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UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON NUCLEAR WASTE

October 20, 2004

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE

(ACNW)

154TH MEETING

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WEDNESDAY,

OCTOBER 20, 2004

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ROCKVILLE, MARYLAND

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The Advisory Committee met at 10:00 a.m. in the Auditorium of the Nuclear Regulatory Commission, Two White Flint North, 11545 Rockville Pike, Dr. Michael T. Ryan, Chairman, presiding.

COMMITTEE MEMBERS PRESENT:

MICHAEL T. RYAN, Chairman

JAMES CLARKE, Consultant

ALLEN G. CROFF, Member

RUTH F. WEINER, Member

ACNW STAFF PRESENT:

JOHN T. LARKINS, Executive Director

MICHAEL LEE

ACNW STAFF PRESENT (Continued):

LATIF HAMDAN

RICHARD K. MAJOR

ALSO PRESENT:

ROBERT L. JOHNSON

CHRIS McKENNEY

JAMES L. RUBENSTONE, Ph.D.

KING STABLEIN

MARK THAGGARD

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P R O C E E D I N G S

(10:08 a.m.)

CHAIRMAN RYAN: Good morning. The meeting will come to order, please.

This is the second day of the 154th meeting of the Advisory Committee on Nuclear Waste.

My name is Michael Ryan, Chairman of the ACNW. The other members of the committee present are Ruth Weiner and Allen Croff.

During today's meeting the committee will hear an update on the status of the license termination rule from the NRC staff, receive an update on the consolidated issues resolution status report from the NRC staff, and continue its discussion of potential topics for inclusion in the 2005 ACNW action plan.

Mike Lee is the designated federal official for today's initial session.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. We gave received no written comments or requests for time to make oral statements for members of the public regarding today's sessions. Should anyone wish to address the committee, please make your wishes known to one of the committee's

staff, and it is requested that speakers use one of the microphones, identify themselves, and speak with sufficient clarity and volume so that they can be readily heard.

Our opening presentation today is an update on the status of the license termination rule, and Robert Johnson is here to make that presentation.

Welcome and thank you for being with us.

MR. JOHNSON: Okay. Thank you. It's a pleasure to be here. I just have to get my mic situated. I guess that will give me some flexibility. Can everyone hear me?

Okay. I'm going to try to use this advancer, but if I skip ahead real fast, let me know. Like that, yeah. It's really touchy.

Okay. Just an outline for this morning's briefing. It has been, I think, since May of 2003 that I briefed you last on the license termination rule issues, and at that time it was the results of our analysis, and so I want to go through some background just to fill in the gap in time, and there are some new folks that may not have had that background.

I'd like to talk about accomplishments in FY 2004, and our plans for upcoming activities during

2005 to 2007 with respect to the LTR analysis actions.

And then just to give you some more in depth idea of how we're implementing some of the actions, we'll go through a couple of site specific examples.

And then lastly, to end it, we'll throw out some ideas for potential ACNW reviews of our future work, and maybe we can discuss and get some feedback from you on what you might feel would be useful and of interest to you.

Okay. A little bit of background on the LTR, but before I guess I do that I should say that the LTR work past and future has always been a team of people working on, as you can tell, a variety of issues, and some of those people are in the audience today. So for some of the examples that I might talk about if you have detailed questions that I can't answer, I'll have some help hopefully from the audience, and that way we can hopefully address the questions that you might have.

Going to the background though, the LTR analysis of the eight issues, the Commission paper was done in May of '03 and then we briefed ACNW also in May of '03. The Commission approved the actions for the eight issues in November of '03, and then there

was a ninth issue on intentional mixing of soil. That analysis was completed in March. The Commission approved the actions for that particular issue in May, and then as you recall, the ACNW was briefed this summer in July on that particular issue.

So that sort of fills the gap a little bit about where we've been since we briefed you last. Now I'd like to turn to accomplishments in FY '04, and these are the actions that really follow what we have in the budget. We're basically still following the original plan we had in the SECY paper for those activities that have been budgeted, and even the planned activities that I'll talk about later are those that have been and continue to be budgeted.

And that means their schedules are the way they are because of the budget that we have.

Of course, accomplishments in '04 was the completion of the Commission paper on intentional mixing, and then the Commission approval of all the staff's recommendations. I'll go over those in a minute. A couple of my slides coming up kind of remind you what the nine issues were, and then issue by issue I'll just sort of touch upon, you know, what the Commission approved and maybe some of the comments that they had. They had a few comments relative to

some of those issues.

So that will be sort of a refresher on what the issues were or what the issues are and what the Commission had to say about them.

The other major accomplishment this year was the completion of the regulatory issue summary, or the RIS, as we call it. I'll talk about that a little more in a moment.

And then lastly the accomplishments focused on some site specific implementation relative to institutional controls and realistic scenarios, and those are the examples that I'll talk about later in the presentation.

Let's look first at the regulatory issues summary published this past May, and its purpose was really to inform licensees and stakeholders of the LTR analysis results. It basically boiled down 130 pages of the staff Commission paper into about 13 pages. That was maybe a little easier for people to kind of read in one sitting, and if they are interested, then they can go and get more detail.

It also identified opportunities for stakeholder comment and invited early feedback as we proceed with some of our activities. It summarized the analysis that the staff had done for the nine

issues all combined. Since the eighth and ninth one on mixing were separated in time we wanted to wait for the RIS and combine all of the issues together so that it would be easier for stakeholders to have one document that was short, hopefully digestible and under one cover.

The RIS then also includes the Commission approvals and any comments that the Commission had relative to each issue. So people could get a whole picture, you know, in digest form of the analysis and the results of the Commission's comments.

The RIS was really a final action for two of the issues. The .05 weight percent not being used as a decommissioning criteria was one of the issues where we just, you know, completed our work and described and gave that conclusion in the RIS.

And then the issue on developing a separate uranium and thorium standard was also -- just the whole description of that, you know, was completed and documented in the RIS, and there's no further actions planned for either of these two issues.

The Commission also approved the staff recommendation to begin implementing approved options for institutional controls and realistic scenarios and not wait for the actual draft guidance to be developed

to begin working on those issues, and that's particularly for institutional controls for licensees that may express an interest in using those. We do not want it to delay decommissioning progress and wanted to proceed with those where there was a desire by licensees.

Bear with me. Okay. I'll just go down each of the nine issues here in brief and start with institutional controls, and the Commission approved the recommendations for a risk-informed, graded approach, some new options for NRC monitoring and enforcing under the LTR, and particularly that's under a legal agreement, and a deed restriction where NRC would be mentioned in the deed restriction. That's one new option.

The second new option is the long-term control license that I'll talk about more in a minute. So the Commission approved those new options, but in particular, they requested public comment on the draft guidance, and those comments be shared with them before the guidance was finalized. So they're very interested in what stakeholders will think about these issues, and of course, our plan for developing the guidance will include we have to make time to prepare a Commission paper that will share the comments with

the Commission that we get on particularly institutional controls, but probably other issues as well if we have comments.

With respect to the issue on unimportant quantities, the Commission approved the recommendation of the staff that the .05 weight percent is not to be used as a decommissioning criterion.

Similarly, the Commission approved the staff's recommendation that a separate uranium and thorium on restricted release standard should not be developed.

And then with respect to the issue on on-site disposal standard, the Commission approved the staff's recommendation to use the current practice of a few millirem on a case-by-case basis for approval.

They also approved another recommendation the staff had to use up to 100 millirem as long as there was sufficient financial assurance to cover the difference there.

In addition the Commission commented that we should add a third option of allowing 25 millirem without financial assurance and for short-lived radionuclides.

But the idea is that, yo know, there would be decay to unrestricted levels probably within, you

know, a few years and, therefore, financial assurance might not be necessary.

With respect to the next issue on describing the relationship between the LTR and control of disposition of solids, the Commission approved our description in the RIS, asked us to provide that in a RIS, but they also asked us to clarify statements that were made in the SECY document that reduction in conservatism in the LTR analysis might have some impact on off-site use, and I'll explain that briefly for a minute.

What we meant there was in past practice it was believed that the on-site use using the default resident farmer would probably bound any off-site use, and so there wasn't a requirement to analyze off-site uses.

When we came up, of course, with the more realistic scenario approach, you know, the Commission said, "Well, if you're moving toward more realistic scenarios and away from the resident farmer, what impact might that have?"

And so in the RIS we explained that the realistic scenario approach should also consider if off-site uses were reasonably foreseeable, in addition to just on-site uses.

