'Don't let it melt without me!'" Randall Thompson recalls. "It was exciting. Our attitude was, 'Sure I may get some cancer, but I can find out some cool stuff.'"

What the Thompsons say they found out during their time inside TMI suggests radiation releases from the plant were hundreds if not thousands of times higher than the government and industry have acknowledged — high enough to cause the acute health effects documented in people living near the plant but that have been dismissed by the industry and the government as impossible given official radiation dose estimates.

The Thompsons tried to draw attention to their findings and provide health information for people living near the plant, but what they say happened next reads like a John Grisham thriller.

They tell of how a stranger approached Randall Thompson in a grocery store parking lot in late April 1979 and warned him his life was at risk, leading the family to flee Pennsylvania. How they ended up in New Mexico working on a book about their experiences with the help of Joy's brother Charles Busey, another nuclear Navy vet and a former worker at the Hatch nuclear power plant in Georgia. How one evening while driving home from the store Busey and Randall Thompson were run off the road, injuring Thompson and killing Busey. How a copy of the book manuscript they were working on was missing from the car's trunk after the accident. These allegations were detailed in [several newspaper accounts](#) back in 1981.

Eventually, after a decade of having their lives ruled by TMI, the Thompsons decided to move on. Randall Thompson went to college to study computer science. Joy Thompson returned to publishing and writing.

Today they live quietly in the mountains of North Carolina where, inspired by time spent seeking refuge with a traveling circus, they have forged a new career for themselves as clowns — or what they like to call "professional fools." As Joy Thompson wrote in [the fall 2001 issue of Parabola](#), a journal of myth, the role of the fool is to help people "perceive the foolishness in even ... the most powerful institutions," noting the medieval court jester's role

of telling the King what others dare not.

That conviction has led the Thompsons to tell their story today.

“They haven’t told the truth yet about what happened at Three Mile Island,” says Randall Thompson. “A lot of people have died because of this accident. A lot.”

Anomalies abound

That a lot of people died because of what happened at Three Mile Island, as the Thompsons claim, is definitely not part of the official story. In fact, the commercial nuclear power industry and the government insist that despite the meltdown of almost half of the uranium fuel at TMI, there were only minimal releases of radiation to the environment that harmed no one.

For example, the Nuclear Energy Institute, the lobbying group for the U.S. nuclear industry, [declares](#) on its website that there have been “no public health or safety consequences from the TMI-2 accident.” The government’s position is the same, reflected in [a fact sheet](#) distributed today by the Nuclear Regulatory Commission, the federal agency charged with overseeing the U.S. nuclear power industry: TMI, it says, “led to no deaths or injuries to plant workers or members of the nearby community.” [The watchdog group Three Mile Island Alert offers their take on the NRC factsheet [here](#).]

Those upbeat claims are based on [the findings of the Kemeny Commission](#), a panel assembled by President Jimmy Carter in April 1979 to investigate the TMI disaster. Using release figures presented by Metropolitan Edison and the NRC, the commission calculated that in the month following the disaster there were releases of up to 13 million curies of so-called “noble gases” — considered relatively harmless — but only 13 to 17 curies of iodine-131, a radioactive form of the element that [at even moderate exposures causes thyroid cancer](#). (A curie is a measure of radioactivity, with 1 curie equal to the activity of one gram of radium. For help understanding these and other terms, see the glossary at the end of this piece.)

But the official story that there were no health impacts from the disaster doesn’t jibe with the experiences of people living near TMI. On the contrary, their stories suggest that area residents actually suffered exposure to levels of radiation high enough to cause acute effects — far more than the industry and the government has acknowledged.

Some of their disturbing experiences were collected in the book *Three Mile Island: The People’s Testament*, which is based on [interviews](#) with 250 area residents done between 1979 and 1988 by Katagiri Mitsuru and Aileen M. Smith.

It includes the story of Jean Trimmer, a farmer who lived in Lisburn, Pa. about 10 miles west of TMI. On the evening of March 30, 1979, Trimmer stepped outside on her front porch to fetch her cat when she was hit with a blast of heat and rain. Soon after, her skin became red and itchy as if badly sunburned, a condition known as erythema. About three weeks later, her hair turned white and began falling out. Not long after, she reported, her left kidney “just dried up and disappeared” — an occurrence so strange that her case was presented to a symposium of doctors at the nearby Hershey Medical Center. All of those symptoms are [consistent with high-dose radiation exposure](#).

