

Public Comment on: U.S. Nuclear Waste
Technical Review Bd. Spring Meeting
May 29, 2008 – Las Vegas (from transcript) 15 pages

July 7, 2008
1952 Palisades Drive
Appleton, WI 54915

We are on the brink of the application to NCR to build this repository and still do not know the final specifications of the TAD. I expected this, years ago, when I kept asking about the cask and all they looked at, for all those years, was the mountain. Now here we are in the same situation we were at the Pt. Beach plant in Wis - in a rush to develop a cask and fit all its changes into the total system from now on. Plus, the contents of that “can of peaches” I talked to you about is still unknown. If a supplier doesn’t know the conditions of the fruit it cans - it can corrode, cause health problems, even explode. Spent fuel in a cask is like this can of peaches – But nobody is going to open them to see if they are any good after canning, sitting on a shelf (aging) and transported. What is the condition of the pellets? the cladding? the assembly hardware? The CRUD? Nobody wants to look at this, yet everything depends on it. Do you know? I sure don’t. Do you know what some French company is possibly going to fabricate to hold this waste? I sure don’t. Yet everything now depends on this.

I am still hopeful that those of you on the board are honest enough, and value your personal integrity enough, to hold DOE and NRC to do the right thing. If you build this repository, which I don’t think you should do, at least make sure it is done the best possible way. Keep asking the tough questions! Thanks so much.

Sincerely,

Fawn Shillinglaw

(attached 15 pages of comment)

1. Will the Board maintain the same relationship with a 2nd repository? It should be, and this needs to be settled now. Please get this into documentation.
- P 24 2. Seems to me that “acts of war” and “deliberate sabotage” should be very much inside the regulatory framework, not outside it. These are major concerns and must be considered completely. Why not?
- P33 3. I’ve always known that the cask welds are the achilles’ heel of the containers and the thickness of the alloy 22 on the weld is of major importance in stress corrosion cracking. So the welding process and the tests for welds should be looked into by the board. There were numerous failures to do this correctly in our VSC-24 subcontractors – even to the point of grinding down welds too far and not reporting weld cracks etc. How can you hold subcontractors to nuclear regulatory standards when being made by the French? This really bothers me. How will these welds be inspected? Do you know? This is important. Sometimes the concern here is “honesty”. Once those cracks are already in the repository, how can these be retrieved or repaired? This is a real concern, and is a regulatory requirement for procedures that really work, isn’t it?
- P35 4. So how is it the final weld, after the material is in place in the TAD,
line 18 + 19 inspected fully, or is this impossible?
- P55 5. “So in the first few hundred years, the only way to get a dose from that
line 16 repository is if there should be the improbable volcanic eruption.” I find this statement improbable. I keep thinking of the “butterfly effect” and the great surprise of the NRC and everybody else connected with the VSC-24 cask at Pt. Beach in Wisconsin when we had that hydrogen explosion here – completely unexpected. I’ll never forget that note we got through the freedom of information act – “what are we going to tell Fawn Shillinglaw”. I was watching every move they made here as far, as the available documents would let me. To call that explosion (was what it was) an “ignition” was ridiculous! Even the radio reporter interviewing the plant publicity man questioned the use of that term. So you see, I have reason to be skeptical. This is a first repository - just as ours was a first genuine certification of a cask. Ask you know - first use of anything reveals the problems – and there will be some unexpected ones.
- P68 6. The NRC’s stipulation to not attempt to model climate change over a
line 7 a million years tells me that it is so uncertain, you can’t do it. That is ominous. What is the Board’s prediction on climate change?

