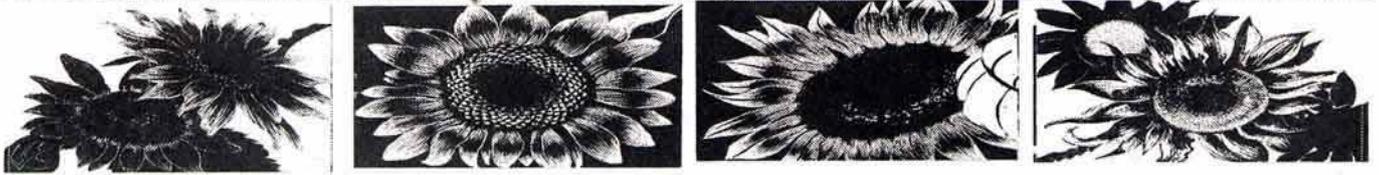


# NUKEWATCH

## QUARTERLY



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News & Information on Nuclear Weapons, Power, Waste & Nonviolent Resistance

## EPA's Plan to Raise Radiation Exposures Challenged

WASHINGTON, DC (ENS) — Public employees have filed a lawsuit demanding documents related to the U.S. Environmental Protection Agency's plans made "in secrecy" to allow public exposure to increased levels of radioactivity following nuclear accidents or attacks. The lawsuit filed October 30 under the Freedom of Information Act by Public Employees for Environmental Responsibility (PEER) claims that the agency "wrongfully withheld" comments submitted by EPA and other federal and state agency officials, and by representatives of private corporations or trade associations, to the EPA Office of Radiation and Indoor Air as it prepared its updated Protective Action Guides.

The new radiation guides would increase allowable public exposure to radioactivity in drinking water, including a nearly 1,000-fold increase in strontium-90, a 3,000 to 100,000-fold hike for iodine-131 and an almost 25,000-fold increase for nickel-63.

The radiation guides are protocols for responding to incidents ranging from nuclear reactor accidents, to radioactive transportation spills, to dirty bombs.

"The new draft standards have been promulgated in secrecy despite sharp controversy about allowing public exposure to radiation levels vastly higher than those EPA had previously deemed unacceptably dangerous," claims PEER, a national nonprofit alliance of resource professionals employed by government agencies at the local, state and federal levels.

"EPA has bypassed open dialogue on how much radiation the public will be allowed to receive in the event of a release, and is now suppressing evidence of internal dissent on these controversial proposals," said PEER Executive Director Jeff Ruch.

PEER said in a statement Oct. 30 that it has received "verbal reports that both internal and external reviewers registered grave concerns about the radical relaxation of radiation exposure limits being proposed."

In its lawsuit, PEER claims the comments are a matter of public concern because they address whether EPA is meeting its mission of protecting the environment and public health with respect to radiation releases.

The new radiation guidance would also allow long-term cleanup standards thousands of times more lax than anything EPA has ever before accepted, permitting doses to the public that EPA itself estimates would cause a cancer in every fourth person exposed.

These relaxations of radiation protection requirements are favored by the nuclear industry and allies in the Nuclear Regulatory Commission and Energy Department, PEER claims.

The plan to relax radiation standards was signed off on in the final days of the Bush administration, and suspended by the new Obama administration prior to its publication. Obama EPA appointees are now weighing the plan.

On June 11, 2009, PEER submitted a request under the Freedom of Information Act for all of the comments to the Office of Radiation and Indoor Air. ORIA has yet to produce any of the documents requested, months beyond the response deadlines mandated under the Freedom of Information Act.

On Oct. 16, EPA's Office of General Counsel directed ORIA to comply but conceded that the only way to enforce its order would be in court. ORIA had not met previous self-announced timelines

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## Retiring Reference Man\*

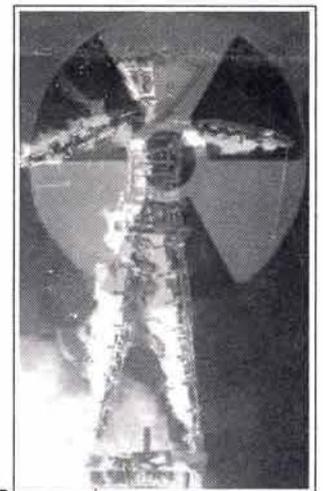
By Arjun Makhijani, Ph.D., and Lisa Ledwidge

Reference Man — a hypothetical adult white male — is currently the basis of many federal regulations and compliance guidelines, including workplace radiation exposures, cleanup of radioactively contaminated sites, and some radionuclide limits in drinking water, notably alpha radiation-emitting transuranic radionuclides. The use of Reference Man is scientifically inappropriate because the vast majority of people, including women and children, fall outside the definition:

*Reference man is defined as being between 20-30 years of age, weighing 70 kg [154 pounds], is 170 cm [5 feet, 7 inches] in height, and lives in a climate with an average temperature of from 10° to 20°C [50° to 68° F]. He is a Caucasian and is a Western European or North American in habitat and custom. (International Commission on Radiological Protection, 1975).*

The continued use of Reference Man does not take into account the greater radiation doses received by some parts of the population that result from the same environmental conditions and the higher cancer risks per unit of dose that they face. This especially applies to women (including pregnant women) and children.

Specifically, the overall fatal cancer risk experienced by females is 37.5 percent greater than that experienced by males for the same radiation exposure. The differential cancer incidence risk is even higher (52 percent higher) for women than men.



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## UN's Nuclear Watchdog Condemns Israeli Bomb Threats Against Iran

Mohamed ElBaradei, who retires Dec. 1, after 12 years as the head of the UN International Atomic Energy Agency (IAEA), said November 4, that Arab nations are "not comfortable reading that Israel has 200 warheads and it wants to bomb a country just for having the technology," the *Wall Street Journal's* Joe Lauria reported.

The Israeli government maintains a public policy of refusing to confirm that it has a stockpile of nuclear weapons that may, according to author Seymour Hersh, reach to 600 warheads. Conservative estimates, including one by former President Jimmy Carter, put the number at 150-to-200.

In a speech to the Council on Foreign Relations, ElBaradei said that his IAEA inspectors had no proof that Iran has a nuclear weapons program, the *Journal* reported. Iran's government says its nuclear program is for electric power generation, a program that is permitted under the terms of the Nuclear Nonproliferation Treaty. Iran is a party to the treaty [only four nuclear-armed UN member states are not: Israel, North Korea, Pakistan and India], but in 2003 was found by the IAEA to be in violation of some of the treaty's safeguards. In November 2007, a U.S. National Intelligence Estimate concluded that Iran had halted its nuclear weapons program in the fall of 2003 and that it had remained shuttered as of mid-2007.

ElBaradei went on to say that any military assault on Iran — spoken of openly by both U.S. and Israeli government and military officials — would "solve nothing" because Iran would start up a crash nuclear weapons program and, additionally, "you can't bomb knowledge" meaning that the science behind H-bomb building is no longer secret or hard to attain.

ElBaradei even alleged that if Iran were attacked, "Every Iranian, even in Los Angeles" and all its allies would endorse the country's nuclear program.



## NASA's Monkey Radiation Experiments Draw Outrage

In a NASA-funded study designed to prepare astronauts for spaceflight, up to 28 squirrel monkeys (pictured) are to be subjected to doses of radiation that will, according to the experimenters, add to what is known about how such poisoning affects the performance of a variety of tasks.

The Physician's Committee for Responsible Medicine, based in Washington, DC, has objected to the deliberate endangerment of the monkeys and wrote to NASA Administrator Charles Bolden Nov. 5, urging him to suspend the program. The group says the tests are both unethical and useless. *Scientific American* reports that PCRM's petition to Bolden asserts that the study, "would be one giant leap backward for NASA," calling it "unnecessary" and "cruel."

The research project, led by Jack Bergman of McLean Hospital, a Harvard Medical School affiliate in Belmont, Mass., was one of 12 awarded radiobiology research grants through NASA's Human Research Program. PCRM charged that Bergman's tests would even violate NASA's own published rules regarding animal ethics.

The animal welfare group PETA reports that the monkeys will be subjected to a "massive dose of gamma radiation." Seven PETA members staged a protest Nov. 19 outside NASA headquarters in Washington, DC, wearing monkey masks while locked inside small cages and holding signs that said, "No Tax \$ for Animal Abuse," and "Stop Radiation Tests on Monkeys."

Anticipating the uproar over the planned experiments, Bergman's public relations officials told *Discover News*, "After the radiation exposure, the monkeys can look forward to a lifetime of being looked after by staff and veterinarians at McLean Hospital." Historically, this is not true.

Between 1944 and 1973, the government conducted thousands of radiation experiments on thousands of mostly poor, powerless and sick U.S. citizens who were unaware they were being used as lab animals. In her 1999 book *The Plutonium Files*, Eileen Welsom wrote that NASA was in on these ghastly crimes as well. In one large experiment that lasted 17 years, and which was paid for in part by NASA to study radiation's effects on astronauts, 194 patients were exposed to "total body irradiation" at a research hospital at Oak Ridge, Tennessee. NASA's human victims were never provided long-term, follow-on health care.

— *Scientific American*, Nov. 6; *London Telegraph*, Nov. 2; *Discovery News*, Oct. 29, 2009

### Lake Superior Barrels Update

## Nukewatch Prompts Minn. PCA to Correct Web Site Errors

By John LaForge

LUCK, Wisconsin — The Minnesota Pollution Control Agency will act to correct several factual errors in its official web site information about barrels of military waste dumped into Lake Superior in the late '50s and early '60s — prompted by persistent complaints from Nukewatch.

A Nov. 3 email from the MPCA Information Officer Stephen Mikkelsen said the agency's "Lake Superior barrels leadership team" agreed to make several changes in the agency's web site pages that deal with the scandalous dumping of at least 1,457 barrels of waste that came from Honeywell, Inc.'s Twin Cities Army Ammunition Plant in Arden Hills, Minnesota.

In written comments to the MPCA, Nukewatch pointed to the web site's erroneous denial that 17 toxic chemicals were found in several barrels in 1990. The MPCA also currently denies that radiation was ever reported being emitted from any of the barrels. Nukewatch also noted that the case is not closed and that an on-going investigation of the more than 1,400 barrels that remain in the water — some "perilously close" to the drinking water intake for the city of Duluth, according to a February 1995 letter to the U.S. Environmental Protection Agency (EPA) from U.S. Representatives David Obey and James Oberstar — should be noted on the web site.

Regarding the MPCA's erroneous statement that, "Just as in 1976, no radioactive material in the barrels was detected," Mr. Mikkelsen wrote in part, "This paragraph in the factsheet will be re-written to more accurately reflect the conclusions stated by EPA in its Nov. 27, 1990 report."

Nukewatch had reminded the agency: "This mistake contradicts the official report of the 1990 survey written by Mark O. Semler" of the EPA's National Air and Radiation Environmental Laboratory. This "Final report of results from survey of drums in Lake Superior" says, "Drums 33, 37, and 38 had marginally elevated gamma [radiation] exposure rates," and "Drum 11 had slightly elevated gamma levels."

## Indian Point Puts Public Health at Serious Risk

Thyroid cancer incidence rates in counties closest to the Indian Point nuclear reactor in New York state — 35 miles north of midtown Manhattan — are among the highest in the nation, according to a newly published study by Joseph Mangano, Executive Director of the Radiation and Public Health Project, a research and education organization based in New York.

For the first time, county-specific cancer incidence data for most U.S. states was made available by the U.S. Centers for Disease Control and Prevention. As reported in the current issue of the *International Journal of Health Services*, Mangano's study, which relied heavily on the new cancer data, found that thyroid cancer incidence between 2001 and 2005 for Orange, Putnam, and Rockland Counties — those nearest to Indian Point — are among the eight highest in the U.S.

Thyroid cancer risk increases after exposure to radioactive iodine-131, produced only in nuclear weapons explosions or nuclear reactors. There are no other known major risk factors for the disease.

