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OCT 23 2001

National Nuclear Waste Dilemma

Department of Energy; comments on Yucca Mtn nuclear waste repository, 10-5-01:
Request to deny nuclear waste storage at Yucca Mtn, Nevada

When nuclear power plants operate they produce high-level radioactive waste in the form of spent fuel. This nuclear waste is extremely dangerous and remains so for tens of thousands of years. That poses a monumental storage problem. When nuclear power plants were designed and built, they envisioned managing this problematic waste by storing it temporarily in water storage pools inside the plant. Storing nuclear waste under water is in fact safe and effective because the water works as a very efficient shield against the radioactivity. The spent fuel that is put in the water pools is hot (both in thermally and radioactively). So the water also serves the purpose of dissipating some of the heat and cooling the spent fuel rods. [Before transferring spent fuel to dry cask for storage outside the pools, they have to have been in the pool 10 to 15 years to begin cooling them. Even then this nuclear waste is 600 degrees F when its loaded into the casks.] For the pool storage system to operate safely the water has to be circulated by pumping systems and the water cooled to prevent boiling. You can see the water cooling system in the pool as well as in the reactors is critically important and must have back-up systems to ensure uninterrupted operation.

These on-site storage pools were not designed nor built large enough to hold all the spent fuel rods produced over the life of the nuclear power plants. So you can see the problem coming. There are 102 nuclear power plants operating in the US today. Many of these plants have operated long enough to now be running out of storage space in their on-site water storage pools. [That was the situation at NSP's Prairie Island plant here in Minnesota in 1994. That is what led to the contentious battle in the legislature as NSP asked for authority to move some of the nuclear waste out of the pool and store it in above ground metal casks outside the plant.] As these plants run out of pool storage the utilities operating them face big problem. Without additional storage space the plants have to shut down. Moving the older spent fuel rods out of the pool into cask storage is expensive, very controversial with the public, a very short term "solution," which requires a lengthy governmental permitting process open to public comment. [These dry casks have a design basis life of less than 40 years.]

With plants running out of storage space on-site, utilities are asking the federal government to take their nuclear waste. That is what is driving a push in Congress to find and construct a permanent national nuclear storage repository. Because finding, studying, and building such a facility has been so problematic and has taken so long, there is now also a push in Congress to open and use an above ground interim site immediately. This proposal would require shipping nuclear waste from plants around the country to the site for temporary storage until a permanent repository opens.

Now to the problem(s):

- The proposed national "permanent" nuclear waste storage site is at Yucca Mountain, Nevada.
- The proposed "interim" site is also in Nevada (near the Yucca Mtn site).
- The sites are on Western Shoshone treaty land and they don't want nuclear waste on this

land.

-The sites are home to the endangered desert tortoise.

-State's rights issue? The people of Nevada, their state legislators, their governor, and their federal congressional delegation are all strongly opposed to Nevada becoming the nation's nuclear waste dump. Nevada has no nuclear power plants and produces no high-level radioactive waste, yet they would be forced to accept waste from other states who do produce it. A national repository will require shipments of high-level radioactive waste to be transported over our highways, bridges, and rails through our cities and agricultural lands, over rivers and mountains. Proponents often claim that one national storage site will be better than having nuclear waste at various sites around the nation (as I said above, nuclear waste is now stored in water pools on-site at nuclear power plants). Proponents claim that security would be easier at a single national site. But high level security is the reality and is in place at all nuclear power plants (extending to on-site waste storage) today. The real security concerns should be raised about the long routes that these numerous shipments of radioactive waste will travel to a national site. If terrorists are intent on striking at nuclear waste, these shipments along the thousands of miles of highway and rail routes (some through cities) will be easier targets than at secured nuclear power plants. Opening a national repository will not mean there will be a "single" nuclear storage facility. It will be one more storage site in addition to on-site storage already in use around the nation. As long as nuclear plants continue to operate, they require on-site storage. A federal repository will not replace on-site plant storage. It merely eases storage capacity problems so plants can continue to operate (and churn out ever more nuclear waste).

-Along with the security concerns raised above there is the issue of emergency preparedness that will be required along the thousands of miles of highways and rail lines. In case of accident, sabotage, terrorist attack, leaks and/or spills there will have to be trained professionals ready and close at hand. As with every human endeavor we know that accidents happen, human error occurs, machines do the unexpected, fail, or break (as with the Challenger space shuttle, the Three Mile Island, Enrico Fermi, and Chernobyl nuclear power plant accidents). Will every police and fire department, every hospital and ambulance crew along the routes be trained and equipped to deal with nuclear disasters? How much will such training, equipment, and preparation cost, how long will it take, and who will pay for it? Who decides which communities along the routes get such protection? Who decides which communities don't?