- P69
line 16 + 17 7. Maybe this is a small thing, but they say they “don’t care about the diffusion of water through the “drip shield” and that the stress corrosion cracks “will be tight and will not support water flow”. Do you agree with this? We had a downpour last night and you look where the leaves are clogged and where the ground is eroded by the sprouts, and you wonder about water traveling over cracks, and if the cracks in the drip shields will not actually enhance corrosion, and “open up” and be paths for the drips to be enhanced. I’m never quite sure if the drip shields will end up being more of a problem than protection in the end. The devil is in the “real” details.
- P77
line 5 8. Does the Board agree that the invert would stay the same buried in magma? No problem here? They don’t modify it at all.
- P78
line 8 + 9 9. “They play their chemical roles”. I like this phrase, and that’s what nobody understood at PT. Beach at first- the formation of hydrogen from the painted coating should have been a predicted “chemical role” – nobody expected it. Chemical roles produces different materials that have new chemical roles, etc. etc. – is this understood well enough by the Board in DOE’s explanation of the repository chemical roles? Are you satisfied?
- P83
line 13 + 16 10. Mr. Swift infers that EPA and NRC “have chosen to limit speculation about processes that might become more important over a long period of time”. So that erosion on the mountain surface, for example, over a million years (gullies, ridges, etc.) that might change infiltration rates and UZ flow maps are not considered. So we don’t know what the climate changes will be like and we don’t know what the mountain surface will look like. Doesn’t this bother you at all?
- P85
line 21 11. I appreciate Dr. Latanision’s concerns over public and political understanding- That is often not considered.
- P86 line 3 12.* Dr. Garrick refers to a public document. How can I get that? *
- P86 line 20 13. Dr. Latanision answers my question – I sure was surprised at the talk about “codisposal packages” too. “That’s stunning”, he says, “that its 1/3”. – I had no idea of that either. Why are we finding this out now? And what should be redone?
- P87, 88, 89 14. Yes, the prototyping, the fabrication, the weld testing, what you learn from real experience here. Problems arise in a lack of communication here where some workers don’t even realize the ramifications of what they see happening, or sometimes concerns are “covered up” on purpose. One

subcontractor is in competition with another, in a time crunch to get these made, has new workers on the job –whatever. Who will oversee and inspect all these things and make sure that “lessons learned” at one place are communicated to others? I found that in the VSC-24 cask, often documents weren’t updated - even use of the same SAR- there were so many changes in procedures etc. that I felt everybody was not on the same page in the rush to get the casks to the plant. Haste creates problems. Where are all the casks to be fabricated? By workers experience in this kind of work to NRC specifications? How tested? How inspected? This is where communication and updates of all documents is of major importance or you end up with casks in all different sorts of development as the design changes don’t catch up with fabrication. It is essential that changes are minimal and changes are communicated. Results of “lessons learned” at all stages are of major importance. Stop fabrication if there are concerns. This had to be done with the VSC-24 – constant problems because everything was always in flux.

P90 15. Thank you Dr. Abkowitz! You said it a lot better than I. It needs to be validated in a laboratory environment. The VSC-24, as far as I was concerned, wasn’t even off the drawing board either, yet NRC certified the cask design, when the vendor had a list of technical problems- “to be solved later”- that really angered me- and no real procedure for opening the cask. We were amazed! We wanted the real thing tested, before we got it at Pt. Beach. Your concerns are valid to be sure.

P91 16. Mr. Swift’s response about a “reasonable range of belief” makes me wonder. What about belief over a million years? How does the Board deal with this?

P96
line 2 17. Mr. Swift says “the modeling cases sort of fell out as a “computational convenience”- What is computational convenience?”
Do you really understand all this computer modeling? It becomes way to complicated and ever-changing to me. I still think that what you put in is all that it can spit out, and if you don’t expect something that you should have and you didn’t put it in there - it won’t be there! It’s the real fabrication, and the real testing, of the real thing, over time that will teach you the lessons - and if things go too fast, there will be huge problems. Its better to take the time to do it right and make sure everybody involved communicates, before we bury 100 casks we have to retrieve the next year!