At a Nov. 16, 2009 press conference in New York City, Mangano declared that his report should put an end to any further consideration of extending the operational life of the accident-plagued Indian Point reactors.

"A sound energy policy should focus on safe sources, such as wind and solar power. Federal regulators should not allow a threat to the health of millions to operate for 20 more years," Mangano said.

— Joseph Mangano, "Geographic Variation in U.S. Thyroid Cancer Incidence and a Cluster Near Nuclear Reactors in New Jersey, New York, and Pennsylvania," *International Journal of Health Services*, Vol. 39, No. 4 / 2009, p. 643

## Missile Base Chiefs Fired

MINOT, North Dakota — The Commander of the Minot Air Force Base, Col. Joel Westa, and the base's Missile Wing Commander, Col. Christopher Ayres, were relieved of their respective positions in October. *Air Force Times* and the *New York Times* report that the firings came in the wake of a string of accidents and rule violations. The airbase in West-central North Dakota controls 150 nuclear-armed Minuteman III missiles and scores of W-80 warheads used on Air Launched Cruise Missiles which are fitted for B-52 bombers. The base is one of only two in the U.S. that still houses the B-52s.

Air Force Commander Major General Roger Burg also fired two officers formerly under Ayres' authority — Col. Lyman Faith, a Maintenance Group leader, and Lt. Col. Andrew Healy, CO of a Missile Maintenance Squadron.

In August of 2007, officers and airmen loaded a B-52 with six nuclear-armed Cruise missiles, and the bomber then illegally flew to Barksdale AFB in Louisiana.

In July of 2008, three Air Force "missileers" fell asleep while in control of an electronic component that contained old launch codes for nuclear-armed intercontinental ballistic missiles.

More recently, base personnel were involved in two crashes of vehicles carrying missile parts, including an August 31 rollover of a heavy trailer carrying Minuteman III rocket engine parts.



## The Post's Lies of Omission Hype North Korean Threat

By Bruce Gagnon

The *Washington Post's* Oct. 13 story, headlined "North Korea Fires Five Missiles," intentionally mislead its readers.

North Korea did fire five short-range missiles, and its government did declare a navigation ban in waters off its eastern and western coasts, but the problem with the *Post* story is what they did not report. This missing piece of information happens to explain why North Korea has taken such actions.

What *The Post* left out of their story was that U.S. and South Korean militaries had just begun major war games (Oct. 13-16) that included the *USS George Washington* aircraft carrier battle group. The exercises were held in the western or Yellow Sea between Korea and China.

North Korea does not know if the U.S. will launch a "shock and awe" attack on them. But after all, they have seen Iraq and Afghanistan attacked and they hear the rattling of the U.S. war sabers over Iran. So, like so many people have told me, North Korea can't take a chance when these big military exercises happen. They drop everything they are doing and stand ready to defend themselves. It is one reason their economy is such a mess.

The North Koreans fired five short-range missiles harmlessly into the sea as a warning that they were on alert.

*The Post* wrote, "Secretary of State Hillary Rodham Clinton, reacting to reports of the missile launches, said the U.S. and its allies are trying to demonstrate to North Korea that the international community will not accept its continuing nuclear program."

The U.S. state department, military and industrial press feign surprise at such "outlandish" and "unexpected" behavior by "unstable" North Korea and use the missile launch incident as a pretext to remind the world that good Americans are working hard to stop North Korea's nuclear program. The U.S., in other words, is just an innocent bystander, a "good uncle" that just shakes his head in dismay at those strange North Koreans.

So, in the U.S. and around the world a misinformed public hears another example of how "crazy" the North Koreans are, once again firing missiles at phantom targets. But in this case, I had a kernel of mostly unreported news at my disposal. I could see how the government and *The Washington Post* are misleading the public. Even most members of Congress probably won't know about the war exercises just off the North Korean coast.

— Bruce Gagnon is the Coordinator of the Global Network Against Weapons & Nuclear Power in Space.

# Disarmament Activists Confront Trident Sub Base

By Bonnie Urfer

On November 2, five peace activists calling themselves the "Disarm Now Plowshares," entered the Naval Base Kitsap-Bangor in Puget Sound, Washington, to act against the giant Trident submarine nuclear weapons system.

Susan Crane of Jonah House in Baltimore, Anne Montgomery of New York City, Steve Kelly of Oakland, California, Bill Bischel of Tacoma and Lynne Greenwald of Bremerton, Washington, used bolt cutters to get through a perimeter fence. Then, walking for four hours under a full moon, and with some additional fence cutting, the group reached the security surrounding what's called the Strategic Weapons Facility - Pacific (SWFPAC).

The group carried a banner declaring: "Disarm Now Plowshares: Trident Illegal & Immoral," and near the SWFPAC they poured blood, hammered on the road and fences, and scattered sunflower seeds. When they cut into a SWFPAC fence, alarms sounded. They were thrown to the ground, handcuffed, hooded and held for four hours by base officials. Still hooded, they were taken out through the very holes they had made in the fences. Questioned by base security, FBI and the Naval Criminal Investigative Service, they offered only their names. They were cited for trespass and destruction of government property, issued a "ban and bar" letter and released.

In a prepared statement they said, "The manufacture and deployment of Trident II missiles, weapons of mass destruction, is immoral and criminal under International Law

## Disarmament Activist Parries Christian Theology With Prosecutor

**Editors note: Carl Kabat, 75, a Catholic Priest and Plowshares activist entered a Minuteman III missile silo in Colorado last Aug. 6 to commemorate the U.S. atomic attack on Hiroshima with an act of nuclear disarmament. Kabat is in jail in Greeley, Colorado awaiting trial on misdemeanor charges of criminal mischief and trespassing. Bill Sulzman reports about an unusual pre-trial hearing.**

By Bill Sulzman

Carl's Nov. 6 hearing was routine in some ways and anything but routine in others. The first witness was Weld County Sheriff's Deputy Warren Sitzman who had taken Carl into custody Aug. 6 after the Air Force apprehended him. Sitzman went through the details of the arrest, often reading from his own notes. Then defense lawyer Jacob Goldstein of the state public defenders office had all the banners unsealed from the evidence bags and held up for Weld County Court Judge Dana Nichols to see. Bread and wine found at the scene were also submitted as evidence. Each time Deputy Sitzman read the banners for the record. At the end of that testimony Goldstein made a motion for access to the Air Force's arrest report. The prosecutor said the Air Force was refusing to turn it over. Judge Nichols ordered the evidence be produced by Nov. 10.

## Judge Releases Protesters After Mistaking Some for Derelicts

By Frank Cordaro

Four of the eight people arrested Nov. 4th protesting the space weapons bazaar in Omaha were jailed overnight. Fr. Louis Vitale, Fr. Jim Murphy, Steve Clemens and I were all charged with a misdemeanor akin to trespass.

The next afternoon's "jail court," presided over by Douglas County Judge Darryl Lowe, turned out to be the most entertaining and perplexing two hours I have ever spent in a court room. Jail courts are where people who don't bail out after arrest, the poor mostly, see a judge for the first time.

The officer who talked to the 60 of us before the hearing told us that Judge Lowe is different, and he is. Lowe showed himself to be self-aggrandizing, racist, sexist and inappropriate. He asked questions well beyond the scope of his duties as a judge, delving into people's personal lives. Lowe was also one of the most caring and humane judges I have ever seen work from the bench. Beyond his large and extremely entertaining ego, Lowe showed real concern for the people brought before him. It was justice with a heart.

The order of the cases proceeded from the most to the least serious. We four protesters were last, and still in our orange jail outfits, so when Fr. Louis Vitale was called we were the only defendants left in court. The prosecutor explained that we all had the same charge and that the arrest took place at the Qwest Center the day before. The Judge didn't even look at the paper work and directly asked Louis, "What do you plead?"

"No contest," Louis answered. And even before Louis could say anything else, the Judge declared, "Five days!" and pounded his gavel, adding, "If you had pleaded 'guilty' it would have been three days. Next!"

Louis was dumbfounded and tried to explain that all he wanted to do was make his plea and ask that the sentencing be postponed. Fr. Louis added that he needed to be on a plane Nov. 7 for a speaking engagement and Mass obligations on the 8th. The five-day sentence would make it impossible for him to make his commitments. Judge Lowe would hear none of it. He pounded his gavel and told Louis that if he wanted to appeal the sentence he would have to come up with a \$100,000 bond! "Next!" he shouted, as the guards led Fr. Louis, a Catholic Priest from California, out of the court room.

Fr. Jim Murphy, a Wisconsin Priest, was next and Judge Lowe asked him "What do you plead?" "Guilty," Jim said, and the Judge declared, "Three days!" pounding his gavel.

and, therefore, under United States law. As U.S. citizens, we are responsible under the Nuremberg Principles for this threat of first-strike terrorism hanging over the community of nations, rich and poor....

"Major parts of the base have been retooled for the deployment of the Trident D-5 missile system which replaces the D-4. Each of the 24 D-5 missiles on one Trident submarine is capable of carrying eight 475 kiloton warheads (each warhead is about 38 times the explosive force of the Hiroshima bomb.) The D-5 missile can also be armed with 100 kiloton warheads. The Trident fleet at Bangor deploys both the 475-kiloton W-88 warhead and the 100-kiloton W-76 warhead.

"The submarine base, 20 miles from Seattle, is home to more nuclear warheads than the arsenals of China, France, Israel, India, North Korea and Pakistan combined — more than 2,000 nuclear warheads. In November 2006, the Natural Resources Defense Council found that the 2,364 warheads at Bangor amount to 24 percent of the entire U.S. arsenal."

Speaking from Poulsbo where the disarmament activists continue to vigil at the entrance to the base, Susan Crane said, "The largest stockpile of nuclear weapons in the U.S. is here at Naval Base Kitsap-Bangor. So it makes sense to me to get to these nuclear weapons and say *no more*."

"The idea of plowshares actions is to begin to disarm our own hearts and begin to disarm the weapons. They have to happen together..." Crane said.

Since 1980, there have been about 100 "Plowshares" nuclear weapons disarmament actions around the world.

After a break I was called to the stand. I had been informed this might happen but I had no idea how broad ranging the questions might be. For an hour-and-a-half I answered prosecution and defense questions on Catholic theology (transubstantiation!), bible translations, Catholic teaching on nuclear weapons, international law, the effects of nuclear weapons, the Nukewatch map of the Colorado missiles, the range of nuclear weapons, the chain of command for firing weapons, etc.

I thought the prosecution would object to exploring the quotes on Carl's banners concerning "fools for Christ" and "Swords into Plowshares" but they wanted all the details and wanted to argue about them. I found out later that the two prosecutors are in a courthouse prayer group and Bible study. This [they thought] was their turf! It was comical.

At the Nov. 10 motion hearing Judge Nichols ruled that an affirmative "choice of evils" argument could not be used in Carl's defense. The judge ruled against the prosecution's attempt to enter evidence of Carl's two previous actions at Minuteman missile silos. And the judge ruled that Carl's clerical garb could be worn during the trial, now set to start Dec. 21 in Greeley. — *Bill Sulzman is a disarmament activist with the Rocky Mountain Peace Institute in Colorado Springs.*

"Next!" shouted the Judge again, as Fr. Jim was lead out of court and back to jail.

Steve Clemens of Minneapolis was called, and the Judge finally asked, "What were you guys doing at the Qwest Center in the first place?" The judge assumed we were arrested for intoxication or vagrancy. He thought we were four old drunks.

Steve said, "Your honor, we were there to protest the 'Strategic Space Symposium.' We were there to protest the selling of space weapons technology to STRATCom." And from the inmate sitting area I shouted, "You just sentenced two Catholic priests to jail!"

"Catholic priest! Protest!" exclaimed Lowe as the blood went out of his face. "Bring those two priests back before me. Give me their files."