So in coming up with, you know, an identification of the critical group, the potential for off-site use should also be considered, and if it is, then you would analyze it. So the idea here is that for realistic scenarios you should be covered even if off-site uses are reasonably foreseeable.

So that was the approach that we explained in the RIS, and we'll probably have some follow-up guidance in the guidance base, you know, when we develop this further.

That kind of leads into the next issue on realistic exposure scenarios. The Commission approved using the reasonably foreseeable land use approach recommended by the staff.

Changes to financial assurance to prevent future legacy sites. they approved our recommendations to move forward with guidance and a rulemaking, but some of their comments indicated that they wanted us to, again, seek public comment on some of the proposals that we had. And there were a number of them.

I didn't plan on getting into those today, but you can see what the comments were in the RIS and see if you have interest in those, but they will be incorporated into our proposed rule and our guidance,

and of course seeking public comment on those items that the Commission wanted us to do that for.

The next one is changes to licensee operations to prevent future legacy sites. The Commission approved our recommendation for operating facilities to minimize contamination, increase licensee monitoring and reporting for high risk sites.

Now, along with that recommendation was the idea that the staff would develop a risk informed and performance based approach to identify sites that might have a high risk or activities on site, that might have a high risk of contamination, and therefore causing future decommissioning problems.

Now, you might recall this issue. When we looked at lessons learned, for the site we had today how do we get here for some of these sites? The idea is, well, you may have had chronic spills over a long period of time that weren't detected or maybe they weren't reported and our inspections, you know, weren't looking for those things.

And so the goal here is to come up with an approach that would identify those sites that we should focus -- that licensees should focus their attention on and maybe have more monitoring and reporting, if necessary.

And then for NRC we would focus inspections on these facilities or on the activities in the facilities to try to prevent any activities that might create future decommissioning problems.

The Commission did have a comment though, I guess, when we developed guidance on monitoring requirements. The point of how much of monitoring is enough for this particular case, and so they want us to be careful with that and be limited in our data requests and look carefully at how much is enough, but don't go overboard. That's how I read their comment.

You can appreciate that, I think, and we'll address that in guidance development. Intentional mixing, you heard from that recently. They approved the current practice of mixing to meet waste acceptance criteria. They approved the staff's recommendation for meeting the LTR criteria in limited circumstances and on a case-by-case basis.

Okay. Let's move ahead to what's on the horizon. What's coming up in '05 to '07? You may have heard this before, but basically the first part is to develop decommissioning guidance, to revise guidance in the NUREG 1757. It would focus on four issues: institutional controls, on-site disposal, realistic scenarios and intentional mixing.

So we'll follow up and expand upon the work in our commission papers to develop draft guidance for public comment.

We're looking to stakeholder involvement. We want to explore the grievant statement, for instance, participation and development of the guidance very similar to what was done for NUREG 1757. We found that very useful and valuable, both helping us out, but also helping out those agreement states that participated.

And we're expecting some form of early stakeholder input and possibly a meeting or workshop are that follows on recommendations from the committee on intentional mixing, that it would be useful to get feedback from licensees that might use this material up front, before we start developing guidance.

So we do intend to do that. Exactly how many and when, you know, we have to work out.

And then the draft guidance is supposed to be provided or published in September of '05 and a final in '06.

Looking ahead to an activity that's planned for FY '05 principally, the inspection and enforcement procedures for operating sites, and this is what I just talked about a little bit. It will be

focused on enhancing monitoring reporting, itemizing contamination, developing this risk informed approach, identifying those sites and then writing the revised procedures, and that will be during the course of this year.

The other activity that's planned is developing a rulemaking and supporting guidance for those two issues that relate to preventing future legacy sites, and these are the changes in financial assurance that we have in mind, changes in licensee operations that I just talked about.

And right now, even though we will be starting that proposed rulemaking this year, it's scheduled for publication in '06, and then a final rule and guidance in '07.

Now I'd like to move on to some specific examples. First, with respect to institutional control options, at the Shieldalloy site in Newfield, New Jersey, and just a little bit of background.

This is a site, like I said, in Newfield, New Jersey. It used to be and still is a manufacturing facility for specialty steels and super alloys, aluminum alloys. In the past they processed ore containing columbium, which they used in their alloy process.

Well, the ore also contained uranium and thorium. So when they went through a smelting process to separate out the columbium from the rest of the material, they ended up with slag that contained uranium and thorium in amounts greater the .05 weight percent. So they became a licensed process and facility.

And what they have right now is about a 68 acre site made up of eight acres of storage yard where the slag pile and bag house dust pile is, and then the rest of their 60 acres, that's where their current manufacturing facilities, buildings are located, and they're right outside of Newfield, a small town, you know, across from a bank, and there's residential areas nearby. There's other industrial areas nearby. There's farming, you know, adjacent to their site. So it's a mix, and they're right on the outskirts of a small town, maybe 1,500 people. So they're an industrial facility, but they have a lot of variety of land use surrounding them.

Well, this is a few years ago when they first submitted their decommissioning plan for restricted release, but it was reviewed and rejected by the staff. They had at that time no acceptable way for providing long-term institutional controls or the

financial assurance that needed to go along with it or the public involvement that's required by the license termination rule for these kind of sites. So those were the reasons for why they were rejected.

Rejection came at about the same time that our SECY paper came out with options like the long-term control license, and so Shieldalloy expressed an interest in trying out the long-term control license, and so it certainly serves as a first example of applying the risk informed, graded approach and applying the long-term control license, and that's why I wanted to use it as an example today.

Well, one other bit of background that I just overlooked in my notes is just for a perspective general round figures. The amount of slag they have is about a million cubic feet of slag of bag house dust, and by their estimates, it would cost about $100 million for off-site disposal in contrast to, again, their estimates that will be revised when they resubmit their DP, but around five million for leaving it on site with restrictions on use. So there's quite a contrast in cost and also they have had a history of bankruptcy. They have a similar site in Cambridge, Ohio that they came out of bankruptcy and had an agreement to, again, use restricted release and build

disposal cells on the Cambridge site, again, with the similar slags, similar process, and everything.

So Ohio being an agreement state, you know, there's sort of a parallel approach here, and we, in fact, drew upon some of the experiences that Ohio had with their intent to use the decommissioning possession only license for that site in Cambridge.

So we have sort of a parallel process and examples going on here. In any event, ShieldAlloy needed guidance to prepare their revised decommissioning plan, particularly for the long-term control license. So we moved forward to prepare some interim guidance in May of '04, and we expect that this interim guidance will evolve and we'll fold it into our draft regulatory guidance in '05.

This interim guidance, as I'll talk about in a minute, contains some basic concepts because the understanding as we worked with Shieldalloy and others, the understanding of this possession only, long-term control license was new, and it was sort of we were trying to explain it and get the idea across.

And so concepts are important to grasp first, and we included that in the interim guidance, and then we included section by section in the decommissioning plan, what information they needed to

submit when they resubmitted their guidance.

I should mention here that the interim guidance and the interest that Shieldalloy has in using it has certainly got the attention of the State of New Jersey. They've written two letters to the Chairman saying that they object to restricted use they object to the long-term control license, and they believe the policy is sort of a first of a kind experience in kind of a proving ground, you know, for something that's new that has been untried.

And the first letter the Chairman responded, emphasizing that the LTR allows the restricted use option, assuming that the licensee can meet the requirements in the license termination rule, and that's an important point, you know. This is an option that they have proposed to use, and they still have to submit their decommissioning plan. They have to still demonstrate to us that they have met the requirements, and we would have to review those, that demonstration, and approve it.

So there's nothing approved. It's just that we're moving forward with trying out this option at this point in time.

But the Chairman also emphasized that the long-term control license would enhance the long-term

control because the federal government stays in the picture. NRC stays in the picture.

So that's an enhancement to long-term control, and the fact that the policy is untried and so forth, we pointed out in our response that really the development of license was based on the ten years of general license experience for the mill tailings program. It was also based, like I said, on the State of Ohio's intent and experience to use a similar license.

CHAIRMAN RYAN: Robert, just a quick extra point on that last bullet.

MR. JOHNSON: Yes.

CHAIRMAN RYAN: I think it strikes me, too, that -- there you go, that one, the last one there -- that not only is there long-term control from the licensing standpoint, but there's also I would think from the state's perspective involvement for financial assurance.

You've talked a little bit about that already, and I guess my own view is that that's a significant increase, and it's probably a more realistic treatment of financial assurance and disposal cost monitoring and all of the things you've mentioned.

Is that a fair summary on my part?