- P97
line 17 18. Does the Board now agree that they can screen out localized corrosion in dust deliquescent environments? Keep asking the right questions. Thank you.
- P97-105 19. This continuing disagreement on dust deliquescence and localized corrosion does not seem to be settled.
- P101
lines 5 + 6 20. I don't trust the drip shield. They say its possible for 10% of the casks "in seeping environments, which is only 40% of the waste packages, which might see localized corrosion if there were no drip shield". So how many are actually in this "seepage environment" really? And if the drip shields failed for some unknown reason, just really how many casks could actually have localized corrosion in the first few 100 years? I'd like to know this, wouldn't you? Let's look at what really could occur. I'm very interested in these ongoing tests and the dependence on nitrate/chloride ratio. Chemical reactions can be surprises as we know. Are you really satisfied with Mr. Swifts' response?
- P105
line 24 21. So the ICRP revised its dose corrosion factors. Do you agree with this? Should NRC be using this? I've found out that NRC is new to all this too – they are just human beings and doing a job. They have never licensed a repository. Don't be afraid to question their reasoning for requirement standards. Changing the rules, I've found, is often done to get things done faster. This is not always a good thing.
- P107
line 10 + 11 22. "We have also revised the criterion for stress corrosion cracking". Is this OK?
- P108
line 4 + 7 23. This bothers me. Its like EPA and NRC say here, that since we can't predict climate change – forget about it. That's avoiding a major concern. The whole world is looking at! Here it says, "However, the EPA and NRC took that question off the table by specifying that we use a long-term average climate, essentially acknowledging that was a very difficult uncertainty to work with in regulatory space." So if you can't work with it, forget it as if it isn't out there or what? That's an uncertainty I see as of major importance, and a reason for keeping the casks above ground and constantly monitored so you can actually see what's happening and repair or replace casks as needed over time. Burying garbage has always resulted in pollution of our land and water, and affected human health in the end – we never seem to learn from past mistakes. Why not?
- P111 24. Dr. Arnold says the TAD is only conceptual with 2 different specific

line 7 + 10 designs now. Is this so? Then how can they use this design in computer modeling if they haven't even finalized it? That's what happened with the VSC-24. The design was not finalized before certification (or tested well) - so change, after change, after change, after change! That leads to a mess, believe me! What really is the conceptual design right now? Do you know? Will all this modeling need to be redone if changes are made in haste just before licensing? I fear it will.

P113 P2 25. Dr. Arnold- great question! So the cladding did not fail as they assume. Can it actually cause something unexpected if it remains intact? Expect the unexpected. – It usually happens.

26. Why not call it a hole if that's what you mean? (a "patch" is something that covers a hole, like a hole in the knee of my grandson's jeans!) A patch is not a hole!

P117 27. Mr. Arnold says if fuel assemblies are dropped, the pellets can spread out- if entrapped in a TAD - "it just rattles, I'm not sure much of anything happens". I think we need to know. The age and condition of those pellets is something nobody knows after long term above ground dry storage, transport on rails, and trucks, dry – wet – dry – wet - nobody has tested the real thing! Will these pellets fall apart to dust? Are they already brittle, cracked, and pitted? Who knows? Nobody seems to want to really analyze the real thing after storage and transport and "aging" in Nevada. What will these pellets and cladding really be like? Don't you want to know? I do. It may make all the difference. A pellet has a long history from the day it goes into the reactor- the pool-dry storage-wet transfer-transport horizontal-aging, vertical-wet transport - what is its real life, its real condition physically and chemically? Doesn't anybody want to really know this over time??? Why not?

P140 line 4-13 28. Dr. Cerling- I hope you pursue a "robust answer as to why they say that water is re-oxidized once it's been reduced. If it's puzzling, ask more questions until you are satisfied. Thanks.

P163 line 5 and 9 29. Dr. Helton says "the residual stress variable would be hands down the dominant variable with respect to the uncertainty you're seeing here.-That has to do, when you have a seismic event and you bang the waste packages together." He says, "It causes stress, and this residual stress level defines the stress level at which you will get waste package failure". – I have just read a very enlightening book called "A Crack in the Edge of the World" by Simon Winchester about the earthquake of 1906 (written in 2005) – a good read for any of you that have not read it. The information

