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U.S. DOE

OCR WM

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1952 Palisades Dr.

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Yucca Mt. Site Characterization Office

Public Comment on Draft EIS for geologic repository at Yucca Mt.

Dear Wendy,

I'm glad to see a woman in charge of this. No, I'm no feminist. I'm just a grandmother and I want a safe future for my little grandson Jake, who will be one year old this Christmas. Women think more about the future for children - it's a natural instinct I guess. And with the holiday season beginning I see the world more and more through the eyes of future generations. I have been following NRC public documents on dry cask storage at nuclear plants for years, ever since I heard we were to have one of the first generic casks loaded here in Wisconsin at our St. Croix nuclear plant - which is near a state park on Lake Michigan where I have taken my children for years. [the history of dry cask storage of the VSC-2X casks, which was a complete fiasco, is a foretelling of the future of cask behavior at Yucca Mt.]

Spent fuel has a memory. That is a very important phrase to remember. What ever has happened to it at reactors - will have an affect on its future behavior in a repository. When the EIS for Yucca Mt. fully evaluates what is actually happening with dry cask storage in reality - now - at reactors, then I think you will see how poorly your basis for using the pellets, the cladding, and any cask design, as major barriers - is not prudent. [My close

scrutiny of NRC oversight, of utilities push for cheap materials and casks, vendors lack of integrity, and subcontractors lack of quality assurance, leads me to see clearly that human arrogance is pushing for Yucca Mt. to open. Human greed is pushing for cheap faulty designs to be generically certified and this

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has been a major mistake right from the start. The explosion of a VSC-24 cask at Pt. Beach is a basic part of the story for

Material interactions were ignored by utilities, vendors, and the NRC. Public trust and confidence in all three of these entities has not been restored since that event. In fact, things have gotten worse and worse. There is a complete lack of Standardization and integration in the whole waste system, and human error in fabrication and cask handling has lead to problem after problem. Coatings that create hydrogen gas and carbon steel that reacts with pool water to make it so turgid you can't see to load or unload a cask are huge problems nobody has solved.

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NRC is certifying design after design - all different - all changed for site-specific needs of each plant later (from generic designs). They now use 72.48 with ease to change things. And they build casks before they are even certified, as NRC gives exemption after exemption. The enormous pressure by the nuclear industry to get these cheap design certified as fast as possible and get casks loaded as fast as possible is a key mistake, and has already caused problems that affect the whole waste system. These casks have not been time tested, have not even been built ^{before certification or use at} plants, have not been tested by unloading which is a major concern.

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From my observations, I predict that the cask itself, and the state of the spent fuel when it finally gets put into any dry cask container (if ever) should be major concerns. Yet, I see little research done in this area. My fear is that you will end up with a "radioactive soup" in Yucca Mt. in 100 years or more, that you won't be able to evaluate for material interactions any more than you can evaluate the reactions inside the Hanford tanks. Once underground,

you expect these casks to be retrievable. You think you can return the waste to the surface. How? who will do it? How hot will the tunnels be? 400° or more? What if the remote

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equipment breaks down, a tunnel caves in, or there's an earthquake? What if the cask welds or seal go before you expected them to? These are the "Achilles Heel" of these casks. The weakness in fabrication will cause problems. How are you going to unload all those transport or storage casks at Yucca Mt? How are you going to repackage all that spent fuel and HhW at Yucca Mt. before you even consider putting it underground? What condition will

~~**~~ that fuel really be in after storage, transport, storage, + transport? — how many times? What happens to fuel in the wet-to-dry process repeatedly? It is wet in the reactor and pool, dry in casks at the plant, wet in unloading again, dry in transport, wet in unloading again?, dry in interim storage, wet or dry transfer to a disposal cask? dry in the mt. at 1st, and wet again at the end? Think of a rock in a stream encrusted with moss etc. —

Tell it out; dry it in the sun — what happens? Stuff gets hard and brittle and falls off — especially if you transport the dry rock in your pocket (like fuel in cask) Then what happens if you put the rock in water again — say water full of chemicals like a reactor pool? Stuff reacts - fall off — forms gases — not steam what? Remember spent fuel has pinhole leaks and hairline cracks in cladding — any amount is acceptable to NRC. And rods may be deprecinized. And fall off. Platters fall off and expose holes. Then what???

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So far, you already have casks at utilities with the following concerns: Some weren't charged/tested correctly, some have vent holes too small and need to be drilled larger in

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welding. Some are so full of cracks in the seal welds that UT testing shows these cracks (certified to be able to be moved at 0°) cannot now be moved below 35° , we have undocumented

weld repairs in cracks, we have coatings that create flammable hydrogen, we have welds ground down so that walls are too thin in crack shells in those areas, we have Safety Analysis Reports changed so often, that they don't represent reality. We have crack designs that are "chameleons" — called "generic" — but changed at every reactor site. You have low level waste BTRAs etc. being put in HLW containers. No low level waste should take up room in a HLW repository. It's going to cause a problem if DOE has to take low level waste out of the cans at Yucca Mt. packaging facility. Yet utilities are mixing low level in with high level assemblies in dry storage at their reactors. This should not be allowed.

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The waste handling facility at Yucca will be receiving a huge jumble of so called "generic" can designs — mostly new just NRC certified — (not time-tested or even ever built for prototype testing before use at reactors) Dry can storage is still in its infancy. But NRC keeps certifying cans after cans and utilities change the designs for their facility needs — meaning they all end up really being site-specific designs. All the spent fuel will be in different containers, having different past histories by the time they get to Yucca handling. How on earth can you have one facility appropriate to unload all of these different designs and assemblies? The specifics here are not being looked at and they need to be evaluated — in detail! How are you going to unload and repack all these cans? What are costs and doses here? We need to know this 1st before any repository is ever considered.

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You talk about re-receive from the repository also. How? How will you get the waste out of these packages once you

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have them in place in the drifts? Robots and robotic rail systems depend on "active" workable part. The public want to know what you plan to do in the case of a series of defective casks already placed in the tunnels. What are possible scenarios for problems here? Let's do some brainstorming and trouble-shoot now on this situation. You know I'll never forget what Mr. Haughey of NRC said when the VSC-24 mess was going on. He told NRC staff that Murphy's Law would be in effect — that whatever could happen — would probably happen — and to expect the unexpected. Remember — nobody — nobody at NRC expected the paint on the cask to cause an explosion at Pt. Beach in Wisconsin. A minor detail? Somebody completely overlooked materials interaction and environmental effects of these. The vendor, the utility, and NRC itself never saw the concern here — the hydrogen gas formation (yet, there was an unexplained pressure build up in testing of a similar design — the VSC-17 that I always was wondering about). This is a lesson that nobody seems to have learned much from — this paint interaction with pool water, as handling procedures at the Palisades plant were so poor, even after not being allowed to load casks for years, that they had 2 hydrogen burns when loading the 1st cask after this. They used a flammable plastic tube to vent the hydrogen! It was too close to the welder — hanging above — and fastened to the vent machine by duct tape! Fell off twice and a weld spark started the tube on fire. This was after years of analysis of the hydrogen problem and promises to the public that it could be "safely" vented!!

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[Then we have the Transport (transportable version of

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the VSC-24) to be used at Trojan. Promise by BNFL to have a new safe coating fail again when the 1st attempt to load a transitor cash resulted in such a reaction that the water became so cloudy with hydrogen bubbles and caued that they couldn't get to load the assemblies! And now they realize that the Carbon Steel itself (which the new coating did not adhere to in areas) reacts with pool water to form hydrogen. WHY DIDN'T THEY KNOW THAT BY NOW???

12 [Problem after problem after problem. So don't expect a person like me well versed in the real history of dry cash storage to blithely accept your plan to unload and load cashes at Green Mt. in a handling facility. There will be more unexpected problems there. And don't expect me to believe retrieval is as easy as you make it sound on paper — without the detailed analysis necessary for this EIS. You have got to look at the track record of dry cash storage so far, and evaluate what the utilities are doing now and how the cash they use and what they are allowing — will effect handling at the repository in the future. It all starts with spent fuel behavior in cashes at reactors. That affect your system and has got to get more attention. It is part of your concern.]

13 (Comment on Summary) [the "no action alternative" was not excluded by NEPA and the public safety demands you take a closer look at it.]

14 [I for one, feel that + transport and disposal is a huge impending disaster. Leave it at the plants and let each state monitor and guard and record the spent fuel forever. The costs and exposures of hauling this waste across the country and attempting to bury it will be way beyond what you expect — expect the unexpected!]

15 [Your EIS makes all the same mistakes NRC made in

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certifying so called "generic" cash designs. You think you can create a scenario on paper that bounds all "generic" analysis of transportation so you don't look at specific. You don't even know if rail or truck will be the priority mode.

You don't even really consider the no action alternative as reasonable for implementation. You need to analyze impacts to specific national transportation routes based on available information and compare transport to leaving it in the states that creates the waste.

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The Draft EIS doesn't even describe fully any proposed action (required by NEPA). Instead you say it bounds potential impacts without selecting a preferred alternative and option. The design apparently is still "evolving". Doesn't seem to me you are ready at all to do an EIS. Your evaluation seems sort of a nebulous "catch all" to say we "cover everything" so we can decide to do "any thing" later on. That ignores all the specifics of decisionmaking! And the devil is in the details here. You ignore the details; just as NRC did in certifying cash designs. The final EIS should include the selected repository design, with all the specifics addressed in detail — analysis of potential impacts of cash handling and retrieval — unloading — including a comparison with reasonable alternatives. This has not been done in the draft. And waste transportation hazards for all alternatives needs detailed evaluation in the final EIS also.

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Stems to me the stigma of nuclear waste activity, of any sort, certainly affects the socio-economic impact which needs analysis for every area involved. If, for example, you route H. Becht fuel, by rail through the Fox Cities, where I live, I'd certainly expect thorough emergency reaction

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evaluations to be done for particular locations. Adverse impacts of potential accident is very important to the public wherever the waste goes. There will be opposition and there will be stigma associated. It is not good for business—people will not want to be in these areas, nor move to them, nor be a tourist in them. I would expect Appleton or Milwaukee WI will react the same way Las Vegas would.

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One accident and you are doomed—the fear of the word "nuclear" is rampant—(it evokes visions of mushroom clouds in most people's minds!) And [environmental justice does enter in on these transport and disposal locations. You need to respond to claims of minorities and Native American claims. Specific transportation routes need to prove they are not biased toward irradiating areas of other races or poor and minorities just because you don't have as much opposition there or can "buy them off".]

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(cont'd.)

Dec 3rd — [I don't know, but as I think of the whole situation this morning it seems like your draft EIS is premature. You don't have enough detailed information to even do the initial decisionmaking yet. It appears you are trying to make this a "catch all" type "generic" document to cover everything—but specify nothing. That's not good enough. The more I read of the document, the more I think you just are not ready to present this yet even in draft form.]

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[Also—may I say here that printing this document on glossy paper makes it very difficult on the eyes—I am continuously shifting the page to reduce the glare—please print these things on non-glossy paper from now on—)]

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[You expect releases from surface facilities at the repository to "make little difference in dose received" by the

public. But you are predicting a "perfect" set up here. You don't know what the condition of cladding and pellets will be in assemblies after long term storage, unloading, transport, unloading, loading again etc — you don't know what emissions will be.

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[You don't know what emissions will be if you have to retrieve casks from the repository and unload them soon after they are placed either. That was the mistake Palisade made in Michigan with their unloading procedures. They never planned for it. When I called them they found the cold flange in cask #4, they shed at NRC — "well, we never expected to have to unload a cask so soon". I was told the unloading procedure was on a shelf somewhere — it was all so nuts! They hadn't planned for unloading — no details of cooldown of fuel-stream shock protection - seismic control etc etc.

or how to cut out the shims they found in around the shield lid. You have to know exactly how you are going to retrieve a faulty cask and unload the contents. You have to know that before you allow even one cask to go into the repository. You need to have the detailed procedures ready.]

