Nuclear Notes

By Howard Hayden, The Energy Advocate, March 2024

“Nuclear energy is expensive,” goes the mantra, but the main reasons behind the high cost are governmental regulation that is often senseless and lawsuits and delays about “the environment.” (The only power available to a bureaucrat is to say no.) As we pointed out in last year’s July issue, the cost of building the nuclear power station Shoreham, Long Island, New York, was ten times that of building a nuclear reactor of the same size (Millstone Unit 2 in Connecticut); both applied for licenses at the same time. Interminable delays were caused by “environmental” concerns. Now [5]

The House on Wednesday evening approved bipartisan legislation that aims to bolster nuclear energy.

The vote was 365-36, with one additional lawmaker voting present.

All of the “no” votes were Democrats and included several members of the Progressive Caucus. Rep. Marcy Kaptur (D-Ohio) voted present.

The legislation aims to bolster the U.S.’s nuclear energy production by speeding up environmental reviews for new nuclear reactors and reducing fees that applicants for advanced nuclear reactor licenses must pay.

Very likely, the motivating factor for reducing the roadblocks to nuclear energy is the worry that “climate change” due to “carbon emissions” is destroying the planet. But it is nice to see that legislators are finally noticing that their very rules are inhibiting nuclear power generation.

Largely due to irrational worries about CO2, a local (Pueblo) power plant (Comanche, unit 3) is destined to be taken offline in 2030, so a committee looked into various power systems to see what could replace the plant. Most of the electricity from Comanche-3 goes north to Denver. Revenue flows south to Pueblo, so the city gets a lot of tax revenue.

There was a lot of anti-nuclear sentiment expressed at a recent town meeting about the issue. So, I wrote:

My Letter to The Pueblo Chieftain [6]

I spent 32 years at the University of Connecticut teaching physics and doing research. Connecticut is a small state, only about 5% as large as Colorado, but its population is 3 million, half that of Colorado. Most of its power came from nuclear power plants, two of which I got to tour with students.

About 20% of the electricity produced in the US comes from nuclear power plants. Seventy percent of France’s electricity comes from nuclear power plants. Each year that a reactor produces power is called a reactor-year. To date, the US has a total of about 4,000 reactor years.

The profession that exposes people to the highest amount of radiation is being an astronaut spending months in orbit. That radiation is from cosmic rays coming from all directions. Otherwise, the most radiation is experienced by aircrews, especially those flying over the poles with little air above them to shield them from cosmic rays.

The people who are exposed to the least radiation are sailors on nuclear submarines. The water around them absorbs not only the cosmic radiation but also the radiation emanating from naturally occurring radioactive elements in rocks and soils. They get very little radiation from the reactor because of the shielding around it.

Here in the Pueblo area, we experience about twice as much background radiation as one gets in Florida, partly because of our rocks and partly because we have less radiation-absorbing air above us. There are places in Brazil and Iran where people are exposed to ten to seventy times as much background radiation as we are. We are also exposed to a slight amount of radiation from a naturally occurring isotope of potassium in our bones.

A nuclear reactor in the center of Pueblo would increase radiation exposure to our citizens far less than 1%.

The Three Mile Island power plant in Pennsylvania had an accident at Unit 2 in 1979, and that accident called a halt to most planned construction of new nuclear power plants. However, nobody was exposed to any dangerous amounts of radiation. In fact, if somebody who lived near the site boundary was frightened by the accident and moved to a place that was about 100 feet higher in elevation, that person would have been exposed to more radiation at the new place.

There have been two other accidents of note. The dangerous one was at Chernobyl. The plant had a design that the US rejected decades earlier on grounds of safety. A near-accident had occurred years before in the same type of reactor in Leningrad, but fortunately, it was stopped. The KGB would not let the operators there convey information to Chernobyl. Enough said.

The accident at Fukushima, Japan was caused by a tsunami, the highest wave of which was about 45 feet. The World Nuclear Organization reports that about 19,500 people were killed by the tsunami, and there were 2313 deaths resulting from the evacuation of 100,000 people. They also report, “There have been no deaths or cases of radiation sickness from the nuclear accident.”

Worldwide, there are about 440 power reactors, and the accumulated experience is about 20,000 reactor-years. There are over 160 nuclear-powered ocean-going vessels, mostly submarines, with over 13,000 reactor-years of operation.

A photograph in a September 17, 2018, issue of Chemical and Engineering News shows about 70 waste casks at the now-retired Zion nuclear power station in Illinois. They contain all of the spent fuel (which is mostly fuel that could be used after reprocessing) containing all of the radwaste from two large nuclear reactors (each one producing 33% more power than Comanche Unit 3) both operating around the clock for 24 years. Those casks are not enough to fill a single coal train that we see many times daily coming through Pueblo.

The waste casks in the photograph sit on a concrete pad that is much smaller than a Walmart store. Workmen can safely walk among the casks. This one picture should disabuse people of the notion that nuclear waste is some kind of unsolvable problem.

[5] Rachel Frazin, “House approves bipartisan bill aimed at bolstering nuclear energy,” 02/28/24, https://thehill.com/policy/

energy-environment/4495980-house-approves-bipartisan-bill-aimed-at-bolstering-nuclear-energy/

[6] https://www.chieftain.com/story/opinion/letters/2024/

03/02/chieftain-readers-weigh-in-on-comanche-3-and-nuclear-energy/72791306007/