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Notes on: Fall Board Meeting US NWTRB  
Sept 27, 2006

p 18  
lines 15-19 “I can assure you it will meet these dates.” “This project is going to go forward.” The new OCRWM (Why is this person always changing? What happened to the other ones any way?) Director is really gung ho! He talks of “cultural changes” he is making from “lessons learned”. I remember that phase often in the NRC documents - to me when a “cultural change” is needed, it means sloppy work was being done or even things that I might argue close to illegal in the past - a “bad attitude”- I guess. Well, good luck to him in changing all that. But I am concerned about a “fast track” program not giving necessary time to the details. We don’t want a repository built by some dedicated date - no matter what!

p 32  
line 4+5 “We now know enough to design this repository and design it right.” - Doesn’t appear that way to me at all.

p 32  
line 18-19 “We’re going to do some things to force the surfacing - I should say force the integration to occur” - I’m all for some “integration”- but “force”?? The science is all important for design decisions, and if you build it before you have done the homework correctly, you will have a mess - that is how our cask vendor for Pt. Beach operated -- build it and certify it now -- make changes later; a mess!!

p 37  
line 6-11 “And I believe the issue was raised as to the role of the NWTRB plays, since it was established to perform independent review, and my understanding, and correct me if I’m wrong, your explanation was that the Board did not have the complete skill set to do that properly.” What??? Is that what he thinks?

line 22 “I don’t think it’s appropriate for the Board to do independent review of those.” - “I need”

Whoa! The picture was really clear from the start that this man represents the industry and is going to get Yucca Mt. open for them as fast as possible. This really scares me the way he talks here – a one man show, really, with him “personally” involved in everything. Well, will see how easy he finds it; DOE has been a rather unwieldy animal in some ways in the past I guess, but he is awfully critical of everything, for somebody new to the game. Seems to me I remember a new head of transportation a while back that was supposed to be a real “take charge” guy from his talk to the board – what happened to him? In any case, the Board knows its duty, and that is independent review of which they do very well without being told how to do it. The Board wants answers to the hard questions – the ones that really count – keep asking them and keep you value system in expecting the best design to protect the future generations of this country. That’s

of main importance. Everybody is getting tired of all this going on, and I 'm sure a lot of you would rather be out of this now, but we the people need you to represent us and remember your commitment when you started on the Board. I am so impressed with the integrity of most of you, and the work you do is invaluable to keeping everybody on the project aware of your oversight. Without your good meetings and workshops, I just wonder when the repository design would be at this point. It scares me to think of it!

p 42  
line 2-11 Good – This is the first I've heard about your visit to Finland and Sweden. So glad you are talking to other countries. Sounds like they are testing the real thing over time which is what I've been begging for over a long time now – yet we don't even really know the properties of passivity on alloy 22 well yet, much less have a final cask design – and now everything seem to depend on it! (I'm not counting on the drip shield doing the job very well in protection.) When are we going to deal with the “practical problems” you refer to here?

p 42  
line 18-19  
new  
OCRWM  
director “I'll tell you the level of frustration on Capitol Hill when I came to this position is palpable. It's like get this Project going or we're going to kill it.” This is scary to me. It's a statement that says – do it – now – no matter what. I'm afraid that the nuclear industry and political power is running the project now, and forget about all the future ramifications of this for our kids and grandchildren. I do find myself thinking more and more about Hiroshima and Nagasaki and how when I 1<sup>st</sup> heard about spent fuel being stored at our Pt. Beach plant, I went back to all the history of nuclear everything and found it fascinating and terrifying and I always remember reading how Gen. Groves felt the people needed to get the “bang for their bucks” - so much money had been spent, and they used the 2<sup>nd</sup> bomb to test if it worked, (being a different design). The controversy on that will go on forever. But a lot of things come down to money – is that what is happening now?

