

Cover story: Valley Advocate Newspapers, July 6-12, 1995.

(Note that some of the facts in this story, about corporations, who owns which nukes, and the nature of the nuclear beast, have changed, but the basic premise is more true than ever. April 2007)

# **NUCLEAR POISONS**

**They continue to accumulate:  
too much, too fast, too hot to handle,  
insidious and deadly,  
lasting *forever*.**

**keith harmon snow**

**T**rained as a technologist, I once believed in nuclear power.

I had certainly heard stories about Chernobyl and Three Mile Island, but the technologist in me denied them. I took it for granted that nuclear power was cleaner, better, safer -- just as they'd told me. Until July of last year (1994), I never considered it further. And then I began my travels on the nuclear landscape.

Even as a child I loved crunching numbers, working with equations. When I got older, I went on to earn an advanced degree in electrical engineering from the University of Massachusetts, where some of the top scientists in the country were working on electromagnetic wave theory, microwave radiation and materials science. General Electric Aerospace Electronics Laboratories paid for my master's degree.

Like many in my field, I had faith in nuclear power. The advertisements in National Geographic, paid for by the U.S. Council on Energy Awareness, bought with taxpayers' money, told me: "Nuclear Power Means Cleaner Air! Reduces U.S. Dependence on Middle East Oil! A cheap, clean, renewable energy source."

## **In the panic to bury the evidence, Yankee Atomic is burying the truth.**

We were told it is clean. It looked clean. It smelled clean. As far as I knew, it tasted clean. I trusted science, computers, numbers, reason. My safety was ensured, I felt, and I was told, by 'defense-in-depth': back-up systems, to back-up systems, to back-up systems. It never occurred to me that science might be lying.

At GE's Aerospace & Defense Electronics Laboratories, my life was more numbers and computers, but suddenly everything was very high-tech. I wasn't just plugging numbers into the Schrodinger Equation (waves) or Maxwell's Equation (electromagnetics), but into components for satellite communications, for MILSTAR satellite constellations and space-based radars, into hardware that would be mounted on the fuselage of the B-1 bomber or the payload of a space-based laser for the Strategic Defense Initiative.

Soon I was responsible for business development. My annual salary was about \$49,000. I published five research papers in the journals of the Institute for Electrical and Electronics Engineers (IEEE). In 1989, I resigned.

Today I am a photographer and journalist. I am not a member or contributor to any organization or society.

Having spent the last four years (1989-1994) in 23 countries, I have come to realize that the world cannot be as neatly summed up as the western media or the U.S. government would have us believe. I have come to realize that the benefits extolled by industry to justify risking-taking of all kinds are often merely illusions -- illusions with deadly consequences.

In the past year, I have visited nuclear power plants and waste sites, talked to workers and plant officials, interviewed government regulators, dug through industry records and attended meetings called with little -- and usually no -- notice to the public. I have collected news reports and scientific papers detailing accidents, systems failures, the sale of shoddy parts and the massive build-up of poisonous by-products that will remain on the earth for millennia.

My investigation has brought me to a grave conclusion: The nuclear power industry, fixated on driving down costs and increasing profits, in concert with the U.S. government and its regulatory agencies, has mushroomed over the past three decades, without regard for what it is creating. It has expanded without regard for the ton upon ton of radioactive poison it is producing, without admitting that there is no safe place to put that poison, without adequate respect for the dangers inherent in the splitting of atoms, and with flagrant disregard for the cautions raised by those in and outside the industry.

My fear and my belief: it is only a matter of time before Chernobyl, USA, is a reality.

**P**ublic documents reveal an industry operating in secrecy and denial, burying the records, poking the contamination into holes that can't, won't and don't contain it.

The intention is to further delude the public, to get the next generation of reactors on-line as the voting age rises above the memory of Three Mile Island and Chernobyl.

