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UNITED STATES NUCLEAR REGULATORY COMMISSION'S  
ADVISORY COMMITTEE ON NUCLEAR WASTE

July 19, 2006

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This transcript has not been reviewed, corrected and edited and it may contain inaccuracies.

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE

172ND MEETING

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WEDNESDAY,

JULY 19, 2006

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OPEN SESSION

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ROCKVILLE, MARYLAND

The meeting convened at the Nuclear  
Regulatory Commission, Two White Flint North, Room T-  
2B3, 11545 Rockville Pike, at 8:30 a.m., Michael T.  
Ryan, Chair, presiding.

COMMITTEE MEMBERS PRESENT:

MICHAEL T. RYAN Chairman

ALLEN G. CROFF Vice-Chair

JAMES H. CLARKE Member

WILLIAM J. HINZEMember

RUTH F. WEINER Member

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ACNW STAFF PRESENT:

ANTONIO DIAS  
LATIF S. HAMDAN  
MICHAEL P. LEE  
DEREK WIDMAYER

NRC STAFF PRESENT:

DREW PERSINKO    NMSS  
JIM SHEPHERD    NMSS  
TOM FREDRICKS    NMSS

I N D E X

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Expanded Potential NRC Use of the Center for Nuclear Waste Regulatory Analysis (CNWRA) Expertise	
Adjourn	

P R O C E E D I N G S

8:31 a.m.

CHAIR RYAN: Let's come to order, please.  
We're at the appointed time.

This is the third day of the 172nd meeting of the Advisory Committee on Nuclear Waste. During today's meeting, the Committee will consider the following: the NRC Draft and Guidance on Preventing Legacy Sites; Expanded Potential NRC Use of the Center for Nuclear Waste Regulatory Analysis (CNWRA) Expertise and discussion of potential ACNW Letter Reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act.

Michael Lee is the Designated Federal Official for today's initial session.

The second presentation will be closed pursuant to U.S. Code Title 5, Section 552(b)(c), items 2 and 6 to discuss organizational and personnel matters that relate solely to internal personnel rules and practices of the Agency and information the release of which would constitute a clear, unwarranted invasion of privacy.

We have received no written comments or

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1 requests for time to make oral statements from members  
2 of the public regarding today's session. Should  
3 anyone wish to address the Committee, please make your  
4 wishes known to one of the Committee's staff.

5 It is requested that speakers use one of  
6 the microphones, identify themselves, and speak with  
7 sufficient clarity and volume so that they can be  
8 readily heard. And it's also requested that if you  
9 have cell phones or pagers, that you kindly turn them  
10 off. Thank you very much.

11 Our cognizant member for this opening  
12 session on the NRC Draft Guidance and Rule on  
13 Preventing Legacy Sites is Dr. Clarke.

14 So Dr. Clarke, I turn the meeting over to  
15 you.

16 MEMBER CLARKE: Thank you, Dr. Ryan. We  
17 will hear some introductory remarks from Drew  
18 Persinko, Section Leader of the Special Projects  
19 Section of the Decommissioning Directorate of the  
20 Office of Nuclear Materials Safety and Safeguards.  
21 And this will be followed by a presentation from Jim  
22 Shepherd and Tom Fredricks, both Project Managers in  
23 the Decommissioning Directorate and co-leaders on the  
24 effort to develop rule and guidance on prevention of  
25 decommissioning legacy sites, part of the on-going

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1 revisions to the license termination rule.

2 Drew?

3 MR. PERSINKO: Thank you, Dr. Clarke. My  
4 name is Drew Persinko. With me is Claudia Craig who  
5 is Section Chief of the Reactor Decommission Section  
6 also in the Decommissioning Directorate.

7 We're here today to discuss the status of  
8 our on-going rulemaking and our associated guidance on  
9 the prevention of future legacy sites. We last spoke  
10 with the Committee in July of 2005 about a year ago  
11 and it was very brief at the time.

12 Just a little background, the rule, the  
13 driver for the rule were the conclusions that were  
14 reached from the license termination rule, the LTR  
15 analysis, that was completed in 2003 and the  
16 subsequent SRM from the Commission. That was SRM  
17 030069 which directed the Staff to proceed with  
18 rulemaking.

19 There are two main parts to this rule.  
20 One is the financial part and one is the  
21 technical/operational part. Tom Fredericks has the  
22 lead for the financial part and Jim Shepherd has the  
23 lead for the technical part. I'm breaking it up as  
24 two, but it's one rulemaking and both Jim and Tom work  
25 closely together.

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1           Our understanding is that the ACNW wanted  
2 to focus on the technical part today. However,  
3 there's a link between the financial and the technical  
4 and therefore we want to talk a little bit about both  
5 aspects. We want to talk a little bit about the  
6 financial aspect as well today. But our emphasis  
7 today will be on the technical side.

8           A large part of the technical side deals  
9 with preventing contamination of groundwater because  
10 that is usually what causes both financial and  
11 technical issues for decommissioning and license  
12 termination.

13           We've been working with the tritium task  
14 force that was formed as a result of the tritium  
15 contamination in the reactors. Jim Shepherd is also  
16 a member of the tritium task force. The conclusions  
17 of the task force have not yet been issued and thus  
18 some of what we say today and what we do will depend  
19 on those conclusions when they're issued.

20           We're relatively early in the process.  
21 We're drafting a proposed rule. I want to make that  
22 clear. This is a proposed rule, not a draft rule at  
23 this stage. Although we formulated ideas on what we  
24 think should be in the rule and we've started actually  
25 putting pen to paper in some cases, and also with the

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1 guidance as well, nothing is yet cast in stone. So  
2 we're still considering various alternatives and  
3 considering different ideas. Therefore, we would  
4 welcome any recommendations from the Committee now.

5 Our schedule calls for issuing or  
6 publishing the proposed rule in March of '07 and the  
7 final rule in March of '08. So with that  
8 introduction, I'd like to turn it over to Jim and Tom.

9 MEMBER CLARKE: Thank you, Drew.

10 Jim?

11 MR. SHEPHERD: Good morning. It's a  
12 pleasure to be with you again. Thank you, Drew. This  
13 is one, I believe, you've seen before when we briefed  
14 you about a year ago that found that groundwater is a  
15 pervasive issue when it comes to both operation and  
16 decommissioning of nuclear facilities.

17 When we formulated the license termination  
18 rule nearly a decade ago, there was a Section 20.1406  
19 that's called minimization of contamination and we'll  
20 talk a little more about the wording in a few minutes,  
21 but it says minimize contamination, but it doesn't  
22 really talk about what that means or how to do or when  
23 to do it. So we will get into some of that.

24 What we're really going to focus on today  
25 is that specific paragraph in the license termination

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1 rule and the commensurate guidance for the Staff on  
2 how to implement it from the NRC side.

3 To do that, we'll start with a little  
4 background information to refresh everyone's memory.  
5 Tom will talk briefly about some financial assurance  
6 and then I will go into more detail on the changes of  
7 the wording of 1406 and the supporting guidance.

8 By way of background, at the request of  
9 the Commission, we looked at the license termination  
10 rule and some of the issues that we'd identified in  
11 implementing it. And there were a number of things  
12 that came out of that, part of which was how do we  
13 deal with the thing that we call legacy sites. A  
14 legacy site very simply is one that has more  
15 contamination than it has financial resources to be  
16 able to remediate.

17 And we have several of those in the  
18 materials side of the house, but we have not yet had  
19 anything like that on the reactor side. There is at  
20 least a theoretical concern on the reactor side.  
21 There are a couple of utilities that have single units  
22 and if those shut down then the revenue goes away  
23 which is part of the problem.

24 The other thought is in the restructuring  
25 of the utility industry, certain entities are gaining

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1 a large number of facilities. To date, our experience  
2 indicates that the actual cost of remediation of  
3 reactors exceeds the decommissioning funding plans  
4 established in the range of \$25 to \$100 million. So  
5 it's not a trivial issue.

6 If you've got one or two plants that are  
7 shut down and you've got one or two or three that are  
8 still operating, \$100 million is not that undoable.  
9 If you have 10 or 15 plants and they're all shut down  
10 and it's \$100 million, there's the potential for it  
11 being a serious problem.

12 What we are proposing to do is to  
13 strengthen the requirements for financial assurance  
14 and to make certain additional requirements on  
15 licensees to identify the potential increase in cost  
16 from unknown contamination and adjusted  
17 decommissioning funding plans to deal with that.

18 Next, Tom is going to talk about financial  
19 assurance and some of the aspects of that that will  
20 affect the ability of sites to decommission.

21 Tom?

22 MR. FREDERICKS: Good morning. I'm Tom  
23 Fredericks, Project Manager for Financial Assurance at  
24 NMSS. I wanted to give you a quick overview on what  
25 the situation with the financial assurance and one of

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1 the threads that runs through the legacy sites is that  
2 they find they don't have enough money to clean up the  
3 contamination that they discover is on their sites.

4 And there's really, I think, two parts to  
5 this, this financial assurance. One is to make sure  
6 that there's enough money in the first place or  
7 assurance of enough money. And the second one is to  
8 make sure the money remains available through  
9 bankruptcy if that happens which it does once in a  
10 while.