MR. JOHNSON: Yes, and it's one of the concepts I'll get into in a moment in a little more detail, but that goes hand in hand. It's not only who stays, but who's going to pay.

CHAIRMAN RYAN: Right.

MR. JOHNSON: How are they going to do it and, you know, that's how it's going to work in the long term if the funds are available, and how are they available?

And of course, the state was concerned about bankruptcy and ownership, and I think the Financial Assurance Trust Fund approach is an answer for that, and we explain that in our response back to them.

But you can see that this issue, of course, plays out across the country. A lot of the same concerns are being raised, and this is our answer to those.

DR. CLARKE: Robert, I think you said originally that when they submitted their decommissioning plan it was rejected, and one of the reasons it was rejected was the financial assurance piece. Is that because the options that they now have weren't in place or they still have to come up with

financial assurance, do they not?

MR. JOHNSON: Their original DP did recognize they needed financial assurance for the long term part of it. It was the amount, you know, that was determined, and of course, that's part of the picture, you know. What's the cost estimate for the long term? And then how do you calculate the fund based on that?

And so that was one of the comments that we had back to them, and they know they'll have to revise that based on our guidance.

DR. CLARKE: And while I have you, will the new guidance help them with that calculation?

MR. JOHNSON: Yes, it will. Yeah, just to answer it now, it's based on what's your cost estimate for annual activities, you know, whether they be surveillance, any maintenance or repair, or any monitoring if monitoring is needed.

So that annual cost, the licensee will need to lay out those activities and lay out the cost of those activities and then look at the annual cost of them.

Then the fund amount is calculated based on one percent of the interest income off of that fund needs to pay for that annual cost of whatever

activities are planned. And we ask them to assume one percent annual return interest income, and that's consistent with what uranium recovery sites us under Part 40, Appendix A.

DR. CLARKE: Thank you.

MR. JOHNSON: Because they're long-term sites, too. So we figured we should be consistent with their approach.

Okay. Some of the key concepts, to get on the right page here. First and foremost is the current license that exists. Our plan right now is to amend that current license, not terminate it and start a new one.

That may sound like a housekeeping thing, you know, and certainly it sounds better if you're going to terminate the license. Essentially we are, but when you terminate the license our agency records, the docket file gets stopped and a new one is set up, and we felt that there's an advantage to keeping the agency records all together in one docket file for the long term.

You know, anything can happen, and things can get divided up and separated and possibly confused. It's important to have the site history in the docket file that exists today to be continuous,

you know, with the future files that will be kept during the course of this if it should proceed.

Well, of course, having a liense changes NRC's role. The original LTR did not contemplate NRC role. So this is a new role I'll talk about in a moment.

The second concept is people really need to understand we're not just continuing the current situation, you know. All of the requirements in the LTR for restricted release have to be met, and there's requirements for financial assurance. There's requirements for public involvement.

Of course, there's the dose criteria requirements both with controls and without controls. They all have to be met, and so really what does the license do? The license satisfies the requirement for a legally enforceable institutional control. So the license is the institutional control. It's a form of government control.

But keep in mind they have to meet all of the other requirements as well, and the eligibility requirements. They have to show that restricted release is as low as reasonably achievable. So all of those requirements haven't changed. They're not getting off or anyone who has used this is not getting

off with, you know, less clean-up. They have to meet the requirements that have existed in the LTR.

Look at roles. The licensee's role here is clearly to provide the controls on access to the site and land use in the future, to provide the surveillance, the maintenance if needed, monitoring if it's needed, any repairs, reporting to NRC and local communities, records retention for their records, and stakeholder involvement. The LTR requires that up front to involve stakeholders, particularly where a restricted release institutional controls are provided.

What's the NRC's role? Well, it's nothing really new. It's our typical oversight to assure licensee's controls are effective. We would include inspections. We would include what we call five-year renewals. So that's similar to the five-year review process that is required in the LTR for durable institutional controls and similar to EPA's five-year reviews.

We just would call it a five-year license renewal process. We of course could also do enforcement, and we would also provide all of the maintenance of all the records for the license, like I said, past and present, past, present and future.

And they're available just like records are today to any stakeholders.

Another key concept that was difficult to work out was maintaining the current site -- the license would maintain the current site boundary, but within it, you would have a restricted area probably like the eight acre area that I talked about where the slag pile is, and then you would have 60 acres of unrestricted use area. But it would still be under the license.

And the reason that we have for keeping it that way is that the unrestricted use area could be used for industrial purposes or whatever purposes would be decided, but we would want to make sure that if there was monitoring needed in that outside area, that that monitoring would be maintained.

We would also want to make sure that NRC has prior approval of any sale of the property, and that the site, the whole site, could not be split up nd let's say parts of the unrestricted use area sold off, thus leaving a small appendage of the restricted use area.

And we feel this approach, you know, should assure ongoing monitoring, but it also should assure ongoing protection of the whole property by the

licensee, and we feel that that will also maintain the value of the site.

The unrestricted area currently has manufacturing facilities there, and it has railroad spurring. There's a lot of value in that property, in the unrestricted area for future use. And that will maintain the value of that piece of property, and it will insure or it will help insure future sale of that property.

Obviously it's going to change hands as we go into the future, and so maintain ownership, especially at the private sites like this, I think it's an interesting question. How do you maintain that?

I sort of skipped ahead to that bottom one. I'll come back to financial assurance in a minute, but I just wanted to make sure I got all of those points, and maintaining ownership and control.

I said prior approval of transfers. Well, that's also to make sure that the future owner who will become a licensee may have to agree to become a future licensee or they won't be a future owner in this case, but that they also have the capability, the expertise to continue the monitoring, maintenance, whatever work has to be done, you know, for the

restricted part of the site.

There's always a question with transfer of ownership. What if the owner can't perform the activities? Maybe there's bankruptcy, some abandonment or whatever.

We addressed that in the guidance as best we could, but we certainly found that this was a new area for us to think about. So maybe all of the answers aren't out here yet, you know, We may learn more in this area.

But we have to be reminded that enforcement authority for the licensee regardless of where they are. They can be sought after.

In the event that the licensee isn't around to perform the activities, a couple of things could be done. The trustee, which is the financial trustee -- they're holding the funds. Okay? -- could be directed to seek a contractor to continue the monitoring and maintenance.

NRC might also have another option of having a court appointed custodial trustee set up, different than the financial funding trustee.

So it sort of gets complicated, but it's an important point. You know, you've got to think about these things for sites that are going the long

term.

Going back to sufficient financial assurance and trust, I think I already maybe talked mostly about that, but it is based on the annual cost estimate that will be in the decommissioning plan, and the LTR. One of the requirements is sufficient financial assurance, and so that will be one of the requirements, and that will be one of the things that we and other parties, stakeholders will review.

And stakeholders are required to or not required, but they're invited to provide their comments on the sufficiency of the long-term costs, you k now, for this. So the licensee, in case Shieldalloy in this case, will need to address that with her stakeholders and get whatever advice stakeholders might have, including the State of New Jersey and other affected parties.

But we feel the trust fund is an important mechanism to provide for that annual cost, including our fees. Whatever fees we have, we do inspections for the five-year renewal. We've given them guidance on what we think our activities would cost in fee space to add into their own cost and add into the cost of having a trustee, financial trustee.

And so that's our current approach. We

would expect that that information would be revised by Shieldalloy when they resubmit their DP.

This site we use the risk informed, graded approach to institutional controls. It's kind of a simple example for using that. In the first part of the graded approach is that based on hazard duration and hazard consequence, you would determine if you would use kind of routine, legally enforceable controls or whether you would be able to justify durable institutional controls, for instance, federal ownership or federal control. In our case under the license it would be federal control.

We felt in our approach that sites with long-term radionuclides, uranium and thorium, that's part of the justification for needing durable controls because it's long-term control that you're looking for, you know, over hundreds of years, and therefore, a durable form is needed surely based on the duration of the hazard.

Now, we'll also see the results in their revised DP on the dose results. I don't know those yet. We'll see what their remodeling comes up with,but you know, they're required to analyze and come up with a dose assuming controls fail, and so based on those dose estimates, that could also justify

the durable controls.

Part of the risk-informed approach is for the licensee to tailor controls to their particular site, to mitigate potential failures that they see as being reasonable both for institutional controls and engineered barriers.

Certain conditions, therefore, would be kind of put into the license to particularly monitor or do surveillance, you know, for those things that we think could fail, and that would be significance of performance.