Sufficient evidence now exists to damn the fission experiment forever. Evidence of latent cancers, ravaged immune systems, genetic mutations and birth defects caused by even very low radiation exposures and "benign" radioisotopes.

Today I reject even the language of nuclear fission. Nuclear "power" suggests strength and security. "Facility" or "plant" is too neat, tidy and sterile. "Nuclear energy" sings of sunshine and children playing, not of what it really is: the harnessing of a nuclear bomb.

The terms "high-" and "low-level" waste are misleading, as well, since "low-level" can include wastes like nickel-59 (a 750,000 year half-life) and iodine-129 (a 16 million year half-life). When talking about "half-life," the time in which half the volume of an isotope decays, remember the remaining half that hasn't yet decayed.

Even the term “waste” is euphemistic: radioactivity cannot so neatly be discarded or shipped to the dump. We should call it what it is: poison. The poison continues to accumulate: too much, too fast, too hot to handle, homeless, insidious and deadly. Lasting forever.

Now, with the rapid push by the Massachusetts Waste Management Board to site a nuclear waste dump in Massachusetts, the poison may soon be coming to a town near you.

In fact, it has already been here.

**I**t was the fall of 1994 when I went to Sherman dam in Rowe, site of Yankee Atomic, one of the oldest and smallest nuclear reactors in the country.

That day I spoke with Tim Henderson, then the reactor superintendent. Henderson talked about the solidarity and pride of the workers at Yankee.

“When the decision was made to shut the plant down, it was like something inside of us died,” he said. In 1991, the Yankee plant was closed because of problems with cracking reactor vessels. I could see the hurt in Henderson’s eyes, hear the pain in his voice. “This was the safest plant in the country.”

After hours in public documents rooms, those words haunt me.

As at most nuclear reactors, the spent nuclear fuel [SNF] rods from Yankee -- permeated with plutonium -- rest in aging, densely packed pools, gaseous and highly volatile. Yankee’s 533 SNF rods sit 37 feet down in a pool cooled and vented to the Deerfield River Valley. It is widely acknowledged, even within the nuclear industry, that an unexpected SNP pool drain caused by seismic activity or pump failure could lead to a nuclear explosion. Many scientists worry that the isotope soup in these storage pits -- rods placed too close together, gases mixing -- could explode spontaneously.

Under the Radioactive Waste Policy Act of 1980, the government was supposed to take responsibility for SNF by 1998. It promised to come in, take it out, and put it somewhere else. But where? To date, the government hasn’t answered that question. Many scientists are convinced there is no answer.

In the meantime, the government is spending billions to study the problem. It has spent more than \$1.7 billion, for example, to study the feasibility of dumping waste deep below the desert in Yucca Mountain, Nevada. (Yucca Mountain, turns out, is a Bechtel / SAIC enterprise. See Keith Harmon Snow, Out of the Blue.) Debate has broken out among federal scientists at Los Alamos National Laboratory, fueled by claims that such dumping will lead to a nuclear explosion. (For the former Soviet Union, feasibility wasn’t an issue: they injected an estimated 1.4 billion curies of radioactive waste straight into the ground, into the aquifer, according to Nikolai

Yeterov, a high-ranking official in the Russian Ministry of Atomic Energy.) At the Hanford Laboratory site in Washington State, the industry already has buried 177 tanks holding 57 million gallons of waste, with a strength of about 360 million curies.

One curie is a very large measure of nuclear poison. The evacuation of pregnant women and children from the vicinity of Three Mile Island was ordered after a suspected release of between 1.4 and 14 curies of the thyroid cancer-causing isotope iodine-131. One curie equals 37 billion disintegrations per second. According to the leading radiation health experts, Dr.'s John Goffman and Ernest Stemglass, for a person in the exposure pathway of a radiation emitter, just one disintegration per second is enough to cause cancer.

By the time of my visit in 1994, Yankee, closed by the citizens in 1991, was being used as a model, intended to show that a plant could be decommissioned, taken off-line, cleaned of radioactive waste.