11 So some of the financial risks that we've  
12 looked at are the inadequate cost estimate and the  
13 initial estimate that they submit to us by the  
14 regulations.

15 Right now, the regulation allows them to  
16 submit an estimate either for a restricted or an  
17 unrestricted release. We plan to change the  
18 regulation to require nonrestricted release cost  
19 estimate based on those assumptions with the  
20 possibility that they could fund for restricted  
21 release if they could demonstrate they meet those  
22 conditions and this extra allowance was required by  
23 the Commission so that if it is possible to do so they  
24 can plan for that.

25 The second thing is bankruptcy. And our

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1 experience is that when a licensee goes bankrupt, the  
2 NRC is in status of an unsecured creditor which puts  
3 us last in line, well, second to last in line. The  
4 shareholders are last. And that leads to some  
5 difficulties because there may not be enough money  
6 left over after the secured credit holders are paid  
7 off to fund the decommissioning. And I'll talk to  
8 some of the things we're going to do about that in a  
9 little bit.

10 Another thing that we're concerned about  
11 is an inadequately-funded license transfer that there  
12 was one case where a company restructured itself and  
13 isolated its liabilities in undercapitalized  
14 subsidiaries, but because they were independent  
15 subsidiaries holding a license, we were unable to get  
16 back to the parent company to reach the money to clean  
17 up. So we want to look more at that.

18 And then there's also the possibility of  
19 increasing costs over time which needs to be  
20 addressed. The other thing and this is the link  
21 between the financial assurance and the operational is  
22 that there are certain operational events that  
23 increase the cost of decommissioning. So when those  
24 happen what we want a licensee to do is to reestimate  
25 and increase the financial assurance.

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1           One of them is spills and particularly  
2           spills that lead to subsurface contamination. In many  
3           cases, the largest cost and the reason that materials  
4           sites, at least, have been unable to fund them is  
5           because there was subsurface contamination and that  
6           they weren't aware of it until they got to the  
7           decommissioning phase. They started doing their  
8           characterization study and then they find they have a  
9           large volume of radioactive soil to dispose of.

10           Facility modifications can change the  
11           extent of contamination, so that should be considered.  
12           And we want periodic updates of cost estimates. In  
13           fact, on this last one, we issued a rule in 2003 to  
14           require the cost estimate to be updated every three  
15           years.

16           In the upcoming rule amendment that we're  
17           going to do and this goes to the next slide, we're  
18           going to codify portions of a regulatory guidance  
19           which will help the licensees to send us an initially  
20           good cost estimate and when they do their updates  
21           they'll be better. We found through experience that  
22           they come close, but they don't follow the guidance as  
23           well as we would like. It leads to delays and we have  
24           to ask more questions.

25           Another thing we're going to do and this

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1 goes to the bankruptcy concern is to require  
2 collateral for certain types of guarantees. There's  
3 about 50 or so licensees at use a self guarantee or a  
4 parent company guarantee. These are guarantees where  
5 the licensee, because of its financial assets or its  
6 parent's company's assets are able to say the  
7 proportion of decommissioning cost in comparison to  
8 our assets is relatively low and therefore, we should  
9 be able to guarantee it ourselves.

10 And so far, we haven't had a problem with  
11 that, but then so far none of those licensees have  
12 come to decommissioning. So we don't know how it will  
13 work in the end. But what we can say, based on the  
14 basis of experience is that if there's a bankruptcy  
15 situation, the parent company guarantee is just a  
16 promise to pay. There's no money behind it  
17 necessarily and when a bankruptcy happens, it's up to  
18 the Bankruptcy Court to decide what money is spent and  
19 for what.

20 In most cases, decommissioning is not an  
21 immediate health and safety concern, so in most cases  
22 the priority of those payments would be relatively  
23 low. That's where the collateral comes in. That  
24 would make the NRC a secured credit holder of the  
25 licensee or perhaps more specifically the standby

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1 trust which will hold the funds will be a secured  
2 creditor.

3 And in the case of a bankruptcy, the Court  
4 would put us on a higher priority to split up the  
5 assets. This is something new with the NRC. It's  
6 going to be an extra burden on the licensees to send  
7 in security agreements. It will be an extra burden on  
8 the Staff because these things have to be maintained  
9 and renewed every five years. But it's a proposed  
10 rule, so I'm sure we'll get some comments on it and  
11 hopefully they will be helpful in focusing our efforts  
12 on this.

13 I mentioned the restricted-use funding all  
14 by trust fund only. In particular, in Part 20, if  
15 there is a restricted use, there needs to be a long-  
16 term care and surveillance fund put aside. Right now,  
17 the regulation will allow any of the financial  
18 mechanisms to be used for that. One of them happens  
19 to be annual appropriations by a government entity.  
20 And there are some others which are things like  
21 letters of credit or guarantees by third party to pay  
22 which we feel may not be very useful in the event that  
23 for a long period of time annual funds have to be  
24 spent because a letter of credit allows the NRC or  
25 somebody to ask the bank for money. The annual

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1 appropriations of the process from the legislature, of  
2 course, has to be done every year which could delay  
3 needed maintenance of the site.

4 So our proposal will be that actual money  
5 be set aside in trust fund and a trustee can authorize  
6 payments as necessary which should make the process  
7 simpler. And we also want to look at the license  
8 transfers to make sure that when they do transfer  
9 control from one licensee to another, that  
10 decommissioning is specifically addressed and there's  
11 enough money with the new licensee to pay for it.

12 And if there are any questions, I'd be  
13 happy to answer them now or later if you have them,  
14 but that's the quick overview of financial assurance.

15 MEMBER CLARKE: Okay, let's have the  
16 questions at the end of the presentation unless there  
17 are any right now for clarification. Thanks.

18 MR. SHEPHERD: Okay, so the other half of  
19 reducing the cost and likelihood of a legacy site is  
20 control contamination. What we intend to do is risk  
21 inform the parts of Part 20 that address this. For  
22 the licensee, we want to improve the spill release  
23 controls, improve the monitoring, if there is an  
24 undetected release, many of which we've seen as part  
25 of the tritium task force.

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1           The systems that we have identified that  
2           have leaked or generally not been amenable to visual  
3           or other standard inspection means, they're  
4           underground or in areas that are not otherwise  
5           accessible. So there needs to be some other way to  
6           determine when events occur.

7           Also, to require remediation, I'll say  
8           promptly, not necessarily immediately, but at some  
9           point when a leak spills contamination of a subsurface  
10          gets large enough, rather than let it continue to grow  
11          over the entire life of the license, to require some  
12          activity on the part of the licensee to reduce the  
13          transport of that material, either by physically  
14          removing it or some kind of an interdiction.

15          On the NRC side, we want to make some  
16          improvements in the inspection program to look more  
17          closely at spill records and occurrences, particularly  
18          repetitive occurrences and where there are issues  
19          identified to revise the enforcement policy as  
20          necessary to address those.

21          The existing requirements in 20.1406  
22          specifically apply to new applicants. Our proposal is  
23          that we would also apply these requirements to certain  
24          existing licensees. Those licensees would be  
25          identified through a risk-informed process to

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1 determine whether a particular licensee or class of  
2 licensees really has the ability to contaminate the  
3 subsurface enough that it will affect their  
4 decommissioning funding.

5 A major step we took in that is called the  
6 General Guidance for Inspection and Enforcement to  
7 Prevent Future Legacy Sites. This is a letter report  
8 we did about a year ago and evaluated 82 operating and  
9 shut down decommissioning sites to identify how much  
10 contamination there was and the potential sources of  
11 that contamination.

12 The current rule says minimize site  
13 contamination. What we would add to that is the  
14 ability to detect the existence of that contamination,  
15 particularly from areas that are not readily amenable  
16 to detection. And as I said that in certain cases  
17 require them, the licensees, to perform remedial  
18 actions when we reach some limit of contamination.

19 In addition to the rule, we would develop  
20 supporting guidance that will help define the  
21 monitoring program. We would begin with a requirement  
22 for an adequate site characterization. One of the  
23 things in the SRM was that we should not develop, in  
24 essence, a research program at every site that it  
25 becomes very expensive for the licensees to implement.

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1 We need to do an intelligent evaluation of what should  
2 be monitored and how often in order to minimize the  
3 cost.

4 In addition to monitoring, there are  
5 things related to sampling, how often do I take  
6 samples, how do I treat the samples, how do I analyze  
7 the samples.

8 Not everyone recognizes that you don't get  
9 a complete spectrum of contaminants by any given  
10 analysis method, for example, with the tritium issue  
11 today, it's fairly easy to detect tritium, but there  
12 are different analyses that need to be done to protect  
13 or detect the other isotopes.

14 And finally, come up with some definition  
15 of action limits. At what point does a licensee have  
16 to do things either entry into the decommissioning  
17 record file, some sort of interdiction or actual  
18 physical extraction of the material or is it just an  
19 increase in the financial assurance in order to be  
20 able to cover the cost at the end of the license  
21 period.

22 Groundwater is the big issue. There will  
23 be some things in the beginning of the guidance to  
24 address leak controls, spill controls inside the  
25 facility. For many licensees, much of that already

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1 exists. The more sophisticated licensees, the large  
2 ones have fresher instrumentation levels, fresh  
3 moisture detectors, sump levels and so on. So the  
4 real issue in the place that the additional guidance  
5 is needed falls outside of the physical boundaries of  
6 the facility.