p 43  
line 7-8 “and so , another 2 or 3 years of prototype testing, or something like that, I didn't think is going to tell us a lot more than we know now.” – Do we even have a prototype of the cask at this time? Has one been tested at all? They never tested the actual VSC-24 cask we got in Wisconsin – and we had an explosion that the vendor, the nuclear plant, and NRC were all completely surprised at and had no clue as to what happened at the beginning until a lot of tests were done after. Don't let that happen at Yucca Mt.

p 52  
line 12 “post – emplacement criticality issue” – Doesn't this have to be resolved and doesn't the design depend on that?

line 16-22 “The requirements for the surface condition of the waste package, whether they're now a problem. And if they are a problem, what do you have as a surface spec, and what kinds of inspection can you do after you've handled that thing, and what repair procedures you have” – Good questions! Finally we are looking at reality. Once they realized that the Pt. Beach problem was a painted coating, they started looking at every interaction they could find – like did the handlers have oil on their hands, what cleaning agents were used, how was the handling device decontaminated – with what? – and even, then, there were

found to be weld cracks on the surface that were repaired by the fabricators and not disclosed. I remember one of these lead into the side seam weld of the cylinder – a dangerous place. How can that passive layer on alloy 22 be protected and remain pristine all along that casks route to final placement???? Who is looking at this important concern. Everything depends on that passive layer being intact, doesn't it? That was never what anybody expected when Yucca Mt. was supposed to be the main protection at 1<sup>st</sup> and nobody would even look at a cask design. I asked about the cask design forever! Now, I think it's too late to do a good job in testing it at all. This new director wants to license the repository now and make changes later. That is dangerous.

p 53  
line 17-23  
new  
OCRWN  
director

“I mean, just not credible or practicable to have certain high quality, high glass surface finishes on waste packages you're going to put in a tunnel underground. I mean it's just not.”

Well! This is his answer! Did he attend your workshop?? Does he know anything about alloy 22 and all that depends on it? Appears not! Even so, I think he came up with the right answer – it won't work. I've though that all along. So now what?? This is eye-opening to say the least!!!

p 59  
line 19

“Whatever waste has been emplaced can be retrieved” This NRC requirement got lost in the generic certification of our cask in Wis – as I told you – one paragraph saying – you take the waste our the reverse of the way you put it in – we were furious! They accepted that and what a mess it was when they realized they might have to open one long before they had any idea how to do it. That cask still isn't opened as far as I know – it's at Palisades in Michigan being especially monitored. That's the only reason we finally went through all the unexpected procedures (on paper) to see how to really open the cask and retrieve the spent fuel. Retrievability is part of licensing and needs to be looked at carefully. Can't you just see a movie version of all the alarms going off at the surface of Yucca M. and the men in charge saying, “but we never thought we'd really have to take a cask out so soon – we don't know how yet!” Don't let this happen. If this thing gets licensed – every thing for a retrievability plan has to be ready to be used. I know that from experience with our design here – the unexpected often happens.

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p 63  
line 22-23

“Repository system must be composed of multiple barriers” – “defense in depth” –

p 64 line 2

“Understanding the capabilities of these barriers” - OK – this NRC person says this, and the OCRWM Director has just said that he doesn't see how the surface of the alloy 22 can be protected - so now, what is your understanding of the capability of this all important barrier??? This is where it is all going to come together and really look at what is possible in reality – the day to day functioning of the total system – are you visualizing it from beginning to end – what really happens?

p 69  
line 7-8 “The biggest technical problem I have is that we have not seen a final design yet.” Astounding! And this NRC person is talking about all the safety levels etc. yet they haven’t even seen this yet and I fear this administration has put in a new OCRWM Director to get this done while they are still in power. This licensing is on a fast track! Will NRC buckle under is the question! Can NWTRB keep this from becoming political?

p 71  
line 19-23 I’m glad to see that the NRC has recognize the difference between “process” and “product”. A design “in process” is not ready for licensing I feel (Right – there will be some things not nailed down for sure, but I feel that designs in constant flux as the DOE has now – are just not ready to be licensed – yet are being rushed to judgement anyway.) The NWTRB has to be very careful to handle this right and become a real force in itself as the Board was meant to be when created.

