

An Open Letter To VSNAP

Dear VSNAP members:

I attended the 12/14/11 VSNAP meeting at the Vernon School. I did not sign up to speak, but I would like to offer the following comments to the Panel regarding what was disturbingly *not said* by those who testified.

I strongly recommend that at your next meeting, you request a presentation by Arnie Gundersen who will give you much straighter answers about what happened at Fukushima and why and how we should take precautions to prevent it occurring here. Here are a few clarifications of what the NRC gentlemen did not seem to want admit to understanding, saying it would take years to fully understand:

- A loss of electricity led to a loss of cooling capability, water boiled away or leaked out of the pool, and the fuel overheated and began to melt.
- It is thought that as zirconium cladding melted, a hydrogen buildup resulted in an explosion, similar to what occurred in the Fukushima reactors that exploded.
- Pieces of spent fuel, either from the reactor fuel pools or from Unit 4, were scattered across the landscape. Some were found up to a mile away.

“There is reason to believe that hydrogen, which fed the appalling explosions at Fukushima, may have been created, at least in part, from localized boiling of spent fuel coolant, especially in areas where fuel cooling channels may have been blocked by debris. Vermont Yankee’s spent fuel pool contains more high-level nuclear waste fuel than all four of the Fukushima reactors combined. NRC has calculated potential latent fatalities of a spent fuel fire at VY to be up to 25,000 out to a range of 500 miles, despite successful early evacuation (95%) of the ten-mile evacuation zone. “ (ref. USNRC – NUREG-1738),” Raymond Shadis.

Please also refer to “Spent Nuclear Fuel Pools in the United States: reducing the deadly risks of storage,” a report by Robert Alvarez of the Institute for Policy Studies, available here, from which several of the following points are excerpted:

http://www.ips-dc.org/reports/spent_nuclear_fuel_pools_in_the_us_reducing_the_deadly_risks_of_storage

- The spent fuel pool explosion at Fukushima released an average of 410,000 curies of Cesium 137 per day for the first month. (Alvarez)
- Fukushima’s spaciouly-racked spent fuel pools held about 80 tons of spent fuel at the time of the loss of coolant accident, explosion and melt down.

- Vermont Yankee's spent fuel pool holds approximately 700 tons of spent fuel right now, far more than it was ever designed to hold, packed in dense configuration.
- The fuel pool radioactive releases at Fukushima would have been much worse, but for the fortunate fact that much of the fuel from the reactors is collectively stored in a large fuel pool remote from the reactors. Only the hottest fuel remains in the rooftop fuel pools.
- US nuclear plants were not designed to store spent fuel permanently. The US government promised to take it away. That never happened.
- The nuclear industry and the NRC have stalled moving fuel out of the overstocked, over-aged spent fuel pools and into dry cask storage.
- The underlying assumption of the NRC policy allowing for expanded pool storage is that in the near future the government will permanently dispose of it all, as required under the 1982 Nuclear Waste Policy Act.
- This assumption is codified in NRC regulations under the oxymoronic title, the "Waste Confidence Rule." (I call it the "Rapture Rule"--ss)
- As a result, only 25 percent of the 65,000 metric tons of America's spent fuel is stored in dry casks today.

The tall, debonair NRC guy said that as far as NRC is concerned, spent fuel pools are a fine way to store spent fuel, and NRC has no plans to start requiring licensees to move fuel out of them and into safer dry casks. He also said he did not know how any dry casks at Fukushima might have fared as compared to the spent fuel pools. This total lack of curiosity or concern on his part sums up the attitude at the NRC as they drag their heels on learning the lessons of Fukushima. It is shocking and despicable, and we lag far behind the response of several other nations that have curtailed new nuclear development and mandated the timely closure of their old nuclear reactors and their replacement with renewable sources of power.

Unlike the NRC, concerned citizens and a select few of their representatives, such as U.S. Congressman Edward Markey, have sought to understand the lessons of Fukushima. Here are some facts about the inadequate regulation of U.S. spent fuel storage pools Rep. Markey and his staff have uncovered, in the report "Fukushima Fallout: Regulatory Loopholes at U.S. Nuclear Plants;" (available here, and I highly encourage all VSNAP members to read it): <http://markey.house.gov/docs/05-12-11reportfinalsmall.pdf>

- Spent fuel pools contain no protection from hydrogen explosions such as the hardened vents that the NRC misleadingly pretended made US reactors invulnerable to hydrogen explosions (Fukushima reactors had hardened vents too, but the loss of electrical power made them inoperable!).
- NRC does not require **any** form of hydrogen mitigation at spent fuel pools.