At the bench we explained our protest. Lowe congratulated us for our witness and said he believed in nonviolent civil disobedience. He said that more of it needed to be done. He told us his father was active in the civil rights movement, adding "of course I was only four years old at the time." He shook each one of our hands.

We were all sentenced to time served, given a pat on the back and in essence told "Job well done!" The judge ended the session saying "I hope you all come back again next year!" Justice, not necessarily the law, was served that day in the Douglas County jail. — *Frank Cordaro is a disarmament activist and a Catholic Worker from Des Moines. This is an abbreviated and edited version of a longer report.*

## U.S. to Stock Heaviest Gravity Bomb in Military History

In October, the military awarded a \$52 million contract to McDonnell Douglas, Corp. to adapt a 30,000-pound so-called bunker buster bomb for deployment on the \$2.2 billion B-2 stealth bomber, the *Kansas City Star* reported. About 20 of the bombs are being made.

Previously, the biggest non-nuclear bomb in the U.S. arsenal was the 22,000-lb "massive ordnance air blast" or MOAB. It explodes above its target and has quaintly been called the Mother of All Bombs. I guess that mother now has a daddy.

Four tons heavier, the GBU-57 is called a MOP, for massive ordnance penetrator. Some reports suggest the new bomb can burrow through 200 feet of reinforced concrete before detonating, but many analysts are skeptical. Earlier

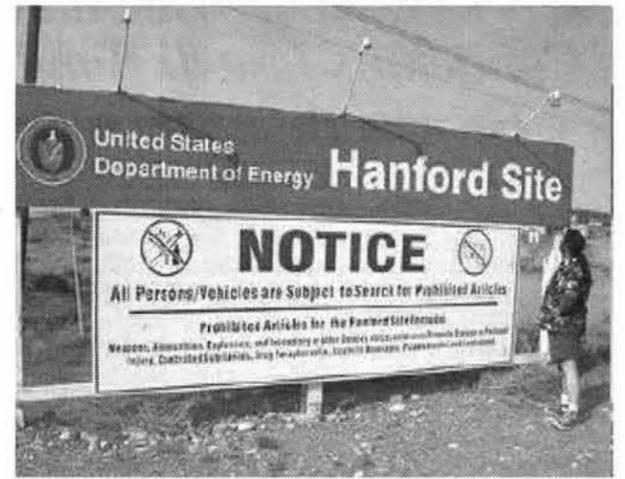


Photo by Tony Case

Sign at the Hanford Nuclear Site in Washington state, where 55 million gallons of radioactive waste is now in underground storage tanks. In the future, DOE plans to ship it offsite for deep geologic storage.

## Hanford's Radioactive Waste Shell Game

By Bonnie Urfer

In eastern Washington State, the Hanford Reservation — a vast plutonium production complex that's been called perhaps the most polluted place in the western world — is left with extremely vexing radioactive waste problems. One aspect of them is that since 2003, the Energy Department (DOE) has been working on the Draft Tank Closure and Waste Management Environmental Impact Statement. At least 177 large underground tanks there hold millions of gallons of highly radioactive liquids left from reprocessing uranium. For 40 years, reprocessing was done to extract plutonium for use in nuclear weapons.

The 6,000-page Draft EIS was issued in October and covers the Fast Flux Test reactor, underground waste tanks, contaminated soil and groundwater, a ban on imports of foreign waste and disposal of low-level wastes on site.

The new Draft EIS recommends:

- \* deactivation and entombment of the Fast Flux Test Facility — a 400-megawatt reactor;
- \* removal of 99 percent of liquid waste from the leak-prone million-gallon underground tanks and the mixing of the remaining deadly sludge with grout to be left in place;
- \* continuation of a ban on importation of certain kinds of radioactive waste to Washington State.

Imports of rad waste are currently suspended pending construction of a \$12.2 billion vitrification or "glassification" facility intended to turn high-level liquid radioactive waste into ceramic-like logs. Imports could start again if the facility is finished sometime around 2022. Even the proposed vitrification program will not have the capacity to process the volume of Hanford's low-level waste.

Elsewhere on site, workers completed the removal of the K East Basin, a 1.2 million-gallon concrete tub that once held 1,100 tons of plutonium-laden hot reactor fuel (the greatest hazard left from plutonium production) under 20 feet of water. Excavation of contaminated soil from under the tank has begun. The tank was first known to have leaked in the 1970s and the extent of the ground contamination is unknown. More than 2,000 large containers were filled with radioactive waste from inside the basin and dumped in an on-site landfill.

Shipment of radioactive materials is something like a shell game. From the Hanford site this year, South Carolina's Savannah River Site (SRS) was sent 2,300 canisters of plutonium, and a dozen packages of unused reactor fuel. The DOE is consolidating some of Hanford's plutonium and storing it at SRS to save on security costs. Several tons of hot reactor fuel still remain stored at Hanford awaiting permanent disposal. Twelve drums of plutonium-238 that originated at SRS will be returned from Hanford by the end of 2010. Certain types of plutonium-contaminated waste is currently shipped from Hanford to the underground Waste Isolation Pilot Plant in Carlsbad, New Mexico.

The DOE claims that about 2,500 full-time clean-up jobs have been created or saved at Hanford with the use of federal stimulus money. Considering the enormous volume and boggling complexity of its radioactive wastes, these positions could be called permanent.

— *The Oregonian*, Sept. 28; *TriCity Herald*, Oct. 1, 27 & 28; AP, Nov. 13, 2009.

tests have proven that earth-burrowing bombs can smash only 40 feet into hard objects.

The military's announcement of the build-up was seen as a thinly-veiled threat against Iran which was recently found to have underground nuclear facilities. The *Star* went on to openly speculate about what U.S. aggression would achieve in Iran and what backlash could be expected to result from any attack. Iran might attack U.S. troops in countries on either side of it, send missiles into Israel, and sink tankers in the Persian Gulf.

Owen Cote, a security analyst at the Massachusetts Institute of Technology, told the *Star*, "If you can delay their nuclear program, that's good.... But you have to think about what (the Iranians) will do the day after you bomb them." — *JML*

# NUCLEAR SHORTS

## Prairie Island to Further Increase Outdoor Waste Casks

PRAIRIE ISLAND, Minn. — Xcel Energy, owner of the Prairie Island reactors on the Mississippi River, is one step closer to extending its operation after the state's Office of Energy Security gave tentative approval to adding 35 new high-level radioactive casks to the 29 already on site. With 104 nuclear reactors in the U.S. looking to get rid of their radioactive waste, more and more owners are being allowed to store hot fuel in outdoor casks. Xcel is looking for an extension of its license through 2034, 20 years beyond its current limit. Not everyone is pleased with the office's action.

Nearby Red Wing city officials formally complained that "[the renewal application] doesn't adequately address public safety concerns...[or] community concerns related to the permanent storage of highly radioactive nuclear waste within the city." The 400-member Prairie Island Indian Community lives in the shadow of the reactor complex. The tribe fought against the initial dry cask storage plans in the early 1990s, and now they face more than a doubling of the waste stored on the open-air tarmac. The tribe said, "living 600 yards from the twin nuclear reactors and more than two dozen large steel storage casks, our community has faced a constant threat to our health and well being for the past 40 years."

— Minneapolis *StarTribune*, Oct. 25, & NPR, May 26, 2009

## Waste-laden U.S. Ship Sent to Indian Scrapyard

NEW DELHI — India's Alang ship-breaking scrapyard is in the news because the former U.S. ship *Platinum II*, laden with radioactive and other toxic materials, anchored nearby Oct. 4 in order to be dismantled. The 682-foot ocean liner formerly used by the Navy is allegedly carrying hundreds of tons of poisons. Gopal Krishna, Convener of the Indian Platform on Ship-breaking, a lobby group protesting the ship, wrote Oct. 10 to federal regulators that the vessel "contains an estimated 210 tons of toxic polychlorinated biphenyls (PCBs), about 250 tonnes of asbestos besides radioactive material." Krishna demanded that it be sent back to the U.S. Earlier this year, the U.S. Environmental Protection Agency investigated the ship's private owners over the PCBs onboard which potentially make the ship's "export" illegal. In January the owners agreed to pay a \$518,500 fine. PCBs are used in wiring and paint and have been banned in the U.S. Their export is a violation of U.S. law unless authorized by the EPA. — *The Times of India*, Oct. 14; & *AFP*, Oct. 16, 2009

## That Hanford Shit is Hot

HANFORD, Washington — Government contractors are using helicopters equipped with sensitive monitors to locate radioactive excrement at the Hanford Reservation, the massively polluted former plutonium weapons production site. One 14-square-mile zone of trenches is filled with some 50 million gallons of radioactive salts containing the extremely dangerous isotopes cesium-137 and strontium-90. The salts have been consumed by rabbits, badgers and other animals that have spread the poisons in their scat. The helicopter crews document the hot crap using GPS coordinates. Ground crews then remove the radwaste for dumping at another Hanford site. Fear that the local water supply will become poisoned spurred the search. Bats, bees, snakes, mice and insects have all been radioactively contaminated at the infamous site. Hanford's plutonium complex included nine reactors and giant fuel reprocessing facilities. Fluor Hanford, Inc., a cleanup contractor, has estimated that 140 acres closest to the plutonium production area is saturated with contamination up to two feet deep. Taxpayers picked up the \$300,000 helicopter tab through the current stimulus program. — *National Geographic News*, Oct. 21; *Seattle Post-Intelligencer*, Oct. 7, 2009; *Tri-city Herald*, Sept. 25, 2000

## Japanese Reactor Workers Poisoned With Tritium

TSURUGA, Japan — Fourteen workers were tested for tritium exposure after an October 8 accident at Japan's Fugen reactor, in which about 70 milliliters (2.37 ounces) of heavy water leaked from the reactor. One person ingested tritium, the radioactive form of hydrogen, in an amount above the allowable limit set by the Japan Atomic Energy Agency. According to JAEA, the leak released 1,000 times the permitted amount of radiation inside the reactor building, but none leaked to the outside. The Fugen reactor is undergoing dismantlement and has been shut down since 2003. During 20 years of operation it caused a dozen tritium leaks and a radioactive steam leak in April of 2002. Decommissioning is expected to take 30 years and produce 4,000 tons of radioactive waste. Irradiated fuel rods have been shipped to the Tokai Reprocessing Center — site, in 1997 and 1999, of two of the country's worst radiation accidents. — *Mainichi Daily News*, Oct. 13; *AFP*, Oct. 9; Nuclear and Industrial Safety Agency & Ministry of Economy, Trade and Industry report, Oct. 9 2009; *Japan Times*, April 10, 2002

## Bomb Tests Bite Back with Ground Water Contamination

JACKASS FLATS, Nevada — A test well over a mile upstream from the site of "Benham" — a 1.5 megaton nuclear bomb test detonated on Dec. 19, 1968 — produced results that show contamination 3,000 times the allowable drinking water standard for tritium. The contamination is part of a groundwater plume that spreads nine feet further each year and has now migrated beyond the boundary of the Nevada Test Site. The National

Nuclear Security Administration announced that tritium contamination had taken only 35 years to migrate beyond the Test Site.

Darwin Moran, spokesperson for NNSA said it will take another 240 years to reach a public water supply and by that time the tritium will have decayed to undetectable levels. The groundwater contains many contaminants however, including radioactive chlorine, iodine, technetium and plutonium. Heavier isotopes such as plutonium travel at a slower rate but have a half-life of 24,000 years.