That day in July, Henderson led a tour of Yankee. The grass on Sherman Dam was tall and green, painted with yellow and orange flowers, but knowing of Yankee's 34-year history of intentional releases of radioactivity, it echoed an incongruity within me.

There were both planned and unplanned spills and leaks, flushed into the Deerfield River in keeping with the myth that radioactivity highly diluted becomes sufficiently harmless. But risks from exposure are continuous and cumulative. The routine venting of gases and liquids continues today at all operating and decommissioning reactors. The industry refers to the waste as "below regulatory concern" and "ALARA: as low as reasonably achievable, taking into account the state of technology and the economics of improvements in relation to benefits ... and other socioeconomic considerations." Ultimately, public safety decisions are based on reactor design, cost and industry convenience.

**T**he history of nuclear reactors lives in the Nuclear Regulatory Commission records -- at the public document rooms throughout the country. Yankee's records are stored at Greenfield Community College.

As time passes, the recorded information in Greenfield becomes increasingly impenetrable with language designed to obfuscate. A chronological survey reveals the creeping paralysis of bureaucracy and the mythology of science. Records show the industry's increasing disdain toward health and safety. They show scientific and technological malfeasance, complicity with regulators and government. They show severe ecological hostility.

Early Yankee records attest to technological utopianism at its worst. With the increasing complexity of computer-based systems and human engineering, the

nuclear cancer thrived and multiplied. Defense-in-depth -- the notion of layered backups -- was born.

In Greenfield, I took a random sampling of Yankee documents. Here's some of what I found:

- 1961: Reports describe the start-up and the early reactor “scrams,” or emergency situations, the production and handling of poisons having lifetimes of thousands or millions of years.
- 1962-1965: Reports 14 to 65 from February 1962 to May 1966 are missing. (So far, I have not found out where they went or why they are missing.)
- 1966: In September, 33 gallons of radiotoxic water spilled out of the spent fuel pit and into sewers and ground water. Workers sent to measure contamination in culverts mixed up the east and west side culverts because a road had been moved. Everything was flushed with “service water” (otherwise known as the Deerfield River) and mopped up.
- 1966-67: Radioactive wastes mixed with 5,247,528 gallons of water for “safe” dilution were intentionally released. Radioactive gases were vented. Some 827 drums and four casks with 37,000 curies of solid wastes, along with spent fuel rods with over 64,950 curies, were shipped on the roads of Western Massachusetts to an unspecified destination.

As early as 1966, the 6-year-old Yankee reactor faced regular contamination leaks as high pressures and temperatures blew holes in reactor pipes, seals and bearings. There were major, regular steam generator tube (SGT) repairs, as SGTs disintegrated from day one. Testifying to the technological problem-solving, leaks were found by wrapping tubes with saran wrap.

**T**he '60s. A long time ago? Not for radioactive waste. And even recent Yankee documents hold alarming information.

In 38 shipments from Nov. 30, 1993 to April 7, 1994, Yankee shipped 126,888 curies of irradiated waste by road or rail; destination, Barnwell, S.C. (One shipment, I have since found out, was rejected in Barnwell and sent back to Yankee because it was “too hot.”)

The Union of Concerned Scientists, among other nuclear groups, cites the cracking of steam generator tubes as one of the most urgent reactor safety issues today, because a major SGT rupture could trigger a serious reactor “event,” initiating a sequence of events leading to a meltdown, a Chernobyl, or worse.

“With many nuclear reactors getting older, these unresolved safety issues are of

more concern now than ever,” says Paul Gunter of the Nuclear Information Resource Service, a Washington, D.C.-based watchdog group. Reactor vessel cracks caused by aging is another issue, the one that forced the closure of Yankee in 1991. For Yankee, closure meant decommissioning the plant—gathering up the waste not already buried, packing it up on trucks or in railroad cars and sending it away. of the in Shelburne Falls. “They want to go into the business of decommissioning nuclear reactors. They show one picture with the reactor in it-, in another picture it’s all gone—as if there’s no contamination.”