There was also Bill Peters, an auto-body shop owner and a former justice of the peace who lived just a few miles west of the plant in Etters, Pa. The day after the disaster, he and his son — who like most area residents were unaware of what was unfolding nearby — were working in their garage with the doors open when they developed what they first thought was a bad sunburn. They also experienced burning in their throats and tasted what seemed to be metal in the air. That same metallic taste was reported by many local residents and is another symptom of radiation exposure, commonly [reported in cancer patients receiving radiation therapy](#).

Peters soon developed diarrhea and nausea, blisters on his lips and inside his nose, and a burning feeling in his chest. Not long after, he had surgery for a damaged heart valve. When his family evacuated the area a few days later, they left their four-year-old German shepherd in their garage with 200 pounds of dog chow, 50 gallons of water and a mattress. When they returned a week later, they found the dog dead on the mattress, his eyes burnt completely white. His food was untouched, and he had vomited water all over the garage. They also found four of their five cats dead — their eyes also burnt white — and one alive but blinded. Peters later found scores of wild bird carcasses scattered over their property.

Similar stories surfaced in [The People of Three Mile Island](#), a book by documentary photographer Robert Del Tredici. He found local farmers whose cattle and goats died, suffered miscarriages and gave birth to deformed young after the incident; whose chickens developed respiratory problems and died; and whose fruit trees abruptly lost all their leaves. Local residents also collected [evidence of deformed plants](#), some of which were examined by James Gunckel, a botanist and radiation expert with Brookhaven National Laboratory and Rutgers University.

“There were a number of anomalies entirely comparable to those induced by ionizing radiation — stem fasciations, growth stimulation, induction of extra vegetative buds and stem tumors,” he swore in [a 1984 affidavit](#).

Scientists say these kinds of anomalies simply aren’t explained by official radiation release estimates.

Evidence of harm

✖ The evidence that people, animals and plants near TMI were exposed to high levels of radiation in the 1979 disaster is not merely anecdotal. While government studies of the disaster as well as a number of independent researchers assert the incident caused no harm, other surveys and studies have also documented health effects that point to a high likelihood of significant radiation exposures.

In 1984, for example, psychologist Marjorie Aamodt and her engineer husband, Norman — owners of an organic dairy farm east of Three Mile Island who got involved in a lawsuit seeking to stop TMI from restarting its Unit 1 reactor — surveyed residents in three hilltop neighborhoods near the plant. Dozens of neighbors reported a metallic taste, nausea, vomiting and hair loss as well as illnesses including cancers, skin and reproductive problems, and collapsed organs — all associated with radiation exposure. Among the 450 people surveyed, there were 19 cancer deaths reported between 1980 and 1984 — more than seven times what would be expected statistically.

That survey came to the attention of the industry-financed TMI Public Health Fund, created

in 1981 as part of a settlement for economic losses from the disaster. The fund's scientific advisors verified the Aamodts' calculations and launched a more comprehensive study of TMI-related cancer deaths led by a team of scientists from Columbia University. The researchers [found](#) an association between estimated radiation doses received by area residents and instances of non-Hodgkin's lymphoma, lung cancer, leukemia and all cancers combined. Crucially, however, the researchers decided there wasn't "convincing evidence" that TMI radiation releases were linked to the increase in cancers in the area because of the "low estimates of radiation exposure." The paper did not consider what conclusions could be drawn if those "low estimates" turned out to be wrong.

By the time the Columbia research was published in the early 1990s, a class-action lawsuit was underway involving about 2,000 plaintiffs claiming that the radiation emissions were much larger than admitted by the government and industry. (The federal courts eventually [rejected that suit](#), though hundreds of out-of-court settlements totaling millions of dollars have been reached with victims, including the parents of children born with birth defects.)

Consulting for the plaintiffs' attorneys, the Aamodts contacted Dr. Steven Wing, an epidemiologist at the University of North Carolina School of Public Health in Chapel Hill to provide support for the plaintiffs. Dr. Wing was reluctant to get involved because — as he wrote in [a 2003 paper](#) about his experience — "allegations of high radiation doses at TMI were considered by mainstream radiation scientists to be a product of radiation phobia or efforts to extort money from a blameless industry." But impressed with the Aamodts' compelling if imperfect evidence, Wing agreed to look at whether there were connections between radiation exposure from TMI and cancer rates.

Wing reanalyzed the Columbia scientists' data, looking at cancer rates before the TMI disaster to control for other possible risk factors in the 10-mile area. His [peer-reviewed results](#), published in 1997, found positive relationships between accident dose estimates and rates of leukemia, lung cancer and all cancers. Where the Columbia study found a 30 percent average increase in lung cancer risk among one group of residents, for example, Wing found an 85 percent increase. And while the Columbia researchers found little or no increase in adult leukemias and a statistically unreliable increase in childhood cases, Wing found that people downwind during the most intense releases were eight to 10 times more likely on average than their neighbors to develop leukemia.