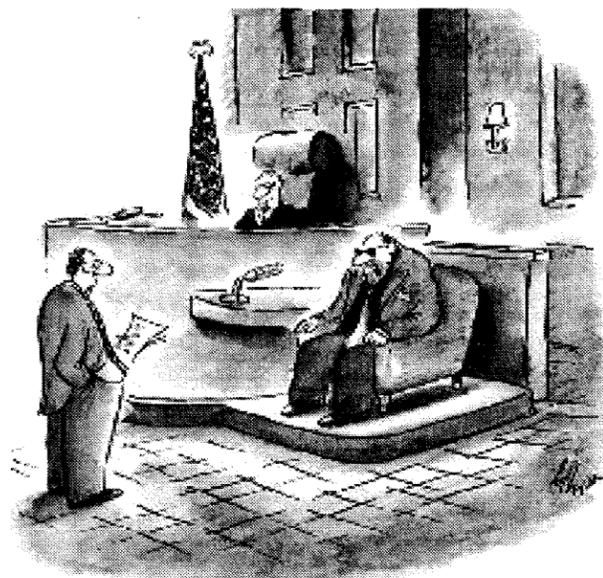
According to the *Las Vegas Review-Journal*, if the tritium plume takes an unexpected turn toward drinking water sources, the DOE will provide needed supplies for residents. The tritium is assumed to have come from two underground H-bomb blasts, Benham in 1968 and another in 1975. The explosions were two miles from the test well where the high levels of tritium were detected. The DOE plans to install six new radiation monitoring wells near Pahute Mesa, where 82 underground bomb tests were detonated. An agreement between Nevada and the DOE requires the government to collect water found to be highly radioactively contaminated.

— *Las Vegas Review-Journal*, July 27 & Oct. 22; U.S. Water News Online, August 2009; & the Nevada Division of Environmental Protection, Bureau of Federal Facilities, Summer 1998

## Mafioso Waste Disposal

LONGOBARDI, Italy — According to an inside informant, Italy's Calabrian mafia muscled its way into the lucrative business of radioactive waste dumping in the 1990s. Instead of obeying expensive state law regarding its disposal, underworld gangs sailed radiation-laden ships 18 miles into the Mediterranean Sea and blew them to pieces. According to state investigators, 32 ships have been destroyed over the past 20 years, all loaded with the cancer-causing trash. On Sept. 12, Italian authorities discovered the sunken remains of the 110-meter *Clunsky*, loaded with 120 barrels of what the mob might call economic liability. The Environment Ministry is petitioning the European Commission to assist in assessing the extent of the damage. An underwater camera was used to take photos of the *Clunsky* and evidently rad waste was not the only thing the mafia was sending to Davy Jones. Two bodies appear to be among the barrels.

— *AFP*, Oct. 26; *BBC*, Sept. 16; *UPI*, Sept. 25, 2009



"Sometimes our borrowers find themselves underwater."

## What Goes Around Comes Around: World War II Atom Bomb Wastes Poisoning Rio Grande River

The Rio Grande River provides water for 10 million people in communities downstream from the Los Alamos nuclear weapons lab in New Mexico, assembly site of the U.S. atom bombs used to destroy Hiroshima and Nagasaki in 1945. Highly radioactive and toxic wastes dumped crudely by early bomb builders, and over 60 years of reckless nuclear weapons production, left plutonium, cesium, other fission wastes — plus the toxin perchlorate which is used in rocket propellant — among the contaminants documented in canyons that drain into the great river.

*Los Angeles Times* reporter Frank Clifford writes that a tributary of Acid Canyon had two to three million gallons of highly radioactive liquid dumped into it. Even today, about 60,000 gallons-per-month of liquid effluents containing americium, plutonium, perchlorate and fluoride are discharged into Mortandad Canyon, after most of the radioactive isotopes have been removed by the Radioactive Liquid Waste Treatment Facility.

Lab officials claim the poisons pose no health risk because of dilution. But the state's Environment Department secretary Ron Curry told the *LA Times*, "When you see a child's footprints and Tonka toys in canyons where there is plutonium, there is reason to believe that a lot more work needs to be done to make the environment safe."

The Lab has agreed to update its plan to remediate 2,000 separate sites and complete "clean up" by 2015. Wetlands and dams are under construction in an effort to trap

contaminants in the canyons. About 300 monitoring wells have been installed. Some of the deadly waste must be handled remotely with robots, canned and shipped to the Waste Isolation Pilot Project site near Carlsbad, NM. One cost estimate for removing "accessible" contamination is \$13 billion. However, there is no complete record of where all the wastes were buried on the 40-square-mile compound.

In all, 18 million cubic feet of waste resides at Los Alamos. Air monitors recently installed at the Santa Clara Pueblo confirmed that radioactive dust is blowing with the winds. In their drinking water, the nearby towns of White Rock and Los Alamos have recorded a level of DEHP, a compound in plastics and explosives, 12 times what is permitted. — *SmartPlanet.com*, Nov. 3; *Los Angeles Times*, Nov. 1; & *Homeland Security News*, Nov. 2009; Concerned Citizens for Nuclear Safety, *The Rio Grande Watershed Initiative*, revised Aug. 19, 2004; *High Country News*, Nov. 24, 2003

## Truck Topples, Spills Uranium Mine Waste

MOAB, Utah — EnergySolutions, Inc. has been trucking a mountain of uranium mine tailings, 15 million cubic yards, away from the defunct Atlas Uranium Mill on the banks of the Colorado River. It is dangerous work, and on Oct. 14 a truck slid off a road on site and tipped over with a full load. The \$100 million removal project was put on hold for five days pending a safety review when a container broke open in the tip over. The spill occurred on a road leading from the 130-acre waste mound to a rail siding where the radioactive tailings are transferred. The waste is then taken 30 miles north and dumped in a landfill. The tailings are left from the uranium mining that fueled Cold War nuclear weapons production. It takes 900 metric tons of uranium ore to create the 2.2 pounds of plutonium used in one H-Bomb. Over 265 million tons of mill tailings, enough to fill a train that could reach around the world, are left behind at various locations in the U.S. — EnergySolutions, Inc. News Release, Oct. 10; *KSL News Radio & Desert News*, Oct. 18, 2009; & *National Geographic*, Sept. 2007

## Earthquake-Damaged Reactors Still Shaken Up

KARIWA, Japan — Seven nuclear reactors occupy the Kashiwazaki-Kariwa site, 125 miles north of Tokyo. It is the world's largest nuclear power complex. All seven were damaged by the massive earthquake that struck the area in July of 2007. The damage that's been made public included radioactive cooling water splashing from pools, a fire in a transformer, rad waste barrels knocked over, "soil liquefaction," the offsite release of radioactive gases and structural damage to buildings. The 7-unit complex has been shuttered for two years while the operator, Tokyo Electric Power Company (TEPCO), has been making repairs as well as paying an enormous bill for replacement power and fuel and for geologic surveys, engineering and construction.

Reactor No. 7 was the first to restart but a radioactive xenon-133 leak from a fuel rod, detected July 23, registered 450 times the "norm" — one day before the reactor was scheduled to start up. Each of the reactor's 872 fuel assemblies must now be carefully inspected. On Nov. 19, a fire caused by friction on a crane brake broke out in the turbine room of reactor No.3.

Large protests have taken place in an effort to keep all of Kashiwazaki-Kariwa's reactors offline. Even several members of the government's investigative review committee have warned against any restart. — *AFP* & *Kyodo News International*, Nov. 19; *Reuters*, Nov. 5; Citizens' Nuclear Information Center (<http://cnic.jp/english/newsletter/nit130/nit130articles/kk7restart.html>); & TEPCO News Release, Sept. 24, 2009

## Resources

- \* **AlliantACTION!** Email: [alliantaction@circlevision.org](mailto:alliantaction@circlevision.org); Web: [alliantaction.org/home.html](http://alliantaction.org/home.html)
- \* **Bulletin of the Atomic Scientists**, 77 W. Washington St. Suite 2120, Chicago, IL 60602; Tel.: (312) 364-9710; Web: [thebulletin.org](http://thebulletin.org)
- \* **Global Network Against Weapons & Nuclear Power in Space**, P.O. Box 652, Brunswick, ME 04011, Tel.: (207) 443-9502; Email: [globalnet@mindspring.com](mailto:globalnet@mindspring.com); Web: [space4peace.org](http://space4peace.org)
- \* **Institute for Energy & Environmental Research**, 6935 Laurel Ave., # 201, Takoma Park, MD 20912; Tel.: (301) 270-5500; Email: [info@ieer.org](mailto:info@ieer.org); Web: [ieer.org](http://ieer.org)
- \* **Nuclear Information & Resource Service**, 6930 Carroll Avenue, Suite 340, Takoma Park, MD 20912; Tel.: (301) 270-6477; Email: [nirsnet@nirs.org](mailto:nirsnet@nirs.org); Web: [www.nirs.org](http://www.nirs.org)
- \* **Physicians Committee for Responsible Medicine**, 5100 Wisconsin Ave., NW, #400, Washington, DC 20016-4131 Tel.: (202) 686-2210; Email: [pcrm@pcrm.org](mailto:pcrm@pcrm.org); Web: [www.pcrm.org](http://www.pcrm.org)
- \* **People for the Ethical Treatment of Animals**, 501 Front St., Norfolk, VA 23510; Tel.: (757) 622-7382; Web: [peta.org](http://peta.org)
- \* **Public Employees for Environmental Responsibility**, 2000 P St. NW, #240, Washington, DC 20036; Tel.: (202) 265-7337; Email: [info@peer.org](mailto:info@peer.org); Web: [www.PEER.org](http://www.PEER.org)
- \* **Radiation & Public Health Project**, PO Box 60, Unionville, NY, 10988, Tel.: (609) 399-4343; Email: [odiejoe@aol.com](mailto:odiejoe@aol.com); Web: [www.radiation.org](http://www.radiation.org)
- \* **Voices for Creative Nonviolence**, 1249 W. Argyle St. #2, Chicago, IL 60640; Tel.: (773) 878-3815; Email: [info@vcnv.org](mailto:info@vcnv.org); Web: [vcnv.org](http://vcnv.org)
- \* **Wisconsin Network for Peace & Justice**, 122 State St. #402, Madison, WI 53703, Tel.: (608) 250-9240; Web: [wnpj.org](http://wnpj.org); Email: [info@wnpj.org](mailto:info@wnpj.org)

# Retiring Reference Man: The Use of Archaic Standard in

Continued from front cover

For children, the fatal cancer risk per unit of dose is higher than for adults. The risk of developing cancer from exposure is about 3.7 times greater for an infant boy than the risk for a 30 year old adult male receiving the same radiation dose and 4.5 times greater for an infant girl than the risk for an adult female. A female infant has about a seven times greater risk of getting cancer than a 30-year old male for the same radiation exposure.

It also should be noted that, even though Reference Man is taken to be an adult male in his twenties, the definition makes no mention of the possibility that a man may become a father and what that might mean in terms of the impacts on the framework of radiation protection regulations. Further, while radiation dose to the gonads is calculated in the Reference Man framework to take account of possible hereditary effects, non-cancer reproductive effects are not part of the U.S. regulatory framework for radiation protection.

This article provides some examples where Reference Man is currently used in U.S. radiation protection standards or official guidance documents, and makes some recommendations for change. It examines some key policies of three U.S. federal agencies: the Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE). We also comment on the recent correspondence between then Senator Obama, Congressman Henry Waxman, and the EPA about Reference Man.\*\*

**Environmental Protection Agency external dose**  
EPA calculates a person's external dose using guidelines provided in Federal Guidance Report 12 (FGR 12). The calculations are based almost entirely on Reference Man, with the exception of the inclusion of sex-specific organs of women such as the uterus. Children are not at all considered in this guidance.

Specifically, FGR 12 calculates "[a]ll organ doses" using a hermaphroditic phantom that is based on the Reference Man model. The weight, location of the organs, density of organs, and other features of this model are, with the exception of the female specific sex organs, those of a male that is slightly heavier than the Reference Man as defined above (73 kilograms versus 70 kilograms) and also somewhat taller (179 cm versus 170 cm). Thus, while FGR 12 does include doses to the ovaries and breasts, the basic geometry of the body and the weight of the model is that of an adult male.