A lot of things can happen to the site, but part of what asked Shieldalloy to do was use sensitivity analyses and try to determine which of these things that could happen, could fail, would be important to meeting the dose criteria.

So in that sense it's performance based. In that sense it's using the results of dose assessments, and it's therefore risk informed.

We'll see how all of this plays out in the DP because it will be an example, you know, for all of us to review and see how they approached it.

Looking at engineered barriers, that was another concept that we talked about in the guidance. We've indicated they need to evaluate the contribution

of any engineered barriers that are used to compliance. Again, they should be using sensitivity analyses.

The slab being uranium and thorium, the thorium is the primary risk here for direct exposure. So shielding in a cover, you know, for the long term might be important, and then how could that shielding fail. Could it erode and expose the slag?

And therefore if that's true and that's important, then erosion control would be important for them to design and implement.

Another item we said that we did not feel that they should rely on whatever engineered barriers they had. They should not rely on active, ongoing maintenance and repair. They should be robust; they should be passive; they should be more like covers used maybe for mill tailing sites. That's what a goal should be.

Because part of the analysis is to assume failure of institutional controls, and when you assume failure of institutional controls, then your maintenance goes away. Any monitoring or any surveillance and maintenance goes away, and you would have to analyze how any barriers you use would degrade over time.

So if they degrade quickly and you can't meet the dose criteria, then you've got to see how to make them more robust and not as dependent on maintenance.

Last, here on finality, this is an important concept that's already in the license termination rule. It's important to industry that when we're done and terminate a license, we're done.

And the statement you might remember is in 1401(c) indicates that future clean-up would only be done if there was a significant risk, if there was a significant risk to public health and safety.

And that concept and our guidance, we said that concept still applies to this long-term control license. so that people that might worry, well, it's still under an NRC license. Maybe they will want to have more clean-up done in the future, and we feel that finality is important in that concept that's already in the license termination rule is also important to this kind of a site.

I was going to move on to realistic scenarios now. If you had any questions on institution controls in this example, we could either do them now or do them afterwards. It's up to you.

CHAIRMAN RYAN: I'd say keep rolling.

MR. JOHNSON: Okay. Keep rolling. Okay.

Shifting into examples for implementing the realistic scenario approach, I just lifted here this year 11 decommissioning sites that are in various stages of implementing the realistic scenario approach that was in the LTR analysis.

As you'll see, we've got two power plants at the end and we have West Valley, and then the rest are material sites. Some of these examples I would say when completed are going to be good case studies. They're going to be good lessons learned, you know, for other licensees to look at and see if it's similar to their situation.

But of course, all of these are site specific, but I think they do illustrate approaches, in general.

The first one I wanted to look at was Fansteel, and this is a facility located in Muskogee, Oklahoma. It processed ores that also contain uranium and thorium. In 2002, they filed for bankruptcy, and their goal is unrestricted use. They're taking a phased approach to decommissioning, and they have very limited funds, of course, because of the situation they're in.

They proposed use of an industrial

scenario as a reasonably foreseeable land use, and this was based on primarily as I understand it the Port of Muskogee on the Arkansas River, the sites on the Arkansas River.

To the north adjacent to the site is the Port of Muskogee and its facilities. The port is also interested in purchasing part of the site in the future to expand their facilities.

Like I said, the Arkansas River is on the east bordering the site, and then you have highways on the other side of the site, and there's a fossil fuel plant across the river.

And so the staff reviewed the licensee's proposal, followed up with the port and its interest in purchasing and expanding its facilities in the future, and so the staff supported the use of the industrial scenario by the licensee.

However, the State of Oklahoma challenged that decision and proposed that a resident farmer, primarily a resident farmer scenario might be more appropriate because there are farms in the area, across the river and all.

The Atomic Safety Licensing Board reviewed the licensee and staff's analysis, as well as the Oklahoma's basis and upheld the staff's decision for

the industrial scenario for that site.

So it serves as an example. Of course, it's based on the reasons that were given at this particular site, but it does illustrate an example of using an industrial scenario, not a residential farmer and having it challenged by a state and then having it upheld by Atomic Safety Licensing Board.

The second example is Kiski Valley. This is a non-licensee. It's a waste water treatment facility in Pennsylvania. They treated sewage sludge by incineration, disposed of the sludge ash in an on-site lagoon. The contamination is enriched uranium that came from a Sanitary sewer release from the B.W. Apollo facility years ago.

So not being a licensee, part of the process was for the staff to do a dose assessment, which was done and then reported on in a Commission paper.

The staff used reasonably foreseeable land use scenarios. The staff felt that on-site, in place in the lagoons, no action was the approach to analyze.

We used a recreational use scenario as a river par, and the dose resulting was about one millirem from that scenario.

But part of the realistic scenario

approach is to consider input on land use from state officials, land use planners, and in this case Pennsylvania felt that a reasonably foreseeable approach would be removal of the material for off-site disposal.

Staff analyzed that as well, and the worker excavation of the material would result in about a 15 millirem exposure dose, and then the landfill, initial disposal of landfill, was bounded by another scenario that the staff did.

The staff did some less likely use scenarios to kind of bound the uncertainty, and that's part of this approach for realistic scenarios as well. You would base compliance on what you think is reasonably foreseeable, but there may be other scenarios that you want to analyze to see, you know, what's the result and the uncertainty.

The results of, I guess, the scenarios that were analyzed here was an agricultural scenario as well as a resident intruder, and both of those resulted in about a 20 millirem does.

And so it was felt that the analysis of the agricultural one on site would bound the disposal in an off-site location. So you get an example here of a number of things.

You know, what's reasonably foreseeable, involving a state in this case also saying what they think is reasonably foreseeable. And part of that was an off-site use, and so it's not just on-site use.

If off-site use is determined reasonably foreseeable, then it should be analyzed, and so this example, I think, shows a lot of different aspects of the staff's approach.

The Commission approved this commission paper and moving ahead with no action, and so, you know, it went through their review and approval, and therefore, again, it's an illustration of this approach that the staff is using for this kind of site.

I'd like to end on kind of reminding you where we were going in '05 and suggest that we think it would be useful as we develop our draft guidance on institutional controls and scenarios and mixing that we involve ACNW in the review of that draft guidance before it goes out for public comment.

The question would be, you know, when. Our schedules aren't set up, and so this would be a good time to, you know, think about it and give us your feedback. It might be springtime, you know if you think about doing some draft work and then meeting

with you and having you have time to review it and give us feedback so that we can publish it by September.

But here we are in October. So you know, we can kind of divide up the year and see how we can get the job done, if you feel that reviewing would be something that's important and of priority to you.

The second thing that might also be of interest and use to us is this risk informed approach that I mentioned earlier for operating sites to identify which operating sites or activities on those sites would be considered high risk.

And how do we do that? How do we apply it? How do we factor it into our procedures. It's going to be interesting. It's new. To me it's not something that we -- we don't often do this every day, you know. So it would be useful, I think, to get review of the staff's approaches or ideas from the committee.

So those are two ideas to throw out for discussion and for your thoughts, and if there is interest, then maybe we can proceed with some more details on schedules and you know, all of that as we develop our plans in the next month of so.

And that ends my presentation, and any

questions, I'll try to answer any questions you might have or seek help from those in the audience.

CHAIRMAN RYAN: Well, Robert, thanks for a real informative presentation. I think we have a really clear picture of where you have been and where you are going. It sounds like an exciting time ahead on the LTR.

I guess let's start right here at this point. What's the path forward that we could be helpful on? You know, when I think about our working group meetings, for example, as you were talking, I was thinking about from my own experience.

Are there any sites out there that have been terminated in one way or another, not maybe under the current LTR but other licensees that have terminated activities that could be case studies now, you know, some of the older history sites, not only those licensed by the NRC or perhaps an agreement state? I think there is probably a number of maybe smaller licensees that have done those kind of terminations. I just wonder if we could mine some information there.

The second group I thought about -- and I am just throwing out these ideas just as we're talking here -- is the FUSRAP sites.

MR. JOHNSON: Okay.

CHAIRMAN RYAN: You mentioned a couple uranium thorium sites. So I thought immediately of the FUSRAP sites as uranium-thorium-radium, you know, type sites.

I think of the upstate New York area, for example. And St. Louis has a cluster of them around there. And they have been evaluated and addressed in terms of not exactly license termination but the same kind of finality sort of concept of being finished with them and so forth. So that is something to think about.

And, again, most of those wastes were disposed and taken to Envirocare, but some was left behind. It led me to think about, well, somewhere along the line, there is a little bit of an overlap or at least the LTR bumps up against decommissioning. Where is that line, something to think about? You know, if you had to take all the waste and remove it, like the slag pile, you've decommissioned it.