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[You also need to know how much water you are going to need for any of these operations — for decontamination etc. Your evaluation shows that demands (along with Nevada Test Site activities) would exceed lowest perennial yield estimates under the low thermal load for packaging scenarios. What about in retrieval? And have you evaluated how pumping that water out of the local supply affects that geological formation? Say you really deplete most of it, can areas of the aquifer dry out and cavitate? Will air movement replace areas where water flowed before? What effect would this

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have on emissions and dose? Every thing you could possibly have to do at the repository will effect everything else. You need to examine the scenarios of the unexpected and cash handling so far shows that the unexpected happens frequently. The truck accident is bad. []

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[] In your summary you refer to bats, tortoises, beetles etc — and your effect on them. Have you evaluated the possible effect of them on your project? Bats for example. What a perfect home for bats & would think. (Ever been to Carlsbad Caverns? — full of millions of them). So can bats survive in the repository in later years as things cool down and cave in? What could bats do in there? Effect of bat guano for example? And what happens to bats reproduced after they are irradiated and come out into the public domain? What about other animals — burrowing things? Lizard, snakes, prairie dog — whatever you have in Nevada — and the minute plant and animal (like beetles) that can raise havoc in great numbers? What can happen to species in there over time? Can they dig into the repository? How could it affect them and how could they effect it? Nature loves to fill in spaces with whatever can get in there — how severe will all opening to the tunnels be? Ventilation system for example — once bats get in there — how would you get them out? These things have to be considered long term when fracture form + rock tunnel cave in and water seeps etc. — There will be cavities formed and new channels to the tunnels. So often its the unexpected that causes huge problems in such scenarios, especially for such a long time prediction in the future. Considering exotic

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species come in so easily nowadays with trade all over the world. Who knows what could get started growing or becoming active in those tunnels? Have plant and animal experts done close evaluation and predictions for future possible conditions — not just for big things like bats — but for small microscopic worms, or whatever could be in there? We don't want a surprise in 100 years or later that the repository is full of poisonous snakes or something that loves the habitat later on. What is possible?]

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* [And in the high thermal load — especially if global warming raises temperatures too — is there any possibility that any water in cavities in the rock or to the graffi itself could boil and form steam?? Could there be a pressure build up under there if things overheat? What could cause this? Think about it. The Native Americans may be very right in their view of the intrusive nature of a repository and its impact to "all elements of nature".]

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[In sort of reading along your draft EIS summary as I write comments here and I note that you repeatedly say you "recognize" native american viewpoint, but that's it — you "recognize" it. But what is your response to their claims???]

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[And then the sabotage issue gets 2 paragraphs — you just don't expect a problem here. I think this is an extremely likely target to hold delivery trucks of concrete hostage or to take over part of the repository — say the ventilation area controls — and threaten to blow up part of it, or drop a bomb into the area from a plane — or for a truck bomb etc. Ever see the movie "The guns of Navarone with Gregory Peck"? Men determined to get into a facility, will find a way — especially

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in a war situation — then too — we have a lot of nutty people doing crazy things these days — shooting up kids at schools etc. — or drugs etc. Nothing surprises me anymore. Even little Appleton, WI has knife by shootings and gangs now (where I live). I'd say your risk of sabotage is great — The repository is a real target. And a facility any government would want to have control over as a threat to gain demands I would think. And sabotage of the SNF in transport has really not been evaluated effectively for modern day weapons and scenarios with actual crash designs that may be used. Our hearing on the YSC-24 crash revealed concerns here.

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[Your section on Rail corridor impacts (p5.55) looks to me like the cheapest route and requiring less than a day for a one way trip would be what you call the "nonpreferred alternative". Because the US air force oppose it — because of "security" — What? Seems to me that the best route mainly because of that. Security would be tighter there. Some seems better than routing it near the Las Vegas metropolitan area for heaven's sake!]

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(cont'd.)

[I don't see why DOE sees leaving waste at the 77 sites not likely to occur. It was never planned to be that way since the reactors started, but really everybody knew that would be the situation since there was no plan for disposal. This is nothing new! I would say it's most likely to stay where it is.]

29

[Your radiological impact from scenario 1 (no-action) is based on a postulated aircraft crash it says. However I do not see this airplane crash (with fuel fire from the plane) into a full crash array in most safety analysis reports for dry cask designs. Has DOE looked carefully at what NRC and cask vendors are evaluating here? Just what is the scenario? It should

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be a full tank array and a large jet crash into a full fuel tank fire, and probably a tank pushed into another tank or tipped over etc. just what could happen here? [] and what could be the scenario if aircraft from Nellis Air Force Base has mechanical trouble and crashes into the interim storage above you are not? What is the evaluation here? []

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[] And why the 100 yr. scenario where workers are not there and tanks deteriorate? What is your hypothetical situation here? a nuclear war? a sabotage event? Plague? What? or no funds for workers or an accident at the plant that wouldn't allow people to get near the tanks - ?? One thinks of "On The Beach" and other such awful movies on wars etc. What is really possible? Do we know? I suppose right now people in Las Vegas fear that workers are not being paid to mind the temporary reactor or storage facilities as they should be maintained there, and with the millennium problem, things get even more messy! Could that happen here in 10,000 years?? Mekes one wonder.....[]

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[] P 5-59 mention of "exceeding" the proposed edition inventory of 70,000 MTHM is probably just what will happen and I think people in Nevada realize that. Once you finally get any repository site accepted, that will probably be where everything will go whether kept above ground or below. You will have too much trouble ever siting a 2nd or 3rd repository and you will need the space. It's inevitable. And you already have impact from nuclear testing and possible storage of waste at Nellis Air Force Range. How unfair to hit people in Nevada with all this just by a vote of Congress! Wisconsin put up a real fight when DOE was considering a repository in granite in our state, and would again if you tried to site a 2nd

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repository here — nonetheless I feel it unfair to deny this all over

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Nevada. [Your term "incident free" sounds like a sale — nothing is really "free" — expect "incidents" — there will be some, and I expect faulty fabrication of casings, and poor designs and handling procedures for casings. to provide the biggest doses to workers and the public. These designs are new, vendors are new, subcontractors are not used to nuclear QA criteria — etc. — a perfect set up for problems. And we already have a lot in dry cash storage at plants. The track record is bad already!]

sunday Dec 5th —

34

[P S-63 Once again on this page you state the Native American tribes view of "irreversible impact to + radioactive lands", yet do not respond to it. What is your answer to them? I'd really like to know as from what I've read about the whole history of nuclear related activities from mining uranium to waste placement, the Native American Tribes have been repeatedly lied to and "dumped on" in many ways in the past. How do you rationalize doing it again?]

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[What I'd like to see here is a full evaluation of how much you could cut down any future inventory of waste necessitating repository disposal. Why isn't that an alternative? Close aging and little reactors and aging pools. Stop spent fuel production. Develop off shore wind to the fullest extent and promote solar and biomass and renewables, daylighting and conservation etc. — do what is the safest thing to do — STOP nuclear waste production. People the world over would like to see that plan as an alternative — even if it would cost more to begin with — in the end it would most likely cost less and lead to a safer and healthier world. It makes the best common sense. Yet you let politics and the nuclear industry drive your plan to produce more waste which make no sense.]

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[I see on p 5-64 that you refer to an "Emergency Planning and Community Right-to-Know Act of 1986" - I understand that, possibly this week, plutonium for NERX fuel testing is going from Los Alamos to Canada - through Michigan, yet citizens in Michigan apparently have no "right to know" where or when or how it is going through their state. Why not? If this is a precedent for future waste transport along secret routes, then I strongly object. I want to know where this stuff is so I can avoid it in the future, I don't want to be anywhere near any future waste transport, with my grandson in the car especially! The public certainly deserves to know.]

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[p 5-64 - once again, your "findings" with the "no administration control" seems only developed to scare people from leaving it at the present sites - nobody in their right mind would just let the stuff fall apart on the pads over time - why would you even talk about this as an alternative at all?? I don't see why this is discussed in here.] (This is end of comment on the summary):

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Now as I read [p iii] of Volume I you state that the proposed action addressed is for disposal of SNF and HLW "currently in storage". We don't currently have 70,000 MT HM today, do we? And how rapidly is this going to change with the new fuels and new cores to be used - NERX for example - and high burn up fuels - and plant license renewals? You are planning for something you don't know the total of as I understand it - and there is very little talk of siting a 2nd repository any place. That's kept quiet. My bet is you'll never even attempt it. So "currently in storage" is not valid as I see it. What is really currently in storage, right now??

39 [In the 1st section you talk of vitrification and more fuel use as if they are "done deals". They are not. Vitrification has problems and MOX hasn't even gone to Canada yet to be tested as far as I know.

40 How can you predict anything about them at this stage? And the sodium and aluminum salts in HLW needs close evaluation as to its eventual interaction with card materials (as they break down in a repository).]

41 [P. 2-1 says "DOE does not intend to represent the No-action alternative as a viable long-term solution" — Why not? If you ain't treating it as viable then you ain't really evaluating it as an alternative at all.] And if you are uncertain when DOE would make any transportation-related decisions, then you are not ready to present this EIS as far as I'm concerned.

42 Transportation decisions may be the crux of the problem.

In fact I think transportation should have been evaluated

43 long before Yucca Mt was. If state governments and citizens are going to oppose transport all across this country, the waste may never get to Nevada at all. We've seen lot of opposition to transport in other countries.]

44 [The more I read on the less I have any confidence you are ready to make any decisions. You have many "options" for every choice and haven't come to the details of anything really. How much waste? In what form? In what package? On what transport? When closed? etc. You are leaving all such decisions to the future. That's how we got in this position in the 1st place — leaving the real decision making to the future.]

45... and [on p 2-16 you realize everything also depends on how the waste arriving is packaged]. You blithely say you will test interior gasses of these cans, vent and cool them, and

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~~X~~ remove their lids as if it is just a common practice. Well — it has never been done with any of the present cash designs up for certification holding 21-24 etc. assemblies. You don't know how this will work at all. Especially with the lack of standardization and integration of the many cash designs utilities are loading with any total waste system DOE has in mind. Your p. 2-19 is a fantasy at this point. And so is p2-20 — so you have a pool to empty the dual gamma canisters — every design? How? What chemicals in the pool? How gaseous released? How filters cleaned? What reactions possible with cash material and pool water? The cash affect the pool and the pool affects the cash — and over time how dirty will that pool become? Can you really do this?

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[And then on p2-20 you discuss high particulate air filters — where will all those go — & expect there to be a lot of them as unloading will be a messy business.] and [you talk about maintaining pressure differentials to ensure an air flow for ventilation, Depending on anything not passive is risky.

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Fans can break. Then what? How contaminated would a fan be? How long to replace a defective one or broken one with the standby one? If that one has problems, how long before you have a problem heat up in the repository? What are risks here?

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p 2-21 [What is the "Cooling tower"? You say water from it will be put in ponds lined with "heavy plastic sheets"? How long will these last? and how contaminated will that area become long term — can wastewater leak at seams of sheets? No plastic sheet lasts very long.]

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[If you are cooling and venting cash as you unload them, I assume gaseous and water released will be

50 highly contaminated. [On p2-27 you reference an electric-powered overhead trolley system to move waste packages. What could go wrong with this, after drifts are full, to prevent you from retrieving a waste package? Trouble shooting now will prevent future problems here.] Also you say the 18 ft. diameter replacement drift "could have steel ribbing or be lined with concrete." Well, which is it? Why don't you know? Wow, and you expect to move waste packages over others. This really sounds risky — any fabrication problem with the one above or the one below, or the trolley itself, and you have a blocked drift with damaged cash. Then what? How would this affect ventilation?