- Spent fuel pools at offline reactors (such as those undergoing refueling) require **no secondary emergency generating capacity**. Thus the conditions that led to the Fukushima Unit 4 fuel pool meltdown are legal under NRC regulations.
- NRC has no requirement that reactor hardened vents must be operable, and there has never been a requirement in place for hardened vents in spent fuel pool buildings.
- US fuel pools are holding, on average, 4 times more spent fuel than they are designed for and are densely compacted.

While NRC is complacent about storing hazardous high-level nuclear waste in overstocked, 40 year-old spent fuel pools, Obama's Blue Ribbon Commission is busily looking at alternatives.

One of the alternatives they are looking at is underground storage in domestic granite deposits. A report to the Commission by Sandia National Labs, entitled "Granite disposal of U.S. High Level Radioactive Waste," (available here: <http://prod.sandia.gov/techlib/access-control.cgi/2011/116203.pdf>) lists the prime sites in various states around the country. The first site on the list is the Barre, Vermont granite formation.

This report is worth reading, as it projects the radioactivity of man-made radionuclides out to 1 million years and beyond, (only about half of the isotopes charted are gone by then) and models storage methods in granite that it finds acceptable as waste disposal options. Here is a quote from the report:

"Corrosion of the canister could potentially produce enough hydrogen and other gases to create a reservoir of gas at sufficient pressure to penetrate the buffer episodically....The process for associated aqueous release of radionuclides involves failure of the bottom of the canister, gas pressure build up within the canister, and.....expulsion of collected liquid from the bottom when the gas pressure exceeds the buffer swelling pressure."

Thus, in perhaps merely hundreds of years, we can expect cask failure, blowout of the clay plugs in the granite holes, and toxic leaks. A good half of the radionuclides produced in nuclear reactors remains deadly for more than a million years. While the report's engineers estimate that the "buffer" packed into the holes made to store the waste canisters will perform sufficiently well at holding in the leachate from these exploded casks for a while, they have no way to test this assumption.

Clearly, science without empirical evidence is no way to skin this particular cat.

The NRC, (as well as the Vermont Yankee spokesperson downplaying the significance of the contamination of the Vernon aquifer as indicated by the contamination in the COB deep former drinking water well), love to talk about safety in terms of probabilities and models, while ignoring their own concrete evidence, such as well water contamination, or the explosion of reactors *and spent fuel pools* that their models predict can never explode. Doesn't it seem that talking

about the safety of aging nuclear reactors *theoretically* or the purity of the Vernon aquifer *in the short term only* is very much like rearranging the deck chairs on the Titanic? Isn't it time to tell these sociopaths to stop making these hundreds of poisons which do not exist in nature and which persist until eternity, for which we truly have no permanent disposal solution that even approaches the longevity of their toxic threat? How can we burden future generations with trying to isolate from the environment for thousands of year that which we have FAILED to isolate from the environment in Vernon, Vermont for just 40 years? And how are our descendents to do this post-oil, when we cannot even do so now, with all the wealth and technological prowess and democratic institutions now at hand? How can we ask future generations who will not have any of the benefits of nuclear electricity production and may not have any of the political advantages we supposedly currently enjoy to bear this thankless burden?

By now we are familiar with the methodology of the nuclear industry and the NRC when dealing with the public, including the civil government of the states in which they are privileged to operate. They feign ignorance, they lie, they mislead, they say "we'll get back to you on that," but don't, they tell partial truths but omit key information, they use faith-based arguments with no basis in reality, but only in theoretical promises or "statistical space," they hide crucial documents from the public by passing them to their regulatory co-conspirators on secret computer servers the public cannot access, they write regulations with enough wiggle room for their licensees to drive a Mac truck through.

These people should never have been allowed to operate in the democratic state of Vermont, and the sooner they are driven out of here, the better. But it is best to make the Legislature aware that they are not going to take their waste with them, ever. And the sooner Vermont begins to demand the strictest standards for decommissioning and waste storage (including HOSS storage, hardened on-site spent fuel storage), the better. There is much to be remedied in the former Public Service Commissioner's weak and unenforced MOU's. The state has a right to negotiate for the highest environmental standards, the lowest possible residual radiation levels on site, and the most robust spent fuel storage criteria, as other states have. It is not too early to begin this legislative and bureaucratic process.

Thank you for the opportunity to comment.

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