MR. JOHNSON: Yes.

CHAIRMAN RYAN: So you're then in the space of looking at that MARSSIM approach to saying the residuals are okay, but if you leave something behind, where do you stop thinking about MARSSIM and

start thinking about LTR?

MR. JOHNSON: Okay.

CHAIRMAN RYAN: You know, it's kind of a continuum, maybe not exactly, but it's just something that I thought about.

So I guess with those couple of additional ideas, it would be interesting to think about a working group meeting, perhaps a day or something of that order, where we could ask others to come in to help us all.

And the folks I'm thinking about are folks from perhaps those programs, the Corps of Engineers and the FUSRAP side, other licensees who have terminated activities in one form or fashion.

I can't think of the name of it, but there was a thorium site in Chicago.

MR. JOHNSON: I don't know.

CHAIRMAN RYAN: Was it Kerr McGee activity?

MR. JOHNSON: Anybody?

CHAIRMAN RYAN: West Chicago, the West Chicago site.

MR. JOHNSON: West Chicago?

CHAIRMAN RYAN: And so, you know, again, I'm just thinking off the top of my head here. I

think there are maybe some other examples. And I would just suggest that if we could bring in some of those experiences, the real life experiences, that might help inform us all a bit from a broad spectrum of perspectives, touching on the issues that you raised there and maybe getting their reaction and asking them what works or doesn't work.

Looking ahead, I think about some of the details that I know Chris and Mark wrestle with are what do I do with an engineered barrier and how do I credit it or discredit it, what is the right way to do all of that?

So some of the details of how the staff is going to assess a particular licensee's submittal and, you know, what's the range of failure rate of caps, for example, things of that sort that seem reasonable and can be defended from the staff's point of view.

Let me just call it the technology of the risk assessment or risk informing the assessment might be an area where we could bring in some other folks who have done a lot of that. I know Jim Clarke, one of our consultants, has been very active in that area. EPA probably has some folks or some practitioners who have served on EPA sites that could give us some insights there.

And, again, my reach is to try and say who are the practitioners that have done good solid credible work in real circumstances that we can draw from?

Does that sound like at least a concept of how to organize a day or so of a working group meeting?

MR. JOHNSON: That sounds like a good suggestion, lessons learned from other similar sites that pertain to our current cases.

CHAIRMAN RYAN: Now, what the exact topics are that you want to --

MR. JOHNSON: Right.

CHAIRMAN RYAN: -- prioritize as the things we really need to know the most about, the things we know the least about now. You know, we could certainly work on that agenda.

MR. JOHNSON: Yes, yes.

CHAIRMAN RYAN: But that is just what I was thinking about.

MR. JOHNSON: Another example of a reaction is Ohio in the Cambridge site. In talking with the project manager a couple of weeks ago, they indicated Ohio is proceeding. You know, they have just closed their first disposal cell and capped it.

And they will be working on a second one.

So I think lessons learned again. We've got parallel processes, how they analyzed it, again, under the LTR as an agreement state. So I think the idea of looking for case studies, lessons that help us with our issues at our sites.

CHAIRMAN RYAN: I think also of Sheffield and Beatty. Those are low-level waste sites that have been closed and capped and finalized. I don't know if that is too big or too complicated a situation, but how they have done that, what their monitoring issues are. There may be some fruitful thinking there.

West Valley, of course, you have mentioned. And there are some closed commercial disposal cells at that location.

DR. CLARKE: Mike, as Robert mentioned, a lot of this has come out of their experience with mill tailings sites and the way that program has been set up. I think it would be good to maybe even kick it off with that program. They have been doing annual inspections and surveillance monitoring to offer ten years or more at some of the sites. They probably have the best database of anybody's.

CHAIRMAN RYAN: And you certainly have some insight into the EPA side of performance

assessment in terms of what is working over time and what needs attention. So yes, we are interested. I think we can help put together something that would be of benefit to you and us.

MR. JOHNSON: Okay.

CHAIRMAN RYAN: Jim, let me start with you. Any comments or questions or --

DR. CLARKE: I had a couple of questions, Robert. Following up on my own question earlier that I think Mike alluded to, one of the challenges if you have an engineered containment system that has to last a long time, one of the challenges is going to be to estimate up front what it is going to cost to maintain that system.

I wondered if there is a plan to give the licensees any help with that. I mean, do you include replacement costs, your exceptional maintenance costs? How do you get your arms around that considering that if you set up a trust, it is just not going to cover the costs you might really encounter down the road?

MR. JOHNSON: We've talked generally about that in our meeting with Shieldalloy on this guidance and recognize that it's a trade-off. How robust your design of your engineered system is can maybe minimize the reliance on maintenance. That was the concept

presented earlier. When you diminish how robust the barrier is, that may require more reliance on maintenance and repair, replacement, whatever, and, therefore, the cost increase.

And so I think they understood that there is a trade-off here and they have to make decisions about how to design their facility for performance as well as looking at the maintenance cost over the long term and any repair if they feel that replacement of parts of the cap, you know, would be something that is expected or not.

That is why we sort of have favored. And we will see how it plays out, you know. We have favored this robust approach, like the mill tailings, at least for the erosion control cover, because there isn't a need for reliance on active ongoing maintenance and repair. And so that simplifies the picture. You know, maybe it is an oversimplification.

DR. CLARKE: There isn't yet.

MR. JOHNSON: We'll see. So I guess personally I just feel like pushing on that concept and its application to other cases. It may work in some cases. It may not.

If erosion is really an issue at this site to maintain that cover, if that is really important,

then they should follow our guidance. If there is some other issue, well, then it is a different question.

DR. CLARKE: Well, the five-year renewal, does that give an opportunity to revise your thinking?

MR. JOHNSON: The five-year renewal?

DR. CLARKE: As you gain experience with the performance of the system as time goes on.

MR. JOHNSON: I think the five-year renewal should look at, as I guess we said, the effectiveness of the whole system, the controls, institutional controls, as well as the engineered controls. And any weaknesses that are identified that hadn't been dealt with before are going to have to be dealt with.

DR. CLARKE: You have an opportunity to do that.

MR. JOHNSON: Right. And so I think that will help with that, any unanticipated things that happen, but part of their job I think is to analyze what could happen at this site under the conditions at the site.

DR. CLARKE: Yes. I just wondered if you planned on giving them any analytical tools to help them do that.

MR. JOHNSON: No. We don't have any plans for giving them analytical tools. I think the first thing, -- and maybe others in the audience might comment -- the tools we talked about are just using their sensitivity analyses and try different bare components and which ones are important. And then maybe you might change your reliance on those components in your analysis.

For instance, if a particular barrier fails by 10 percent or 50 percent or 70 percent, what does it mean to the overall performance of the system?

I think Shieldalloy certain recognizes that this is sort of why. There aren't any cookbook answers out there that I am aware of anyhow. And so they're kind of wrestling with this right now, too. And their DP when they resubmit it will give us some ideas of how they have tried to think about it and approach it and what tools they have tried.

DR. CLARKE: Just one more.

CHAIRMAN RYAN: Sure.

DR. CLARKE: I'm trying to check my understanding of your graded approach to institutional controls. If you're in the higher risk category and there's a requirement for durable controls, is there any way to meet durable controls other than having

federal ownership and control or state ownership and control?

MR. JOHNSON: I wish I had my table in front of me. I don't. I believe those were the principal mechanisms because of the longevity and because of the -- that is very consistent with the mill tailings approach.

Like I said, we have learned. We have been kind of copying off them, you know, using things that are consistent with that regulatory approach, which was to rely on state or federal -- it turns out federal DOE, but, I mean, the states have an opportunity to step up. So we have tried to stay consistent with --

DR. CLARKE: For example, you have layered or redundant controls in both definitions. And if you're in the durable category that's layered, it includes state government control.

MR. JOHNSON: Right.

DR. CLARKE: And then the others all look to me to put you in the federal ownership and control category through an LTC or something like that.

MR. JOHNSON: I guess my view would be that state and federal, it could be either, I mean, just like UMTRCA if you can work out an arrangement

where that might be agreeable and there is a commitment by a state to do that kind of a role.

DR. CLARKE: Thanks.

CHAIRMAN RYAN: Sure. Ruth?

MEMBER WEINER: I'm a little concerned about your rules for unrestricted use areas. You said they can't be sold off piece-wise, keeping them together makes a site more valuable. Isn't this working against future sales? It seems to me you have so many restrictions on unrestricted use that it would be tough to find a buyer.