Dr. Wing reflected on his findings at a [symposium](#) in Harrisburg marking the 30-year anniversary of the Three Mile Island disaster last week.

"I believe this is very good evidence that releases were thousands of times greater than the story we've been told," he said. "As we think about the current plans to open more nuclear reactors, when we hear — which we hear often — that no one was harmed at Three Mile Island, we really should question that."

Documenting discrepancies

Randall and Joy Thompson couldn't agree more. If anything, they think Dr. Wing's findings understate the impact of Three Mile Island because they're based on low-ball estimates of radiation releases.

"Given what he was allowed to know or could figure out, he did a slam-bang job of it," Joyce Thompson says.

In 1995, the Thompsons — with the help of another health physics expert who was also hired to monitor radiation after the TMI disaster, David Bear (formerly Bloombaum) — prepared [a report analyzing the Kemeny Commission findings](#). Their research, which hasn't been covered by any major media, documents a series of inconsistencies and omissions in the government's account.

For example, the official story is that the TMI incident released only 13 to 17 curies of dangerous iodine into the outside environment, a tiny fraction of the 13 million curies of less dangerous radioactive gases officials say were released, primarily xenon. Such a number would seem small compared with, for example, the 1986 nuclear accident at Chernobyl, which released anywhere from 13 million to 40 million curies of iodine and is [linked to 50,000 cases of thyroid cancer](#), according to World Health Organization estimates.

But the Thompsons and Bear point out that the commission's own Technical Assessment Task Force, in a separate volume, had concluded that iodine accounted for 8 to 12 percent of the total radioactive gases leaked from Three Mile Island. Conservatively assuming the 13 million curie figure was the *total* amount of radioactive gases released rather than just the xenon portion, and then using the Task Force's own 8 to 12 percent estimate of the proportion that was iodine, they point out that "the actual figure for iodine release would be over 1 million curies" — a much more substantial public health threat.

In another instance, the Kemeny Commission claimed that there were 7.5 million curies of iodine present in TMI's primary loop, the contained system that delivers cooling water to the reactor. But a laboratory analysis done on March 30 found a higher concentration of iodine in the reactor water, which would put the total amount of iodine present — and which could potentially leak into the environment — at 7.65 million curies.

"Thus, while the apparent difference between 7.5 and 7.65 seems inconsiderable at first glance," the Thompson/Bear report states, "this convenient rounding off served to 'lose' a hundred and fifty thousand curies of radioactive iodine."

They also offer evidence of atmospheric releases of dangerously long-lived radioactive particles such as cesium and strontium — releases denied by the Kemeny Commission but indicated in the Thompsons' own post-disaster monitoring and detailed in the report — and show that there were pathways for the radiation to escape into the environment. They demonstrate that the plant's radiation filtration system was totally inadequate to handle the large amounts of radiation released from the melted fuel and suggest that the commission may have arbitrarily set release estimates at levels low enough to make the filtration appear adequate.

Shockingly, they also report that when readings from the dosimeters used to monitor radiation doses to workers and the public were logged, doses of beta radiation — one of three basic types along with alpha and gamma — were simply not recorded, which Joy Thompson knew since she did the recording. But Thompson's monitoring equipment also indicated that beta radiation represented about 90 percent of the radiation to which TMI's neighbors were exposed in April 1979, which means an enormous part of the disaster's public health risk may have been wiped from the record.

Finally, in [a separate analysis](#) the Thompsons point to discrepancies in government and industry accounts of the disaster that suggest the TMI Unit 2 suffered a scram failure — that is, a breakdown of the emergency shutoff system. That would mean the nuclear reaction

spiraled out of control and therefore posed a much greater danger than the official story allows.

The Thompsons aren't the only ones who have produced evidence that the radiation releases from TMI were much higher than the official estimates. Arnie Gundersen — a nuclear engineer and former nuclear industry executive [turned whistle-blower](#) — has done his own analysis, which he shared for the first time at [a symposium in Harrisburg](#) last week.

"I think the numbers on the NRC's website are off by a factor of 100 to 1,000," he said.

Exactly how much radiation was released is impossible to say, since onsite monitors immediately went off the scale after the explosion. But Gundersen points to an inside report by an NRC manager who himself estimated the release of about 36 million curies — almost three times as much as the NRC's official estimate. Gundersen also notes that industry itself has acknowledged there was a total of 10 billion curies of radiation inside the reactor containment. Using the common estimate that a tenth of it escaped, that means as much as a billion curies could have been released to the environment.