p 75  
line 16+17 “You should have the ability to go back to where you were, where it was safe” – I’m glad to hear the NRC say this. I hope they enforce it!

p 76 line  
line 15-16 Good question. So DOE is actually considering this “spray deposited metastable alloy”? This reveals that cask designing was considered way too late as I’ve always believed. Fine – if they find something better, use it, but the problem is here we are in the final stages and now they are considering this big change. We had a lot of discussion with NRC over the years about changes in our cask design and procedures. We felt that we ended up with a lot of different designs in use because so many changes were necessitated after initial certification. Heaving a lot of changes in the system (that could have been resolved before certification – lead to mistakes made – its hard for workers just being used to doing a new job (loading and transferring – etc. a never before used cask at a plant where this was never done before) and then having to deal with constant changes just when they were getting procedures straight. You have to put yourself in the fabricators and daily workers shoes to really see how changes lead to problems in the future. One needs to feel some confidence in procedures. Some changes will be necessary, but to license something and then constantly change it because it wasn’t really ready in the first place is wrong!

p 78 “Safety Evaluation Report” – We dealt with safety Analysis Reports (SAR) and Safety Evaluation Reports (SER) and I can tell you – read the code of Federal Regulations on all this – you really need to look at those parts reference if you don’t really understand. The code has loopholes for changes made without NRC oversight and believe me, our vendor and plant found them and used them. There was a lot of argument about definition of terms like “margin of safety” etc. Know these terms from the code. You may need all this information in the future. When dealing with the NRC it really pays to follow the code. The repository is a new licensing process and if you see problems with the code on this – please get on this issue now – they are willing to listen to concerns. Write directly to the Commissioners if you need to. Then it gets looked at faster. We had a lot of problems with changes being constantly made with NRC staff. Just when we felt we could have a dialogue with one and understood each other, that staff member would be

moved to another area or gone. Not that it was done on purpose. But it often worked that way and we'd have to start all over again.

p 79 line 5 So if it goes out over the signature of the "Office Director of NMSS – get to know that person now – some of these people are very willing to listen and really helpful. At, least – get your views to that person in charge – deal with authority. We found it really helped all involved.

p 83 line 15 "It seems like everybody wants to retire." I think he's right. And this is happening because, in my mind, Yucca Mt. nuclear waste has been one big headache since the 1<sup>st</sup> waste was produced. Nobody had the answers then, and nobody does now. It won't just go away either. We are all tired of all this, but I am depending on the NWTRB to keep at it because it is too important not to, especially now.

p 86 line 1 "The repository is 1000 ft over your head." Wow! I never realized that. So where do we get "deep underground repository"? Sounds more like we are actually entombing the waste in an above ground pyramid. That's a whole different picture! Amazing how one who isn't on the scene doesn't get the real feel of how it really is. So could one tunnel into the drift from the side of the Mt. if needed to be done in the future? and what about the Mt., as a whole, and access from future weapons? I've heard of some weapon being developed as )I'm sorry the term has slipped my mind – a sort of "hole digger" bomb is all I can think of – goes underground as I understood it.) Funny we all talk about a mountain, yet think of way underground in our mind – how does this make a difference?

p 91  
\*\* Are we depending on retrievability? And how will that really work – not just on paper. I think that before any licensing , some casks need to be put in and taken out to prove to the public they can actually do it – show everything works as expected. Maybe do this again after some years. We have fire drills etc all the time – so why not here??

