

Rad Waste's "Gaseous Ignition" & "Exothermal Events" are Explosions

By John LaForge

Last April's explosive news from the folks who bring us safe, effective, reliable nuclear power and weapons, was that at least four barrels of military radioactive waste blew apart April 11 somewhere inside Idaho National Laboratory (INL) property, near Idaho Falls. INL officials said the "ruptured" or "breached" barrels contained a sludge of unidentified fluids and solvents from the long-shuttered Rocky Flats plutonium weapons site near Denver. INL officials said they were trying to determine which radioactive materials are in the sludge.

The accident was reported by ABC News, the Associated Press, the *Seattle Times*, the *Japan Times*, Industrial Equipment News, and Fox Radio among others. Laboratory spokespersons at first said a single 55-gallon drum holding radioactive sludge "ruptured." Energy Department (DOE) spokesperson Danielle Miller wrote April 12 that, "Later, there were indications that a second and possibly a third drum may have been involved." On April 25 Erik Simpson, a spokesman for DOE contractor Fluor Idaho, announced that in fact four barrels had burst. Simpson said the "ruptures" were heard outside the building where they took place, but he didn't call them explosions.

The DOE's Miller called the prompt deconstruction of the waste barrels an "exothermal event"—a pseudonym for "bomb" that means "a chemical reaction accompanied by a burst of heat." The phrase harkens back to the official gibberish used to describe an explosion of hydrogen gas in a loaded high-level radioactive waste cask at Wisconsin's Point Beach reactor site in May 1996. The cask contained 14 tons of highly radioactive used reactor fuel, and the explosion (a word strenuously avoided by industry PR folks) lifted the cask's 4,000-pound lid and left it askew. Point Beach operators called it a "gaseous ignition event."

One theory about the cause of the bursting waste drums is that "radioactive decay made the barrel[s] heat up and ignite particles of uranium," the AP reported April 12. Unfortunately for the first responders, "When the firefighters left the building, emergency workers detected a small amount of radioactive material on their skin." The very next sentence in this AP story has the DOE's Miller saying, "None of the radioactive material was detected outside of the building where the rupture[s] occurred."

Because of what officials said was "decades of secretive record-keeping," INL officials do not "know the exact contents," of the barrels, Joint Information Center spokesman Don Miley reportedly said. Neither DOE nor INL described what got on the firefighters' skin.

Rad Waste Explosions "Actually Happening"

Miley told the press, "They haven't run into anything like this actually happening"—but exploding rad waste has been around a long time.

It happened on Valentine's Day 2014, at the US Waste Isolation Pilot Plant in Carlsbad, New Mexico. A barrel of military plutonium waste exploded underground, contaminating the entire facility, including the elevator and ventilator shafts, and even poisoned 22 workers internally because they inhaled plutonium-laced dust.

More recently, on October 18, 2015, a fire and explosions spurred by rainfall hurled 11 buried barrels of radioactive chemical waste from a trench into the air and spewed debris like a geyser 60 feet high at a "US Ecology" site near Beatty, Nevada. This shocking fire in one of 22 shallow trenches of radioactive waste couldn't be put out with water hoses because water started it in the first place. Authorities had to close US Highway 95, cancel school, and await more explosions while they let the fire burn itself out. US Ecology had its records seized by Nevada's Radiation Control Program, which has never disclosed what sorts of radioactive materials were burned in exploded Trench 14—although the dump site is known to hold a total of 47 pounds of plutonium and uranium isotopes.

In September 1957 at Kyshtym in Russia, a tank holding 70 million metric tons of highly radioactive waste

exploded and produced a massive plume that contaminated 250,000 people across 410 square miles.

High-level radioactive waste always comes with the risk of explosions, and the danger helped move the Obama Administration in 2010 to cancel plans to use Yucca Mountain, Nevada, northwest of Las Vegas, for the burial of 80,000 tons from commercial US reactors. Physicists Charles Bowman and Francesco Venneri at the Los Alamos National Laboratory warned in 1995 that at the Yucca site the material could erupt

in a catastrophic explosion after steel containers dissolve. Bob Halstead, Director of the Nevada Nuclear Waste Project Office, has called the Yucca project, "an exercise in planning for a nuclear catastrophe that is fundamentally rhetorical. It's theatrical security because the preparations that are being made by the Department of Energy have no real chance of succeeding. They satisfy the public...because they're a symbol of control....This waste is going to be deadly for tens of millions of years...."