51 p2-31 The waste package itself has now become the primary engineered barrier. That I do not like at all. For the history of cash shows they will NOT be pre tested, time tested, or built by fabricators experienced in this — this cash will be a new design. Nobody knows how it will react in there. Carbon steel is not good enough. Besides it reacts with many materials. If you had to retrieve a waste package, how would you unload it — dry? — carbon steel reacted with the pool water at Trojan with the Trust cash. Would you allow any coating? I suggest you don't — they have risks. Stainless steel is what you need. To do all this work and then use cheap materials on your "primary barrier" makes no sense to me. Carbon steel should not be used. Use stainless steel or more alloy — you need as much corrosion resistance as possible in this crucial barrier.

52 And you talk about neutron absorbers. You don't know how long they will maintain their integrity. That is a big question here. It is not time tested for dry cash storage yet. And I am very interested in the support for the cash. Why are they designed

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This way? I gather the cash sits horizontally on a "V" of steel.

What kind of steel? This is a crucial area of metal on metal and needs as much corrosion resistance as possible, for water ~~could~~ collect or condense there later on and rust these two metal surfaces together and prevent retrieval. This

* It is a real concern. It was with USC-24 concrete sitting on metal liners of the concrete outer shell. NRC demanded a different design and ceramic tiles were the accepted solution between these metal-to-metal surfaces so they wouldn't corrode together and prevent retrieval there. But — handling procedures had to be very carefully directed not to set the ceramic concrete down too hard on the tiles and crack them. Are they now cracked in loaded USC-24s? Nobody knows. None has ever been unloaded. What is DOE's evaluation of corrosion rusting the support and the cash together over time? Has this been done? It needs to be done.

57

[This choice of the thermal load directs everything else as far as spacing, ventilation, etc. Why hasn't this decision been made by now? How can you evaluate an EAS that has made no major decisions?]

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[If you reuse the railcar and the shielded transporter, how contaminated will they be over time? How will that affect the outer surface of waste packages — and eventual doses at retrieval? P2-32 sounds like playing with a train set — and you expect this all really to work as expected overall that time? I sure don't. What are doses if somebody has to get in there and fix that gantry or locomotive system? You know it's like these outer space benders — one little screw or something loses and the whole thing goes "Ka flooey!" All that money lost! I predict problem after problem with your system that will cost the public plenty.

There is too much that can go wrong here.] Learn it

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...14 at the plants where at least we are gaining some headway and experience with trouble shooting, and can get at the casks easily.

59 So many unexpected problems have developed already. Nobody expected coating reactions or that they would have to get the seal welds. There are too many unknowns in dry cask storage so already think of disposal casks that will really work as planned. All you have is a "preliminary conceptual" design. I read the full transcript of the NWTRB meeting on this cask design and if shrink fitting is still an option, I think it's a mistake. Not enough experience with this.

60 p 2-37 Has this fill placement system for closure really been thought out in detail? What about weight and pressure of the fill on the containers? What happens when you cut the ventilation off? What goes bust - The seals? The welds? The supports for the casks? How will they fall apart inside and outside the cask over time - How will the cask affect each other?

61 Being an artist, I'm really interested in these "monuments" and what you expect people to understand from them in the future. What is planned here? (Monuments to notify possible future intruders)

62 p 2-38 I would say you showed definitely plan on retrieval of a few strategic waste containers over the years, so that you know you really can do it if needed, and so you really know what is happening in some waste packages overtime. That's the only way this should be done. Look at the actual package itself. All your computer data predictions will not predict the unexpected. This testing of actual packages, as you go along through time, is crucial as far as I'm concerned - and should be a definite part of the plan. Will it be so?

63 I really object to any barge transport risking contamination
 64 of our waterways. It's not worth the risk. the dedicated
 rail — build the tracks if you need them. The interstate
 65 highways are just too dangerous. Buffer and escort cars and
 satellite monitoring sound good. But once again — the risk of
 66 sabotage in any transport is great.

P2-53 The heavy haul + racks sound like a real menace
 on any highway — 220 ft. long, 20 to 30 mph, 200,000 lb. —
what an obstruction to any traffic flow and a set-up for accidents!

P2-56 — You say "one or more qualified companies that provide specialized metal structures, tanks, and other equipment would manufacture new shipping casks" — just as "nonrelevant" as that — "simple" — I say, wait a minute — have you looked at the track record of cask vendors? Do you know the problems? This is not just an easy thing, these are new designs — untested, not time tested, and you expect it all to go like clockwork. Well, don't. The demand for casks is great and subcontractors are not used to nuclear QA. Did you ever hear of Seira Nuclear and Marsh Metalfab and that fiasco?

Do you know of the faulty casks Pacific nuclear sold DOE in True-pact agreements long ago? I mean who are we going to really trust to build these things?? And how do you really plan to verify shielding, structures, and heat transfer in these casks? How and when will O-rings be replaced — how are casks monitored en route? What if they "leak"? What is "minor cask maintenance" anyway? Has this been carefully thought out?

68... P2-56 This is too big a risk to just use
 & "conceptual" designs for this ETS. If the design is insufficient for NRC licensing, then I say why

68

Are you even presenting this at this point? You are not ready if it is just "evolving". How do you expect people to comment on an "evolving plan"? We don't really know what the plan is at all. The more I read of this draft EIS, the more astonished I become at the lack of any real decisionmaking at this point.

69

p2-57 [You need drip shields - but will they work? How have they been tested? What ceramic coating has been tested? If rockfall could crack it, it may exacerbate corrosion in the cracks; have you thought of that? Water will collect in cracks in ceramic and rust there. What "additives" and "fillers"? What "gitters" under waste package? Anything - any other materials - chemist especially - need to be evaluated for final repository conditions when everything in there becomes mashed together in a "radioactive soup" - what will be the interactions of materials then? And interactions of new materials formed from interaction? This is crucial to your plan and must be evaluated in detail.]

70...

Jan 11, 2000 - Well I'm still here - Y2K didn't "do us in" - Took a break for the holiday - hope you, who are reading this, had an enjoyable vacation - Happy New Year!

Had to get into all this material again: _____ To see....

[Two things happened that I think are relevant during the interim - the MOX transport mess in Michigan with the Parallel Project for one. If that is representative of the way citizens and NEPA regulations are going to be treated in future radioactive shipments, then I foretell disaster. If things are going to be done in secret, without full

..78

notification of local authorities and citizens, then there is bound to be more and more opposition. Certainly an EIS was required for Parallel and not an EA, you can't segment such a huge project. It was all handled very badly.

8
(cont'd.)

The other thing was [the NRC withdrawal of the direct final rule to allow the VSC-24 case^{certificate} to be amended to allow putting BPRAS in the assemblies. I sent in comments, but I don't know what caused the withdrawal specifically. One of my concerns was putting low level waste in high level waste containers. Those assemblies are eventually bound for Yucca Mt. and a high level waste repository with limited space and radiation and thermal loads, is no place for low level waste. NRC should not allow utilities to put them in cases now. What is DOE position on this? The lack of communication — and knowledge of history of dry cask storage — between NRC and DOE (and NWTRB) is going to cause problems. DOE needs to know the details of what is really happening with dry cask storage at reactors to the assemblies eventually to be put in DOE's hands.

71

p 2-59 "[No action alternative]" — why don't you evaluate creating no more spent fuel? If Yucca Mt. were found inadequate, certainly it would be prudent to stop spent fuel creation. It only makes sense. Yet DOE evaluates "no effective institutional control after 100 years" — Why? Of what value is that? Certainly the waste would be controlled and certainly less waste would be easier to control. Why is the assumption that we have to create 70,000 MTHM valid? It should not be.

72...

p 2-61 2.2.2.1 [Storage Packages and Facilities at Commercial and DOE sites: I find this section rather scary:

...72

Do you realize what has just happened at Tuxor trying to load a Transitor case for Beta sale?? They couldn't do it!

And I think they knew they couldn't do it, before they even tried it, because the coating didn't adhere right, and they knew it — They "painted on" parts when it was supposed to be baked on. So the paint came off — presto! a mess in water reactions and turbidity so you can't even see the assembly. You can't count on the VSC-24 and its sister "Transitor" at all. The coating needs to be changed, or eliminated, or just get a new case design! It has been years now that this problem has caused mess after mess.

Why can't it be solved? I assume it's money — They want to use cheaper Carbon Steel no matter what — is this the case? Why not use Stainless steel?

35
(cont'd.)

You say "Utilities could elect to continue operations until their fuel pools are full and then cease operations" — or put the future fuel creates in day cash — why?? Why allow this creation of more and more spent fuel?? If utilities continue to do this, in spite of the uncertainties of it ever leaving the site, then let them safeguard what they create.

You state 4 things:

...14...

- (1) Dry storage is safe and economical — what is your proof for this statement? I'd really like to know. Is a hydrogen explosion at Ft. Bleach safe? I don't think so? Are weld cracks in cases at Palisades safe? I don't think so. Is extra funding for UT testing of welds economical? I don't think so. Is reducing shielding on the transfer case to allow the weight of added BPRAs in it safe? I don't think so. — There's a list like

25

...14

73

This a mile long — Do you know what you are talking about? □

(2) Fuel rods in dry storage are likely to be exxonentially secure for long periods — you state this as if you have some evidence — what, did like to know? The "generic" (so-called — but each one gets so many changes, it ends up "site-specific" anyway) casks NRC is certifying are new designs — never built or tested in full scale — with real fuel overtime — never unloaded. You have no real evidence from fuel stored in any of these cask designs to prove this "likelihood" you refer too. Did like to see each cask design unloaded after 5, 10, 15 yr. and an inspection of assemblies inside and full evaluation of impacts of unloading on the cladding and pellets. All your computer analysis will not tell us the real thing any more than all the Computer analysis for the VSC-24 told us that a coating would cause a hydrogen explosion. If nobody enters the right data, nobody knows about uncertainties, right? There are too many uncertainties. Test the real thing. Unload casks. This has to be done. I've been requesting it for years and years. □

74

(3) "Dry storage generates minimal, if any, amounts of low level waste." Do you know this for sure? How? If you keep recasking over time — won't all the cask be low level waste? And the pads? And probably soil underneath the pad? And the transport casks and transporters and transfer casks etc. etc. — all the "facilities needed for dry cask" — consider everything used now that wasn't needed for just pool storage before. That all becomes new low level waste, doesn't it? Even if you decontaminates it — the material used for that becomes low level waste itself. □

75

- (4) [u]dry storage units are simpler and easier to maintain.
What is the basis for this statement? You mean than aging pools? Are they really? Do you realize the huge number of problems with dry cask so far? at least, in a pool, you can see the assemblies. You know what is happening with them and with the water. You have access to them to change situations. This idea that once in a cask, everything is fine, is based on nothing — just prediction, you don't really know.]

76

- [you say here that most utilities and DOE have not constructed SFSIS — right! Dry cask storage is in its infancy, yet your whole plan is based on it working as predicted. Why is your EIS based on horizontal modules rather than vertical? Horizontal, such as Nukoms, have to rest on a pedestal. Is that the best way? Why? Is a stainless steel outer shell the best (better than carbon steel) — I would think it is. But why have you chosen this cask design above others certified by now? Where is your comparison of descriptions of all casks on the market? Are these casks really safe in an airplane crash as you indicate? With a fuel fire from the plane?]

77

- [Seems to me Calvert Cliffs casks were made with walls thinner than specified, as wells were ground down. Considering about this? Nukoms casks had this problem at Davis Besse and there were other problems with certain tests not being done right. (hydrostatic test etc.) Why are the tubes at Hanford carbon steel? and vertical? They should be stainless steel. Why are you using "galvanized steel pipe sections" at West Valley? Why are the plugs concrete? Where is the design for this? Is it NRC certified? Who fabricates these things? What is their historical track record?]