Even so, the model does not accurately represent female adult doses to many organs, since women are on average lighter than men. Generally, the lighter a person, the greater the dose from a given amount of external radiation to internal organs, all other things being equal, since there is less shielding of these organs by the rest of the body. Therefore, the same external radiation field would produce a greater dose in the internal organs of females.

Moreover, the chemical composition of female bodies is different from that of men. For example, on average, females have a greater proportion of their body weight as fat than men. Hence it is critical to have a model that is specific to females of various ages, if external doses to many organs are to be accurately estimated.

The problem is even greater in the case of children. The approach used in FGR 12 would generally underestimate doses experienced by children's organs, for instance, because their bodies are thinner and more radiation gets through the outer layers to reach the various organs. This is even acknowledged in FGR 12. Further, the chemical composition of children's bodies is substantially different, including that of radiosensitive organs.

One reference cited in FGR 12 contains data on infants and children of various ages that could have been used to estimate external exposure doses to people of varying ages. But the EPA did not do so.

The problems of using a Reference Man approach (with a couple of female organs added into the model) are compounded by the facts that children are at higher risk than adults of getting cancer from the same dose of radiation. Females are at higher risk than males of getting cancer from the same dose of radiation. Using a hermaphrodite model that is basically a grown man with female organs added on is not a suitable substitute for scientifically sound models for women and children (of various ages) in their own right.

## Internal dose

The current guidance generally used for internal dose calculations is Federal Guidance Report 11 (FGR 11). FGR 11 uses Reference Man. The newer FGR 13 contains dose and risk factors for children, but the dose conversion factors in FGR 11 are still the basis of most U.S. radiation protection regulations.

Dose conversion factors are the numbers used to convert intakes of amounts of radionuclides to radiation dose (which, according to regulations and the National Academy of Sciences, is proportional to cancer risk for solid cancers).

The 2002 update to FGR 13 specifies dose conversion factors at various ages, although it continues to average the values for males and females. Hence it is possible to calculate the doses to infants and to children at various ages in order to determine whether the same environmental conditions, such as water or food contamination, produce a higher dose for adults or for children. However, it is not possible to use FGR 13 to determine if boys would receive a higher dose than girls or vice versa.

In the case of the Clean Air Act regulations (40 CFR 61 Subpart H), children are specifically excluded from the compliance calculations in order to maintain "consistency" with earlier compliance models.

When FGR 13 is used to estimate the dose from internally deposited radionuclides for a specified set of environmental conditions, the segment of the population that gets the highest dose may or may not be children. For instance, the dose to the thyroid experienced by infants due to breathing air contaminated with iodine-131 will be about 11 times greater than that for an adult male, after taking into account the fact that infants breathe only about one third the amount of air per day on

average as an adult male. But the ingestion dose from drinking water contaminated with iodine-129, another radioisotope of iodine, will be greater for an adult. This is because the higher dose conversion factors for infants for iodine-129 are outweighed by the higher water consumption of adults.

However, the risk to infants of developing cancer from the ingestion of iodine-129 will still be greater despite the lower radiation dose received, with the difference being greatest between female infants and adult males. This is because radiation doses received in childhood are more likely to lead to cancer than the same dose received as an adult. In the case of the risk of thyroid cancer, for example, the risk to female infants drinking the same contaminated water as adult males is about

## Definitions

**Dose:** A measure of the energy deposited due to radiation exposure in a person, organ, or other medium. Units are rad or gray (Gy), with 1 gray = 100 rad. When the relative biological effectiveness of a particular radiation type (relative to gamma radiation) is taken into account, the value of rad or gray is multiplied by a quality factor to yield the units rem or sievert (Sv); 1 sievert = 100 rem.

**Risk:** The probability of injury, disease, or death, usually expressed as a value ranging from zero to one. In radiation protection, "risk" is shorthand for the chance that a given radiation dose will lead to death from cancer.

**External dose:** Dose received by a radiation source outside the body, e.g., from an X-ray machine or gamma emitting radionuclides in soil.

**Internal dose:** Dose received by a radiation source inside the body, e.g., an inhaled dust particle containing plutonium or ingested tritiated water.

26 times greater, even after taking into account the fact that infants drink much less water on average than adults.

## Clean air standards

The U.S. regulation that governs air emissions of radionuclides (excluding radon) from Department of Energy facilities is specified in 40 CFR 61 Subpart H and is administered by the EPA. (CFR stands for Code of Federal Regulations.) It specifies that the dose to the maximally exposed member of the public due to radionuclides released to the air shall not exceed 10 millirem per year.

An air dispersion model developed by EPA, called CAP-88, is generally used to estimate the doses for compliance calculations. The most recent version still uses adult dose conversion factors. According to the user guide, "Although FGR 13 contains age-dependent dose factors, CAP 88-PC only uses the adult factors in order to retain consistency with previous versions."

Hence, in the case of the Clean Air Act regulations (40 CFR 61 Subpart H), children are specifically excluded from the compliance calculations in order to maintain "consistency" with earlier compliance models. This is unjustifiable from the point of view of public health.

## Nuclear Regulatory Commission

Nuclear Regulatory Commission (NRC) radiation protection regulations in the workplace and for the general public generally use Reference Man, with a minor and unsatisfactory adjustment for age in the case of some external exposure calculations. These regulations are specified in 10 CFR 20, which cover NRC licensees including all nuclear power plants and commercial fuel fabrication plants.

## Workers, including pregnant ones

The regulations for workers are based on Reference Man, with one exception: pregnant workers. When a woman declares her pregnancy to her employer, the dose to the fetus must be restricted to 500 millirem for the duration of the pregnancy.

This limit was set in the 1970s to provide the fetus with the same protection as was then given to the general public, once a woman declares her pregnancy, which is, in effect, a declaration of her intent to carry the pregnancy to term. However, the maximum allowable exposure for the general public was reduced from 500 millirem to 100 millirem per year in the late 1980s, while the limit for fetal exposure in the workplace has been left unchanged.

The fetal exposure limit is obsolete by a factor of five or more. It should be reduced to, at most, that of the general public. "At most" because:

- In the latter stages of pregnancy, fetal exposure results in risks that are comparable to those of infants;
- In the early stages of pregnancy, there are risks of non-cancer effects that have not yet been adequately studied or quantified and are not yet considered in radiation protection regulations; and
- The limit does not address the radionuclide burden a woman may accumulate before she realizes she is pregnant, which will irradiate the fetus and may even be preferentially remobilized and relocated to fetal tissues.

## The general public

The use of Reference Man carries over to the regulations governing exposures of the general public, notably without regard to gender. A reduction in the air concentration limits derived from adult values by a factor of two is made for many radionuclides "to adjust the occupational values (derived for adults) so that they are applicable to other age groups."

As with occupational exposure, the regulations for the general public ignore females in the population, despite the fact that they are the majority. The factor of two adjustment to account for the fact that the general population is exposed from childhood to adulthood does not include gender differences.

Moreover, although the factor of two is sufficient adjustment for some radionuclides and routes of exposure, such as the ingestion of cesium-137, it is inadequate for others, especially for the heightened risks of exposure early in life. For instance, for a given level of intake, the thyroid dose due to inhalation of iodine-131 in the first five years of life is over five times greater than the dose received during the entire adult lifetime, defined as ages 18 to 70 years. Further, for external dose where the person is submerged in an external radiation field, the NRC regulations drop the factor of two for lifetime exposure.

## The curious case of Connecticut Yankee

The perverse effect of relying on Reference Man has long been evident. For instance, in the Connecticut Yankee decommissioning proceedings, the utility argued it was only required to consider Reference Man in its decommissioning plan. In summarizing the arguments of Connecticut Yankee, the Commission, referring to its regulations that establish radiation protection standards (10 CFR 20), noted:

*Although the plain language of the regulation does not restrict the terms "critical group," "individual," or "human being" to mean any specific age, race, or gender, CY [Connecticut Yankee Atomic Power Company] argues that the regulation incorporated the Environmental Protection Agency's "Reference Man" concept, which assumes a person is a white male, age 20-30. CY contends that the critical group at Haddam Neck should be composed of resident farmers, as CY described them in its License Termination Plan, and that the "average" member is therefore an average farmer. Doses to children are therefore irrelevant, it argues.*

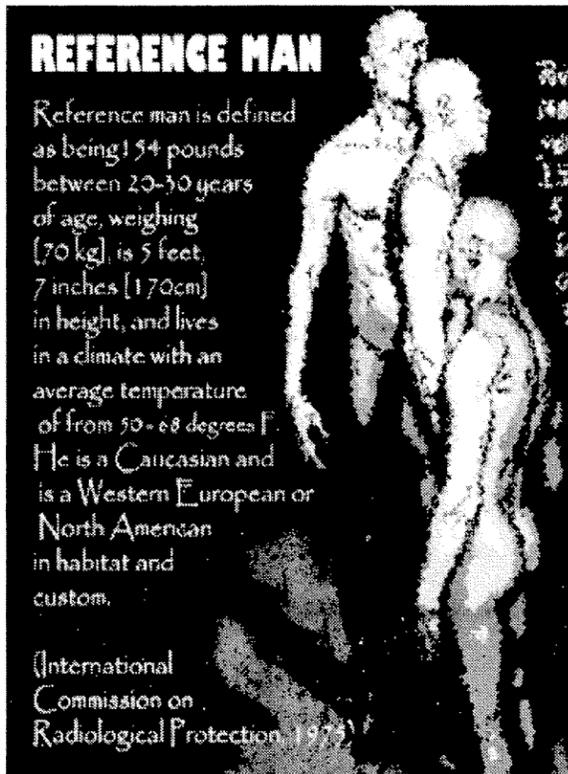
The Commission eventually ruled that the Connecticut Yankee should consider doses to children, but that:

*If the evidence shows, as CY claims it will, that doses to children are lower than doses to adults, CY will prevail without the need for an appeal. But even if the evidence shows that doses to children are higher, CY will still have the opportunity after the [NRC's Atomic Safety and Licensing] Board's final decision to argue before the Commission that our regulations prohibit considering doses to children.*

The NRC's decommissioning guidance sets metabolic parameters either for Reference Man or "at the mean of the distribution for an average human." The decommissioning guidance also states that,

*The metabolic parameters were set at "Standard Man" or at the mean of the distribution for an average man.*

Evidently, the NRC uses the term "average human" and "average man" interchangeably, which is a lamentable



# Radiation Protection with Recommendations for Change\*

confusion, with significant consequences for a majority of the U.S. population.

While the NRC uses Reference Man in its overall regulations specified in 10 CFR 20, it uses a different framework in evaluating the effect of the emissions from power plants. These emissions are supposed to be kept "as low as reasonably achievable" (ALARA). The design criteria for this are specified in federal regulations 10 CFR 50, Appendix I. The 1977 guidance for use by the NRC staff in evaluating nuclear power plant applications includes dose conversion factors for infants, four-year-olds, teenagers, and adults. In its guidance, the NRC specifies the evaluation of internal doses to the public in each of these age groups to ensure that the dose to the most exposed does not exceed ALARA guidelines. In evaluating the design of reactors to meet the ALARA criteria, the NRC's guidance, in effect since the mid-1970s, specifies parameters that enable the calculation of internal radiation doses for exposed individuals of various ages, including infants. However, external radiation doses were not estimated according to age in this guidance.

## Department of Energy

Reference Man is also used in the DOE guidance, "Radiation Protection of the Public and the Environment," because it uses the dose conversion factors from FGR 11. The DOE guidance allows for exceptions to the use of Reference Man, but the use of other models requires special permission and must be approved by DOE. Further, the guidance allows parametric variation, such as location of the individual in relation to the radiation source, but not variation for gender or age.

For external doses, the DOE guidance specifies using dose conversion factors for submersion from EPA's FGR 12, but also refers to a 1988 DOE document that considers a hermaphrodite model that is an improvement over the Reference Man model. The use of a lower weight (58 kilograms) and the locations of the ovaries and breasts are more appropriate than that in FGR 12, but there is still no routine consideration of children in the DOE guidance.