Pictured: Some of the 177 tanks holding 56 million gallons of liquid high-level radioactive wastes at the Hanford Reservation on the Columbia River in Washington state. At least 77 of the tanks are leaking. Over a period of 40 years, nine Hanford reactors along with chemical "reprocessing" to get plutonium for weapons, produced billions of gallons of such waste. At least 450 billion gallons were dumped on land or injected into deep wells. Clean up operations could last 100 years were estimated in 1988 to cost \$175 billion. Energy Dept. photo.

Fukushima, Chernobyl and Three Mile Island: Just the Tip of Disaster Iceberg

The World Nuclear Association says on its website that its goal is "to increase global support for nuclear energy," and repeatedly claims that "there have only been three major accidents across 16,000 cumulative reactor-years of operation in 32 countries." At least the lobby group acknowledges the catastrophes at Three Mile Island in 1979 (US), Chernobyl in 1986 (USSR), and at Fukushima in 2011 (Japan).

However, claiming that these three stand alone as "major" disasters cynically ignores the series of large-scale disasters that have been caused by uranium mining, nuclear power and weapons, radioactive waste, handling, and the nuclear fuel chain. The following is an abbreviated list of some of the world's other major radiation accidents.

CHALK RIVER (Ontario), Dec. 2, 1952: A Canadian reactor's loss-of-coolant caused a meltdown and an explosion and became the first major commercial nuclear reactor disaster.

ROCKY FLATS (Colorado), Sept. 11, 1957: This Cold War factory that produced plutonium triggers for nuclear weapons factory 16 miles from Denver caused 30 to 44 pounds of breathable plutonium-239 and Pu-240 to catch fire in what would come to be known as the second largest industrial fire in US history. Filters used to trap the plutonium were destroyed and it escaped through chimneys, contaminating parts of Denver. Nothing was done to protect its downwind residents.

WINDSCALE/SELLAFIELD (Britain), Oct. 7, 1957: The worst of many fires burned through one reactor igniting three tons of uranium and dispersed radionuclides over parts of England and northern Europe. The site was hastily renamed Sellafield.

KYSHTYM/CHELYABINSK-65 (Russia), Sept. 29, 1957: A tank holding 70 to 80 metric tons of highly radioactive liquid waste exploded, contaminating an estimated 250,000 people, and permanently depopulating 30 towns which were leveled and removed from Russian maps. Covered up by Moscow until 1989, Russia finally revealed that 20 million curies of long-lived isotopes like cesium were released and it was later declared a Level 6 disaster on the International Nuclear Event Scale. The

long covered-up disaster contaminated up to 10,000 square miles making it the third- or 4th-most serious radiation accident ever recorded.

SANTA SUSANA (Simi Valley, Calif.), July 12, 1959: The meltdown of the Sodium Reactor Experiment just outside Los Angeles caused "the third largest release of iodine-131 in the history of nuclear power," according to Arjun Makhijani, President of the Institute for Energy & Environmental Research. Released radioactive materials were never authoritatively measured because "the monitors went clear off the scale," according to an employee. The accident was kept secret for 20 years.

CHURCH ROCK (New Mexico), July 16, 1979: Ninety-three million gallons of liquid uranium mine waste and 1,000 tons of solid wastes spilled onto the Navajo Nation and into Little Puerco River, and became the largest radiological disaster in US history. Little Puerco feeds the Little Colorado River, which drains to the Colorado River which feeds Lake Mead—a source of drinking water for Los Angeles.

MONJU (Japan), Dec. 8, 1995: This sodium-cooled "breeder reactor" caused a fire and a large leak of sodium coolant that contaminated the Pacific. Liquid sodium coolant catches fire on contact with air, explodes on contact with water, and costly efforts to engineer commercial models of breeder reactors have failed.

TOKAI-MURA (Japan), Sept. 30, 1999: A uranium "criticality" or "neutron burst" killed three workers and dispersed radioactivity across the populated urban area surrounding the factory.

—Sources: Gar Smith, *Nuclear Roulette* (Chelsea Green, 2012); Joseph Mangano, *Mad Science: The Nuclear Power Experiment* (OR Books 2012); Stephanie Cooke, *In Mortal Hands*, (Bloomsbury, 2009); Jinzaburo Takagi, *Criticality Accident at Tokai-Mura* (Citizens' Nuclear Info. Center, 2000); Helen Caldicot, *Nuclear Madness, Revised* (Norton, 1995); Arjun Makhijani, et al, *Nuclear Wastelands* (MIT Press, 1995), & *The Nuclear Power Deception* (Apex Press, 1999); Catherine Caufield, *Multiple Exposures* (Harper & Row, 1989); John May, *Greenpeace Book of the Nuclear Age* (Pantheon, 1989); Anna Gyorgy, *No Nukes* (South End Press, 1979).