78... p2-69

- [I also do not foresee that you won't have to replace

...78 some containers - or even a lot of them - at Yucca Mt. Your "low cost" is based on not replacing containers, but if every thing does not go as planned, they will need replacing.

79 p 2-69 [The fact that this EIS analyzes disposal of all of the projected waste that could go to Yucca Mt. shows that this is in fact a consideration. This flies in the face of all the promises made to limit the site to 70,000 MT+HT. You are acting in bad faith with the general public and the state of Nevada by putting this wedge in here, and it breeds distrust of any further DOE promises in the future.]

80 p 3-9 3.1.1.4 [I really am ashamed of our history with Native Americans and, although I certainly do not know the details of the treaty issues with the Western Shoshone, I see the phrase "The title to the Nevada lands had gradually extinguished and set a monetary award as payment for the land" objectionable. What do you mean "gradually extinguished"? That's a very strange term. Coming from Wisconsin, the home of Aldo Leopold and his great "land ethic", we think as the tribes — land is much more important than money. The fact that since 1946 to the year 2000 they have not accepted payment, when surely they could use it, speaks of the value they place on their land. There is a lot more to this issue of racial concern than the public is being told. I'd like to know the details here.]

81 p 3-14 [As I look at the climate, it looks like there can be heavy downpours — "an inch in a matter of hours" — what do you do if you find out later that water is coming into the tunnels before expected? Can you pump it out or dry it out in any way? Is there any brainstorming on such a problem? What do they do in Mine when this happens?]

82... p 3-29 — [The 1992 Little Skull Mt. earthquake is proof

...82

of modern seismic activity. Wernicke's study in "Science" magazine 1998 shows concern of accuracy of your studies.

I predict you have, in fact, underestimated potential volcanic and seismic hazards. And, frankly, I don't see why this issue isn't given main priority for it could halt everything.

Why aren't your ground motion site effects studies done before you put out this draft EIS? You need to reassess this before you go further, and it should have been done by now.

83

[p] 3-3573b The US Geological Survey 1997 has a new methodology that could result in longer 100 yr. flood limits. And

there are differences of opinion on the complex groundwater systems. So it comes down to — which experts do you choose to believe? and at which point in time do you say —

"no further studies — we know what we know is right"? I think "never" is the answer. You just don't really know for sure any of this. It's all prediction, assumption, uncertainty —

especially with global warming and climate change very evident already. Floods and droughts will change water routes — drought could actually open up fissure and fractures & wider opening I would expect. You can't

predict the weather long term any more than our local weather man I suspect — you don't know for sure. [That's why I distrust putting spent fuel underground. You can't

see it, you can't get at it, you can't get it out — it's a recipe for disaster in the distant future. Keep it above

ground where we can see the containers, guard, monitor and repair them. As far as I'm concerned, it's common sense.]

People have been trying to bury their waste all through history, and it has come back to haunt them everytime. Polluted water, brown fields, gas formation,

84

chemical interactions, etc. etc. are the result — rusting open containers and tanks — no liner or container last forever and ground is "active" — it reacts to water, weather, plant and animal life —

To me, burying spent fuel is like an Ostrich putting his head in the sand on the basis that if you can't see it — it will go away — "out of sight, out of mind".

It's a huge "fooling of ourselves". You can't pass a radioactive repository on uncertainties and I think that's just what it comes down to.

85 p3-86 [This chlorine 36 study sounds way to premature, and considering its use is still under investigation, certainly no conclusions making use of this should be used at all.

— The more I read of the uncertainty of methods of study, the more I realize that in no way should spent fuel from reactors be allowed to travel west until every study method is fully acceptable.] Full cash arrays of spent fuel do not exist at this point. We don't know for sure how long the above ground casks will last, how the spent fuel will be inside them over time, how to unload them, or how casks will really affect each other over time when a pad is full of them. Radiation reflected, sky shine, affects on the pad and soil below it, etc. are really unknown. More

time is needed. Certainly it isn't prudent to ship all this spent fuel from commercial reactors out west to one big FSFSI and then find you have unexpected problems.]

"Haste makes waste" — an old adage, but true!

87... [The "perched water" does not sound good. Have you ever watched water come out of a spring? We have a piece of land in a valley full of springs. I often watch the

...87 water flow down the valley sides and streamlets and springs and rockfall areas, and bluff area uncovered, and think about how and where the water is going inside the rocky valley walls. You can picture it in your mind - those fractures and faults and cavities holding the runoff until it comes out below. And it's obvious that over time, small passages become larger and fractures connect to form continuous pathways. The few tests you do now, and the limited sampling, can in no way predict when those passage will connect in the future. Continuous pathways will lead to disaster eventually and you do not know when this will happen.

88 I stopped here to reread Jon Christensen article on the reporting in the N.Y. Times of Aug 10, 1999. The calcite crystals certainly pose a problem. Has this geologist at Shell of Norway determined their age, evaluates the bubbles inside, and told us if water rose up from geothermal activity in the past? and are we going to rely on one man and one study here? I certainly hope not. These crystals need a lot of detailed evaluation.

89 I am very concerned about the evaluation of the peer review panel and their view on uncertainties in corrosion rate of the waste package. That is my biggest concern too. The NRC report says that the water leakage calculations vary by several orders of magnitude - why? Scientists are conducting tests of the first full scale mock radioactive waste cask heated in the rock to see effect on water - did water actually "pour out of the borehole in July" ?? If so, then you have a lot of work to do in this area. If chlorine 36 percolated halfway through the mountain in just 50 years, you have

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a big problem here. The fact that concern over water collecting above the repository and heating up made you scrap the hot design just last year shows you have a long way to go. 81 meters of spacing might not keep briney water in drainage routes you expect. You continue to be "surprised by the water". It will go wherever it can. And you don't know for sure how fast radionuclides will travel through the rock either. It can hitch a ride on a lot of particles you may not expect at all. What are tests here? []

91

[] To predict that the containers will last 10,000 years is absolute folly in my opinion. To expect one container to fail in 1000 yr. is more folly. The fabrication of storage casks so far has been a disaster, and with so many new designs coming up, and new fabricators and unexperienced subcontractors — expect a lot less than perfection in QA, fabricator, materials, inspections. As more and more casks are needed by commercial reactors, and the need is to get them "fabricated yesterday" as pools are filling rapidly — expect more of the likes of March Metalfab — where some weld repair were not even documented! (People have been forbidden from this work as punishment for NRC violations.) And even the NRC, in licensing the certificates for more and more casks, is making a huge mistake in "generic" rulemaking and handing out exceptions, as far as I see it. []

92

[] You think groundwater will dilute the radioactive waste in the end — but will it? Is "dilution the solution"? Often not — it causes more problems. []

93

[You know for Mr. Van Tuik to say "in some sense, it's science fiction to project out 300,000 years", is right — it is science fiction! For him to say then "absolutely nobody is going to get hurt by this repository for hundreds of thousands of years", implies that then somebody will — this is all fiction too — it may happen long before then.]

94

[The comparison to the Manhattan Project worries me. I always think of General Groves saying we had to drop the bomb to prove it works and prove to Congress and the public that they got something for their money. Dr. Ernest Moniz says "We got to advance toward geological disposal." Why to we have to? To prove to Congress and the public that we'll get our money's worth? I think not. Yucca Mt. has become a movement forward by its own inertia because scientists want to do it. But they will see it "long gone" by the time humans are affected by the disaster they created. It is too big a risk.] Believe me — I'm

95

* { No advocate of what we have now in dry cask storage — I'd been fighting for safer casks since the 1st design was on the board. But, dry cask storage above ground is a far sight safer than moving this dangerous waste all over the country, and hiding it underground in Nevada!]

96

[P 3-51] single borehole tests prove nothing —

I wonder how the groundwater path may change over time or the situation you level — you can't take for granted that water flowing out of the repository in the future will do what you expect. What if the tunnels are "washed out" long before you expect?]

63...
(cont'd.)

[P 3-98 — Transportation — Barges are just too dangerous — somehow water is bound to become contaminated. Don't

...63

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allow this. [And of course, I object to any secret, uncharted, shipments by local authorities. All local and state authorities, and the public, need to know where the spent fuel is traveling. The public has a right to avoid being near this dangerous waste if they so choose. When realized parallel could result in plutonium going across the Mackinac Bridge in Michigan, & was worried — what a dangerous situation and set up for terrorists. Tunnels and Bridges are no place for radioactive waste shipments.]

98

[p 3-126 Heavy-Haul Truck Routes in Nevada — "all routes have potential flash flooding concerns" — This is nuts! Sorry, but it just seems that this is not an area for nuclear waste.

p-127 And "None of the candidate (route) would totally avoid Designated Groundwater Basins" — why take this risk?]

99...

[p 3-139 3.3 "Affected Environments at Commercial and DOE sites"

This makes no sense at all to me. FSFSI's are licensed by NRC and each design are certified for 20 years. After that the casks need to be evaluated and spent fuel need to be resealed if need be. You ain't going to do that in the repository. Once in there, the casks will stay till they fall apart and groundwater will be affected over time. you have no

basis for your hypothetical site being affected by "material degradation", why NRC doesn't even take "rain days" or "wet days" into account — Temperature is the big criteria. This whole idea of letting casks fall apart at reactors in 100 years is a big scare tactic to balance out what will happen at the repository. When this case is just not going to happen. It showed not be in here at all. I mean unless everybody needs to or we have a war and this country is so bombed out

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That ISFSIs are left to fall apart, I see no basis for this degradation ever to happen. You are just trying to make an example of possible contamination all over the country with cans falling apart, to be able to say we need a repository. We don't. I have been one of the major critics of dry can storage tanks — at reactor sites. For years I have followed NRC documents and followed dry can design development. But with all the problems so far, I see no way that all the cans at all the reactor ISFSI's will some day be left to just degrade and contaminate water in each area like they will in the repository. This just won't be plausible. And I strongly object to DOE using this as an example to persuade Congress to insist that spent fuel be transported from reactor ISFSFs to Nevada.

100

p 4-59 No matter how you look at it hauling waste across the country and storing it at Nevada has to bring an increase to cancer and radiation doses. Why risk this? Too many accidents are possible. Some will happen. Human error will be a big concern. This is not a perfect world.

101...

p4-65 4.1.8.3 Sabotage — If it wasn't so serious, I'd have to just laugh at this one paragraph. You say the repository is not an attractive target because of its remote location and low population. Did say that's just why it would be a good target. You say sabotage is unlikely. I very much disagree. Weapons and transportation by air or all terrain vehicles are being developed all the time — saboteurs could drop into this area from the air or hijack a heavy haul truck and get in — etc. — holding an area here hostage —

...101

Say threatening to drop a bomb down the air shaft or something etc — just brainstorm on future scenarios with all this spent fuel in one place — and with everybody knowing where it is and truck coming in and out all the time — A Truck Bomb is a risk in itself! Sabotage needs a great deal more consideration here — with future weapons and sabotage made possible in mind — and reasons to do it. We have a lot of enemies in the world and some pretty crazy groups in our own country — and people on drugs do scary things!

102

[P] 4-72 What is the amount of pollution from all the fossil fuel used to store and dispose of nuclear fuel? What are all the externalities here?

74
(cont'd.)

[P] 4-75 What is the total low-level waste projected for the repository lifetime? Where will it go? This has to be solved now before any decision is made to open Yucca Mt. I see now on p4-78 that you plan to put it at the Nevada Test Site, so Nevada gets stuck with the whole bit, right? Have you evaluated low level waste from unloading casks and reashing casks? This will need to be done. And I wouldn't count on Envirocare or isting forever to take mixed waste either. I see you plan to put mixed waste and landfill waste at the test site too — more waste in Nevada, and if the test site closes in the future — what then?? And I wouldn't plan on recycling dual purpose containers.