7 And it will also include things like  
8 storage and process ponds that are just sitting there  
9 outside the facility that have large liquid volumes.  
10 Or perhaps on-site 20.2002 disposals that may have the  
11 potential for contaminating groundwater if they were  
12 to leak.

13 Frequency of sampling is something of a  
14 variable. During normal operations, normal weather,  
15 there will be some frequency, quarterly, semi-annually  
16 or in some cases even annually for background wells.  
17 But there needs to be a plan if we change that  
18 frequency in the event of some occurrence, be it a  
19 natural event. Those of us from around here recognize  
20 that a couple of weeks ago they had what was being  
21 characterized in the newspapers, at least, as a 300-  
22 year storm. That affects the amount of water in the  
23 groundwater, groundwater levels, groundwater flow  
24 paths, interaction with surface water and so on.

25 Seismic events will significantly alter

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1 groundwater flow. So in the event of such an  
2 occurrence, those things need to be change the  
3 frequency of the sampling. Likewise, if there's a  
4 known event, a large spill from a process failure  
5 somewhere, that the frequency of the sapling may need  
6 to be increased in order to determine whether or not  
7 or how much stuff actually got out of the facility.

8 Tom Nicholson in the Office of Research  
9 has a contract to develop a comprehensive groundwater  
10 monitoring strategy and we will use the results of his  
11 study significantly as a part of this guidance and  
12 results of that. And this is a brief summary of the  
13 things in Tom's study.

14 Once we have identified sampling, well  
15 placement is a particular issue. We must characterize  
16 the subsurface well enough to know where in fact the  
17 groundwater is going and under what conditions.  
18 Again, at Indian Point, they believe that the  
19 groundwater that was migrating away from the site  
20 towards the river was intercepted by their discharge  
21 canal. And therefore, it was not a problem. It would  
22 be encountered in the NPEDS and so on.

23 Subsequent analysis in new wells on the  
24 other side of that canal found that, in fact, not all  
25 of the material is being captured by that canal. So

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1 there are issues. What depth do we have the wells?  
2 How do we design the well, large screen, small screen?  
3 How do we sand pack it? What materials should it be  
4 made of so that it doesn't degrade as a result of the  
5 subsurface chemistry or the contaminants that could be  
6 introduced even by the site or that may be introduced  
7 by somewhere else. We have sites where there are dry  
8 cleaning facilities upstream in the TCEs and so move  
9 through the site that could affect the material.

10 There will also be guidance on sample  
11 acquisition. There's the eternal debate of whether  
12 you filter the sample or don't filter the sample. If  
13 you do filter it, when do you count the filter and  
14 what do you do with the number? How large should the  
15 sample be? How should it be preserved?

16 There is a lot of guidance on these topics  
17 already existing. Much of it in the EPA. There are  
18 many, many ANSI standards that address individual  
19 aspects. So we don't intend to generate new guidance,  
20 but to point licensees to a set of existing guidance  
21 that meets the requirements that the NRC feels are  
22 appropriate for these sites.

23 Another thing is what type of analysis  
24 should be done on each sample? As I said, not all  
25 analyses provide all of the information. It's very

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1 expensive to do things like alpha gamma spectrometry  
2 on every sample and it's probably not necessary. So  
3 we do the simpler, less expensive analyses first.  
4 Then there will be some kind of a trigger that says  
5 that we get to a certain point or if there's a certain  
6 trend in the analysis, then we do additional spectrum.

7 The licensees need to have a response  
8 plan. And I believe the emergency plan template, if  
9 you will, is a usable approach where there are certain  
10 contamination levels that will be a function of what  
11 it is that spilled. Is it highly mobile? Is it long-  
12 lived or is it short-lived? That we can set trigger  
13 points and then there will be specific actions that  
14 the licensee should take: increased financial  
15 assurance for things that are not particularly mobile,  
16 there's not a lot of it, but it's above and beyond the  
17 original cost estimate, up to highly mobile nuclides  
18 and large volumes that have the potential for a public  
19 dose off-site. They must actually go out and prevent  
20 the off-site migration of those.

21 On the NRC side, I believe we can modify  
22 our existing inspection program. There's a tendency  
23 to view decommissioning records as something that  
24 becomes important at the time of decommissioning.  
25 What we would like to do is get inspectors to look at

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1 those records as required by 50.75, 40.36 and the  
2 other comparable paragraphs, on a rather regular  
3 basis. It doesn't have to be frequently because we  
4 don't expect large numbers of spills from a facility,  
5 but every year or two or three or five or something  
6 like that, to ensure that the licensee is, in fact,  
7 keeping track of what's going on at the facility.

8 As we increase the on-site monitoring,  
9 there will be more information available as to the  
10 condition of the subsurface and we would like the  
11 inspectors to look at that also.

12 On enforcement, there are requirements for  
13 record keeping and reporting. The trend today is if  
14 something is not a short-term threat to public health  
15 and safety, it is not something that we are going to  
16 focus on. We would like to modify that a little bit  
17 focus on a longer term perspective that with many of  
18 the sites, there is no immediate threat to public  
19 health and safety, but if there are large volumes of  
20 contamination that are not remediated over decades,  
21 they can easily become a public health and safety  
22 threat.

23 CHAIR RYAN: Just a point there if I  
24 might. I guess I can see where some sites might be in  
25 that mode, but I'm not sure a lot would. But to me,

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1 the higher issue is kind of on the financial assurance  
2 side that if it continues on for some period of time  
3 you end up with a bow wave of waste that's real  
4 expensive to dispose and you just don't have -- that  
5 won't happen. So I caution against waving the public  
6 health and safety flag that might happen in the  
7 future, because we'd be hard pressed to -- I mean  
8 think of how many are out there now. Where is the  
9 public health and safety been challenged by a long-  
10 standing legacy site?

11 MR. SHEPHERD: Well, we haven't yet had a  
12 licensee who has physically abandoned the site and  
13 generally speaking for subsurface contamination,  
14 unless a member of the public can physically inhale or  
15 ingest it, it really isn't much of a public health and  
16 safety issue.

17 CHAIR RYAN: That's my point. I just  
18 don't see where that's a valid way to characterize,  
19 but I do very strongly agree it's very valid to say  
20 the financial assurance doesn't get smaller. It's  
21 going to get bigger by the financial obligation.

22 MR. SHEPHERD: Financial obligation.

23 CHAIR RYAN: Right.

24 MR. SHEPHERD: That will increase over  
25 time.

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1 CHAIR RYAN: That to me is the higher  
2 thing, you know, fixing it earlier rather than later  
3 is going to be better for everybody, the licensee and  
4 the regulator. So I just caution on that health and  
5 safety spectrum uncertainty and raising that early  
6 about what it might look like down the line.

7 MR. SHEPHERD: As Drew said, the current  
8 schedule for our proposed rule is in the spring with  
9 a final rule a year later. This is a six-month delay  
10 from the schedule we had at the beginning of the  
11 calendar year, primarily from Part 50 considerations.  
12 As we begin looking at the license termination rule,  
13 our focus was on the materials sites where we actually  
14 have the problems to be addressed and once we started  
15 proposing modifications to Part 20, it occurred to us  
16 that Part 20 applies to reactor licensees also.

17 The reactor world is of the opinion that  
18 their radiological and environmental monitoring  
19 program is adequate. As a result of the recent  
20 identification of tritium releases, NRC has formed a  
21 task force to evaluate what we should do as a  
22 regulator and the industry has also had a fairly  
23 vigorous response. There was an NEI initiative  
24 presented in a public meeting about a month ago that  
25 said, in essence, by the end of July, every operating

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1 reactor site will have a site-specific plan for  
2 subsurface monitoring, groundwater monitoring on-site  
3 and how the results of that will be reported. So in  
4 essence, they pulling rent back inside the fence line.

5 We felt that it would be counterproductive  
6 to go forward with a rule that did not consider all of  
7 the things that came out of both the industry and the  
8 NRC initiatives by trying to either pare out the  
9 applicability to Part 50 or to guess what the results  
10 might be. So again, as Drew said at the beginning our  
11 proposal right now is still net fluid as we're waiting  
12 for the final results from the results of these stamp  
13 courses.

14 So there are some specific things that we  
15 would solicit comments from the Committee on to ensure  
16 that we are properly risk-informing this whole  
17 process, the level of actions, the selection of  
18 licensees to whom it applies. How do we define  
19 mandatory actions? They are basically the three  
20 levels, the financial assurance, interdiction and the  
21 physical remediation.

22 And if you have any thoughts on the  
23 proposals for the decommissioning funding and how we  
24 should go forward with that, we'd appreciate those.

25 What we really want to come up with was

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1 how much should be done and when should it be done?

2 And with that, we'd be pleased to accept  
3 questions, comments.

4 MEMBER CLARKE: Thank you both. That was  
5 a very well-done presentation.

6 Mike, why don't you go first, since you  
7 have to leave.

8 MEMBER CLARKE: And I apologize. I have  
9 to run upstairs to the other building for a meeting,  
10 so this is an interesting approach. One thing that  
11 struck me in kind of the earlier conversation about  
12 financial assurance is if I'm a licensee, and I do all  
13 the right things to show the regulator that I don't  
14 have a lot of risk for legacy type questions or  
15 issues, does my financial assurance obligation  
16 decrease?