At a recent Greenfield meeting open to the public (on the condition that the public keep quiet), Yankee and NRC officials discussed the Yankee property. Prior to the meeting I interviewed the NRC’s Morton Fairtile, an industry player since the 1950’s. He said that “Yankee’s steam generators weren’t that contaminated.”

Fairtile’s statement doesn’t square with the records. The two Yankee steam generators stripped out and shipped in December 1993 were contaminated with 681 curies of the deadliest poisons known to humanity: cobalt-60, iron-55, nickel-63, plutonium-241 and cesium-137, according to NRC records in Greenfield. Those radiation levels exceeded NRC regulations for shipping.

At the meeting, Yankee and the NRC discussed contamination of the property: soils, ground water, sediments on the bottom of Sherman Pond at the out-pipe of the reactor. Language used seemed designed to obfuscate. It was a sort of industry insider’s code. It told me there was much being said without words. Evident, in any case, was the gross negligence of an economically driven, accelerated decommissioning.

The NRC asked Yankee to clarify its interpretation of “radioactive.” The question suggested that more than three decades after Yankee began operating, regulators and plant operators were still unclear in their mutual understanding of the poison being handled. Or, again, that the definition of terms has become a means of blurring the truth for the public in an effort to minimize the cost of “clean up.”

On Yankee’s plans to ignore the radioactivity at the bottom of Sherman Pond, at the reactor discharge point, the NRC said, based on experience at other sites, “there is probably significant contamination.”

Here is an excerpt from a transcript of that meeting:

**Yankee:** There is no significant exposure pathway from the radioactivity in Sherman Pond sediment as long as it remains under water.

**NRC:** Cobalt-60 is what we’re talking about.

**Yankee:** If you bring it above water, there is a very low exposure.

**NRC:** Can you please clarify whether or not Yankee plans on excavating any soil from Sherman Pond? To reduce the amount of concentration below water?

**Yankee:** We have no plans to do that.

With that, regulators and Yankee moved on to another topic. The contamination of Sherman Pond remained acknowledged but unresolved, at least in front of public witnesses.

Missing from the discussion of nuclear power  
is any true sense of interconnectedness,  
or community,  
with self, other, or with the earth  
that we eat and breathe.

Regulators and industry officials aren't alone in ignoring the issue of nuclear poison. Many environmentalists whom you might think would be alarmed have been silent.

Norman Sims is a professor of journalism at UMass, a member of the board of directors of both New England FLOW ( a consortium of white-water boating groups) and the 66,000-member Appalachian Mountain Club. Like other big environmental groups in the United States, including the Conservation Law Foundation [true at the time; now more complicated], the AMC has been silent on nuclear issues.

I spoke with Sims one day at the Charlemont Inn, after he finished a rafting trip on the Deerfield River. I was introduced to Sims by the bartender, who clearly knew him as a regular, after I asked if there was anyone around whom would talk to me about the river. At first Sims dodged my questions about Yankee, but in the course of our conversation, it became clear he had an opinion.

I asked him, as a professor of journalism, an ethical question: Do the boaters have a right to know about the continued releases, from 1993 to 1995, of radioactivity, as spelled out in documents in Greenfield?

“Don't quote me on this,” he said. “Don't quote me on anything involving nuclear power. A lot of these nuclear groups are so rabid that they just won't stop. I'm a whitewater boater. I drank the river today. I'll drink it tomorrow. They're not dumping anything in the river.”

“You hope,” I said.

“I don't care. You have to understand some of the scientific principles involved. My advice: avoid the nuclear issue. It's an old issue that's pretty well



known to a lot of people. They're moving the radioactive material out of here. The machinery that was in the plant is slightly radioactive. My attitude is get it out of here, take it someplace, let the government dispose of it."