✘ Gundersen also offered compelling evidence based on pressure monitoring data from the plant that shortly before 2 p.m. on March 28, 1979 there was a hydrogen explosion inside the TMI containment building that could have released significant amounts of radiation to the environment. The NRC and industry to this day deny there was an explosion, instead referring to what happened as a "hydrogen burn." But Gundersen noted that affidavits from four reactor operators confirm that the plant manager was aware of a dramatic pressure spike after which the internal pressure dropped to outside pressure; he also noted that the control room shook and doors were blown off hinges. In addition, Gundersen reported that while Metropolitan Edison would have known about the pressure spike immediately from monitoring equipment, it didn't notify the NRC about what had happened until two days later.

Gundersen maintains under the NRC's own rules an evacuation should have been ordered on the disaster's first day, when calculated radiation exposures in the town of Goldsboro, Pa. were as high as 10 rems an hour compared to an average cumulative annual background dose of about 0.125 rems. No evacuation order was ever issued, though Gov. Dick Thornburgh did issue an evacuation advisory on March 30 for pregnant women and preschool children within 5 miles of the plant. The government also did not distribute potassium iodide to the public, which would have protected people from the health-damaging effects of radioactive iodine.

Lessons for the future?

When asked by Facing South to respond to these allegations, a spokeswoman for the Nuclear Regulatory Commission did not address them directly, instead stating that it continues to stand by the Kemeny Commission report. The NRC further insists that the radiation releases from Three Mile Island had only "negligible effects" on the physical health of humans and the environment, citing other reports from federal agencies [For a PDF of the NRC's response to Facing South, see [here](#).]

But Gundersen and the Thompsons argue such claims don't address new findings at odds with the government's account.

"I believe [the] data shows releases from TMI were significantly greater than reported by the federal government," Gundersen says.

They also say their findings that releases were potentially much larger have important ramifications for current plans to expand the nuclear power industry.

With more than \$18 billion in federal subsidies at stake, 17 companies are seeking federal licenses to build a total of 26 nuclear reactors across the country, the first applications since the 1979 disaster. The Atlanta-based Southern Co. plans to begin site work this summer for two new reactors at the Vogtle site in Georgia, where state lawmakers recently [approved legislation forcing ratepayers to foot the bill](#) for those facilities up front. Florida and South Carolina residents have also begun paying new utility charges to finance planned reactors, [USA Today reports](#). Plans are in the works as well for new reactors in Virginia, North Carolina, Alabama, Mississippi, Louisiana and Texas.

Harold Denton, a retired NRC official who worked in Three Mile Island during the crisis, recently [told Greenwire](#) that changes made after the 1979 disaster "significantly reduced the overall risks of a future serious accident." But the Thompsons and Gundersen point out that the standards the NRC is applying to the new generation of nuclear plants are influenced by assumptions about what happened at Three Mile Island. They say the NRC's low estimates of radiation exposure have resulted in inadequate requirements for safety and containment protocols as well as the size of the evacuation zones around nuclear plants.

Other nuclear watchdogs have also raised concerns that the NRC's standards for protection against severe accidents like TMI remain inadequate. In a December 2007 report titled ["Nuclear Power in a Warming World,"](#) the Union of Concerned Scientists notes that the worst accident the current generation of reactors was designed to withstand involves only partial melting of the reactor core but no breach of containment. And the NRC requires operators of plants found to be vulnerable to severe accidents to fix the problem "only if a cost-benefit analysis shows that the financial benefit of a safety backfit - determined by assigning a dollar value to the number of projected cancer deaths that would result from a severe accident - outweighs the cost of fixing the problem," the report states.

Given their personal experiences, the Thompsons warn that we may be fooling ourselves into believing nuclear power is safer than evidence and history suggest.

"Once you realize how deep and broad the realignment of facts about TMI has been, it becomes really pretty amazing," Randall Thompson says. "I guess that's what it takes to protect this industry."

(Images from top: Photo of President Jimmy Carter leaving Three Mile Island for Middletown, Pa. on April 1, 1979 from the [National Archives and Records Administration](#); photo of Randall Thompson swallowing fire by [William Mosher](#); map showing increases in cancer rates in the TMI area after the disaster courtesy of Dr. Steve Wing; graph showing dramatic spike in pressure inside the TMI containment on March 28, 1979 courtesy of Arnie Gundersen.)

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