-Public opposition to shipments of high-level radioactive waste through communities will be strong, organized, and vocal. We need only look at last summers' example of Navy plans to ship Viet Nam era napalm across rails from California to Illinois. Public opposition was immediate and effective. Elected officials moved quickly to stop the shipments. Look at the large demonstrations which take place in Europe every time nuclear waste is transported. There is a glimpse of truly huge security concerns. Last summer in Germany tens of thousands of citizens turned out along the railroad route to block nuclear waste shipments. Large police and army contingencies (over 30,000) have to be called out to guard, clear, and arrest people all along the route. (New York Times, 3-4-97, page A6) Last fall National Public Radio reported that there has been a government and company cover-up of radioactive leaks along those routes. Some places registered 2,000 times the levels regarded as safe. In response to those leaks police unions are saying they will no longer be willing to put their

members at risk of radioactive contamination to protect the shipments. What will the response of the American public be to these shipments through our communities? There will be 15,000 shipments over a period of about 30 years and passing over rail or highways in 44 states enroute to the Yucca Mtn site. I raised the question above - who pays? The national legislation now pending (supported by Rep Gutknecht and Senator Grams) transfers the title (read responsibility and cost) of this nuclear waste from the utilities to the federal government. How's that for corporate welfare? The nuclear utilities and industry who profited from the production of this high-level radioactive waste are now about to get the cost of shipping, securing and storing their pollution passed on to American tax payers. This nuclear waste is the most dangerous and long-lived pollution human-kind has ever produced. It will have to be secured, isolated and stored for literally tens of thousands of years (at taxpayers expense). So much for the argument nuclear power is "cheap."

-The Yucca Mtn site has been under study for over a decade and has consumed more than 5 billion federal tax dollars. These expenditures have brought some knowledge - nuclear waste "disposal," and it's associated problems, are far more complicated, extensive, and expensive than were ever imagined. We've also discovered major problems with the Nevada site (political, environmental, and geologic). Research at the site is far from complete and there is no firm time table as to when the site might be found acceptable or rejected. No estimate on future costs, and is yet no time table of when construction might begin or when any nuclear waste might roll into the site. With no other site under consideration and nuclear plants running out of storage space, the pressure to approve Yucca Mtn is great. So great that environmental review is being short circuited to get an interim site mandated immediately. And worse yet, Yucca Mtn may be approved even with its many deficiencies.

-The sites in Nevada are in an active earthquake zone. (Rochester Post-Bulletin, 3-27-98, page 9A) The area has 33 know earthquake faults and has a class 4 earthquake designation, the highest US Geological Survey rating. The sites in Nevada are relatively young geologically, are not nearly as stable as once thought, and are prone to further volcanic activity in the future. In the most recent study, data indicates that Yucca Mtn could have an earthquake or lava flow every 1,000 years. Ten times more frequent than earlier estimates by government geologists.

-Yucca Mtn has been found to have considerable water migration under it - not good for a "permanent" nuclear waste site (ground water contamination is a major and now expensive problem at the Hanford, Washington nuclear waste site).

-There is a question within the scientific community as to the wisdom and safety of long-term geologic (underground) storage of high-level nuclear waste. [see NY Times article, March 5, 1995, page 1 for a better and more complete explanation.] Briefly, here's the problem: Over the years as the underground steel containers that hold the nuclear waste begin to deteriorate, the waste contained within will no longer be isolated. As waste is released it allows for mixing with high-level radioactive waste from neighboring containers which are also breaking down. The danger arises when enough nuclear waste concentrates and reaches critical mass, causing a spontaneous nuclear explosion.* This would be disastrous. Radioactive waste and debris would then be spread deep into the ground water and up into the atmosphere. It should be emphasized that these concerns were first raised by scientists at Los Alamos National Nuclear Laboratory in New Mexico - not by nuclear opponents. After internal debate and study they were unable to settle the matter and went

public in hopes of getting other scientists to debate and study this problem. To date it has not been settled. This may be the strongest argument yet against geologic underground storage of nuclear waste. *[This is not hypothetical speculation – an explosion occurred in 1958 at Kyshtym in the Ural Mtns of the Soviet Union when enough nuclear waste material did concentrate and reach critical mass.]

-The Dept. of Energy has stated the Yucca Mtn site would be for storage of both military and civilian nuclear waste. It was originally designed for (even though it hasn't been found acceptable yet!) the storage of 70,000 tons of nuclear waste. Because of the site's close proximity to several earthquake fault lines, even if constructed, the site may have to be limited to a smaller storage capacity. Today we have about 40,000 tons of civilian nuclear waste and nobody is saying anything about the amount of military nuclear waste we presently have. "Presently," is another part of the problem because the US is now accepting foreign military nuclear waste (in the form of nuclear weapons grade material) as part of nuclear weapons reduction treaties and to lessen the threat of nuclear proliferation. Bottom line is that Yucca Mtn's capacity would be full the day the doors open. There is no other national site being considered, nor being studied. Might one of the earlier studied sites, such as the northern Minnesota granite shield, be next in line? We'd better be careful in advocating for the federal government to "take" the nation's nuclear waste. We might have argued ourselves right into position for a national repository in our own back yard. Scary? You bet - and consider the logistics. Minnesota is far closer to the majority of the nation's nuclear waste (most being out east). The route here is shorter and doesn't pose the problems, expense, and risk involved in transporting high-level radioactive waste across the Rocky Mountains to Nevada.