But in the rush to dispose of all visual evidence of Yankee, to nurture the "clean environment" myth, Yankee and the NRC dismissed all efforts to evaluate and document aging mechanisms. Thus began the accelerated stripping and shipping of hardware, with over 126,888 curies of radiation. Reactor internals were buried without an autopsy. In the panic to bury the evidence, Yankee Atomic is burying the truth.

**F**rom the observation decks at the New England Electric Power Pool, or NEEPOOL, in Holyoke, you can see where the energy comes into your life. And the supply-side looks big.

On the wall is a huge information grid, offering moment-by-moment status of every provider on the energy landscape -- from Hydroquebee to the big boys in New England: Pilgrim (665 MWe); Connecticut Yankee (590 MWe); Seabrook (1,150 MWe); Millstone 1, 11 & III (660, 875 & 1,140); Vermont Yankee (496 MWe); and Maine Yankee (860 MWe).

Recent inspections at Maine Yankee identified more than 500 confirmed cracks in some 17,000 steam generator tubes, prompting the NRC to demand inspections at dozens of similar reactors nationwide. Up to 13 utilities have filed lawsuits against the manufacturer, Westinghouse, alleging massive steam generator fraud. Many were settled out of court, the parties reaching agreements to seal all records and evidence from public scrutiny.

In the widespread and consistent failure of reactor components, like Maine Yankee's steam generator tubes from Westinghouse, I hear the familiar tune of planned obsolescence.

In fact, Westinghouse has a nasty history of fraud. Low-bid at \$500,000 in 1974, the Bataan reactor in the Philippines ended up costing more than \$2.7 billion with interest when it was finished in 1985.

The Philippine government moth-balled the reactor because of safety concerns before it could go on-line, later filing suit in the New Jersey Courts against Westinghouse and consultants Burns & Roe, on the basis of bribery to the corrupt Marcos regime. Although it accepted a Westinghouse settlement of \$49.5 million, the Philippines is still paying. As of Oct. 31, 1988, the Philippine government was paying \$355,000 per day in interest alone.

"Our newly formed Westinghouse Government & Environmental Services Co. directly supports our government's goal to clean up [Department of Energy]

facilities,” reads the Westinghouse Annual Report. “With regard to remedial actions under federal and state Superfund laws,” it reads elsewhere, “the Corporation has been named as Principally Responsible Party [to environmental damage] at numerous sites [52] located throughout the country.”

Westinghouse employs about 80,000 people. The Energy Systems Division, with a \$2.6 billion backlog of orders, is “a strong cash generator with room for growth in the \$30 billion global nuclear fuel and service market,” the report says. The Power Generation Division, “a major competitor in its \$65 billion market,” has a \$2.3 billion backlog (1994).

Annual U.S. government subsidies for the nuclear industry exceed \$20 billion. While domestic markets may be depressed because of unplanned downtimes caused by safety problems, the cost of decommissionings and the waste storage crisis, sales overseas are red hot.

Korea has nine reactors in operation and 14 reactors planned or under construction. In China, power production lags demand by 20 percent. Canada recently signed contracts to build two reactors near Shanghai. U.S. and Canadian companies are rapidly building nuclear plants worldwide. The deal is: Buy U.S. technology; we’ll take the poison.

There are more than 438 nuclear reactors worldwide, 112 in the United States, poisoning the earth through daily operations. By 2020, the U.S. nuclear industry will, by some estimates, have produced 30,000 tons of plutonium; the acceptable body dose is one-millionth of a gram; one pound could wipe out humanity. Given the widespread dispersion of poisons, no place is safe from nuclear fission. The creeping paralysis of bureaucracy is spreading the nuclear cancer.

**I** believe that all production of nuclear poisons should stop immediately and that the poisons should be stored with the contaminated reactors in the cavities designed to contain them. Jointly we should guard and monitor them, like temples, protecting ourselves and future generations, protecting the earth to the best of our abilities. (This proposal was put forward by Joanna Macy, and others, in their Nuclear Guardianship Program.)