17 MR. FREDERICKS: The obligation is based  
18 on a site-specific cost estimate, if your license  
19 possession limits are high enough. If they're fairly  
20 low, you just have a formula amount to provide a  
21 certain amount.

22 So the problems come with the large ones  
23 and site-specific cost estimates. If by means of  
24 minimizing the spread of contamination in your design,  
25 in your operation, you show us that there isn't much

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1 to clean up, then it's not going to cost as much. So  
2 yes, your financial assurance burden would be  
3 decreased.

4 CHAIR RYAN: I think that aspect is  
5 something to really emphasize because licensees, I  
6 believe, and I was a licensee, so I'll tell you from  
7 my own experience, that if I can reduce costs or  
8 financial burden by being proactive and again just  
9 from a general control of materials standpoint, it's  
10 a good thing to do. But if I also get the benefit of  
11 having a reduced financial obligation, I think that's  
12 an incentive that will stimulate licensees to get on  
13 the track earlier rather than later, rather than say  
14 oh, I'll just wait and do it later. If they can say  
15 they won't have as much cost, that might be something  
16 to benefit.

17 You mentioned something else too that I  
18 was going to just touch on quickly and that is license  
19 limit versus limit at risk. If I have 10,000 curies  
20 in a sealed source, that's a whole lot different than  
21 10,000 curies in a 100,000 gallon tank of some liquid.

22 MR. FREDERICKS: Right.

23 CHAIR RYAN: So I would say it's not just  
24 the quantify of inventory, but the physical and  
25 circumstances and all of that that should also play

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1 into some measure of at risk or what is at risk.

2 And all of those characteristics of  
3 underground versus above ground, accessible versus  
4 inaccessible and you know all of those things that  
5 you've touched on through your presentation, hopefully  
6 that would be in the guidance in your design, things  
7 to avoid, things to focus on or lean towards and those  
8 kind of things.

9 MR. FREDERICKS: Yes, they do and the  
10 regulations differentiate specifically between sealed  
11 sources and unsealed sources. And the guidance --  
12 well, some of the guidance we're going to develop for  
13 the operational portions of it for the financial  
14 assurance portions of it. It details that they should  
15 total up all the different areas and extent of  
16 contamination, unit costs multiplied to get the final  
17 cost and one thing we're going to emphasize going  
18 forward is that they need to know what kind of  
19 subsurface contamination they have because we found  
20 that licensees have a tendency to say well, I have no  
21 data to show me that the ground is contaminated.  
22 That's because they didn't look.

23 So we're going to encourage them very  
24 strongly to take a look and if there is subsurface  
25 contamination, use some sort of modeling to give an

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1 estimate of how large that will be in the future. If  
2 nothing else, it will call to their attention that  
3 it's spreading and by forcing them to give us a  
4 number, they can at least thing about well, should I  
5 spend \$100,000 today to dig this up and ship it off,  
6 or should I wait 20 years and perhaps I'll have to  
7 spend \$1 million.

8 So I think just the fact that they're  
9 providing certain information will hopefully trigger  
10 some rational thought process on their part.

11 CHAIR RYAN: And that kind of leads into  
12 my last question or just idea that there's a range of  
13 sites. My own terminology of the very old legacy  
14 sites, stuff that's been around since the '50s and  
15 '60s and they probably have long-standing problems  
16 that have degraded over time, those kind of things to  
17 relatively new sites that might have minor issues.  
18 I'm just wondering how you're going to write a rule  
19 that spans that wide range of potential issues that a  
20 wide variety of facilities and a wide age of  
21 facilities. That's a tough one.

22 But I think it's important to try and at  
23 least sort out how many of the really tough older  
24 sites do you have versus how many licensees and it  
25 leads into the last point which is how does this roll

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1 out to agreement states?

2 MR. FREDERICKS: Okay, well, the agreement  
3 states -- well, in the proposed rule process, of  
4 course, they'll be contacted and I think we've had  
5 some -- the IMS people are more attuned to contacting  
6 them and getting their input.

7 CHAIR RYAN: As we heard, they have 90  
8 percent of the licenses out there. It's a big deal.

9 MR. FREDERICKS: It is and they'll have to  
10 be compatible for the most part with financial  
11 assurance.

12 That's why I raised it. I think that's a  
13 big area to think about up front.

14 MR. SHEPHERD: It certainly is. As we  
15 identify the groups of licensees that are impacted,  
16 there will be some. The ones that come to mind are  
17 things like cobalt irradiators that have large sources  
18 and relatively large volumes of water.

19 CHAIR RYAN: Sure.

20 MR. SHEPHERD: As we found in the tritium  
21 task force, a small crack in the pool can over time  
22 result in a significant release of water and  
23 contamination to the subsurface. And yes, it would  
24 impact a number of those.

25 CHAIR RYAN: Thanks. Thanks, Jim.

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1 MEMBER CLARKE: Thank you, Mike. And let  
2 me just throw out a comment and then I'll bring in the  
3 other Members, but using the trust as the financial  
4 vehicle, especially on a restricted use situation, we  
5 do have some experience with that. The EPA, some of  
6 the Super Fund sites have set up trusts and the ones  
7 that come to mind are the GEMS Landfill in New Jersey,  
8 the Presidio in San Francisco has turned into a park.  
9 I think it was a former DOD facility. And Oak Ridge,  
10 several years ago, set up a Tennessee trust to cover  
11 monitoring surveillance and maintenance for their new,  
12 what's called a RCRA/CRCLA landfill that they were  
13 building to manage cleanup waste. Those are the three  
14 that come to my mind. I know in the interim there  
15 have been some other trust agreements entered into  
16 too.

17 If you haven't looked at that, you might  
18 want to see and how they're doing. Also, I think  
19 there have been some evaluations, the Environmental  
20 Law Institute comes to mind. They might have looked  
21 at this as well. I'm not real sure about that, but I  
22 know there was at one time there was a great deal of  
23 interest in using trusts for the whole stewardship  
24 issue.

25 Ruth?

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1 MEMBER WEINER: Thank you. I have sort of  
2 wide ranging questions. Have you looked at the DOE  
3 legacy sites and have you looked at that for any kind  
4 of examples, guidance, what can be done? What kind of  
5 health risks are associated with legacy sites and so  
6 on?

7 MR. SHEPHERD: We have looked to some  
8 extent at DOE sites, primarily as ground information,  
9 if you will, because of course, we don't regulate the  
10 DOE. So it's a little difficult to say that would be  
11 the basis for regulation on DOE sites.

12 But the kind of --

13 MEMBER WEINER: I was thinking of --

14 MR. SHEPHERD: -- that exists at those  
15 sites, especially during their remediation tends to be  
16 potential for worker exposure and how they go about  
17 things.

18 Generally, I think the DOE sites have more  
19 stuff and nastier stuff because their legacy sites, if  
20 you will, go back to weapons production and several  
21 variations on weapons productions until they found one  
22 that worked. And during the '40s and even the Cold  
23 War in the '50s, the mentality was much we need this  
24 now. If something doesn't work, throw it out in back  
25 and we'll worry about it later. And later didn't come

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1 until about 10 or 15 years ago. And there are not  
2 many things that NRC licenses that have that range of  
3 both chemical toxicity and high levels of radiation  
4 that we have to worry about.

5 MEMBER WEINER: I was thinking more from  
6 a lessons learned and health risk point of view.  
7 Rocky Flats is now and I recognize you don't regulate,  
8 the NRC doesn't regulate them, but it's a good -- it  
9 provides a spectrum of legacy sites, if you will.

10 Rocky Flats, for example, is now  
11 completely gone and the plan is to make that into a  
12 wildlife refuge. Certainly at other sites, Oak Ridge,  
13 Sandia, there's been a fair amount of cleanup from the  
14 Cold War days and it seems to me it just provides  
15 first of all, you can look at these sites. These  
16 sites have been around for more than half a century in  
17 most cases, and see if there has been any risk to the  
18 public or -- and what the risk has been to the  
19 workers. And you might look at that.

20 I'm just curious as to what your take on  
21 that is beyond the fact that yes, they handled more  
22 and generally more toxic stuff, but it's the same kind  
23 of -- it's the same kind of thing. You're looking at  
24 radiological impacts and you have radiological -- you  
25 have a whole raft of legacy sites that have given you

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1 radiological impacts. And I just wondered what -- you  
2 know, how that factors in. I guess you've really  
3 answered the question.

4 MR. SHEPHERD: In writing a regulation  
5 that basically says clean this up, it doesn't have a  
6 large influence because right now we don't say very  
7 strongly clean it up. We're going to say more  
8 strongly clean it up. I think that from what I have  
9 seen, the value of the lessons learned are more to  
10 those who have to figure out how to clean it up which  
11 is probably a detail that would not be in the  
12 regulatory requirement per se. Certainly, I will go  
13 back and reevaluate what we know about DOE sites that  
14 can be factored into the guidance.

15 MEMBER WEINER: That was my point. Also,  
16 it seems to me that with defining, with your proposing  
17 requirements for long-term monitoring and so on,  
18 you're not getting rid of legacy sites, you're  
19 managing legacy sites. What's the difference?