MR. JOHNSON: There's really only one restriction, I think. And that restriction is you get prior approval from NRC and you don't divide up the site. Otherwise, you can use it for whatever purpose you want.

MEMBER WEINER: Yes, but those two restrictions along I don't know whether you have any sense of how long it would take to get approval from NRC and keeping the large area together, not selling it off piece-wise. Then you have to look for a buyer who wants a large area.

MR. JOHNSON: Okay. That's true.

MEMBER WEINER: So are you, in effect, creating legacy sites?

MR. JOHNSON: I guess the approach that we took was to prevent the small isolated eight-acre piece of property that has no use or future use other than because of the restrictions. And who will buy that?

MEMBER WEINER: Well, I thought you were referring to areas that were released for unrestricted use.

MR. JOHNSON: Yes, but if you do allow sale of those portions of the property, all or parts of it, eventually you might get down to only the eight acres. And in attracting a buyer for that, single eight-acre with all the restrictions and things they have to do may be more difficult than keeping the site together.

CHAIRMAN RYAN: Ruth, let me offer you an alternative view. I think I would take exactly the opposite view for the reason that certainty about what is expected; that is, this has got a license on it and I am going to be the licensee, and there is a path forward, would probably make me more interested in it, say, from an industrial use, brownfield kind of circumstance than the uncertainty of the licensee who is trying to sell it, saying, "Well, I'm not sure what the rules are, but we'll figure it out as we go

along."

So I think that while it's not an ideal, perhaps pristine site with nothing, no baggage, attached, it's a whole lot better if its path forward is determined through something like this and there is a clear regulatory path and not.

Now, is there a risk or is there something there to think about? Well, sure, there is, but at least you've got as a buyer an understanding that there has been some pedigree flushed out on what exactly that shapes up to be.

So I see it just the opposite. I see it as a positive to a potential buyer in an industrial circumstance, rather than a negative.

MEMBER WEINER: Maybe so. I just had one other question and a suggestion. You can probably figure that you're going to get a request for a backyard farmer scenario almost every time, either from the stakeholders or from the state or both. So you might just consider making that part a routine part of the analysis.

MR. JOHNSON: I see.

MEMBER WEINER: It's just a suggestion. That way you've answered that question up front. The question I have is, have you had any interaction or

impact on the DOE decommissioning sites? Because they have to go through a very similar process.

MR. JOHNSON: I can't say that we have had any impact so far. I mean, you may be aware of --

MEMBER WEINER: Do you interact with them?

MR. JOHNSON: We have started interactions with them. And we in September signed an interagency agreement to assist DOE in their cleanup program, their risk-based in-states program.

There are a number of tasks in that agreement. And they include a lot of things that we do and they do in common. A lot of the common issues, long-term stewardship and modeling and scenario development, are all issues that are identified for us to work with DOE on at their request.

And we started this work by attending a recent meeting in Chicago to kind of get a sense for all the stakeholders' concerns with DOE's approach to risk-based in-state cleanup. So our plans are to work with DOE over the next few years and talk about how we do things, talk about what guidance we have in these areas that might have common issues, and do reviews at the request of whatever they ask us to review.

So what I think is good about it is it is beginning to exchange information on issues we have in

common. And not only they can see how we're approaching things, we can see how they're approaching things.

And sharing that information may have an influence, may have an impact. We'll see. I think there is a lot of potential for it in the future, but it's not altogether clear exactly what we are going to be doing in the next few years. But I think it's a good start. And then we have interest in working together.

MEMBER WEINER: Thank you.

CHAIRMAN RYAN: Allen?

MEMBER CROFF: Yes. A couple of questions. I would like to start with this Fansteel example. Was the risk from that site without institutional controls analyzed?

MR. JOHNSON: Yes. The site is not proposing restricted release. It's proposing unrestricted release. So there are no institutional controls assumed or proposed.

MEMBER CROFF: Okay. But it's proposed for industrial use?

MR. JOHNSON: That's right.

MEMBER CROFF: Were risks from residential scenarios or other things analyzed there?

MR. JOHNSON: I can't answer that, but, Jim, can you or Mark?

MR. THAGGARD: Yes, I can answer that.

CHAIRMAN RYAN: Yes. Mark?

MR. THAGGARD: We did look at the resident farmer scenario, kind of bound what the doses could be.

MEMBER CROFF: And what did that number come out to be?

MR. THAGGARD: I believe it was right around 100 millirem.

MEMBER CROFF: Okay. And to continue down that path, it is supposed to be an industrial use scenario. What kind of mechanisms are put in place to make sure it stays industrial use?

MR. JOHNSON: Mark?

MR. THAGGARD: Well, the thinking is if it's release for unrestricted use, there would be no mechanism. I mean, that is part of the risk that you take in terms of trying to do the analysis, that you have to try to take a best estimate on what you think the land use scenario is going to be.

And that is one of the reasons that we bounded the analysis to try to figure out in the worst case if it reverted to something other than industrial

what the doses could be.

But any time you use a realistic scenario, you would have maybe some small probability that some other land use scenario could occur at the site. And that is part of the risk that you're taking.

MEMBER CROFF: Okay. But I am assuming there are like zoning regulations or something there at this point.

MR. McKENNEY: Well, in this case, of course, -- this is Chris McKenney from NRC -- we have the discussions with the Port of Muskokee for the fact that they are going to buy a portion of the property, the fact that all of the area around it is pretty much industrial except for on the other side of the river so that there is a lot buying into the fact that the likelihood of it being industrial is very high.

From a risk standpoint, your probability of having a resident farmer or resident of any type is relatively low. So going into making a risk management decision and saying, "Well, I know what the worst case scenario is. I know what the likely scenario for a single dose is," then you can do some relative weighting in risk management space to say, "Will the public be protected?"

For the fact that the high risk, the

unlikely scenario is still under 100 millirem or right about 100 millirem, that is still within the dose limit of the public dose limit overall.

MEMBER CROFF: I understand. I mean, in many of these areas, there is sort of no perfect answer.

MR. McKENNEY: Right.

MEMBER CROFF: I mean, it's a balance. But I wanted to understand how it worked at a site like this.

A second question. This concerns the five-year inspections. I have no right to expect you to know the answer to this. Let me preface it. The NRC is sort of signing up for five-year inspections into the future of some of these sites. And so are people who watch over RCRA sites, FUSRAP sites, and the uranium mill tailings, and DOE sites.

Is there any idea of how many of these things the country, if you will, the nation is signing up for? And they seem to be sort of scattered all over, I mean, organizationally scattered in many places, the responsibility for these, including states, of course.

MR. JOHNSON: I can't answer for the other folks in the country. I can only say that we have 20

some odd mill tailing sites currently under DOE stewardship. And there are probably maybe 20 more Title II sites or so. And then literally right now we have two sites and then West Valley.

So, I mean, we don't have many current sites that we're aware of that are going to need this other than those two or three. Of course, DOE may have over 100 or so depending on how that sorts out.

But I'm not aware of the numbers in the other programs to be able to answer your question.

MEMBER CROFF: Okay. Thanks.

CHAIRMAN RYAN: Just to help Allen a bit, I think, too, that a number of the sites where there is activity or action, it is really the licensees that are decommissioning, rather than terminating under the termination rule, leaving materials behind and need the assessment.

Particularly in the agreement state level, I would say there are a lot more folks that are trying to just completely decommission a site and clean everything up to the MARSSIM-type approach than leave something behind. So there is a much bigger number there, I would say.

MR. JOHNSON: When we did the LTR analysis, we did ask the agreement states if they were

aware of any plans for restricted use across all of their sites in their states. The only answer was Ohio and this Shieldalloy Cambridge site. There were no other sites that they were able to identify at that time. That was maybe a year and a half ago.

So from the standpoint of agreement states, our agreement states implement the LTR. There was really only one site at that time that was planning restricted use.

CHAIRMAN RYAN: A couple of questions that struck me as I was listening to the discussion. On the financial assurance requirements, I am always reminded that sometimes people think things aren't going to be as expensive as they turn out to be in this arena. So, again, that's where I think getting some of the actual expenses might be of great benefit.

The other is you mentioned earlier in your presentation, Robert, about sites that half short half-life material or shorter half-life material versus sites that have source material that are essentially unchanged from now on out into the future.