103

[P] 4-85 / 4.1.13.4 — last paragraph — you mean you will "listen" to their arguments and then go ahead and do what you want. There is no real consideration of Native Americans here that I see.

104

p 4-86 Right. The cash manufacturing companies are not known, and there are none I would recommend right now either. Lots of problems need solving. The "experience" is not there. All this is new to workers and fabricators.

105

p 4-86 I frankly think that basing your analysis on some old Navy representative sites from 5 manufacturers at that time probably isn't very valid. Manufacture of containers is just coming into its "hey day" with lots of new designs up for NRC generic certification. Who are these 5 facilities you base your analysis on? Just what do they actually make? ("Components" are not "cash")

106

p 4-88 Disposal containers — do not use carbon steel. Will you fit the top welded closures?

16 different containers — sounds like a real mess in figuring interactions when they all degrade!

107

p 4-88 Shipping containers — depleted uranium and lead adds to hazards in any accident and adds to total waste at close of the repository, why use these materials?

108

"Polypropylene sheath? What is the fire hazard here?"

109...

p 4-98 Retrieval activities — you know I have learned from experience to distrust any evaluation that just says — this is just the "reverse" of that. It never really is! The "reverse" is usually much different when actually looked at as to how it would work in reality! I remember the SAR for the VSC-24 saying unloading would just be the reverse of loading — I think there was one paragraph. And the NRC accepted it!! We of the public objected strongly. Then when a defective VSC-24 cash at Balsiades was

...109

decided to be unloaded — and only then did they find out about the steamshock in cooling, the problems with getting the skins out around the shield lid, the problems of cable and special tools needed to get things out differently than they were put in. The reverse is not always simply doing what you did initially in backward sequence — this frequently does not work in reality. Just how — a detailed plan of all the equipment used — do you plan to retrieve the casks from the repository? Think of every move you have to make — will it really work. This needs evaluation — detailed evaluation. I frankly see lots of problems getting the casks out, all kinds of things could happen to the tracks, the tunnels, dip shields, cask thermal, etc. equipment doing the reverse — That could be hindrance in getting the casks out within 50 years. Casks at a reactor need to be recertified in 20 years.

So you only evaluate retrieval for the high thermal scenario. Why? Look like now it's more likely the low thermal scenario will be the case. Space for 70,000 MT HM of waste aboveground — nothing earthquake hazards for full cask assay on pads and flood of one concern. Then will you recast them in 20 years if needed or what? Who will monitor all these? How? I'd really like to see a detailed plan for this giant TSFSI for it may be needed to be done!

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[Figure 4-6] When did this "typical" concrete storage module design come from? I've never seen one like it. How can there

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be an air inlet and an air outlet at the top of the cask? All the casks I know have inlets at the bottom and outlets at the top, and NRC has stated that if all inlets on the bottom are blocked, the outlets at the top will NOT act as inlets. Please explain your design? What are the locking plates for? Is this a 2 piece thing, or what? If so, why?
 You have only a shield lid on top — isn't a double welded closure demanded by NRC? Also I don't understand the steel liner — why isn't it under the waste package too? And if there is a metal to metal contact at the base of the waste package and the liner, you need to prevent corrosion there with ceramic tile or something.
 Moisture can condense on the flat surface of
the bottom of the waste package.

111

[Nowhere — here at this giant TSFSI in nevada — after retrieval — here is where you could have the big degradation of casks that you describe could happen at reactors. The reason it could happen here is that there are just too many casks in one place to recash them all if need be in 30 - 40 years etc. What is the plan for storage monitoring and uptake of cask, if the whole repository load is actually retrieved? What are doses to workers and the public if all these casks need future unloading and recashing?
 Plan for that!!]

112...

[you are better off leaving small TSFSI's at the reactors where they are now and can be taken care of.]

...112

Why are you expecting only to put the waste package in a concrete module? Some fuel may have to be unloaded. And module may have to be replaced too. Think of this large repository ISFSI long into the future. What will we have to be done? Long term? Just remember, all the movement of the cash handling will result in some problems. I doubt that your statement p4-107 "The waste packages would not be opened" will prove to be the case.

113

P 4-110 The Waste Staging facility implying waste going to Yucca Mt. To be stored on pads should not begin here. You are implying an interim storage site in Nevada that may be a defacto above ground repository. That should not even be considered!

114

P You know that public distrust of the DOE is widespread. The DOE is notorious for putting radioactive waste in all sorts of unacceptable containers and places, since bomb construction started, and the mess left as these have deteriorated, has not given the public any faith in the DOE's ability to store waste in a repository either. I always think of the tanks at Hanford, the buried fuel at INEL - some of which they can't even locate, sea-dumping, public + worker exposures not admitted etc. etc. Your past is full of situations showing you didn't do things right. Do it right this time — don't open this repository.

P 5-3 Why "idealized" packages with "idealized contents" evaluated. This is certainly not dealing with reality. And the steady level of radon will produce problem if it escapes

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into any monitoring enclosure or if some mechanism robotic things don't function right and people have to go in there and fix things to retrieve the waste later on.

116

P5-4 250 types of DOE fuel? 16 categories? Wow! What a mess of different materials all together when they degrade. I don't see how you can evaluate possible interactions of material for all this in the big "radiation song" of Yucca Mt. at the point all the casks degrade and get wet. Seems impossible. Too big a risk to take.

117

5-5 I think your theory that all these gases formed will decay, before canisters fail, is totally wrong.

118...

5-5 You say the material "Screening process" considers total inventory, solubility of the material in water, and chemical toxicity — but all these materials — under heat, pressure, and radiation could form new materials, couldn't they? And don't count on water to dilute things. Could water make some reactions worse? How do concrete binders and conditioners react with material in degraded BPR's for example?

You say DOE "selected" Chromium, molybdenum, and uranium for detailed assessments. Why wasn't every material possibly created in there given a detailed assessment? The biggest mistake NRC made in certifying the RSC-24 cask was that neither NRC, the vendor, or the utility looked at possible material interaction during all handling procedures — and the cask's effect on pool water as well as the pool water's effect on the cask! Presto — an explosion at Ft. Black in Wisconsin that nobody — nobody expected!

...118

So don't expect me to be satisfied with your "selecting" certain materials to look at for detailed interactions. Tools like alloy-22 may not be the answer for a waste container material if its going to cause many problems when cash finally fall apart and get into the water.

119

[p5-6] Are you sure about trapped gases? Triceloy can create hydrogen can it? Under what conditions? Remember the bubble at Three mile Island? What caused it? Do we even know really? Or do we know the make up of the mess left at Chernobyl? Really, do we know the context and interaction there?

120

[p5-7] Water and the Waste Package = what? You worry most about drips from above — But — be creative — what else could water do in there? Could it actually condense on the surface of the cash under certain conditions? Especially as the thermal load becomes less over time? Could it collect on the stands holding the cash and form rust there? Think of your water heater in your basement on bricks — the plumbers always put it on something to let air circulate beneath the bottom, but water condenses often on the bottom surface in moist basements and where does the hot water heater rust and leak? On the bottom where its surface is on the bricks most likely — right? Or could water collect on the floor of the tunnels — run in there from fracture path? Could the drift lines actually be a hindrance by causing

42

...120

moisture to collect on its outer surface or on its inner surface? Could the drift liner crack and let water come in there? Could the drip shield crack if rocks fall on it, and actually exacerbate corrosion by causing water to drip on one area of the cask a great deal by being sort of funneled to the lowest point of the drip shield? — what could end up focusing a water drip, or a water collection, on one specific area of the cask causing a hole to form or exacerbate degradation? All sorts of things could happen — a chip or dent or uneven surface causes water to collect — look at your concrete driveway — the pits are the low points and that where cracks start too. With nobody to check the concrete or the metal as they do at ISFSI's at reactors — things will just get worse over time if a cask or drift wall has a fabrication defect or is damaged in handling.]

121

[P 5-8] Yes — water that flowed through the unsaturated zone into the proposed repository could dissolve some of the waste material, if there is a break in the package containment, and could carry it through the ground water system into the accessible environment where exposure to humans could occur." I'd say it's only a matter of when this will happen. I expect it will happen.]

122

[P 5-9] I don't think cladding should be counted as a barrier. Nobody knows what shape that metal will be in by the time it ever gets to Nevada. The loading, unloading, transport handling, drying, radiation, heat etc — over time can effect this cladding. you

...122

don't know what cladding will be like after all that's done to it is done before it gets put in a repository. I predict it to be dry and brittle and cracked and full of pits and holes and crud and blisters flaking off. I predict trouble when you dry, and irradiate, and heat up this material, in storage casks, and bounce it around in shipping on rails and roads and barges, (and unload and load and wet and dry and wet — and steam shock — and short term high heat, etc. — you don't know what rods and pellets will really be like) all these procedures will have an effect on it.

I get so tired of tons of computer printouts that don't deal with reality. You change this and that to fit the modeling — you segment things that are related — you analyze parts that really interact — you don't see the whole picture as things really will happen in "real life" — the real thing! That is a main problem with cash vendors. They don't build a full size prototype and run it through dry runs to see the problems. Why the VSC-24 was never built anywhere before the 1st one was built (before certified by NRC by exception) and then loaded at Palindes the day after certified. What a mess! Nobody ever really knew how the unloading procedure should go — but they loaded anyway! Don't do the same thing at DOE with the repository — please!!

123...

[5-10 Why would the water and gas flow back to the repository? What else could happen here?

...123

Temperature and pressure effect on water movement is of the utmost importance here. As is rock mineral alteration. We need to know the answers here.

124

[p] 5-13 Vapor processes need a lot of study as does solubility of material from casks.

Why are we dealing with only "jits and patches"? What about cracks? Especially cracks in welds? Could high thermal loads and radiation exacerbate any small crack that was initially acceptable in UT tests? Could the crack lengthen or deepen or widen? Current UT testing does not do well with ① cracks in a line just not connected ② parallel cracks ③ radial cracks ④ the width of cracks^{(5) transverse cracks.} Just how will DOE criteria for closure welds on casks deal with this issue?

It took something like 9 months for Palisade to find cracks in welds "to be acceptable" after UT tests on the pad on loaded casks, then NRC allowed licensees to restrict movement temperature to 35° in order to allow larger cracks in the welds to be acceptable. The cask was certified to be able to be moved at 0°!! How will DOE deal with such a situation? How will welds be tested? What cracks will DOE find acceptable? How will these cracks act over time under repository conditions???

125

[p] 5-13 I find the reference to colloids interesting for I was reading about colloid transport in a book recently concerning PCB transport. It also referred to radionuclides moving faster than expected when they attached to colloids.

126... [p] 5-14 You say radionuclides would be more dispersed

45

...126

and the concentration of the nucleides in any volume of water would decrease. That is a big question though. I wonder how concentrated the water really would be that carries this finally out into the public domain. Is there a scenario where the groundwater would be so little, but enough to flow out, that the concentration would be a lot more than predicted? How do we know how dilutes it will really be long term? Groundwater and aquifers will change over time.

127

[p 5-14] you say the dilution factor was "recommended in an expert elicitation exercise" — What? This is curious. Please explain.
Is this all based on a recommendation by one person on his so called "expert opinion" ?? Why?

128

[p 5-15] Seems to me that the Sygynastic claims have not been fully refuted. Why not?

129

[p 5-15] I do not agree that Lehman and Brown's theory of flow of the will not come into effect because of the "long lived" waste packages — Don't depend on this. Work on the theory that the packages will not last as long as expected. Be prepared for that one Know what to expect in that case.