on plate tectonics, the San Andreas Fault- The history and geography of the whole situation is fascinating. He says p363 that “It is not a question of whether a big earthquake will occur, nor even a question of precisely where it will hit. There will be a quake, it will be considerable, it will be somewhere in the vicinity of San Francisco, it will more than likely affect the San Andreas Fault or one of its cadet branches – it will take place, most probably before 2032”. On p379 there is a neat photo of the precise point where the trans-Alaska oil pipeline crosses the trace of the Denali Fault- It shows the teflon-coated slides beneath the supports so that the 4ft. diameter pipe will remain undamaged by any rupture beneath it. In November 2002 the earth there moved 18 ft. to the right and the “slides” worked with the build in curves to absorb the energy. The engineering for this is really something you should look at in relation to cask displacement below and above ground I think. (I kept thinking of that pipeline as a row of casks as I read on). It says on p383 that “the Butterfly effect” is written into the rocks of the American West, and into the rest of the world. As well”- He says “the occurrence of trauma in one place seems to have an effect on the other, as though the whole of Western America were ringing like an immense brass bell.” The geysers periodic eruption times changed in a seismic event far away- what really happens? There are a lot of unknowns in seismic and igneous events- and they are related in some ways. Is humankind somewhat overestimating what they can predict at Yucca Mt.? I think so. This was a fascinating book, I thought- read it if you can. (tectonic plates and fault lines)

30. The last I saw of the aging overpack design for casks at Yucca had a sort of “tie down” to the concrete pad, supposed to keep the casks from going over in a seismic event-what do you know about these plans? - why necessary? I have never seen such a thing in all the cask and pad designs I’ve looked at over the years. I’m very curious about why these are needed – how tested- etc. Aren’t you?

P165 line 17 31. Dr. Abkowitz sees the choice of the 6 variables as “bizarre” in the way they are measured and how they relate back to the 6 different scenarios they originally came from.

P166 line 14 He asks how they arrived at these 6. The answer is that the individual analysts felt they were important. Why? And are there any “washing effects” of one another?

P166 line 25 Do you all understand this? Dr. Helton says “correlations wreak havoc in analyses of this type. “But aren’t correlation very useful information? Is all this being done this way “to fit” into the computer model- so it works

the way they want it too? Computer models have limits? Are you aware what the limits are? I sure am not, but I do know that reactions “hinge on each other” and if the computer can’t convert thing without making a mess of it, then it may spit out a model with every thing neatly in its little box and not represent reality at all in the end! I know you are all experts, but one of you understands the field of his expertise in relation to the repository that others may not. How often do you get together to ask each other questions? How often does the board communicate and just discuss what is happening? I hope a lot more as we get down to licensing now-things are happening way too fast and I’m alarmed at people being “surprised” too often in these presentations.

P185
line 6 and
17 -20

32. Dr. Kadak is asking what we all want to know the truth about. “Are we completely relying on the engineered barrier”, he asks” what does this say about the effectiveness of the natural barriers? He asks. As I understand it, the engineered barriers - (the TAD), is not being finalized yet, and may be developed by a French vendor. I foresee all kinds of problems with this - political being a big one. A secondary repository site was in Wisconsin. If we are depending on a cask, then why even haul the waste to Nevada and endanger people all along transport routes for years and years? Costs are going to be a big issue – always are – “Follow The Money” is always a good plan and you’ll see where corners are cut. If we are, in fact, relying on the engineered barrier, (which was never really answered in this discussion) then it is not too late to say no to the repository idea. If the money spent tells us it won’t work well, and is too uncertain over time, then its money well spent. I always wonder if FDR would have lived, if he would have dropped the atomic bomb on a city like Hiroshima, or used it that way at all. If General Grooves had released the scientists’ petition instead of holding it up, would history have been different? Here we are, in an oil and energy problem, wanting to build more reactors and create more waste, yet demanding North Korea blow up its cooling tower. We may regret all this in the future. What do you think? It is all connected in many ways. Who can predict what USA will be like at all in 10,000 years???

P190
line 11-

32. Victor Gillinsky, consultant from Nevada asks about the drip shields – (not to be in for 100 years from the repository start) – physical difficulties and costs, of installing them? By leaving this to the future, will this cause problems? Why aren’t they put in as the drifts are filled? Will they affect retrieval? If so, how will this work? Do you know?