20 MR. SHEPHERD: Maybe semantics. To us, a  
21 legacy site is one that already exists and doesn't  
22 have the resources to adequately remediate. Our goal  
23 here is to preclude that from occurring in the future.

24 So future legacy sounds like an oxymoron,  
25 but what we're really trying to do is not get in the

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1 position where we have sites that can't afford to  
2 clean up by forcing them to clean up more as they go  
3 along so that there isn't a larger bundle left at the  
4 end and in the event that there is a larger bundle  
5 than they reasonably estimated, there would still be  
6 some money available to address that.

7 MEMBER WEINER: So basically you want to  
8 prevent them by assuring enough resources that they  
9 can clean up to some level and then release the site.

10 Are you going to use the SADA monitoring?  
11 I have it here somewhere. It's Spatial Analysis and  
12 Decision Assistance model in any way or are you going  
13 to suggest using it, requiring it, what?

14 MR. SHEPHERD: Well, we certainly would  
15 not require any particular approach of a licensee.  
16 That's one system out there that is developed by the  
17 government and therefore is perhaps less costly than  
18 some of the other monitoring and modeling systems.

19 One of the discussions again in the  
20 context of the tritium task force is the reactor  
21 licensees appear quite willing to go out and do  
22 additional monitoring. They are much more reluctant  
23 to do modeling.

24 Coming from a more research-oriented  
25 background, if you don't have a conceptual model of

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1 your site, how do you know whether you're monitoring  
2 the right stuff in the right place at the right time.  
3 So that's kind of an on-going debate. SADA is one  
4 tool. There are many others out there that could be  
5 used.

6 MEMBER WEINER: I imagine that will be  
7 part of the guidance to ensure that the monitoring is  
8 done in the right place.

9 MR. SHEPHERD: Again, the SRM said don't  
10 go out and establish a research project at each of  
11 these sites which is a fairly accurate description of  
12 what many of the large reactor licensees have done.  
13 They've gone out and drilled literally dozens of holes  
14 all over the site.

15 They don't have the information on which  
16 they base locating those wells.

17 MEMBER WEINER: That's a very good point  
18 because you really would need that. Are you going to  
19 require both upgradient and downgradient monitoring  
20 for groundwater?

21 MR. SHEPHERD: Yes.

22 MEMBER WEINER: Have you had any industry  
23 response to this proposal? I know it's not -- the  
24 proposed rule hasn't been issued yet, but have you had  
25 any feedback on how this --

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1 MR. SHEPHERD: We had a workshop a year  
2 ago and the only comment there was well, we don't  
3 really need these additional rules because we don't  
4 operate like that any more. As Dr. Ryan mentioned,  
5 you know, we've got these older legacy sites and not  
6 operating like that any more isn't a whole lot of  
7 assurance that things won't go wrong.

8 One of the comments NEI made in presenting  
9 their initiative at the public meeting a month ago was  
10 we are doing all of this voluntarily and we do not  
11 expect regulatory creep as a result of it.

12 (Laughter.)

13 Now I have presented this concept at the  
14 last three ANS meetings, so that spans a year and a  
15 half. There's been plenty of opportunity. We haven't  
16 really gotten any strong feedback yet and I suspect  
17 it's more because people haven't actually come to  
18 recognize that this is a requirement that will affect  
19 you and in particular your pocketbook.

20 I think when that registers, we will get  
21 plenty of advice as to how much is and is not needed.

22 MEMBER WEINER: I see, so you can just  
23 wait for that.

24 I was just wondering if you yet had the  
25 argument that this is going to provide an additional

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1 burden and it may be so burdensome that it restricts  
2 development.

3 MR. SHEPHERD: We were anticipating that  
4 argument up until the NEI initiative. And the amount  
5 of monitoring, at least in the one-page outline that  
6 they presented would, we believe, more than likely  
7 meet the majority of the requirements or in some cases  
8 exceed.

9 We're trying to risk inform this thing.  
10 No, you don't have to have 50 wells at every site.  
11 What you do have to have is a good model of the  
12 subsurface so you know where to put a half a dozen  
13 wells that will tell you what the situation is.

14 So we think that the resistance will be  
15 less other than we want to do all of this voluntarily.  
16 We don't want it to be required.

17 Does this rule require a formal backfit  
18 analysis is one of the issues that we're addressing.  
19 One perspective is what we are seeking is additional  
20 information, not necessarily physical changes to the  
21 facility. So is drilling a well when taking samples  
22 periodically a change or is it not a change? We  
23 haven't got a final ruling on that yet.

24 MEMBER WEINER: Thank you.

25 MEMBER CLARKE: Thanks, Ruth. Allen?

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1                   VICE-CHAIR CROFF: I want to follow up a  
2 little bit more on something Ruth has started here.  
3 I can see where a -- that the financial assurance  
4 requirements that were discussed a little bit earlier  
5 would provide at least an implicit driver for a  
6 licensee to not release something to start with. In  
7 other words, to take measures to make sure they don't  
8 release something.

9                   Do you foresee anything more explicit in  
10 the proposed rule to encourage them not to look at  
11 their facilities, look at how their operations and how  
12 they conduct them and so as to, so as to improve  
13 release prevention, if you will, and somehow, you  
14 know, to give them a carrot to do so by, you know,  
15 factoring that into the financial assurance  
16 requirements?

17                   MR. SHEPHERD:        The, the explicit  
18 requirement has to do with minimizing contamination,  
19 which can be directly related to disposal cost, be it  
20 now or later.           I'm not sure, in terms of an  
21 incentive that we have something in the equivalent of,  
22 if you only release a small fraction of, of some  
23 limit, you know, you get an attaboy every month and  
24 if, once you collect enough attaboys, you can, you can  
25 decrease your financial assurance by some percentage.

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1 I don't know exactly how we would do that.  
2 You know, regulations are more of thou shalt nots,  
3 rather than we'll reward you for doing stuff above and  
4 beyond the requirement.

5 Any suggestions you have on what those  
6 incentives might be, we can certainly think about.

7 VICE-CHAIR CROFF: I'm, going back to the  
8 risk triad, I'm, you know, I'm looking for something  
9 in there that maybe encourages or maybe even requires  
10 some discussion of the probability of a release,  
11 probability that it occurs. And maybe the consequence  
12 or the magnitude also.

13 I'm thinking out loud here, but, you know,  
14 requiring some degree, some amount of information on  
15 what, you know, well, the probability and the  
16 consequence to get them thinking about gee, you know,  
17 maybe if we, maybe if we put something under this  
18 tank, you know, a catch pan or whatever, or line the  
19 room, a particular room or facility with welded  
20 stainless steel of three feet, it would make a release  
21 essentially impossible. And thereby, and of course  
22 the carrot they might see is some, you know, factoring  
23 that in to the financial assurance requirements, if  
24 the probability's essentially nil, well, that gets  
25 them to, you know, that gets, I would say the

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1 regulator and the environment to the place they want  
2 to be and maybe gets the licensee to the place they  
3 want to be, lower cost.

4 That's just one idea. But, I guess what  
5 I'm suggesting overall is moving sort of further back  
6 up the pipeline, if you will, and trying to factor  
7 something in so to encourage measures to prevent  
8 releases, you know, thus eliminating the possibility  
9 of a legacy and the need to consider it.

10 MR. FREDERICKS: Well, one idea that we're  
11 thinking sort of along those lines, with, you know,  
12 probability of release and risk, is that we're going  
13 to ask for comment in the proposed rule on the idea of  
14 having some sort of accident insurance required.  
15 Which is required for reactors, but not for material  
16 sites. And, to that extent, if there was some  
17 financial incentive, you know, if you have to get  
18 insurance, your costs would presumably be lower if you  
19 could show your insurer that the likelihood of a claim  
20 was low.

21 VICE-CHAIR CROFF: Yes.

22 MR. FREDERICKS: But at the same time, we  
23 have to recognize that back in the mid-eighties, the  
24 agency considered requiring insurance for material  
25 sites and after seven or eight years, the conclusion

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1 was that we would not require it because the number of  
2 instances where insurance would have been helpful was  
3 low enough to where it didn't seem worth the cost to  
4 the industry.

5 So, because of that background, we don't  
6 want to propose a rule right now, but we do want to  
7 ask comment on it and perhaps see if the issue is  
8 worthy of being reopened. But sort of requiring  
9 insurance, the long-standing tradition, at least, for  
10 decommissioning is that decommissioning funds are not  
11 intended to include any sort of accidental clean-up.  
12 They're intended to just clean up what happens in your  
13 normal operations. And part of our experience is if  
14 your normal operation includes some chronic leakage  
15 into the ground, well that's going to be very  
16 expensive, so that's -- what we're trying to do now is  
17 to stop those relatively low releases over a long  
18 time, which I guess kind of steps away from what's the  
19 probability of release to well, look for where the  
20 releases are occurring and try to stop them. Because  
21 we think they are occurring. It's just they're so  
22 small, licensees don't take very much notice of them.

23 VICE-CHAIR CROFF: Well, I think maybe  
24 some of the tools that you mentioned earlier, you know  
25 where you were considering site specific inventory,

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1 site specific situations, you might be able to reach  
2 far enough with those to maybe accomplish this, at  
3 least in part.

4 MR. SHEPHERD: Well, it might be an eye  
5 opener if, if the licensee is required to at least  
6 look and find out what's underneath.