130...

[Thinking of something from "Civil Action" (Book by Jonathan Harr)]
Something about that the flow of the contaminated water could go under the river. I found that fascinating. This Darcy's law about the quantity of water flowing through a given area is equal to the hydraulic conductivity of the material which it flows multiplied by the size of the opening, multiplied again by the gradient or angle of incline. How does this fit in with the repository site, climate changes in rainfall rate, changes in size of contaminated cracks and fissures in the surrounding rock by heat from the cracks making them larger and connecting them, and the pressure changes

...130
and temperature changes affecting flow directions and the incline -
all this, and where does the water really go? How much? When?

How could you possibly predict all this? I don't think you can? What
if the runoff flowed off laterally before it got to groundwater
in the saturated zone and got out in surrounding land and air?

* Is this at all possible? Or could it get passed the groundwater
somehow without being diluted and flow out. In other words,
is the groundwater level beneath the repository like a lake
under there? No islands or peninsulas in it? Jim + trying to
picture just how it is under there. Don't assume its one big flow
and covers the whole space. Ever try to drill a well by hand
and not hit water where it was supposed to be? Wedid this
yesterday. Its a surprise. Could this be the case at Yucca in
some areas and throw all your calculations off? Computers
like to deal with "idealized" situations where sameness fits
the calculation to make them "work" — but nature is full
of variation and diversity, so don't expect your next
little projections to be what is really there. It probably won't
be the case. Water (and gase) seek any opening of escape they
can find, and water tends to make its avenues of escape
larger and more continuous as it goes along over time. Don't
forget that. And — Water is a thief. It takes whatever it
can along with it. Don't forget that either. Sometimes I
think scientists get so involved in their intricate computer
models that they forget to look at the real thing — The
total picture of how all of it works together. Often studies
are so ~~per~~ segmented that nobody puts them together
to see if they really work together. That has
happened in cook fabrication and can happen in water
flow studies.

14
(cont'd.)

P 5-15 Earthquakes, Volcanic activity, and possibility of human intrusion would be enough risk to not open the repository as far as I'm concerned. Must safer to leave it in many sites where such occurrences only affect a small part of the total waste. Why put the whole mess of it in one spot where an earthquake or seismic event can cause disaster? Makes no sense to me.

131

P 5-17 The total of uncertainties makes DOE a "fortune teller" as far as I'm concerned. No matter how much data you feed your computer model — you still might as well be looking in a crystal ball! You cannot predict the results over such a long time frame.

132...

P 5-30 This 5.2.4.3.2 Weighting of Conceptual Models — alteration is of great interest for it reveals to me that, in the end, it all comes down to what you call "expert judgement" and the finite time and resources. DOE says — we want a decision by this time, and you men decide what to feed the computer for our final model, with the data we have by then, I would imagine. (When do you say, "stop — we've studied this enough?") Who decides what expert to depend on? why? It comes down to belief. If one scientist believes the computer is right and the choice of data used is right — why should I go along with his belief and choice? When the experts disagree and there are too many unknowns, and I think this is the case with Yucca Mt., then I say admit it. Don't bury this waste underground. You don't know, for sure, what will really happen over time. you just don't.

...132

They used Monte Carlo in designing casks too. It didn't do them much good in predicting the real thing. And this "splitting" technique sounds like it adds more uncertainty. The life of the container and the water flow are crucial data to know and you just can't know these. A rockfall can occur for no reason you thought of—then what?—wrecked casks long before you expected! Then how do you retrieve them when they are damaged?? Has anybody brainstormed on this situation? Your low confidence in table 5-3 in grave areas of importance don't give me any trust in what you truly know. There is too much you don't know and can't predict. Considering those 6 LOWS in confidence in the table, I don't know how you can even put out this draft EIS at this point!

133

[p5-23] Peer Review Panel. So Congress requested "a statement of probable behavior of the repository" and you can't give it to them. You fall back on the old phrase NRC uses constantly in their SERs on SARE for cask designs — "reasonable assurance". I am sick to death of that phrase. It is meaningless. It is a "maybe it is, maybe it isn't" sort of response.

Your analogy to EIS performance representing a "snapshot in time" is a good one. You say you need to "define the snapshot". I say no — you need a "movie", not a snapshot. — a clear view of the continuous flow of events over time — and that "movie" is just not available. My father is a professional photographer and I use photographs for the basis for a lot of my watercolor paintings. A good photographer realizes that a "snapshot" captures an instant, that is rarely repeated. In portrait photography you can help create that instant when

a person looks best — arrange the pose, the composition, the lighting, contrasts, background, shadows — etc.

But, in nature, when my dad and I are out taking photos, we have to find that instant when the clouds part at a certain time of day, when something has the best shadows, from the best vantage point, close or far, from this height or that side etc. You have to capture a moment. As an artist ~~I can~~ can then use many of these moments or snapshots to create a painting — I can take out a stop sign, remove a tree, change a shadow — or even the weather — with a stroke of my brush. But the photographer in creating the work of art — has it rougher — he may be able to change his viewpoint or come back in better sun or weather etc., but rarely can he change the scene very much. DOE must remember that you are a photographer — not an artist. You must take the scene as it is, you can't take the snapshots and "create" a new scene out of them. You have to use only what is really there at that time. I fear you tend to create, and in your case, "creating" is very risky. You only have snapshots, not a movie — that is the whole problem. You don't have enough snapshots.

Then too, you can get into the whole argument of does a snapshot capture reality? I won't go into that whole debate. You think about it. Artists and photographers have for years — and this debate relates to the reality of the pictures of Yucca Mt. your limited snapshots reveal. Are you seeing reality or only a bit that is not true to what surrounds it? I do hope some creative brains forming is being done with trying to look at the total work you are doing and how it connects and makes a picture of reality.

134

5.3

p 5-23 You describe the general direction of groundwater movement N.W. But this could change. An earthquake or seismic event could re-map this whole system. You have springs, alluvial aquifers - connections between these and pressure differences that direct the flow. This could all change if land lifts or drops and pressures change. Rocks do strange things when they crack up or fracture. You can't predict what will happen. What if the volcanic aquifer ends up flowing into the carbonate aquifer ??? What happens to Ash Meadows or Devil's Hole then? And the Devil's Hole pupfish?

135

* although Do you realize how hard it is to manage this huge volume as I am writing notes? - please, next time you put out this amount of material, - separate it into several smaller brochlets easier to handle. I have back trouble and this huge book is awful to handle! []
Weir had about 10 in. of snow while I'm writing this so shooing several times has helped and feeding the birds in between. Lovely!
OK - Where were we? -----

136

I guess I don't like a hypothetical person and use of averages etc.
My mom and dad both had cancer and I'm very attune to the actual person that gets it, no matter how remote the possibility. Cancer is cancer and we all know somebody who has it. You do I'm sure.

136
(cont'd.)

To me, no amount of added radiation to a person is acceptable and why people in Nevada should be targeted, is unfair. Will people in that area be given pills to counteract any unexpected releases? Will those pills to protect thyroid from Iodide-129 etc. be stockpiled in the area and distribution plans be public? They should be. If not, why not?? I'm going to skip over a lot of this on doses, for I don't think you actually can predict them at all. The VSC-24 cash

...136

for example was touted as having such low doses. Well with all the problems - UT testing etc., and now they want to reduce shielding on the transfer cask to lower the weight in order to put in BPRAS. What happens to ALARA anyway? Promises were broken on dose rates. I don't believe predictions of this sort — they don't see reality and they expect a perfect world with no human error. Expect the unexpected. Murphy's law is in effect.

"What can go wrong, will go wrong," as Mr. Haughey of NRC said after the VSC-24 explosion. And it continued to do so.

137 [p.5-36+37] I don't call Hillner, Franklin, and Smeis study of 1998 recent because no dry cask has been unloaded.

You don't know how high temperatures and radioactivity will affect the micaclay cladding over time in dry cask storage, handling, shipping etc. And I predict that drying out of the micaclay is even a bigger concern. Micaclay in water full of a coating of crud covering up pits and cracks and blisters is far different than bone dry micaclay when the crud falls off and, blisters caps fall off possibly, and hairline cracks possibly explode, and pinholes dry at the edges and fray and concole to larger holes. You don't know what happens as the micaclay dries and becomes brittle in the inner environment of a cask. You just don't know! I realize that it was BWR fuel in that case of the large amount of crud found at the bottom of shipping casks that time — I forgot which reactors fuel now — but it said to me that this can happen in PWR fuel too, even if there is less crud expected. Remember this isn't clean micaclay. This micaclay

...137

has been in pool water a long time. What happens when you dry it out? Heat it up? Expose it to more radiation? Bury it over the road to the pad on the Transporter? Jam it in the honeycomb basket of the cash and haul it out again?

Kiwit it in unloading? Wit it again? Just what will fall off when it is hauled over bumpy highway rails + bags across the country? You do not know.

And even if you open several cashes to check the cladding after all this, will they really be representative of the whole with all the different cladding forms and cash designs out there now? There is no standardization or integration to the system.]

138

[p 5-39 Alloy-22 needs questioning if it provides 70% of chromium. What else could be used? You don't even know the hexavalent chromium oral route exposure carcinogenicity now.]

139

[p 5 - 45 You can not predict rock size in falls - nor where they will hit the cash - or if that part of the cash is already covered by drags etc.]

140

[p 6-1 Transportation - DOE has made no decisions so how can one comment? I disagree that providing this information in this chapter "covers everything" so that the public can comment on this draft. If we don't know your decisions, how can we evaluate this? We don't even know the mode you plan and you say factors are not under your control. "Mostly" is not a term I find I can comment on at all. Give us the specifics - make the decisions - then put that out for public comment. This draft is premature. As far as I'm concerned it's all a risk we should not take. [Accidents will happen. I remember reading about a shipment by truck through Chicago where the trailer actually detached from the

141

truck, and the radioactive waste was on its own. (Mayby happened - I wish I still had the document - but it does and can happen) And what about those rails taken out in Minnesota that stopped the wrong train - but did happen? There will be "incidents" I suppose. The public doesn't want this stuff in their backyard - even if just passing through. We had a propane train disaster in a town nearby - the whole area had to be evacuated for days - people snuck back in to get pets out and photo albums etc. And there was a train carrying ammonia (I think that was the chemical) that went off a bridge I remember contaminating a waterway. These things happen. Trucks have hit trains several times in the area.

Sleepy or drunk drivers go right into the crossing lights flashing - bus down - they hit the train anyway. Accidents will happen. Human error and mechanical error. This isn't a perfect world. Weather, road repair etc. - all too risky! Sabotage and Hostages in Hijacking may occur.] And why should Nevada be the funnel? It's not fair.

142 [p 6-20] Unloading storage casks and loading transport casks will be a big concern at beginning and end of transport route. Fuel Handling repeatedly will have an effect on the assemblies and they must be checked. Can you predict these effects? I don't think so. Loading operations are not "routine" and unloading has not been done!! And transportation cask testing needs to be redone. Sabotage event evaluation needs to be redone. The world has changed a lot - these need updating as to road raid hazards and new weapons available.]

143

200...

[p6-29] you are basing some of this on a 1981 study by Fischer. That is just too outdated. The Nuclear Waste Project comments are valid. It's not up to them to do your studies for you, only to comment on what you do. There should be tests to benchmark computer models. All too often this is not done correctly. I had, finally, seeing how the NRC handled the VSC-24 fiasco, I have not a great deal of confidence in what they predict for cash performances either. NRC staff is overworked and can't handle the gigantic amount of problems that vendors and utilities have dropped in their lap dealing with cash certification and use. Every reactor wants cash; every vendor wants certification — there is a big push by the industry to get everything done as fast and as cheaply as possible.