I just want to say something here about materials and fabrication now that all our interchanges with the NRC on our cask in Wis. are coming back to mind. After one reads all the documents on the detailed analysis of the materials to be used and specific design criteria – then after licensing – one sees that materials and fabricators have made changes you didn't expect and are within NRC "allowances", but actually compromise the conservatism you were promised in certification. One case comes to mind of another cask design – I think it was in Ohio – where the shell wall (of the inner liner) was below the thickness required and we were told there like "a margin of error" or something within which the material was allowed – however, it was thin in the 1<sup>st</sup> place - then when welded – they ground down the edges of the weld which made the cask wall even thinner there – and there were problems. So you see that you do all this scientific work for say – thickness of the passive layer on alloy 22 – but if the alloy 22 (or this new "sprayed on" alloy is not put on) or created at the right thickness – or has gouges in it from handling – scratches, whatever, - then what? The material from alloy fabrication to disposal closure is handled and changed by it's surrounding environment constantly over the years. And if fabrication is not as you expect in your experiments to begin with – then all that hard

work to prove it's safe goes right out the window. That is why QA is of utmost importance! In everything. Believe me we found that out

xx Another point. Who does the NRC SAR or SER belong to? Get that straightened out, because it defines who has the authority to make changes. Our vendor thought he could make the changes. The electric company thought they could since they were having their own contractor build them, and then the subcontractor (not use to building to NRC specifics or nuclear precisnesss at all- thought that a little leeway here and there was OK) etc. etc. Who really has to go back to the NRC and say "we need to change this and what procedure do we need to follow to meet your criteria for change?" Get this clear with NRC. What changes can be made without NRC oversight? What procedures need to be followed? This needs to be clearly understood by all, now, or the day after a construction permit is given, changes will be made. Believe me, they will – know ahead what can and cannot be changed and how.

\*\* NWTRB should be in on this now, so when a permit is given, everybody knows clearly what NRC expects for safety changes.

I've been thinking, as I took a break here, this "spray deposited metastable alloy" of which I've just first seen a reference to. If this is a "sprayed on" something to enhance stability, I would question it. First because adherence over time becomes a concern, depth of an even nature in spraying becomes a concern, length of time it lasts is a concern – (I assume it won't be able to recreate itself - ?) I've had a lot of history with a coating on a cask surface. Of course ours created hydrogen. Then some new painted coating - (used at Trojan I think) actually unexpectedly dissolved in the pool water and clouded it up so much they couldn't work and load the cask. Coatings are tricky and I would ask you to question this idea very carefully, if DOE is considering it.

p 157  
line 9-11 "There is 7 times as much iron as uranium. Uranium is a trace component in the repository at Yucca Mt. It is primarily a repository for iron. – I'm amazed!!

p 170  
line 9 "Analogues are difficult." The Roman iron nails requires a very long drying cycle as well as a wet cycle. – The repository will have a continuous supply of relative humidity" – etc. – Analogues seem to be useful, but I agree that you can't put these in a model unless you really prove all the conditions are the same. Seems to me comparing solid nails to a cask wall containing a lot of other materials can't be compared. Also to assume water covering the alloy 22 completely or even at the same time is unpredictable – water will settle where the drip shields allow it through + where it condenses, probably in crevices – any nicks or cracks from handling or fabrication plus areas of a weld that's worked or ground down to form a caved area that collects water – an edge where the cask is welded closed – (and while I'm thinking of these areas – what is used to lift the alloy 22 container-? We had marks left from lifting devices on our casks at Pt. Beach – you can't use trunnions or attached lifters or whatever – and not scratch that surface somehow – Take that alloy 22 through its delivery to the facility – loading – transport into the drift placement on the pallet etc. etc. – what touches it?? List all these. What shape will that surface be in?? Will a passive layer really protect it or will it be full of "water collectible

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locations” after its trip?? This needs some real thought. Rust is not going to protect any of this as I see it. And while were on this, rust adheres metals together, so what can you think of that could rust the cask to the pallet it sits on or the pallet to the invert – anything that can rust together to prevent retrivability?? The NRC needs to evaluate this carefully. As I’ve told you our cask inner canister was set on a pallet of ceramic tiles placed in the inner liner of the outer canister. So that when the inner canister (filled with SNF) was lowered into the outer canister, it rested on those ceramic tiles to keep the metal to metal surfaces from rusting together there in order to allow the inner canister to eventually be removed after long term storage – it was thought by the vendor that it could get rusted (stuck) in there. However, since none of these have yet to be opened after long term storage, who knows what has happened on those storage pads? A lot of people at the hearings felt that it was very possible those tiles got cracked or crumbled when that loaded canister was set on top of them. If so, how effective a rust protection would be left? You will find out when utilities have to unload these in the future.