## "RESRAD"

Reference Man is also built into the main computer program used by government and industry to assess risks from radioactivity remaining after remediation of radioactively-contaminated sites and for projections of radiation doses from low-level waste disposal facilities. This model, called RESRAD, was developed and is maintained by DOE's Argonne National Laboratory.

In the 2007 version of RESRAD, dose conversion factors for children are included, but these new libraries are not required to be used for compliance calculations. In fact, its default dose conversion factor library remains that from FGR 11, which is based on Reference Man. This version of RESRAD is an improvement over prior ones, since one can now calculate doses to children using RESRAD which was not possible with previous versions of the program without modification by the user. However, insofar as the decommissioning regulations of the NRC are based on Reference Man — and they generally are, as discussed above — the nuclear industry is still free to argue that children are not relevant to the regulations and guidance.

## Obama-Waxman-EPA correspondence

**We applaud EPA's declaration that it "does not believe in continued use of Reference Man."**

On May 30, 2008, then-Senator Barack Obama and Congressman Henry Waxman, then-Chairman of the House Oversight and Government Reform Committee, sent a letter to then-Administrator Stephen L. Johnson of the EPA, inquiring about the use of Reference Man in EPA guidelines and standards and plans to phase out the use of the Reference Man model.

In EPA's July 24, 2008 response, Robert J. Meyers, then Principal Deputy Assistant Administrator of the EPA's Office of Air and Radiation, described the current situation as regards Reference Man as follows:

*EPA regulations, guidance documents, and procedures issued prior to 1990 (prior to ICRP Publication 60) were based on Reference [Standard] Man....For some regulatory applications, numerical values to radionuclide-specific doses — as distinct from risks — are still taken from the adult worker dose conversion factors provided in Federal Guidance Reports 11 and 12. However, for many years, our calculations of risk and our regulatory actions and guidance for environmental exposures have factored in the varying age-sensitivity of the population.*

The EPA also made this statement in the same letter:

*EPA does not believe in continued use of Reference Man, and generally stopped using it in 1990. EPA continues to update and improve its age- and gender- specific models in light of continuing research. EPA's radionuclide-specific cancer risk coefficients are used for calculating the excess cancer risk to the general population from chronic low level exposure to radionuclides in the environment. Our*

*risk coefficients and regulatory actions are "conservative" in that they sum the risks from an entire lifetime exposure, taking into account age dependent differences in intake, biokinetics, and sensitivity to radiation. Thus, our regulations are fully protective of the entire population, including infants and children.*

We applaud EPA's declaration that it "does not believe in continued use of Reference Man." An explicit statement along these lines is long overdue and it is a sign of great progress that it has been made. However, the latter part of the same sentence — that the EPA "generally stopped using it [Reference Man] in 1990" is not fully consistent with the first quote from the letter in which EPA admits that it continues to rely on FGR 11 and FGR 12 for "some regulatory applications." Not only are these guidance documents based on Reference Man, they are applied widely, in the EPA as well as in the NRC and DOE. EPA's Clean Air Act compliance is also based on Reference Man.

Further, while the EPA letter states that "the varying age-sensitivity of the population" is factored in to its guidance, there is in fact no specific guidance that even enables a calculation of external doses to children. Children's external organ doses are estimated as if their bodies were as developed as those of Reference Man, which underestimates doses in many situations. The EPA also has not published guidance for calculating radionuclide-specific internal doses to women of any age for a given intake.

EPA does use updated lifetime risks in its calculations, but such calculations are not at issue. EPA, NRC and DOE regulations are not based on risk but on radiation dose. If the guidance for calculating doses is based on Reference Man, then doses to women and children will be systematically underestimated in many situations.

Hence, it is clear that the EPA did not "generally stop" using Reference Man in 1990. Rather, the use of Reference Man continues to be pervasive. And even in the cases where FGR 13 is properly applied to estimating dose that includes age-dependence, the dose conversion factors for males and females continue to be averaged, as are the risk factors.

We appreciate that the EPA has committed to review the gender-specific dose and risk situation in light of the publication of the BEIR VII report, as noted in its letter:

*At issue now is whether separate male and female risk coefficients should be published for the general population, given the approximate two-fold difference in risk per unit dose estimated in BEIR VII. EPA is now examining how best to account for this difference in future guidance and regulations. Any proposed changes in EPA's radiation risk assessment approach will be subjected to interagency review and public comment through the usual rulemaking and guidance development procedures.*

Despite this acknowledged "two-fold" difference in risk between males and females, the EPA's letter also claims "that the BEIR VII risk estimates do not differ dramatically from those currently in use by the EPA and that "current standards and guidance are protective." This is misleading.

Current standards are in terms of dose limits, which were largely set in the era of Reference Man. The fatal cancer risk implied by current standards is all over the map, ranging from about 1 in 240 for the overall NRC dose limit of 100 millirem per year to the pathway specific limit of about 1 in 6,000 (rounded) for the 4 millirem per year drinking water limit for most beta and gamma emitting radionuclides that give a whole body dose. However, the fatal cancer risk to females is about 1 in 200 and that to males is considerably lower — about 1 in 300.

The situation is even more problematic when cancer incidence risk is taken into account. The best estimate for cancer incidence risk for women in BEIR VII is more than 60 percent higher than the EPA's estimate in FGR 13 which averages the risks for males and females. The lifetime cancer incidence risk for females, using the BEIR VII risk coefficients, is about 1 in 100, if the annual dose limit of 100 millirem is maintained. This is very high; a significant tightening of radiation protection standards for the public is in order.

## Conclusions

While there has been a modest amount of progress in incorporating some recent guidance that concerns women into radiation protection, the use of Reference Man in radiation protection regulations remains pervasive. Children have often been ignored, even though the science to determine when they may get higher doses has long been available. Women are either partially included or not included at all.

Current radiation protection standards were mostly set before publication, in the last decade, of conclusions that women

and children are generally at much greater risk of developing cancer than men from the same exposure. Hence, radiation protection standards are outdated in two ways that reinforce a lower level of protection for women and children:

- Radiation dose calculations done for proving compliance with regulations use dose conversion factors for Reference Man, with relatively minor adjustments in some cases. This underestimates radiation doses to children in most cases and to women in some cases for the same environmental conditions. Female children are the most adversely affected in many situations.

- Cancer risks from the same radiation dose are generally higher for children and women, though, for some specific cancers, men have a higher risk.

The failure to estimate doses to children and cancer risks to children when they are in excess of doses and risks received by adults would appear to be in violation of President Clinton's 1997 Executive Order on children, which was reaffirmed by President Bush, with some changes, in 2003:

*A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each Federal agency:*

*(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and*

*(b) shall ensure that its policies, programs, activities and standards address disproportionate risks to children that result from environmental health risks or safety risks.*

## IEER's recommendations abbrev'd:

1. **End the use of Reference Man** for estimating both dose conversion factors and cancer risk in radiation protection regulations and guidance.

2. **Calculate compliance to the part of the population receiving the highest dose.** Compliance with annual maximum exposure limits should be calculated using dose conversion factors for the portion of the population that would receive the highest radiation dose for a given set of environmental conditions.

3. **Develop and publish dose conversion factors for females.** EPA's FGR 11 should be retired and replaced

with an updated version of FGR 13 with dose conversion factors and cancer risks for males and females separately (not averaged) at various ages.

4. **Develop and publish age and gender specific external dose conversion factors.** EPA's FGR 12 should be revised to include dose conversion factors at various ages for males and females.

5. **Develop and publish fetal dose conversion factors** for use in compliance calculations for cases of declared pregnancy.

6. **Fill critical gaps in early fetal dose estimation methods and put protective standards into place until then.** The assumption that the dose to the embryo/fetus in the first eight weeks of pregnancy is the same as that to the uterine wall is not valid for all radionuclides. Consideration should be given to tightening the maximum contaminant limits for tritium and alpha-emitters until a satisfactory scientific framework can be put into place.

7. **Calculate risks for those most at risk.** Lifetime risk calculations should be based on those most at risk. In general, this means that lifetime risks would be calculated for females, unless risks for specific cancers to which men are more vulnerable are being evaluated.

8. **Revise the default parameters in RESRAD.** DOE Argonne should modify the RESRAD program so that the default calculations always refer to those who would get the highest dose and are at highest risk from a given set of environmental conditions.

9. **Reduce maximum allowable fetal exposure in the workplace.** The maximum allowable fetal exposure in radiation-related workplaces (including DOE facilities and those regulated by the NRC) in cases where a radiation worker declares her pregnancy should be reduced from 500 millirem to 100 millirem using dose conversion factors for fetal exposure. This limit should be reduced when dose limits to members of the public are reduced.

10. **Publish reference characteristics for populations not adequately covered.** The EPA should examine and publish reference biological characteristics for sections of the U.S.

*Continued on page 6*

# Reactor Relapse Hit by Three Show-Stoppers

By Harvey Wasserman

The much-hyped "Renaissance" or rather relapse of atomic power has recently taken three devastating hits with potentially terminal consequences.

The usually supine Nuclear Regulatory Commission (NRC) has told Toshiba's Westinghouse Corporation that its "standardized" AP-1000 design might not withstand hurricanes, tornadoes or earthquakes.

Regulators in France, Finland and the UK have raised safety concerns about AREVA's flagship "European Pressurized Reactor" or EPR. The showcase for France's national nuclear power industry, AREVA's vanguard project in Finland is three years behind schedule and at least \$3 billion over budget.

And, the Obama Administration indicates it will end efforts to license the beleaguered radioactive waste repository at Yucca Mountain, Nevada. After more than 50 years of trying, the nuclear industry has not found a single prospective central dump site.

"If history repeats itself as farce, then the nuclear power industry represents the most incompetent jester of all time," says Michael Mariotte of the Nuclear Information & Resource Service. The industry "seems intent on repeating every possible mistake of its failed past — from promoting inadequate, ever-changing reactor designs, to blowing through even the largest imaginable budgets. If the computer industry followed the practices of the nuclear industry, we'd still be waiting for the first digital device that could fit in a space smaller than a warehouse and cost less than a family's annual income."

Nuclear sites throughout the world sit on or near earthquake faults. Ohio's Perry reactor was damaged by a tremor in 1986, just before it went on line. In 1991, Hurricane Andrew did \$100 million in damage to Florida's Turkey Point, causing a critical loss of off-site communication. In July 2007, a massive earthquake shook Japan's Kashiwazaki, shutting seven reactors.

And radioactive waste continues to build up at sites throughout the world, including some 50,000 metric tons here in the U.S.

The vote of *no confidence* from regulators in three European countries has stunned France's AREVA, not to mention its potential customers, including the United Arab Emirates (UAE).

One of the industry's arguments has been that the EPR is safer than all the others. But selling AREVA reactors to the UAE at all has raised widespread fears that the Bomb will soon proliferate throughout the Middle East. Both India and Pakistan got radioactive weapons materials from their commercial reactors. [Israel's arsenal of between 200 and 600 nuclear warheads was made possible in part by France. — Ed.]

AREVA's design safety fiasco follows a Pink Panther-style stumble in October, when federal and state officials opted out of a massive media celebration planned for the Cadarache nuclear facility's 50th anniversary. As much as 39 pounds of plutonium dust is now believed to contaminate Cadarache, a research center, enough to make numerous city-busting H-bombs. According to the London *Financial Times*, "the discovery that France's Atomic Energy Commission (CEA) had wildly underestimated the quantity of plutonium dust that would accumulate — and then delayed notifying the Nuclear Safety Authority — has led the latter to hand its findings to the public prosecutor, who will decide if there should be an investigation into the CEA's management ... This is a severe blow to the credibility of the CEA, flagship of French nuclear research, and to Cadarache, soon to be the site of the world's first fusion reactor."

The ridicule, writes Peggy Hollinger in *FT*, has "cast a shadow over the Nuclear Safety Authority's behavior since it became independent of the government."