7 VICE-CHAIR CROFF: Okay. Thanks.

8 MEMBER CLARKE: Thank you Allen, Professor  
9 Hinze?

10 MEMBER HINZE: A few questions, comments  
11 or concerns not in any priority or order, but in the  
12 order in which you made your presentation.

13 First of all, regarding the funding and  
14 following up on Dr. Weiner's comments about lessons  
15 learned. What is the history of the validity of the  
16 cost estimates that have been made about  
17 decommissioning?

18 MR. FREDERICKS: Or, to rephrase, what is  
19 the final cost as compared to the estimated cost.

20 MEMBER HINZE: Right. The actual cost,  
21 right.

22 MR. FREDERICKS: Well, I think as a first  
23 approximation, well, I want to divide them into two  
24 categories. There are those that have relatively  
25 small possession limits, so there's a formula that

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1 says, if you have this amount, you put aside a certain  
2 amount of money. Those have not, in general, been a  
3 problem up to this point in time, even though in some  
4 cases --

5 MEMBER HINZE: Excuse me, Tom, but is  
6 that, is that a formula that the NRC has or is that an  
7 industry or a --

8 MR. FREDERICKS: It's a, it's the NRC  
9 formula. If you have, it's based on Appendix D to  
10 Part 30. If you have certain multiples of those  
11 numbers, you put aside a certain amount of financial  
12 assurance. For example, up to a million curies of  
13 Cobalt-60 in sealed form, you have \$113,000.

14 MEMBER HINZE: Okay.

15 MR. FREDERICKS: That sort of thing.  
16 Those, in general, have not been a problem in the  
17 past.

18 As for the sites that have the funding  
19 plans, I don't think we really have very much  
20 information on those from material sites, because we  
21 don't require a final number from them, only an  
22 estimate. And, it --

23 MEMBER HINZE: Do you review that  
24 estimate?

25 MR. FREDERICKS: We do review the

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1 estimate, for reasonableness. We'll look at things  
2 like unit cost, you know, how many dollars an hour do  
3 you pay for an HP. How many dollars do you pay to  
4 drive a truck to a burial site, and if the volume  
5 estimate is reasonably correct, then, you know, we  
6 think we, they're probably reasonably correct on the  
7 estimate.

8 MEMBER HINZE: So the track record is  
9 pretty good is what you're saying.

10 MR. FREDERICKS: In most cases. MEMBER  
11 HINZE: What are the cases where it hasn't been good?

12 MR. FREDERICKS: Well, there's one or two  
13 probably where we think that the numbers are much  
14 higher than the licensee has given us. And Jim knows  
15 this better than I. Sequoia Fuels is one where we're  
16 sure that's, and in fact they're actually sure that  
17 it's probably in the \$80 million range, but for  
18 complicated reasons they have only insured \$10  
19 million.

20 Another one is Fan Steel, where they have  
21 given us cost estimate of \$42 million. We think it is  
22 probably much higher than that. It depends though on  
23 your assumptions on the extent of contamination. And  
24 that's where the usual problem is. We had a  
25 contractor look at the Fan Steel site. Their

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1 assumptions are if you have no data showing that it is  
2 clean, we're going to assume that contamination has  
3 spread. The licensee says if you have no data to show  
4 that it is contaminated, we're going to assume that it  
5 hasn't spread.

6 And in this case the licensee was in  
7 bankruptcy, so spending money on characterization was  
8 not as important as spending money to clean up known  
9 spots of contamination. And in that process, as they  
10 do more surveys, we'll find out where it has spread.

11 MR. SHEPHERD: But the data we have on  
12 several of the decommissioning reactors that had  
13 reached either a license termination or at least the  
14 point they intended to be shrinking their site down to  
15 the spent fuel storage, typically, the actual cost  
16 exceeds the estimated cost. The numbers that I know  
17 about range from \$25 to \$100 million, actual versus  
18 estimated. The licensees have in some form or another  
19 come up with the money and successfully  
20 decommissioned.

21 But I think the answer to your questions  
22 is the numbers that we get for decommissioning cost  
23 estimates either early in the license or in the  
24 decommissioning process tend to underestimate the  
25 actual cost.

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1 MEMBER HINZE: If you discern that, then  
2 what do you do? What does the NRC do?

3 MR. SHEPHERD: Well, in reactor space we  
4 don't do anything. There's no requirement that they  
5 update their funding or their funding plan. There is  
6 a formula in 10 CFR 50.75 that says that you multiply  
7 this number times the power of your reactor and that's  
8 as much financial insurance you have to have and come  
9 up with that. Thus far, since no one has said we have  
10 to stop decommissioning, no reactor has said we have  
11 to stop decommissioning because we don't have enough  
12 money.

13 The NRC hasn't done anything and hasn't  
14 really had any motivation to do anything because the  
15 process has been completed. In the materials side,  
16 there are more circumspect disposals at places like  
17 Envirocare, the prices can vary significantly from one  
18 licensee to the next depending on the volume of  
19 material they're disposing, how good friends on the  
20 boards are and all of that.

21 So we don't really have good estimates of  
22 the actual costs for many of the materials licensees  
23 that have, in fact, completed decommissioning. The  
24 ones that I know about again the actual costs have  
25 exceeded the estimates. One I can think of a few

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1 years ago of Texas Instrumentals in Attleboro. Their  
2 original estimate was I think \$750,000. They didn't  
3 have much contamination.

4 It turns out that they had disposed of  
5 things like contaminated duct work and what is, in  
6 fact, an onsite disposal. And their actual costs were  
7 somewhere in the \$4 to \$5 million range. They didn't  
8 like it. It certainly affected the company's  
9 financial arrangements for several years, but they did  
10 in fact pay it. And now the license is done and they  
11 are still financially solvent.

12 MR. FREDERICKS: Jim, if I can add to  
13 that. Some things we're considering in the proposed  
14 rule are to have the licensee as part of its license  
15 termination plan, or I should say license termination  
16 to give us the actual cost of decommissioning as  
17 completed, so in the future we can start disassembling  
18 a data base to find out.

19 And for material sites, the rule is also  
20 going to require that they compare their actual costs  
21 to their estimated costs as they're going on and if  
22 they actuals start exceeding the estimated, then to do  
23 what is necessary to fund the extra cost.

24 MEMBER HINZE: Is there a built-in  
25 inflation factor and is there any relationship between

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1 the national inflation factor and these increasing  
2 costs?

3 MR. FREDERICKS: Well, to the first  
4 question we require an update every three years. That  
5 should take care of that. We don't require any  
6 specific cost inflater.

7 MEMBER HINZE: I see. Going on then, I  
8 was pleased to hear you talk about clean up prior to  
9 decommissioning.

10 I was wondering, Jim, what kind of  
11 criteria are you going to use to suggest or insist  
12 that this clean up prior to decommissioning actually  
13 takes place? How do you teach them that?

14 MR. SHEPHERD: Probably the most  
15 challenging aspect of the guidance is how do we do  
16 that? Things that will be considered in addition to  
17 the obvious volume of the material will do with half  
18 life of the material, if it is going to be around for  
19 a long. Mobility of the material. Amenability of the  
20 site- specific conditions to either transport or  
21 retain the material over a long period of time.

22 There is one site that has fairly  
23 significant uranium contamination subsurface and by  
24 their estimates if they did nothing, it would migrate  
25 offsite in excess of EPA limits 30 micrograms per

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1 liter in a matter of 50 to 100 years. Their solution  
2 is basically redox. We're going to change the  
3 subsurface chemistry by adding molasses and therefore  
4 we will bind the material and retain it onsite.

5 As long as they are an operating licensee,  
6 that would probably be an acceptable solution. What  
7 we need to recognize, of course, is that redox is a  
8 reversible reaction and after they terminate the  
9 license, unless there is a condition in the transfer  
10 of the property that says, you know, you have to have  
11 three cases of Aunt Jemima's that you pour down the  
12 hole every month, it would no longer do what they said  
13 it was going to do. So it's a very complicated issue.  
14 Half life and concentration in volumes are difficult  
15 to come up with. Any suggestions you have --

16 MEMBER HINZE: But it seems to me you're  
17 really walking a fine line here. You want to make it  
18 restrictive to make certain that they really take care  
19 of it. But if you make it too restrictive, you're not  
20 going to cover all of the possibilities. It has to  
21 have restrictions in there, and yet it must have a  
22 sufficient amount of breadth or alternatives to permit  
23 you to cover all of the possible occurrences.

24 You know, I think that's the kind of  
25 wording that you need to get in. You need to get both

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1 sides of that.

2 MR. SHEPHERD: One approach is simply send  
3 us a plan we'll do an evaluation on a site-specific  
4 basis. Because it is much easier to expound in  
5 guidance than it is to in actual regulatory language.  
6 We can go through a whole bunch of if, then, else type  
7 of logic to decide what should be done and when, if we  
8 have enough information. But it is extremely  
9 difficult to do that in a rule that really should be  
10 limited to a few sentences, to a few paragraphs, and  
11 not go on for pages and pages.