Is there a way to connect the two? Because if a site, for example, had some of both, I could see two things happening over time. One is that there would be a much higher need for, say, control

and monitoring early on and then as time went on, some kind of a decrease in monitoring and/or controls. Perhaps it could go down based on the radioactivity quantities that remain over time. So that you change one, the financial insurance requirements, the monitoring requirements, the oversight requirements, and so on, as that degrades down.

So I just think that I would think about -- that may be a rare case. I don't know. But, you know, you might want to think about either during that five-year inspection process or the materials that have been left behind, that you allow for a systematic reevaluation and decrease in control if that's appropriate based on risk or updated dose calculations or changes in use scenarios and so on and so forth.

So that might actually help in the standpoint that you're not making an absolute decision at an early stage, but, as Jim pointed out, you allow for that reevaluation.

I think that's got two sides to it. One is it allows for if things aren't going as expected and they are going in a negative direction, you can certainly address that through increased controls or assurances or whatever. But if radioactive material is decaying or everything is looking just dandy or you

don't need 100 wells but you need 50 or you don't need 10, you need 3, you allow for that to happen over time.

I guess in any monitoring program, too, it's a point of you take a sample to demonstrate compliance. You meet some requirement for a concentration determined in some way or another.

But the other part is that if, for example, you are interested in groundwater, which I guess east of the Mississippi would be a principal type of monitoring, how are you going to figure out how the environment is behaving? Is there a way to not necessarily make a requirement for measure the water level, too, instead of just getting the sample so that you can build your information with a simple addition or two from a system point of view? How is the system behaving?

The next step in that is if you learn more about the system, you can then do a little bit more of a -- I don't want to say a PRA because I don't mean a full-blown probablistic risk analysis, but you can better risk-inform the kinds of calculations that Mark and Chris and others have talked about to really as time goes on feel more comfortable that yes, we have -- I know "bounding" isn't exactly the right word --

we have properly assessed the risks.

Does that make sense?

MR. McKENNEY: Well, the only concern would be that it would defeat the number one purpose of almost all of these, which is finality. Most anything that has the potential that you would be changing controls, changing the agreements on financial requirements, or monitoring periods that aren't up front agreed to at the point of license termination, consistent with the fact that the LTC doesn't involve actual termination, that that would not be finality because you would always be opening the door that the standards could change, all of a sudden some other stakeholder could come in at some point down the road if you are constantly opening the door at every five-year review to better sharpen the pencil. And so I think that there would be a lot of reluctance on just that would be a -- I mean, obviously there could be benefits from being able to do that, but that would be a con that would be mentioned.

I mean, one of the biggest concerns always has been the reason that we have the issues with EPA and us is that licensees think that it would be done with cleanup of a site. And then EPA will make them

clean up five years from now yet again because there is no finality.

And so when we are trying to set up these options, we are trying to look to see, balance everything to the point that maybe it is not the best approach, but finality is such a big key, important part of the license termination rule.

CHAIRMAN RYAN: Yes, I understand the balance point. I mean, it's a good case when you are decreasing in radioactivity now. That's easy. Everybody would like that.

MR. McKENNEY: But we would also have the potential problem of the other site, which is that it is always nice to be able to say that we could reduce potentially the financial assurance requirements or something, but then there is always the chance that what would happen if we had to increase?

CHAIRMAN RYAN: Well, that is the tough question.

MR. McKENNEY: See, the corporation would be like they will be fine with you saying that we will decrease the requirements in the future, but they never want one that would shift to possibly --

CHAIRMAN RYAN: Well, maybe the strategy is you set it at that level that satisfies the

long-term risk and the short-term risk and you don't have an option to go up, you only have the option to go down or stay the same. I mean, you could think about it that way.

I guess I just think that a little bit more of in-depth thinking about that financial risk model and matching it up to the hazard over function of time might be of value.

MR. JOHNSON: Well, I'll react a little bit differently maybe.

CHAIRMAN RYAN: Sure.

MR. JOHNSON: Finality is important as far as -- and I think the requirement of not requiring more cleanup unless there is a safety, clearly significant threat is important. But there is no reason to follow up on your example of a mixed site, a hypothetical mixed site with short-lived and long-lived.

I mean, you know you have that already in your planning stage. And so your DP could very well -- in taking the tailored approach or the risk-informed, tailored approach to controls, you would recognize up front in your plans for monitoring and maintenance that you have got maybe two types of contamination.

And so maybe the controls on the short-lived would only last for 40 years. And so your amount of oversight or your amount of monitoring and maintenance, you may predict that it will diminish because one thing you do know is things do decay and you can calculate the decay.

And so I think in the tailored approach, you might be able to pull something like that off, but you would plan it up front. And I think my reaction is the five-year reviews, if there is something that is happening, there will have to be mitigation to deal with it if there is a significant threat.

CHAIRMAN RYAN: Yes. I know. And I understand there are specific thresholds that you are developing to address significant health risk questions and so forth, but the fact of the matter is that you have got an opportunity to improve your knowledge of is this working.

MR. JOHNSON: Right.

CHAIRMAN RYAN: And I think that is something to -- again, maybe I haven't hit on a perfect example, but if you could build that into the process, that is going to build confidence over the long haul for everybody.

MR. JOHNSON: And the cost projections

that are maybe difficult, I think we realize that. And that is why we are asking for stakeholder input on them, too, you know, up front.

CHAIRMAN RYAN: And, again, to get back to our discussion of potential ACNW working group meetings, if we could grasp in the people that have wrestled with that, either on the RCRA side or the CERCLA side, or folks that have done the radioactive material side of it, that would be I think a great benefit to try and pull that knowledge together.

Yes, please, Jim?

DR. CLARKE: One thing. I think it we could work over shorter time horizons, a lot of this would go away. But the problem is the system has to last hundreds of years or thousands of years and our experience with these systems is maybe 10-20 years at the most. So we are way beyond our experience in our design and our planning.

I think to take this opportunity to respond to Allen's question, there are over 1,000 CERCLA sites. Any CERCLA site that requires institutional controls triggers five-year reviews. So we are going to have several hundred probably of those sites being reviewed every five years, but eventually we will start to get some experience with these

systems and how they perform and how they degrade and what planning horizons are appropriate. But right now we're in the challenge as to up front estimate that, get it right, and go forward because Chris makes a very good point with finality.

CHAIRMAN RYAN: Yes.

DR. CLARKE: People do want finality.

MR. JOHNSON: I might just ask one more thing. If you think about the proposals to review our guidance and the other things and let us know so our planning can incorporate it in a timely way and --

CHAIRMAN RYAN: Absolutely. And I think what we were trying to do is organize any information-gathering that would be helpful to you and us and the review of your drafts in a way that made that connection flow well. So I think we are wide open to working on how that best comes together to help everybody out in a timely way.

MR. JOHNSON: Or to review it in general or focus on particular parts of it that you know is sort of what your preference is.

CHAIRMAN RYAN: And, in fact, what really is areas where you feel you would like to gather information as well. Absolutely.

MR. JOHNSON: Okay.

CHAIRMAN RYAN: Sounds great. Well, thanks very much for a -- I'm sorry. Mike Lee had a --

MR. LEE: Yes. Just very briefly, a lot of reference has been made to performance of barriers and how you judge how long these things are going to last. With Mark Thaggard here, he can remind you as well that you may want to make reference or look into the low-level waste PTP. There was considerable discussion of how you evaluate barrier performance. We used, the folks up in Research, in particular, in their association with NIST, to look at concrete performance.

So there may be some snippets of information both in the guidance documents as well as response to public comments you may want to look at. That also applies to the performance of natural barriers, such as earthen mounds.

My recollection is we also made reference to a National Academy study which looked at the performance of geosynthetics and bitumen covers for shallow disposal facilities. That academy report I think is still out there in the literature. You could look at that, just as ideas as you think about guidance in this area.

Does our reasonably foreseeable land use assume preservation of institutional knowledge? Are you assuming at some point that? Are you going to deal with that in the guidance? You don't have to answer now, but is that going to be articulated in that regard?

MR. JOHNSON: Preservation of records for sites like that, you mean, or --

MR. LEE: No. Institutional oversight, I guess, for lack of a better word.

CHAIRMAN RYAN: So the town council knows what is out there 100 years down the line, that kind of thing.

MR. JOHNSON: No. It was like the previous answer. No because you're not relying on institutional controls, which in some definitions includes records management and all.

MR. LEE: Sure. Well, that is just a segue back into the significance of barrier performance. And if you refer, as you well know, Parts 60, 61, and 63 all at some point rely on isolation to protect the public. So you may want to make reference to that or at least consider that.