p 171  
line 7- 18 “The fuel is distributed somewhat homogeneously amongst the iron.” Is this true? At what time frame? With what fuel? My understanding is that the utilities fill the inner containers that go into a transport pack and at Yucca Mt. DOE put these already filled containers into the alloy 22 cylinder. So how do you know what the inside of all the variety of waste in those filled containers will be like? – especially if stored at Yucca before disposal? – how would anybody check the inside? I have always questioned this. I don’t think you can use any assumptions about this in computer models.

p 171  
line 22-24 “Iron shows up first, fills part of the waste package, fuel starts to dissolve apparently after that.” How does he prove this? What was the configuration of the waste in there? How long aged? Define the exact load in this particular container? Has a test been done over time to prove this?

p 175  
line 11 “There must be some sort of internal pressure created. It may not be sufficient to cause the fuel elements to break.” What gasses are released here? Can water get inside, the hole get rusted shut, and the gases inside build up pressure? Then what? The alloy 22 forms a passive layer on the outside, but what is the inside of that cylinder like? Is the alloy adhered somehow to another material or is it part of it? So would a passive protective layer form inside this cylinder? And if the full degrades, (basket etc.) what is happening to the inside of the disposed canister surface? Can this blob of rust push it outward by force? Can a pressure cause it to split open and hit a drip shield or wall or what? Is this rusting you refer to a good thing or a bad thing when every aspect of the “what ifs” are considered? This needs some creative thinking.

p 180  
line 24+25 “that was a case where iron oxide was being formed on steel at a very low oxidizing conditions in that particular case, and it resulted in crushing the steam generator tubes.”

p 181 line 1 “So, there can be problems and this all needs careful testing before put in models.

What happens to the drip shield, has it by this time dropped on the cask in a pile of rust or what? And how does the drip shield figure in retrieval or is it going in just before closure? In what sequence is all that's in the cask expect to come apart? Will the invert rust out 1<sup>st</sup> or what?

p 188-189 “Initial starting condition when it comes out of a reactor” – what can this be? rods with blisters? pinhole leaks? Covered with crud? Pool materials on it from chemicals that are different at each utility? any cleaning materials that were used to decontaminate the transfer cask from previous unloading? What? The crud is the main thing I worry about – because it is really a “garbage mix” of stuff accumulated over years of storage. Will that dry out being wet and adhering to the surface before? – will it flake off now? and do what? Each of the casks sent from a utility will have a different configuration of materials inside. How can you evaluate what can happen in there after the repository is sealed? Or even before? How could you possibly model all the interactions possible?

p 194  
line 14 “Stability of passive film” – re there any long term test on alloy 22 for this. In a Yucca Mt. environment?

Well, I do worry when the much repeated “I’m going to pound a stake in the ground” and get this thing licensed, etc. etc. by a certain date is referenced. Do we really have an accurate scientific study of the whole integrated waste system at this point to be ready to do this? Do you as individual board members have any bid doubts about anything or are confused about anything at this point? If so speak out please. Because without your great questions, we the public don’t get the answers. We depend on you. At this crucial point, I hope each of you thinks carefully about future generations and if you have a problem eating away in your mind all these years, bring it up now please.

What about the high temperatures? Where is the need for them? Is it costs? Is it making room from new waste from new reactors etc? What temperature ranges are we really talking about and is it accurately put into the license application. If you really think that a low temperature repository design is the safe test and most scientifically capable of valid testing and reliability. Then speak up now.

If you think we have any concerns with details of how the total system works together – as to how retrievability actually works, etc. then as for the detailed descriptions and reasoning for them now. I see a great deal of “parts.” I don’t see them interconnecting to a whole. That worries me. And I don’t see any readiness for prototype testing much less a complete cask design yet. This worries me. It should have been ready long ago.

Thank you for letting me comment.

Fawn Schillinglaw