Exemptions to regulations and codes are handed out all over the place. This leads to trouble! Safety Analysis documents are not current with what is really being done with cash as the procedures and designs are constantly changed by each utility. The "generic" cash has become a chameleon and is "site specific" at each location in the end. Also the lack of communication between vendor, utility, and NRC on problems and trouble-shooting has lead to repeated problems that were not necessary. They could have been prevented. Workers don't even know when to call a fire a fire apparently when it comes to hydrogen flames vented from a cash. And then, at Palisades, the vented it through a flammable plastic tube attached to the machine by duct tape and was way to close to the cash. Do it pinned again!

...200

Do you really expect public trust when such stupid things go on with dry cook storage? And of course the mess at Trojan with Transitor was predictable — but they did it any way knowing full well the coating wasn't completely baked on as it was supposed to be. And other tanks have problems too — you know it. So don't act as if tanks will work as expected. They won't.

144

[p 6-33] If this Sandia study is anything like the "Sandijer" test studied for our hearing on the VSC-24 tank, I dismiss it. You can't analyze a tank using only a part of a rod or an armed missile, or balloons (that mostly burst) to test radiation in the air — the whole thing was a mess and unrelated to the real thing as I saw it. I have not seen this Luis Neumann 1999 Study, but if it relies on a 6 second Atomics tank holding only ④ assemblies — I say get real! You are planning on using tanks for 21 assemblies aren't you? And dual purpose tanks aren't even certified or used yet.

p 6-55 Water rights — This is a key future concern. I know because we have a PCB Superfund probable site in the Fox River in my backyard. Also a water bottling company is trying to drill wells near the headwater springs (in a state natural area) on a trout stream where we own property and fish. Who owns the water? Can the water be sold? Can Great Lakes water be sold? Can trout streams be depleted by bottled water companies?

145

[Can DOE "lease temporary water rights from individuals along the rail corridor"? Do those individuals own the water to give the right to DOE? This needs a great deal of thought. The future is full of water concerns. Just how much water will

Nevada loan to DOE in this Whole operation of transport and disposal? Water is scarce in Nevada, isn't it? Who uses and needs that water? Are water predictions correct? Who really has the right to give that water to DOE? It almost appears as a threat here to the State of Nevada, saying "if you don't give us water rights to drill wells, we'll pay off private individuals for rights."

(And you know full well, that any place nuclear waste goes, people are not going to want to be there.)

146 [pb-86] Heavy Haul trucks will be a big headache in traffic disruptions and ~~the~~ delay this causes accidents!

147 [pb-89] What is the total of pollutants from the total transport of the waste? Here we are trying to cut back on all this, and instead, this project adds to the problem. Are we creating more air hazards to bury a waste?

148 [pb-137] Las Vegas seems like a huge congested area for nuclear waste to travel near. This is a mistake. What is the "spaghetti bowl" there?

149 [pb-7-1] No Action Alternative: You can do as many studies as you like, but the waste has always stayed where it was generated, in spite of years of studies as to where it should go. I would expect it to stay at those sites for a long time in the future too. My proposal would be to put it in a central site in each state that generated it. Those people, after all, used the power. They should be responsible for the waste — their utilities should be liable in that state. If the casks can be removed from waterway vicinities and, say, be put in Wis. at the old Badger munitions location or some such already contaminated spot — so much

...149

The better. The location of nuclear plants on the Great Lakes shores has always been a hazard. And certainly casks in sand dunes at Palisades on the Lake Michigan shore, and casks on Prairie Island in the Mississippi River in Minnesota, are not well located. Put the casks inland in each state - all at one site in each state to be monitored, guarded, and replaced forever. Don't haul it all over the country like a hot potato and don't put it all in one place. Forget about other dangerous sites. Wisconsin would put up a big fight again, if you ever considered our granite location, I know for sure. There was quite a battle just to allow casks at Ft. Peach at the reactor site! And we continue to watch actions there carefully. At each reactor site, I predict you will have controversy, as nuclear waste is stored — but you will have a real uproar if you try to transport it all over the country, I assume.

150

[Your long term storage with no institutional controls after 100 years is ridiculous! Might as well say we dump it all right in the ~~dead~~ lake! Why even write this up? Makes no sense at all. This is used only as a scare tactic to make (Congressman?) think if we don't open Yucca, we may have a disaster — which is just not the case.]

151

[I've read a lot of the documents listed here on centralized interim storage (MRS) and private storage etc. They are not very feasible and amount to environmental racism to Mescaleros, Goshute, or whatever other native American tribe DOE or the utilities try to "buy off." You couldn't site

...151

it anywhere else — only by tribe could you even get a foot in the door with tribe leaders. You know that. Every state will fight hard against any central "interim" storage for we all know it will not be "interim" at all.

152

[p] 7-16 What do you mean "The No-action Alternative assumes that the spent nuclear fuel and high level waste would be treated, packaged, and stored" in a condition ready for shipment to a repository"? Do you mean it should all be in shipping casks? Then "storage only" casks should be unloaded and put in transport casks now. Not left on the pads.

The concern is that we don't know what to expect for sure when we open these casks in 30, 40 years. Can the fuel actually be transported after long term storage at a reactor?

153

Maybe its "condition" will no longer allow it to travel on our roads and rails. That's all I can say is that DOE should not take charge of waste at reactors. The contract was only to take the waste when a repository opened. If it doesn't, utilities should be liable. They created it and earned the money on it. They knew it was a big risk, yet they opened the reactors anyway. They knew full well what they were getting into. No other business could dump their waste in government hands, why should utilities?

154

[p] 7-17 I'm not so very sure as you are that dry storage is the preferred answer. We may need to revert back to pools.

The rosy picture you paint of dry storage safety etc. may not prove to be accurate over time. Dry storage is only in its infancy. No utility has really had to deal with numerous full cask arrays on pads yet — especially in bad weather. Surey & suppose has the

most. There are concerns about snow and ice at Trojan

— The RSC-24 was originally designed with a snow shield, but the ^{speed} ~~shield~~ ^{The shield was eliminated.} blocked inlets too much, ~~But~~ snow can block inlets, and icicles can cover outletlets (that happened once at Ft. Bend and at Ft. St. Vrain) Dragging a blower and then melting iceups on each cash in several pads full of cash — those outlet and inlets need to be open. Outlets will not work as inlets if inlets are blocked. These are things to think about in the future too.

Are fuel rods, as you say, really "likely" to be environmentally "secure" for long periods of time. Is dry storage really "safe"? "Economical"? Is low level waste generates really "minimis"? Is dry storage really "simple" and "easy" to maintain? Better take a closer look at what really is happening with dry storage right now — The repeated blunders costs money. Is having to UT cashes on the pad simple? easy? No way. think again. Dry cash storage could maybe be all these things — but so far the track record is a mess. Make sure you ~~#~~ know what NRC is doing. What happens to that spent fuel at reactors now will affect the DOE program. You know it will, yet I think there is certainly not enough communication or interest in this issue between NRC, DOE, and NWTRB. You have got to include dry cash storage issues at reactors now, and in the future, in your analysis. Look at reality. Studies predict — they don't tell you the actual situation. DOE needs to know what's going on.

[P7-21] What are the canister supports? Are always being interfered in any supporting structures for the cashes.

...154

They can be a real hoy and. Basket design and spaces can be a real problem too in drop and lift analysis — tip overs and surface the casks can hit.

155 [p7-28] The top paragraph is of interest — Doc did not want to overestimate impacts from repackaging — I don't even know what you would do this or any way as it hasn't been done.

157 [p7-31] This airplane crash postulates accident — what kind of airplane? How much airplane fuel in the fire? What kind of cask? One with flammable material in it? These variables need more site specific evaluation. I have always been very concerned about the simplified analysis of airplane crashes into a full cask array — it needs more evaluation. It is one of the big concerns. Seems to me several casks analyze only the fuel from the Transporter in their fire analysis — a plane with full fuel load should be analyzed for a cask design.

158 [p7-38] You say that figure 7-9 shows that more than 20 major waterways could be potentially affected by dry cask storage at locations now, but I'd like to see how many waterways could potentially be affected by transportation to Yucca Mt. and the repository. How many barges on waterways? How many bridges to track and trains cross? How close to rivers and lakes do the roads and rails go? How far? How long? Seems to me this transportation puts many more waterways at risk, and more often, and greater risk of accidents in motion.

159 [p7-43] I have not seen the NRC EIS for relicensing plant and wonder how they evaluated unloading casks and loading a replacement cask. I'd really like to see that, and frankly don't know how they did it since no cask has ever

...155

been unloaded. Surely if they relicense plants, this will have to be done. Relicensing any plant for 30 years would be a grave mistake and put an extra burden on waste storage by allowing more to be created — following the major mistake all through nuclear history by creating more with no plan workable as to what to do with it forever!

Pods are getting old, reactors are getting brittle — it is a dangerous business to keep these aging plants going & think. More and more waste creation makes decommissioning more and more of a problem and pushes it to future generations.

Renewables are ready! Let's use them instead. □

160

[P 8-1] So now you want to dump everything you can in the repository if you open it — surely not what Nevada was told at the beginning of this speculation! So if the NRC says put it in the repository — Congress will agree as in all these other types of waste go — further complicating materials interaction analysis — and the "radioactive soup" at end of repository life becomes more "spicy" than before. (And Nevada gets the Nevada Test Site Waste and Beatty Waste Disposal area too). Poor Nevada. □

161

[P 8-3] "The possible future resumption of nuclear weapons tests." Oh great — and if something unexpected happens there we can blow up the whole repository too! Frankly with certain people elected, I can see this happening. □

162

[P 8-10] Two spaceports? Vandenberg? Kistler Aerospace Satellite launch? And recovery? So how does all this activity relate to airplane crash analysis into dry cask storage? What could possibly crash into a full cask array or several pods of casks at Yucca Mountain? What all flies over that area from the test site or Nellis Air Force Range? Is a lot of it secret? Does the right hand know what the left hand is doing here???

...159

~~#~~ Great! A possible vehicle launch or recovery accident from the Uranium/Star Kibbutz project. All we need! This is a risk that should not be taken. There are unknowns here. This just gets worse and worse!

163

P 8-13 This Timiskwa Shoshone Reservation creation possibility is of great interest. Why? Seems to me we probably owe it to them, right? For some broken treaty of the past? In any case, I'm all for it, but not if they get contaminated land. We are always "dumping" on Native Americans! I'm wondering if they could get casinos there. Tribes in Wisconsin have a thriving business with gambling and support many of their schools and communities necessities with the earnings - plus it gives a lot of them jobs. I'm not for gambling, but I think it's great they have an "industry" earning them money that people around here are willing to go miles to get to and throw their money away.

164

P 8-14 Wow! and here you have gold and copper mining & transport further complicating things. — More traffic congestion and possible pollution.

165

P 8-69 Molybdenum needs more study evidently. When will EPA establish a Maximum Contaminant Level Goal for it?

166

P 8-75 Yes - here we are with recent evidence of plutonium migration from an underground test possibly facilitated by colloids. There are a lot of uncertainties here! Here we are with total underground testing inventory available for transport and could migrate through the same locations in this EIS. This is way too dangerous to even consider this. You don't even have groundwater information on the test sites system and none in relation to the connection with Yucca Mt. site.

...166

You keep saying "These impacts were not performed with the same rigor" — why not ??

167 [p 8-17] all this low-level waste will be cumulative too? What a mess.

168 [p 8-18] Is American Ecology the one with all the controversy?

169 [p 9-13] Barriers: I'm very interested in the ceramic coating idea, but seems to me any rock fall could crack it and exacerbate corrosion in the crack then. Drip shields could get dented by rock fall, form a "funnel type" area, where water collects, and also exacerbate corrosion by leaving up directing more water on one area of the cash. Could Backfill provide a pathway for moisture to the cash, and prevent ventilation from evaporating moisture collecting on the cash and stands?