Finnish regulators have also gone to virtual war with AREVA over the catastrophic Olkiluoto project. In a conversation with me in Ohio this summer, AREVA CEO Anne Lauvergeon blamed the firm's problems on the Finns. But

## Retiring Reference Man, an Archaic Standard

Continued from Page 5

population not adequately covered, including African Americans and Hispanics.

11. **Tighten NRC and DOE rules for maximum allowable exposure from nuclear fuel cycle and nuclear weapons facilities.** The NRC's present radiation protection standard for the general public of 100 millirem per year is inadequate and obsolete, especially in light of the BEIR VII report's conclusions. The NRC should revise 10 CFR 20 for nuclear fuel cycle facilities and limit the dose from nuclear fuel cycle facilities combined to conform with 40 CFR 190, which specifies the EPA standard for dose from a single nuclear fuel cycle facility. The DOE should similarly modify DOE Order 5400.5 to reduce the maximum dose to the general public from 100 millirem per year from nuclear weapons facilities to conform with 40 CFR 190. A considerable tightening of drinking water standards for transuranic radionuclides is also in order.

12. **Publish a White Paper on risk-based radiation protection.** Current radiation protection standards are based on dose limits (or maximum concentrations derived from dose limits) rather than on risk. Their risk implications are quite varied, with lifetime risk being greater for females and annual risk being generally greater for children, especially female children. Even under the tightened standard proposed here, the lifetime risk to females if the maximum dose were received each

similar complaints are now coming from French regulators over AREVA's parallel project at Flamanville, in northern France.

AREVA has also run afoul of British regulators, who say its massive incursions into the UK's nuclear industry have raised serious safety concerns.

Meanwhile the U.S. NRC's critique of the Westinghouse AP-1000 reactor has shattered the industry's expensive image of a "renaissance" that is "ready to go." As the apparent machine of choice at vanguard sites throughout the U.S., the industry has touted the AP-1000 as a standardized "cookie-cutter" design that might make reactor construction and operations easier to manage. Regulators in Florida and Georgia have already imposed massive consumer rate hikes to pay for proposed AP-1000 reactors. An army of high-priced lobbyists is pushing hard for huge subsidies and loan guarantees to go into the Climate Bill.

Wall Street has made it clear it will not finance (or insure) new reactor construction unless backed by the federal treasury. Congressional critics warn that half the reactor construction loans are likely to go into default. "This only underscores Moody's assessment that new reactors are 'bet the farm' investments," says Michele Boyd of Physicians for Social Responsibility. "So why is the federal government going to back these projects with U.S. taxpayer dollars?"

Now these critiques from the American NRC and regulators in Britain, France and Finland confirm that no safe standardized design exists, either here or in France, and that the industry could be years away from finalizing one that can be successfully deployed.

The same applies to radioactive waste. According to the *Las Vegas Review-Journal*, the Obama Administration now seems poised to finalize its promise that "all license defense activities will be terminated" on the proposed Yucca Mountain dump.

Distinguished by its \$10 billion price tag and the visible earthquake fault running through it (not to mention the dormant volcanoes that surround it and the water perched at its peak), Yucca is bitterly opposed by some 80 percent of Nevada's citizenry. After a hugely subsidized half-century of futility, the U.S. reactor industry has not a single named prospect for a centralized commercial waste dump. The "solution," as put forth by Stewart Brand and other industry advocates seems to be focused on leaving high level radioactive waste at the sites and letting future generations deal with it. In the years since the Shippingport, Pennsylvania reactor opened in 1957, the industry's go-to device is a concrete "dry cask" with vent holes and armed guards.

Meanwhile, despite repeated industry denials, the bad news about the health impacts of reactor radiation pours in. "Downwind or near eight reactors that closed in the 1980s and 1990s," says Joe Mangano of the New York-based Radiation & Public Health Project, "there were immediate and sharp declines in infant deaths, birth defects, and child cancer incidence age 0-4" when the reactors shut. "The highest thyroid cancer rates in the U.S. are in a 90 mile radius of eastern Pennsylvania/New Jersey/southern New York, an area with 16 reactors at seven plants, which is the greatest density in the U.S."

The near-simultaneous demise of both Yucca Mountain and the regulatory credibility of the AP-1000 and AREVA EPR (along with the attacks by Moody's and other financial critics), might come as a death blow to such technology in a sane society. But the financial reach of the atomic lobby remains powerful in Congress and the White House.

At this point, the only certainty about the future of reactor construction is that still more shoes will drop on an industry whose decomposed credibility has become legend.

**Harvey Wasserman is author of Solartopia! Our Green-Powered Earth, (www.harveywasserman.com) and Senior Editor of www.freepress.org where this article first appeared.**

**In the case of Clean Air Act Regulations (40 CFR 61 Subpart H) children are specifically excluded from compliance calculations in order to maintain "consistency" with earlier models.**

year would be about 1 in 400. We recommend that the EPA publish a White Paper on risk-based or risk-informed radiation standards where both doses and risks are calculated on a gender and age-specific basis and where the lifetime risk to a maximally exposed individual is kept much lower than that implied by the current single fuel cycle facility limit specified in 40 CFR 190.

\*This article appears in IEER's *Science for Democratic Action, August 2009*. It summarizes the IEER report, "The Use of Reference Man in Radiation Protection Standards and Guidance with Recommendations for Change." Full citations can be found at [www.ieer.org/reports/referenceman.pdf](http://www.ieer.org/reports/referenceman.pdf). For this article's endnotes see [www.ieer.org/sdfiles/16-1.pdf](http://www.ieer.org/sdfiles/16-1.pdf).

\*\*A link to this correspondence is at <http://www.ieer.org/sdfiles/16-1/referenceman-letters.html>



Environmental activists at the G8 summit in Italy in July.

## Ret. NRC Member: Reactors No Answer to Climate Change

By Peter Bradford

Of 26 new nuclear reactor license applications submitted to the Nuclear Regulatory Commission since 2007, nine have been canceled or suspended indefinitely in the last 10 months. Ten more have been delayed by one to five years. The Tennessee Valley Authority has canceled plans to revive a partially built reactor.

Much of this chaos is because cost estimates for new reactors tripled while natural gas prices declined precipitously. The recession and energy efficiency programs postponed estimated need for the power — often exaggerated in any case — by at least five years.

In short, year seven of the ostensible U.S. nuclear "renaissance" looks a lot like the 1980s, a decade of no new orders, multiple delays and cancellations and emerging cheaper alternatives.

What is the response of the industry that took the country through what *Forbes* magazine in 1985 called "the largest managerial disaster in business history"? These companies and their congressional allies are praying to the Mecca of failed industries: the federal treasury. As the economic risks of new reactors become ever clearer, the industry's desire to offload them on the taxpayer grows apace. Though no applicant has yet been found suitable for the \$18.5 billion in loan guarantees that Congress offered new reactors in 2007, Senate Republicans want climate law commitments for 100 reactors by 2030, an absurd goal that would require loan guarantees from taxpayers approaching a trillion dollars for designs that have yet to break ground.

The nuclear industry has said that new nuclear reactors can be built only if taxpayers and customers take the risks normally assumed by investors. Since new nuclear reactors are estimated to cost at least \$6-7 billion apiece and will produce power far more expensive per-kilowatt-hour than other sources (renewables, efficiency and fossil fuels), the excess [and excessive] expense to consumers and the government from having Congress subsidize reactors on the scale necessary to make any difference to climate change will be very large indeed.

The most authoritative recent estimate of the excess cost (a June 2009 study by Mark Cooper) puts the figure between \$1.9 trillion and \$4.4 trillion over the lifetime of 100 new reactors. Such an approach would worsen climate change, because the money spent on nuclear reactors would not be available for solutions that fight it faster and at lower cost. Nuclear loan guarantee proponents could as sensibly urge damming a river to create a lake to fight a raging forest fire.

As a result of the massive cost overruns and rate shocks associated with the last round of reactor construction (in which Wisconsin paid heavily for canceled reactors), the U.S. moved away from power supply planning entrusted to politicians and monopoly utilities toward power procurement based on competitive bidding among different sources. In this system capital cannot be raised for nuclear power reactors because they are too expensive to complete. Indeed, a new nuclear reactor has yet to make a competitive bid to provide power. Hence the need for loan guarantees to assign to taxpayers the risks that Wall Street refuses to bear.

The U.S. has far more nuclear power than any other country. The idea that Congress and state legislatures must override the 30-year market verdict against additional power reactors by providing vast infusions of taxpayer and customer money for dozens of new reactors is beyond sober analysis. Instead, government should set a framework to deal with climate change, support research into innovative technologies (including aspects of nuclear) to help to meet those standards, and ignore the exhortations of interest groups to shovel vast sums at technologies that should long since have been able to make it on their own.

Wisconsin is fortunate in having Congressman David Obey chairing the House Appropriations Committee. His leadership helped derail Senate efforts to lard nuclear loan guarantees into the stimulus legislation last winter. He'll need to do so again.

— Peter Bradford, is an adjunct professor at Vermont Law School, a former member of the U.S. Nuclear Regulatory Commission, and a former Chair of both the New York State Public Service and Maine Public Utilities Commissions. This comment ran in the *Madison Capital Times*.

# On the Bright Side

## Not Dead: Nukewatch Bloodied but Unabashed

LUCK, Wisconsin — To paraphrase Mark Twain, news of our death was an exaggeration.

During the last week of October, Wisconsin Public Radio ran an alarming news segment that speculated that this Winter issue of the *Nukewatch Quarterly* would be our last — unless contributions increased. As is often the case with such news articles, the most striking aspect, the closing of a popular nonprofit due to the economic downturn, made the headlines and made the rounds.

Though there was a kernel of truth to the story — we are in dire financial straits, like most small peace and justice groups — we are not closing down. The nuclear industry would love to see us and other dissenting voices silenced, but we have trimmed our sails and tightened our belts in order to better bring you the information you need to help turn the tide away from nuclear madness and toward a nonviolent future. — Paul Vos Benkowski

## MREA Wins Solar Power Training Grants

The Midwest Renewable Energy Association (MREA) in Custer, Wisconsin has received a \$3.3 million grant from the Department of Energy to begin developing resources and training curriculum for technical and community college instructors across the Midwest. The grant will aid in training instructors in Wisconsin, Illinois, Indiana, Ohio and Minnesota. Eight other organizations have won similar DOE grants around the country for training programs in solar electric and solar heating and cooling.

Tehri Parker, Executive Director of MREA, is excited about this “new era” of solar schooling. “Training in solar electric and solar thermal technologies belongs in every technical and community college across the country. It should be a fundamental component of degree programs that focus on electrical engineering, plumbing, and related fields,” she said.

Wisconsin received a total of \$4.3 million from the DOE, some of which has been allotted to Milwaukee (\$650,000) and Madison (\$370,000). The DOE has recognized Milwaukee and Madison as “Solar America Cities,” two of only 25 in the country. The bulk of the grant, though, goes to MREA. Congratulations!

— MREA News, & Milwaukee *Journal-Sentinel*, Oct. 15; State News Service, Oct. 26, 2009

## Commission Urges End to Federal Subsidies for New Reactors

The Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, a group of current and former federal lawmakers, has formally recommended an end to financial subsidies that promote nuclear power's expansion. Recommendation No. 3 in the commission's Oct. 21 report “The Clock Is Ticking,” is that: “The United States should work internationally toward strengthening the non-proliferation regime, reaffirming the vision of a world free of nuclear weapons by ... discouraging, to the extent possible, the use of financial incentives in the promotion of civil nuclear power.” Fewer reactors mean fewer bombs. — [www.preventwmd.gov/static/docs/report/WMDRpt10-20Final.pdf](http://www.preventwmd.gov/static/docs/report/WMDRpt10-20Final.pdf)

## Florida Power and Light Diversifies with Solar

ARCADIA, Florida — For nearly a year, FP&L construction workers 80 miles southeast of Tampa have been building the nation's largest solar panel energy system — about 25 megawatts worth. The project's 90,000 solar panels will produce enough to power 3,000 homes and avoid 575,000 tons of greenhouse gas emissions. Nevada and California have plans for even larger systems. The Florida project encompasses about 180 acres. Less than 4 percent of Florida's energy comes from renewable technology and the state has not yet legislated clean energy goals or quotas.