12 MEMBER HINZE: Well, maybe the key to that  
13 is your -- first, the blue line there -- risk  
14 informing the process. If you can do that, you've  
15 made giant strides. A few questions or comments about  
16 monitoring. I'm a great baseliner. I think  
17 baselining is extremely important. And one of the  
18 things that concerns about the hydrologic aspects of  
19 this is that that this is not necessarily a static  
20 situation.

21 It's a dynamic situation and you were kind  
22 enough to point that out in your opening remarks. And  
23 I've wondered if you thought about in terms of site  
24 characterization, for example, of giving any guidance  
25 as to the time period over which you monitor for

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1 baseline parameters. Have you thought about that at  
2 all?

3 MR. SHEPHERD: I have. In reactor space,  
4 again, and there's a requirement essentially for two  
5 years of environmental monitoring prior to approval of  
6 the site for construction.

7 MEMBER HINZE: I didn't realize that.

8 MR. SHEPHERD: That would be a useful  
9 starting point.

10 MEMBER HINZE: Yes.

11 MR. SHEPHERD: And I agree. We talk a  
12 little bit about conceptual models that before a  
13 facility is constructed, there should be a baseline  
14 established of what is the underlying hydro  
15 sphertigraphy, but by virtue of the fact that you know  
16 put anywhere from several hundred to several million  
17 tons of steel and concrete on that system, you offered  
18 it. It's the macro of Heisenberg's principle.

19 You can't assume that the monitoring wells  
20 that gave you all of the necessary information before  
21 you built the plant are in fact going to monitor what  
22 they were monitoring after you build the plant. So  
23 whatever the groundwater change will do, it is not  
24 going to come down to a facility, turn 90 degrees,  
25 turn 90 degrees, come back again and go the same it

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1 was before.

2 So that model has to be modified after you  
3 construct the plant. In fact, in the workshop one of  
4 the comments was, and I can't remember which facility,  
5 said they had noticed an actual reversal of the flow  
6 of groundwater as a result of site operations. They  
7 did not have enough information recorded to say when  
8 that occurred, only that when they compare the current  
9 data with the preconstruction data, the groundwater  
10 will be falling in different directions.

11 MEMBER HINZE: Well, it's obvious that  
12 you're on top of that.

13 MR. SHEPHERD: That is certainly thought  
14 about. It's a time limit issue. For a minimum time  
15 to establish baseline is something we should --

16 MEMBER HINZE: And some guidance regarding  
17 that.

18 MR. SHEPHERD: -- keep in mind.

19 MEMBER HINZE: Not just a set time, but  
20 construction and so forth. I was pleased to hear you  
21 talk about involving Tom in a sampling strategy and so  
22 forth for the monitoring. How do you envision this in  
23 terms of detailing the methods for monitoring and I'm  
24 going to signal here that I'm concerned about too much  
25 monitoring. I'm concerned about invasive procedures

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1 for monitoring, which may upset in fact the hydrologic  
2 scheme and I'm wondering about your interest and your  
3 acceptability of the things that are coming down the  
4 pike and that will come down the pike in terms of not  
5 invasive types of monitoring procedures.

6 MR. SHEPHERD: Well, we certainly do not  
7 want to establish --

8 COURT REPORTER: Excuse me, sir. Could  
9 you please raise your microphone?

10 MR. SHEPHERD: We do not want to establish  
11 a monitoring program that in effect serves as  
12 remediation by monitoring. Once we have an adequate  
13 characterization and conceptual model of the site,  
14 routine monitoring should be fairly minimal. In terms  
15 of how we would specify actual techniques, as I've  
16 mentioned there are many, many standards out there, be  
17 there ANSI standards, EPA guidance, and so on.

18 So we don't intend to start from scratch,  
19 but rather to provide a filter. In fact, there are so  
20 many out there I think it is almost impossible for  
21 anyone to really say yes, I'm going to give you this  
22 one as opposed to that one over there, because there  
23 are some differences among them.

24 MEMBER HINZE: I think that goes back to  
25 a question or a comment that Dr. Weiner had. These

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1 regulations and guidance have a longevity which  
2 exceeds that of scientific advances. And I really  
3 would endorse allowing alternatives that permit the  
4 applicant, or the operator, to suggest alternatives  
5 and let this be evaluated. And those kinds of caveats  
6 to the guidance I think are in everyone's best  
7 interests because really you end up with better  
8 information or whatever.

9 Let me, you talked about the inspection  
10 and the record keeping and all of that. Is the idea  
11 here to have some type of quality assurance or audits  
12 on a regular basis or an irregular basis? What's the  
13 idea here?

14 MR. SHEPHERD: Well, the current  
15 requirement and give me just a moment and I can quote  
16 you two of them, is that licensees record certain  
17 types of events that spill material into the surface.  
18 But it is not clear what those should be. There's a  
19 lot of flexibility. On the materials side, it says  
20 "When contamination remains after clean up, that there  
21 should be an entry made in the decommissioning records  
22 that includes information about that spill," but it  
23 really doesn't say exactly what.

24 On the reactor side, it says "When  
25 significant contamination after clean up procedures

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1 remains." So there isn't much out there that is  
2 definitive as to what should be in these records. I  
3 think a QA audit is probably too strong a statement  
4 for what we intend the inspectors to do at this point.  
5 But the tendency today is that inspections and  
6 operating plants tend to focus on operating issues.  
7 In most plants, there are plenty of those to keep  
8 inspectors busy and they tend not to look at the  
9 decommissioning related stuff until decommissioning is  
10 imminent.

11 What we're looking for is an indication  
12 that the licensee is, in fact, recording things. We  
13 need to say what we mean by significant and after  
14 clean up.

15 MEMBER HINZE: You need a triple layer  
16 there to initiate things.

17 MR. SHEPHERD: Exactly. Right. We need  
18 some kind of criteria that is readily understandable  
19 what things get recorded. We have the inspectors look  
20 at the records. We don't expect these events to occur  
21 monthly or quarterly. So they don't need to look at  
22 the records on every inspection but every few years to  
23 see if there is any entries at all. If there are zero  
24 entries, does that mean we've had perfect operations?  
25 Or maybe perfect clean up afterwards? Or does it mean

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1 that there aren't entries being made that should be  
2 made?

3 MEMBER HINZE: This is to your advantage,  
4 but it is also to the operators' advantage to have  
5 better guidelines.

6 MR. SHEPHERD: We believe so.

7 MEMBER HINZE: Three's one more thing  
8 about this monitoring and I'm sure just chatting with  
9 you, I'm sure you're on top of that. But one of my  
10 concerns is that this long-term monitoring not just be  
11 essentially right at the fence line. That gives you  
12 very little opportunity for doing something before you  
13 have a real problem. And that monitoring, I'm sure  
14 the strategy that you're going to develop will  
15 incorporate that.

16 Jim, you have focused here on the hydro  
17 aspects of it. But one of the things that very much  
18 struck me and still bothers considerably as a result  
19 of a recent visit to West Valley is landscape  
20 evolution. The long-term landscape evolution and  
21 material sites. I think there's a real need here to  
22 consider that as a potentially critical topic. There  
23 are a lot of programs, models for this, for landscape  
24 evolution, and they are not all of equal value,  
25 particularly at specific sites based on their

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1 environment.

2 MR. SHEPHERD: Are you talking about the  
3 creek erosion?

4 MEMBER HINZE: Right. All of this kind of  
5 thing. This could be I think this is something that  
6 you probably need to cover. And finally, this was  
7 brought up by Dr. Ryan, it seems to me that there is  
8 a potential world of difference between reactor  
9 material sites. And you're writing guidance here for  
10 both and from just a hydro geology aspect of it, there  
11 could be quite a difference.

12 You're going to have to be very flexible,  
13 very deft at moving around to accomplish both without  
14 impairing the other. And I guess I worry about that,  
15 impairing the other or not covering everything.

16 Have you given any thought to evaluating  
17 this in terms of differentiating between sites based  
18 upon their use, materials versus reactor or their  
19 hydro geology or their environment or whatever?

20 MR. SHEPHERD: Yes, I've given a lot of  
21 thought to it. I think that issue becomes a little  
22 simpler as you look from the bottom up literally. If  
23 you're in the ground and there is something above, it  
24 doesn't really matter whether the NRC calls it a part  
25 30, 40, 50 or 70 license. First, we want to risk

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1 inform and say we're going to focus on those licensees  
2 that have the ability to put stuff underneath. So  
3 we're not going to worry too much about sealed  
4 sources, well loggers, x-ray and so on.

5 We're going to look at things that by and  
6 large have large liquid volumes and have isotopes that  
7 have a long enough half-life that they could present  
8 either a worker or a public health issue. When I'm  
9 characterizing a site, what I'm looking for is the  
10 flow paths within the ground, both horizontal and  
11 vertical. And what kinds of isotopes are mobile in  
12 the site-specific hydro geology, geochemistry, and all  
13 of those kinds of things. And I think if we focus on  
14 the process of moving contamination around, the  
15 distinction between the Part 50 and the other  
16 licensees is somewhat reduced. But certainly, your  
17 point is well taken that we have to be very careful  
18 not to either overburden or overlook aspects based on  
19 license title.

20 MEMBER HINZE: Thank you very much.

21 MEMBER CLARKE: Thanks, Bill. That was a  
22 good comment and I think the other thing that we heard  
23 was there's a range of old sites where you know there  
24 are legacy sites, to relatively new sites, to even  
25 possibly brand new sites. And that strikes me as an

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1 issue as well. I think we would be interested in how  
2 you want to manage the flexibility, how you might do  
3 that.