I think of Tim Henderson at Yankee. Henderson did what he thought was right, just as I did for General Electric. And now we need all the Tim Hendersons we can get, with all their knowledge and experience, to lead us in securing the poison as best we can.

But missing from the discussion of nuclear power is any true sense of interconnectedness, or community, with self, other, or with the earth that we eat and breathe. Shared values and community are attainable; the power lies within us. But

people are numbed by the scale of the nuclear calamity, and until they are willing to accept the enormity of the horrors, to embrace them, to emerge from denial and despair, it will get worse.

“I don’t understand when I see people out there trimming their hedges,” says local clown and political activist Joshua Dostis. “I think, ‘Why bother?’ Don’t they see what’s happening? And Recycling doesn’t cut it. People need to act. We need conservation like ‘Wattless Wednesday’. There’s a beginning. Switch the electricity off -- everyone, everything, every Wednesday. Switch off the nukes. It may be hopeless, but we’re not helpless.”

True.

And so the whole story reminds me of Star Trek and the computer-simulated war between the planets Eminiar and Vendikar. Chosen by computer, citizen’s selected as casualties dutifully reported to termination centers, to their neat and orderly deaths. There was less mess, less of the horror of war. But alot of unnecessary killing. It never occurred to anyone that they might just one day stand up and say “enough.”

**begin.**

Sidebar:

## **The Makers and Takers of Toxins**

**T**here are some 261 nuclear waste producers in Massachusetts, according to the Massachusetts Radioactive waste Survey Report of 1993.

The U.S. Army Watertown, along with Texas Instruments and Sprague Co.mpany, accounted for 79 percent; Yankee Atomic and Pilgrim accounted for 13.4 percent. All area hospitals produce radioactive waste, although they account for less than 2 percent of the total.

There are 15 producers in Hampshire and Hampden counties (including UMass, Mt. Holyoke, Amherst and Smith College); three in Franklin; six in Berkshire; 26 in Worcester. INS Corporation in Springfield, responsible for laundering Yankee Atomic radiation workers’ clothing, produced 654,666 cubic feet

of waste.

And now, a move is on to site a low-level nuclear waste dump somewhere in the state. If there are no 'volunteers' for the dump the state will force it on some community somewhere.

Some 30 to 35 towns, mostly those in Western Massachusetts, comprising the greatest unpopulated landmass, have passed resolutions or town bylaws opposing a waste dump. Those resolutions are based on a document originally drafted by Sunny Miller of the Massachusetts Alliance to Limit and Eliminate Radioactive Trash (MASSAlert), demanding that positions be reduced and eliminated at the source, and that producers be held responsible for the waste.

At a meeting in Lenox last fall, state Rep. Christopher Hodgkins (D-Lee) blasted Carol Amick, executive director of the Massachusetts Low-Level Waste Management Board, for convening secret sessions with public officials to discuss the siting process.

Hodgkins also said: "We want to communities that are benefiting from and generating this waste to be the same fools that are going to take responsibility for storing it."

Like most people, Hodgkins forgets that some 38 percent of the New England energy mix provided to every utility customer on the New England power grid comes from nuclear sources. Anyone in New England who clicks electrical switch, plugs in a lawnmower or an electric car, soaks in a hot tub, cooks with a microwave or types on a computer contributes to the production of nuclear poison.

A 400-acre dump in Massachusetts would certainly draw out-of-state waste and the concomitant threats of transportation. The Office of Nuclear Material Safety and Safeguards reported 72 incidents involving radiation on U.S. highways in 1991: 23 accidents; six handling "events"; 12 shipment thefts; and 31 "other." At least 12 were incidents of contamination.

One incident occurred on Dec. 16, 1991, on Interstate 91 in Springfield, when a truck carrying unused nuclear fuel collided head-on with a wrong way driver, leaving the truck and fuel containers burning for three hours.

~ **keith harmon snow**