170

[— "Richards Barrier"? I'm thinking of how we tried to preserve our garden carrots in sand in a container this year — didn't work. The sand may delay moisture reaching the package, but it could also be saturated and actually collect moisture and hold it close to the cash surface, not allowing it to dry out at all. "Diffusion Barrier" if saturated before expected, would also possible bring water closer to the bottom of the cash and hold it there rather than letting the cash dry out and remain above the emplacement drift and above seepage flow on the bottom floor. You seem to be torn between ventilation keeping the cash dry and "smothering" the cash with some material to keep water away from it. You can't have both. Either air dry it or encase it, but make sure you have good reasons why.] The idea of putting spent fuel in Christies Lat before in the cashes is an idea, but sounds costly

171

* Why.

...171

and certainly not "space saving". Adds another containment to corrode though and sounds like a good idea to me. The more full containment barriers, the better, as far as I'm concerned - for if the walls "go" on one, at least there is another beneath it. All these fillers and barriers have spaces between the particles for water to collect, so I don't trust any of them really. They may backfire in your expectations. ["Coblets" could hold water too, couldn't they? I don't know about iron oxides or aluminum in the waste packages. If you ever had to retrieve the fuel - this could create a real mess in getting assemblies out of a package.

172

And if a canister breached long before expected - (say a cave-in in the ceiling for some reason) could the filler exacerbate corrosion if air and water gets in the cask?

173

[What do you propose as ground support options?

Have any been tested?

(Frankly - the barrier section is the most interesting so far - shows some creative thinking in this area finally - we need more of this type of brain-storming - then we need tests)

174

[p 9-14] The low thermal option sounds the most sound right now.

I think high thermal may be more dry but also may affect rocks to fall - what is testing on all this

What is testing on removal or covering the footprint with soil? What would work? Why? Testing?

175

[p 9-15] Access to Waste Packages - all these fillers etc. -

How would you get this all out to get at the cask?

"Modified waste emplacement" - this sounds more

...175

feasible — a main tunnel for access and cash in alcoves or short side tunnels — The idea of a track getting clogged by a rock fall or something, and not useable, would certainly be easier to "unplug" if cashes weren't in the way. Keep the main tunnel for personnel movement and use alcoves for waste — easier to monitor and repair and replace. Also less chance of one problem causing a mess with the whole tunnel. This paragraph is full of some good creative thinking here. Work out all possibilities and test them. Take your time. Do this the best way possible if you are going to do it open at all. Keep your mind free to all possibilities. Maybe nobody has thought of the best way to do this yet. Keep some people just at the job of brainstorming or have brainstorming sessions for personnel together periodically. The best document for read is when NWTRB had that creative meeting on waste package ideas. It was great! I read the transcript. People interacting who are experts — saying what comes to mind as workable and then discarding it, but at least not "plugged down" in one old idea that won't work.

176

[p7-16] Rod Convoluted — I've read a lot about this in the past and it "sounds" good, but the end fitting creates a problem. I guess it costs more and the utilities won't do it anyway.

It would save space. But no cash designs are out there for this that I know. They were interested in this years ago and discarded the idea.

177

[p8-16] What do you mean "waste package self-shielding"? Like what?

178

[p8-16] I level repository — would help retrievals but could one above the other allow for more avenues of leakage eventually? (Hooray! I'm done with Volume I and I get to shoot snow again!)

Volume II

179 P A-28 Mixed Oxide - you don't know if this will even work in Canadian reactors yet, so how can you say this?

Wow! When look at all the variables for material interactions here in all these waste forms - I say leave it in the cans - separate from each other.

180 A-34 Can you solve the vitrification process problems or has this idea been discarded? How stable is borosilicate glass? Certainly all problem with this and electric metallurgical treatment need to be solved before any repository decision is made.

181 PE-8 This is a tough one - ground supports - what else could be done? Concrete has problems. Rockbolts and mesh has problems. All steel has problems. Cementitious grout is a concern. What kind of fibers or long lasting pipe are they using in sewers now? I know our plumber replaced all our pipes under our sink (from metal) to some sort of white hard plastic-like material - what are all the new materials out there used by mines and water managers etc. - ? have you really consulted with all material manufacturers for ideas here - send out a form asking them to brainstrom some ideas for you - they know what is possible to create - May be you'll find some sort of pipe already made for some other purpose that could work. And if already manufactured, would be cheaper. What does sound feasible? Look at other industries.

182 P E-16 Could you plant a prairie above the repository? Would there be a benefit to these long rooted, long lasting grasses and forbs? Would they help hold water in the soil?

183 P E-20 Self shielding sounds like a good idea

- 191 [f] E-32 Low temperature design + stainless steel in cash sound better
- 184 [p] H-5 (4) PWR assemblies in a basket? I had no idea that's all you planned to put in there. A suspended basket should not be allowed to go above another basket — redesign this. NRC doesn't allow a cash of fuel to be carries over other assemblies in the pool — and for good reason.
- 185 [p] H-7 There is no detailed design of the Waste Treatment Bldg?
- Then how can you do this draft EIS?
- 186 [p] H-11 I disagree that an aircraft or other vehicle in the air from the air force base or test site could it cause a real problem if it crashed into a full cash array or a pad. I don't think this has been analyzed well enough — what type cash? How much fuel in fire? Etc??
- 187 [p] H-19 I've always been interested in CRAB. It hasn't received enough study at all. As it says here "there are very few data for the accident of interest" and "the physical condition of CRAB can be highly variable" — and it may add can cause lots of problems if it falls off the cladding! It could jam in the basket sleeves preventing removal of the assemblies. It could fall to the bottom of the cash. It could cloud prod water and clog water filter. It could pollute the air in unloading. It could reveal pits and cracks when it falls off or is scraped off when dry. What else??
- 188 [p] H-120 Fuel Rod Gap — tritium and krypton etc. — when the pressure in the rod is released and gases go out, I predict more problems than we are considering now — Airborne particulates could be a real problem. You say "No specific reference could be found to the volatile materials in the gap." Why not? Do some tests then.

189 [P] H-21 I'm confused, I thought (21) was the number, but on p H-5 you said (4) ?!]

190 [P] H-31 Be careful here - I doubt it's as easy as that - Retrieval is not just "essentially the reverse of waste package emplacement" Think this through in detail. How will it really work? and maybe you will have to open some packages for an unexpected reason. Accidents may be very different.

[P] I-33 Here it looks like the (21) PWR case is the right one as I thought

191 (cont'd.)
from p. 67

[S] Sorry - all these computer models won't tell me the real thing - do lot of tests on the real thing OK?

- * Make a real model of just what is in a tunnel it would really be like - let water drip on the shield - see what happens. Let rocks fall on the drip shield. See what happens
- * Simulate a real case in a real tunnel as closely as you can. Use as much of the actual situation as you can. Test that in detail! (Don't just do models on computers)

192 [P] I-66 Early Cladding Failure would result in maximum release 2000 years after repository closure rather than 19,000 yr after. That is a whopping big difference and shows we definitely need to open all types of cases periodically and evaluate just what condition that cladding really is in. We need to know this!

193 [P] I-25 It looks like rail may bring it through here. Some don't want to see that happen, but the route down around Milwaukee and

194 [P] I-35 Madison is so congested too (by truck).

↓ I suggest you do the 1987 Schneider study over. Case wasn't even genetically certified then. This study is just invalid as far as I see it. You have to unload the storage case before you load the transport case at a lot of sites now. This unloading will result in a much different scenario.

195 [pI-52] Sorry, I just had to laugh when I read the "potential effects of human error on accident impacts" and DOE response to arguments about undetected error in design and certification, undetected defects in manufacture, error in cash preparation etc. — [DOE sort of says NRC will make sure every thing is OK and prevent anything like this. Are you kidding? This has all happened! Do you know the history of Sierra Nuclear and the VSC-24 and Senator cashes? Nonconformance after Nonconformances — fissile material violation, QA problems over and over, undocumented weld repairs, Charpy testing not done right, crack in sill welds found in a loaded canister, more cashes fabricated than NRC by regulation allowed before certification, unloading procedure not ready, weld cracks in seal lid welds, a coating that causes exploding hydrogen that lifts up the lid on a cash they were loading in Wisconsin, requirement of UT testing on loaded cashes already on the pad at Palisades, St. B. and A NO because of weld cracks. Stop work orders and stop loading orders from NRC numerous times, Vent holes too small for unloading procedures in some Palisades cashes — (had to be drilled larger in unloading), Shims welded in around shield lid and no initial plan as to how to get them out, no soil testing at the Palisade pad until after cash was loaded and on it then — (The EIS for the plant on bedrock was used for the pad on sand dunes!) Concrete for outer shell not mixed correctly, rebars put in wrong at AHO, equipment

195
(cont'd.)

70

not calibrated correctly - etc. etc. etc. A real fiasco! And then BNFL pays them out and promises to do better, do they? No! - we have the mess at Trojan with coatings rubbing off and clouding the water, so you can't see to load, and the repeated hydrogen burns at Pelicans even after we were promised they knew how to vent the hydrogen safely. Then we have nukmos with too thin walls than specified, and we have the T11 casks at Prairie Island where the resin wasn't treated according to specifications and understand it - dry cask storage has had problem after problem after problem. But do I think Yucca Mt is better? NO! for these problems will be hidden underground instead of on pads where we can repair and test and monitor them. If those VSC-24 casks were underground, you'd have had to haul them all back up again several times by now! Where is a vendor we can trust? Where is a firm tested(over long term) cask? Where is spent fuel that has been checked after unloading a cask? I sure can't recommend any! □

196 [p] K-25 The freeze-thaw cycle effect on dry cask storage needs more evaluation. We have been concerned about it for years.

197 Enough - Please make your final EIS less repetitive, and in smaller booklets, on paper that is not shiny. This 2 volume set was awful to read and handle. What else can I say to you, the person reading this? My main interest is dry cask storage. I read every SAR, SER and certificate & contract NRC puts out on new cask designs. I have followed the VSC-24 documents for many years. The details would astound you with their blunders after blunders. Do not put these casks underground, please. Well, I'm very tired of all this and I suppose you are too. Thanks for reading this. Fawn Shillinglaw
January 13, 2000

198

P.S. [Be very careful to evaluate the manufacturer's sheets on any neutron shield material. The RX-277 in the shield lid of the TSC-24, for example, was supposed to be baked to 350° and then moisture was driven out — and gases formed. The sheet, which I don't remember in detail, said something about how high ^{the temperature} it should be allowed to go in order and also that it could regain moisture under certain conditions. But the main thing about any enclosed formed material like this is that it has to be completely enclosed. The materials, and materials in the transfer cash wall, got wet at some location when in the pool as all paths to the material were not welded shut. This could be a big concern in disposal cash as some material actually attract moisture, and if trapped moisture is inside a cash to begin with, you have problems. Also Boral and Boral Panels — will it have continued efficacy? And is any type of poured neutron shield really safe? — uncontrolled void can cause real problems. Also is helium in the cash dry? Really dry? Are weld areas preheated, and are welds done so that they are as strong as the parent metal? Are they UT tested? What is the basis for the critical flaw size acceptance? Are bolted cash better than welded ones? Is an inflatable annulus seal acceptable? Some neutron shield material is a plastic sort of stuff and flammable. What are the highest cladding temperatures for the cash design? How does it affect the metallurgy? Watch for radiation streaming areas. (A lot of things to consider in dry casks.)

Well again — enough — I do think that materials interactions in cash materials and in all materials in the repository are your biggest unknown and your biggest problem. Keep it simpler. Leave the spent fuel in cashes above ground. Thanks for reading all this.

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