President Barack Obama attended the commissioning ceremony and handed FP&L a check in the amount of \$200 million in stimulus funds as an investment in a stronger, smarter, cleaner and more efficient electrical grid. “For the very first time, a large-scale solar power plant — the largest of its kind in the entire nation — will deliver electricity produced by the sun to the citizens of the Sunshine State, and I think it's about time,” Obama said.

FP&L's investment in solar power will look good to share holders and rate payers who are stuck with the company's ownership of eight nuclear reactors currently operating in four states, including two Point Beach reactors in Wisconsin.

Two additional FP&L solar sites are expected to generate 110 megawatts of electricity. The projects will employ an estimated 5,000 people in Florida.

Arizona-based First Solar has won initial approval to build a 48-megawatt plant in Nevada which will produce enough electricity for 30,000 homes. — *Chicago Tribune*, Oct. 23; FP&L News Release, Oct. 27, 2009

## Resistance for a Nuclear Free Future

Celebrating 30 Years  
of the  
Nuclear Resister and  
Nukewatch

A national gathering to advance  
the role of nonviolent direct action  
for nuclear disarmament  
and a nuclear-free energy future

July 3, 4 & 5, 2010

Join us at the Y-12  
nuclear weapons complex  
in Oak Ridge, Tennessee

Nukewatch, the *Nuclear Resister* and the Oak Ridge Environmental Peace Alliance have for months been planning a 30th anniversary action and celebration. This is a vibrant time for nuclear disarmament activists. The coming year promises several national disarmament events and actions, including our July Resistance for a Nuclear Free Future, the May NPT Review Conference in New York, and an August action at the Los Alamos National Laboratory in New Mexico.

In 2010, the Plowshares movement, Nukewatch and the *Nuclear Resister* all turn 30. The July 4th weekend event will help rekindle the passion necessary for disarmament.

**As part of our celebration, we want to honor 30 years of work in a slide presentation. Please send photos you may have of your work along side Nukewatch, the *Nuclear Resister* and the Plowshares movement.**

Come and meet activists from around the world Join with hundreds of others to explore the truth about nuclear madness and nonviolent resistance to it. Help build a global movement to abolish these illegal and useless weapons. Long-lived radioactive weapons waste makes this a multi-generational campaign.

Join an affinity group, become a volunteer, propose a workshop, become a sponsoring individual or organization, spread the word about the celebration — and send us your photos.

You'll enjoy good music, good food, presentations, speakers, workshops, community, nonviolence training and nonviolent action.

## Become a part of the show.

Send us your submissions.

photos:

Nukewatch, 750A Round L. Rd,  
Luck, WI 54853

jpg:

nukewatch1@lakeland.ws

## British PM Suggests Floating One Less Boat

British Prime Minister Gordon Brown has suggested reducing the country's nuclear weapons arsenal.

In a speech to the UN in September, Brown offered to build three rather than four replacement nuclear missile-firing submarines as the country's *Trident* subs are gradually retired. The Royal Navy now has four *Tridents*, known as *Vanguard*-class, and claims to need that many in order to keep one of them at sea at all times.

In a BBC interview Sept. 23, Brown said that all the nuclear-armed militaries “have to make some contribution to the reduction of nuclear weapons.” He did not mention that Britain possesses 160 nuclear warheads, the sixth largest nuclear arsenal in the world behind the U.S., Russia, Israel, France, and China. Brown's proposed reduction, from 160 to 120 warheads

can be seen as a concession to the UK's well-established anti-nuclear movement.

Britain's Campaign for Nuclear Disarmament says *Trident* “ties us ... to the possibility of killing millions of people,” and steadily lambastes the military's rationale for replacing the giant subs. “With the UK facing its biggest economic crisis in decades, there is no case for wasting 76 billion British pounds on replacing the *Trident* nuclear weapons system. The latest poll shows a majority of the population wants Britain to rid itself of nuclear weapons, which have been described by retired generals as *useless*.” — *New York Times*, Sept. 24, 2009; CND.org

## Parking Lots of Wind Power

A 17-turbine wind power project is underway in the parking lot of Sam's Club in Palmdale, California. In an effort to tap one of the high desert's most abundant resources, the city is allowing large shopping centers and business parks to install small wind turbines in parking lots to cut electricity costs. The array is expected to generate 76,000 annual kilowatt hours of electricity from the infamous Santa Anna Winds. The turbines — atop light poles — will be no higher than 60 feet tall.

City officials have been studying various neighborhoods for wind-compatible generators. Last year, 10,000 small turbines were sold to homes, farms and businesses nationwide, a 78 percent increase from the previous year. Wisconsin, New York, Ohio, Vermont and California saw the largest increases. — AP, Oct. 20; *Los Angeles Times*, Oct. 21, 2009

## Spain Can Retire All its Reactors

MADRID (Reuters) — Spain's top energy official said Sept. 28 that the country had enough spare generating capacity to phase out nuclear power, in line with government policy. In recent years, Spain has subsidized renewable energy in order to cut its heavy dependence on fuel imports and reduce greenhouse gas emissions, and is now the world's third-biggest producer of wind power and the second-biggest of solar. Nuclear power is unpopular in Spain and both major political parties ruled out building new reactors in last year's elections. The country's eight reactors generate about 20 percent of total demand for electricity, and will all reach the end of their operating permits by 2021. — *Reuters*, Sept. 28, 2009

## NUKEWATCH QUARTERLY



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Through the prism of nonviolence

## Tess Koenig, Nurse, Mentor, Activist, Friend

By John Heid

*"Individuals can resist injustice but only in community can we do justice."* — Jim Corbett

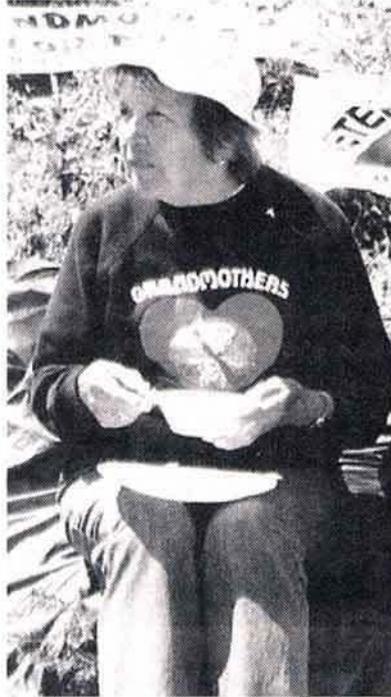
At sunset on a mid October Saturday, Tess Koenig died as she had lived — peacefully. There were no large font headlines in the *Los Angeles Times* the following morning. Amidst the fray of health care reform, H1N1, the housing market collapse, the World Series and war-without-end, Tess passed as inconspicuously as a soft autumn breeze through a stand of northern white pine.

Her death gave me pause. Not because it was sudden. It wasn't. Not because she was young. She wasn't, except at heart. What provoked me was a simple query. "What is the value of a singular life?"

In an American Idolized society chock full of air-brushed stars and super heroes, who counts? In a culture that mass markets the pleasure principle and militarizes identity — "be all you can be" — how does one stand?

Tess was one who found her bearings. Born on Minnesota's Mesabi Iron Range between world wars, she knew something of modesty and making-do. She left the Range, but it never left her.

The so called "war effort" drew Tess into the service of caring for the wounded and ill as an army nurse and afterward, at the Veteran's Hospital in West Los Angeles, she continued this work. Tess witnessed war from the vantage point of its victims. She came to understand in a hands-on way how war turns the moral order inside out.



In later years Tess was to become a proud member of Grandmothers For Peace and Veterans For Peace. Post war, she married another veteran-later-to-become-peace-maker, Bob Koenig. The two became parents. Stories are told of their dual energies. Bob coached youth basketball and baseball. Tess attended the injured players and kept score. Tess always knew the score on the court and later in the courts.

In their retirement Tess and Bob metamorphosed. Their family widened. They went communal. This was how I came to know her... at the Loaves and Fishes Catholic Worker in Duluth, Minnesota.

She prepared meals and faithfully attended peace vigils. Tess had the compassion to serve the hungry and the audacity to challenge the causes of their hunger.

In time I discovered that Tess (and Bob too) were known across the country. From Baltimore to LA, from Clam Lake, Wisconsin to Ft. Benning, Georgia.

Tess knew who she was, and what she wasn't. She lived life fully and by so doing helped others recognize what it means to do justice, to be fully human — warts and all.

Tess Koenig was not my heroine, but rather a mentor and friend. She eschewed the cul-de-sac mentality of the hero/heroine model, a model that panders to narcissism, a model of the impossible, the unattainable, the superfluous, a model antithetical to radical nonviolence.

Tess was down-to-earth, and roll-up-your-sleeves practical. This simplicity kindled a visionary spirit within her. She could delight in a pristine sunset over Lake Vermillion or the diamond in the rough visage of each guest sitting at the dining room table, as clearly as she could decry war.

The last time I called Bob and Tess, their answering machine still had the familiar message in her voice: "The Koenigs say bring 'em home!" Tess's last words. A fitting epitaph.

## EPA's Plan to Raise Radiation Exposures Challenged

*Continued from cover page*

for delivery of documents or promises to provide records on a rolling basis, as they had been cleared for release.

"President Obama directed all agencies to act in a transparent way by placing important documents in the public domain in a timely fashion," said PEER counsel Christine Erickson who drafted the complaint. "Avoiding embarrassment is not a legal basis for deception or delay."

Congressman Edward Markey, a D-Mass., has expressed concerns about EPA's intentions to allow a different standard for radiation exposures following nuclear emergencies than are now in place in the Safe Drinking Water Act and other environmental laws.

On Oct. 29, Markey, who chairs the Energy and Environment Subcommittee of the House Energy and Commerce Committee, sent a letter to EPA Administrator Lisa Jackson raising "serious concerns over the potential for weakening federal policies designed to protect the public from the potentially dangerous effects of radiation."

In the letter, Rep. Markey expressed concern about ORIA's draft "Blue Book" released in December 2008. In the past, Blue Books have formed the basis for EPA's radiation protection regulations.

In this draft, ORIA proposes using risk figures that are almost all less protective than the National Academy of Sciences recommended in its [June 2005] BEIR VII study to assess health risks from exposure to low levels of ionizing radiation, which was partially sponsored and funded by EPA.

This study found that "even the smallest radiation dose has the potential to cause a small increase in risk to humans," Rep. Markey wrote.

But the guidelines proposed by Bush's administration "actually allow for levels of radioactivity that are thousands of times higher than the requirements found in traditional toxic clean-up guidance," Markey wrote.

"Additionally, long-term clean-up standards are proposed that are so remarkably high that they could result in a cancer risk that EPA itself estimates at a breathtaking one in four," he wrote.

Markey asked a series of questions related to EPA's use of "Reference Man" to evaluate compliance with radiation regulations. This model assumes that the typical exposed individual is an average-sized adult white male, even though pregnant women, children and other vulnerable populations could be much more impacted by radiation exposures.

"From disposing of nuclear waste to protecting the water we drink, we must do everything in our power to ensure that government policy follows the strongest possible standards governing exposure to radiation," said Markey.

"Why should people who have been victimized by a nuclear attack or accident be further subjected to a relaxation of the radiation protection standards EPA has previously deemed safe?," he [asked]. "The stakes are simply too high to accept anything less than the strongest scientific recommendations."

— *ENS, the Environment News Service, is a daily international wire service. Its reports are indexed by Reuters/Dow Jones Factiva, and KeepMedia.*

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