P202

33. I find it disheartening that EPRI comes up with results different than

- 203 DOE and thinks “general corrosion” is dominant with few stress corrosion failures”. I’m glad they are truthful, and I know its “professional judgment”, but then what should one accept as the correct analysis when 2 different computer modes come out with different scenarios? How does the Board handle this?
- P206 34 “These results are still pre TAD. We haven’t even figured in the design
line 15 changes due to the TAD”, Dr. Sowder from, EPRI says here. So none of this seems valid to me at all then.
- P209 35. Dr. Kessler of EPRI “that 28.8% of the waste packages actually should be 2.9, 3% waste packages, we got our decimal off one place”. This mistake, before the Board presentation, makes me wonder how many “decimals off one place” got punched into the computer model when somebody was over tired or not paying complete attention. Such a mistake affects the whole model. It’s so complicated - who would even know? This is what worries me. Too much dependence on a computer model and very little testing of the real thing - over time!
- P213 36. EPRI sees drift seepage on the order of a percent and DOE sees it on
line 13- 16 the order of 30 to 40% - How can this be so different? Who is right? Why? All through this EPRI comparison, things don’t relate, aren’t really comparable the way represented, things are left out that DOE included - some radionuclides – cladding is used – etc – it all seems very messy and I don’t get a true sense of comparison by an independent group at all. Do you?
- P240 37. Do you agree with “oxide wedging” information?
line 1-7 Will alloy 22 resist this failure? Can’t this be actually tested?
- P241 38. The chloride ratio from nitrate “from this morning” is “not affecting
line 14 the corrosion rate significantly” How long is this test? Is it adequate? Are you updated on this?
- P250 39. When Dr, Duquette says “No, we’ll talk, and Dr. Ballinger says
line 11 “Okay, I suspected we could” – I can’t help but be very, very curious. Good for you Dr. Duquette! Keep at it. Make sure they get it right!
- P253 40. I am laughing out loud- but it is really, too serious
line 14-17 to laugh at:
Dr. Ballinger “Is this (additional) work necessary prior to submittal? The answer is no, in my opinion. Thank you”
Dr. Garrick- “all right. Let the fun begin.”

Dr. Ballinger “I’ve got my flak vest on”

Dr. Duquette “Unless you’re wearing it over your head, you’re in trouble.”

I love this interchange, but when this group says everything is “OK” at this point with a TAD not even designed – one has to just be surprised!

P254
line 21

41. As Dr. Garrick asks – why don’t we see a clear indication of the mobilization of the waste and what we really end up with is a source term? Will the Board continue to pursue an answer that’s acceptable?

P255

42. Yes - what is the quality of the supporting evidence? I want to see that too. Field work? Lab work? Expert judgment? – Dr. Garrick wants evidence and so does the public! DOE needs to defend all their input for the computer model. Will this be done? How? Public confidence demands it.

P259
line 14

43. Dr. Latanision “I’m not sure there is compelling evidence that we can FEP out deliquescent induced localized corrosion.” Keep at this until you are satisfied!

P262

44. If I got it right, Dr. Ballinger is trying to say that wedging between carbon steel and inconel was the steam generator problem way back when – he says they “operated them like toilets, they had chlorides in between there”. Well – I was around then – at the time, who was on NRC monitoring all this? Why did it happen? Sure doesn’t inspire confidence in the public eye, does it??? It’s always easy to look back and see what they did wrong. Who will look back at DOE, NRC, and this Board in the future? What will they say then??

P272

45. Why aren’t these experiments that the Board suggested 2 years ago being done? If it will resolve the issue. It is necessary. There is great concern here and should be a priority. Why do they just ignore it? They need to prove that what they say is correct! I applaud the board for sticking to this! We need to put to rest this issue of deliquescent induced localized corrosion with the appropriate testing now. - a good meeting with the Board alert and asking good questions. Don’t let up. The public depends on you. Never forget that future generations will look back at what you are doing now, when they look for reasons as to why things are as they are in the future. You are involved in making big historical decisions here. It should be very personal really.

Thank you. Fawn Shillinglaw