4 We've reached the appointed hour, but I  
5 think -- Mike Lee, did you want to add something?

6 MR. LEE: Thank you. Last May the ACW had  
7 a low-level waste working group meeting on commercial  
8 low-level waste management practices. One of the  
9 speakers was a representative of the Entergy Utilities  
10 Group. And he noted that in response to the Sarbanes-  
11 Oxley Act of 2002, utilities, at least his utility,  
12 was in the process of assessing what its liabilities  
13 were in terms of waste management issues.

14 And I'm not an expert in that act, but I  
15 believe that it applies to principally or primarily  
16 public utilities or publicly owned corporations. So  
17 it seems right now that the hammer is out. If this  
18 gentleman is speaking correctly that publicly owned  
19 corporations should right now, in terms of corporate  
20 governance, be assessing what their liabilities are in  
21 terms of their operations.

22 So in the context of materials licensees,  
23 and I don't know how many are publicly owned or traded  
24 at least from the utilities perspective that folks out  
25 there right now should be looking at what their

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1 liabilities are and ultimately this works into  
2 financial assurance and issues like that.

3 Has that come up in your discussions at  
4 all with people or the industry or the stakeholders?

5 MR. FREDERICKS: Not very much really. If  
6 you look at some of the annual reports on some of  
7 these licensees, even licensees in some financial  
8 trouble, in many cases I kind of struck at how candid  
9 they are at what the risk is. They say we have told  
10 the NRC or we have estimated \$40 million. The NRC,  
11 you know, the number may be higher or lower than this  
12 depending on regulatory action and it is uncertain.

13 What we're trying to do is get the  
14 licensees to recognize what they sometimes don't want  
15 to know which is how much, which is to do a better job  
16 on site characterization mainly and look at sub-  
17 surface contamination because there's an incentive for  
18 them not to know that. And that incentive is that  
19 every dollar that they find in environmental  
20 obligations is a dollar of liability that affects them  
21 because it will reduce their ability to borrow money  
22 to operate the business.

23 MR. LEE: I think this comes to the heart  
24 of what this act is calling for is that if regardless  
25 of what your business is, if you have liabilities out

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1 there that is going to affect your profitability and  
2 you have an obligation now from the Enron experience  
3 to accurately report to your stakeholders what your  
4 liabilities are.

5 And in the case of materials licensees or  
6 the utilities that they have an obligation now to  
7 accurately report how much waste they have to manage  
8 and what the costs of that management ultimately is  
9 going to be. So it seems somehow you may want to  
10 speak to the Office of General Counsel to see if  
11 you've got an additional hook now to begin to work  
12 this proposed guidance through.

13 I think this legislation, if it is being  
14 interpreted the way we were lead to believe, folks  
15 should be doing this right now regardless of what NRC  
16 says.

17 MR. FREDERICKS: Well, they do it. But as  
18 I say, they also say that this is uncertain. That  
19 pretty much satisfies Sarbanes-Oxley by saying we have  
20 an obligation, we think it is this much but we could  
21 be wrong. We want them to be closer to right.

22 MEMBER CLARKE: Thank you. Thank you both  
23 and Drew and back to your Mr. Vice Chairman.

24 VICE-CHAIR CROFF: Thank you very much.  
25 Thanks to all of you for very interesting presentation

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1 and hope at least some of our comments will be useful  
2 to you.

3 At this point, we're going to take a ten  
4 minute break to 10:15. We will reconvene and close  
5 session here in this room and will not reconvene in  
6 open session until 1 o'clock this afternoon here. And  
7 with that, thank you and see you in a few minutes.

8 (Off the record.)

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CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on  
Nuclear Waste  
172<sup>ND</sup> Meeting

Docket Number: n/a

Location: Rockville, MD

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.



Lindsey Barnes  
Official Reporter  
Neal R. Gross & Co., Inc.

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**PREVENTION OF LEGACY  
SITES IN THE FUTURE**

**PROPOSED RULEMAKING**

PRESENTED TO ACNW

JULY 19, 2006

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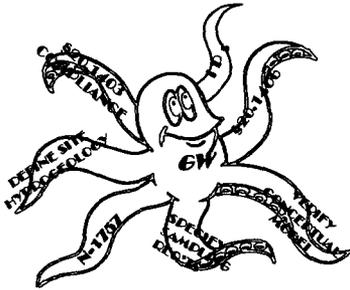
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**SCOPE AND PURPOSE**



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**OUTLINE**

- BACKGROUND
- FINANCIAL ASSURANCE
- CHANGES TO 10 CFR 20.1406
- GUIDANCE TO SUPPORT RULEMAKING

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### BACKGROUND

- LICENSE TERMINATION RULE ANALYSIS
- LEGACY SITES DEFINITION
- PROPOSED NRC ACTIONS
  - FINANCIAL ASSURANCE
  - FACILITY OPERATIONS

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### Financial Assurance

- RULEMAKING TO REDUCE FINANCIAL RISK
  - INADEQUATE INITIAL COST ESTIMATE
  - BANKRUPTCY
  - INADEQUATELY FUNDED LICENSE TRANSFERS
  - INCREASING COSTS
- RISK-INFORM OPERATIONAL COST INDICATORS
  - SPILLS
  - SUBSURFACE (GROUNDWATER) CONTAMINATION
  - FACILITY MODIFICATION
  - REQUIRE PERIODIC UPDATES TO COST ESTIMATES

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### Financial Assurance (cont.)

- ADDITIONAL PROTECTION
  - CODIFY PORTIONS OF REGULATORY GUIDANCE
  - REQUIRE COLLATERAL FOR SELF AND PARENT GUARANTEES
  - HIGHER NRC PRIORITY FOR BANKRUPTCY FUNDS
  - RESTRICTED USE FUNDING BY TRUST FUND ONLY
  - ADEQUATE DECOMMISSIONING FUNDING FOR LICENSE TRANSFER

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**RISK INFORM PART 20**

- REVISE CONTAMINATION CONTROL
  - MONITORING
  - REMEDIATION
- IMPROVE NRC OVERSIGHT
  - INSPECTION
  - ENFORCEMENT

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**PROPOSED §20.1406 REVISIONS**

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| <ul style="list-style-type: none"><li>• EXISTING REQ'TS<ul style="list-style-type: none"><li>- NEW APPLICANTS</li></ul></li><br/><li>- MINIMIZE SITE CONTAMINATION</li></ul> | <ul style="list-style-type: none"><li>• STAFF PROPOSAL<ul style="list-style-type: none"><li>- NEW APPLICANTS AND <u>CERTAIN EXISTING</u> LICENSEES</li><br/><li>- <u>DETECT</u> &amp; MINIMIZE CONTAMINATION</li><li>- PROMPT REMEDIAL ACTION TO LIMIT MIGRATION, IF APPROPRIATE</li></ul></li></ul> |
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**SUPPORTING GUIDANCE**

- DEFINE MONITORING PROGRAM
  
- DEFINE SAMPLING PROGRAM
  
- DEFINE "ACTION LIMITS"

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### **GW MONITORING PROGRAM**

- SITE HYDRO-GEOLOGY
  
- MONITOR LOCATIONS
  
- FREQUENCIES

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### **RESEARCH SUPPORT**

- OFFICE OF RESEARCH CONTRACT TO DEVELOP COMPREHENSIVE, GROUND-WATER MONITORING STRATEGY TO:
  - DETECT CONTAMINANTS
  - EVALUATE PREFERENTIAL PATHWAYS
  - QUANTIFY GROUND-WATER BEHAVIOR
  - AID IN CONFIRMING CONCEPTUAL MODELS
  - COMMUNICATE RESULTS TO DECISION MAKERS AND STAKEHOLDERS THROUGH EFFECTIVE DATA MANAGEMENT, ANALYSIS, AND VISUALIZATION

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### **SAMPLING**

- WELL NUMBER AND PLACEMENT
  
- WELL DESIGN
  
- SAMPLE ACQUISITION
  
- SAMPLE ANALYSES

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### ACTION LIMITS

- DEFINE LICENSEE RESPONSE PROGRAM
  - CONTAMINATION LEVELS
  - ACTIONS

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### NRC OVERSIGHT

- INSPECTIONS
  - DECOMMISSIONING RECORDS (SPILLS, ETC.)
  - "ENVIRONMENTAL" MONITORING DATA
- ENFORCEMENT
  - RECORD KEEPING
  - REPORTING

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### SCHEDULE

- CURRENT SCHEDULE
  - PROPOSED RULE: 3/07
  - FINAL RULE: 3/08
- DELAY FROM PART 50 CONSIDERATIONS
  - RADIOLICAL ENVIRONMENTAL MONITORING
  - TRITIUM RELEASES
    - NRC ACTIONS
    - INDUSTRY ACTIONS

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**SPECIFIC ISSUES FOR COMMENT**

**☐ DEFINE PARAMETERS**

- RISK INFORMING THE PROCESS
- DEFINE MANDATORY REMEDIAL ACTIONS
- DECOMMISSIONING FUNDING

**☐ DEFINE VALUES**

- HOW MUCH
- HOW SOON

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**THE END**

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