-This high-level radioactive waste remains dangerous for tens of thousands of years (the half-life of plutonium in this waste is 24,000 years). [Half-life is the time taken for half of the radioactive isotopes to decay into other materials. It does not mean this waste will be safe when it reaches it's half-life. Generally it takes 10 times the half life for almost all of the radioactive isotopes to fully decay. So some of the plutonium in this nuclear waste will remain dangerous for 240,000 years.] Putting this in some perspective, 12,000 years ago we were just coming out of the last ice age with huge glaciers covering large areas of land. Our genus (Homo) is about 2 million years old. And our species (Homo sapiens) is 100,000 to 200,000 years old. Human recorded history and civilization dates nowhere close to the 24 thousand year half-life of plutonium. How are we going to secure and mark the geological area to warn future generations of the dangerous waste buried below the surface. What signs will we erect, what will they say, and in what language do we communicate this danger to the people of the 41st or 93rd century? Or do we just say the future generations are not our problem and they're on their own? Troubling questions remain with burying our long-lived dangerous waste under a mountain in what we presently consider to be remote wilderness. Some proponents of nuclear power when confronted with these question have proposed a "nuclear priesthood" (likening it in one article to the monks in the Himalayas) to keep and pass this information on to future generations. Is that really the legacy we wish to leave future generations?

-The first step in nuclear waste management is to stop producing it. Siting and constructing a national nuclear repository should not proceed as we continue nuclear waste production. The nuclear waste dilemma focuses our attention on the problems associated with this technology. But it can also help us focus on the need to aggressively pursue an energy

transition to more environmentally friendly alternative energy sources (wind, solar, fuel cells, and biomass). A national storage site now would only allow existing nuclear utilities to argue that the nuclear waste issue has been "solved." It will pave the way for nuclear utilities to continue nuclear operations, thereby continuing to produce ever more nuclear waste, compounding an already difficult and expensive problem. It would slow the inevitable and necessary transition to renewable alternative energy sources. Nuclear power plants can and should be phased out as they run out of on-site water pool storage. Nuclear waste from power plants can continue to be stored safely in these water pools for now. Once nuclear waste production stops, we must search for the safest locations and technology available to begin the long-term task of securing, isolating, and storing this waste.

-There are consequences to consider on Minnesota's home front: In 1994 after a long and contentious legislative battle, the 1994 NSP Prairie Island Nuclear Waste bill was passed. It gave NSP authorization to store nuclear waste in 17 above ground steel casks at its Prairie Island (PI) plant (on the banks of the Mississippi River). But along with that authorization, the bill set Minnesota's energy transition in motion. A Transition which will eventually replace nuclear power and decrease reliance on polluting fossil fuel plants with cleaner and more environmentally friendly renewable alternative energy sources (wind, solar, and biomass). Keeping the 17 cask waste capacity keeps pressure on NSP and keeps our state on track for this important energy transition. The prospect of a national nuclear storage site gives NSP leverage to go before our legislature to overturn the 1994 nuclear waste capacity limits. They'll argue for more storage waste capacity, just until the federal government takes their waste. Increasing storage limits and extending the life of NSP's aging PI and Monticello nuclear power plants is not in our states best interest. It would mean at least ten years additional nuclear waste production and possibly pave the way for relicensing the PI plant in the year 2014. Far better to stay the course and move to renewable energy sources.

-Is it morally acceptable that in meeting our present day "needs" we create such a dangerous and long-lived waste to pass on to our grandchildren? You see, there is no "disposing" of a material like nuclear waste that lasts for so long - there is no "solution" as such. We have produced this waste, it is real and here for us to deal with. The best we can hope to do is to stop making more of it and isolate what we now have as best we can to minimize exposure to people, animals, and the environment. We have committed ourselves to a daunting task - we have committed our children to a daunting task. But we must not allow ourselves to be fooled. We must not bury this waste in a hole in the ground and think we've "solved" the problem. The nuclear industry must not be given any further cover to continue producing this dangerous pollution, waste that we will pass on to our children and they to their children, to store, care, and pay for.

-I urge you to reject Yucca Mountain as an underground geological nuclear waste storage site.

Mark Frederickson
Down River Alliance - Rochester
900 17th St. NE
Rochester, MN 55906