My recollection is thorium is geologically pretty unique. Has thought ever been given just to

try to find a buyer for the thorium? I know that they mine thorium sands in Australia and places like that. As part of the --

MR. McKENNEY: Not for thorium. It mines monozyte sands for titanium.

MR. LEE: Okay.

CHAIRMAN RYAN: And they mine garnet. Thorium is always --

MR. McKENNEY: Yes. Thorium happens to be more like just a waste product out there.

MR. LEE: All right. I just thought there may be a simple way of dealing with it. Thank you.

CHAIRMAN RYAN: I'm sure these companies have looked for buyers for a long time.

MR. McKENNEY: That's right.

MR. LEE: Okay.

CHAIRMAN RYAN: Any other questions or comments? Latif, yes, please, sir?

DR. HAMDAN: Thanks, Mike.

Bob, just one clarification. In your example of institutional control sites, you had the concept of having sufficient financial assurance and trust. But in the same slide, just one bullet down, you left me with the impression that if there is ever a bankruptcy, it may not be covered. I mean, the

financial assurance may not cover a site reclamation in case the licensee goes bankrupt.

So the question I have is, is this concept of sufficient financial assurance sufficient to cover cases of bankruptcies or not?

MR. JOHNSON: It is. And that is one of the reasons why it is there and it is needed, that if the owner licensee goes bankrupt, goes away, there is a source of, an independent source of, funding to carry on activities. And that is the purpose of that trust fund. And the challenge is to determine if you have got the right amount in there.

And then the five-year reviews, one of the reasons for a five-year renewal is to check that trustee and the sustainability of that trust.

DR. HAMDAN: And we know that the terminate amount is really a challenge because of our experience with uranium mill tailings sites, right?

MR. JOHNSON: Right. Yes, there's history there I am aware of. Yes, you are right.

CHAIRMAN RYAN: One last quick question. It's a follow-up to Latif's. If you identify a high-risk operating site, are you going to try and get them on the financial assurance track early? Have you thought about any linkage between ultimate financial

assurance and high-risk operating site?

MR. JOHNSON: That's a good question. I will think about it.

CHAIRMAN RYAN: It's something to think about.

MR. McKENNEY: One of the options about operating plants and decommissioning that is considered is the fact that we may link the funding requirements for decommissioning to activities that are happening at the operating sites.

So if spills were to occur, they may have to either immediately clean them up or take a hit on their decommissioning funding right then. They would have to increase their decommissioning funding for potential cleanup later in the future.

MR. JOHNSON: And that's true --

MR. McKENNEY: And those are the things that we will have to look through in the rule to see how we can implement those sorts of things.

MR. JOHNSON: And Chris is right. One of the subissues in financial assurance space was indicators of higher cost of cleanup, but I think your question may be even different. It's like it's not indicators in that things have happened that you're going to have to pay more for, but it's like the

potential for things to happen.

MR. McKENNEY: There might be different levels of decommissioning funding for different classes of facilities maybe.

MR. JOHNSON: Yes.

MR. McKENNEY: There may be --

CHAIRMAN RYAN: If you take, for example, highly mobile liquid forms, long-lived material, I mean, those are all the risk indicators in the right circumstances, but I just wondered if you guys had thought about the linkage between a high-risk operating site and the financial assurances that may, in fact, come along later.

MR. McKENNEY: That may be a very good option to look at.

MR. JOHNSON: Yes. We'll write that down and put it into our considerations.

CHAIRMAN RYAN: And, again, it is not that I would want to foist extra costs on folks, but if they are heading toward a substantial accumulation of costs, it is better to get that up front and plan for it than it is to have it hit you all of a sudden, I think.

MR. JOHNSON: I think our emphasis initially was for those sites and activities that we

think might be a high potential. Then you want to have procedures put in place, if they aren't already, to monitor and to report and to watch it more carefully so it doesn't happen.

CHAIRMAN RYAN: Right.

MR. JOHNSON: But we should think about your suggestion as well.

CHAIRMAN RYAN: Okay. Well, thank you. Any other questions or comments?

(No response.)

CHAIRMAN RYAN: Thank you all very much. We are adjourned until 1:00 o'clock. Thank you very much.

(Whereupon, at 11:42 p.m., the foregoing matter was recessed for lunch, to reconvene at 1:00 p.m. the same day.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:03 p.m.)

CHAIRMAN RYAN: Okay. Our afternoon agenda calls for two items. One is a consolidated issue resolution status report. Second after that will be a review and discussion of the ACNW 2005 action plan. And that will conclude our afternoon activities.

If Neil Coleman comes in, we might get started on the igneous activity letter. If not, we will take that up tomorrow morning. But we may start that if get here on time to do that.

MEMBER CROFF: He's still working on it as we speak.

CHAIRMAN RYAN: He's working on it as we speak. And he may or may not.

Our first speaker up is you.

DR. RUBENSTONE: Okay. Thanks.

14) CONSOLIDATED ISSUE RESOLUTION STATUS REPORT

DR. RUBENSTONE: I am Jim Rubenstone. I am part of the High-Level Waste Repository Safety Division here at NRC. And I am going to be speaking to you today about the integrated issue resolution status report.

Just as an introduction, this is an

updated report that was issued in 2002 for the first time. And we are currently updating it. The report is not quite finalized yet. We expect that it will be done within the next few weeks, and we will be sending it to DOE, the stakeholders. And that includes ACNW will be getting a copy of the report as well.

This report has contributions from almost all of the technical staff in the Division of High-Level Waste Repository Safety and at the center. So I would like to acknowledge all of those contributions and not name them individually.

What I will be giving you today is an overview of the report, what it is, a brief history, the role it is going to play in our review of a potential license application for Yucca Mountain, and some examples of what topics are included in it.

The purpose is fairly straightforward. The IIRSR gives a status of prelicensing interactions between the Department of Energy and the NRC on Yucca Mountain. These are predominantly technical interactions. So this is a technical information report.

It's a fairly large document. It's going to be probably in excess of 800 pages when it's done plus appendices. So it summarizes where we stand on

interactions.

Next slide, please. Just to run down how this came about, the key technical issues were first identified by DOE and NRC in 1996. In the following year, the NRC began issuing status reports for individual issues. And as that process matured over the next few years, it became clear that these issues were interdependent and that they could be better served by having an integrated report that tied all of them together.

So the first IIRSR, as I said, was published in 2002 as part of a NUREG series. It covered both preclosure and postclosure topics, although at the time most of the interactions had been predominantly on postclosure topics. The current report is an update of that NUREG report.

Next slide, please. The IIRSR is part of the NRC's tool kit for reviewing the potential repository license application. And it's the technical information tool from that kit. It summarizes information that comes predominantly from three sources: documents produced by DOE, technical interactions between the two groups, -- and those are mostly technical changes, Appendix 7 meetings -- and independent analyses done by NRC staff and center

staff on these issues.

In order to prepare the report, we had to freeze the information at a point. So this report is current through March of this year.

The structure of the report follows the review methods that were given in the Yucca Mountain review plan. And the Yucca Mountain review plan, of course, derives its structure from the Part 63 requirements. And we have incorporated into the report the risk information from the risk insights baseline report that was published or prepared earlier this year. This risk information helps us inform what sorts of information is significant for repository performance and to what level of understanding you need to develop that information.

Next slide, please. It is important to remember that we are still in prelicensing space. So the IIRSR is an informational report. It doesn't reach any decisions. It is not the safety evaluation. It doesn't speak to regulatory compliance. Those are things that will be done during the license review.

Next slide, please. I am going to go briefly over some of the areas that are covered in this report without going into great detail. As I said, it's a fairly dense and heavy report. I'm not

going to have time to cover everything in detail.

There are three broad areas we can break things up into. The first is the general programmatic and administrative topics, which is kind of a catch-all term. And then the real meat of the report is in the preclosure safety analysis and the postclosure performance assessment. So for the next couple of slides, I will give some examples of topics that are covered in each one of these areas.

The first one, as I said, is the catch-all things, like in general information site description. And, as I said, the report reflects the information that was developed during the interactions between DOE and NRC. So some of these areas, like general information, we didn't have specific meetings on general information.

So these areas in the report are necessarily a bit spare; whereas, in other areas, there has been pretty extensive interaction between DOE and NRC. For example, quality assurance for the past couple of years, we have been having quarterly meetings on that. So that section is much more detailed.

Next one. The preclosure safety analysis, some of the general areas that we cover should be

familiar: identification of hazards, initiating events, and event sequences, including the probabilities of those events occurring and their consequence analysis.

And then the other part of the safety analysis is the identification of the structures, systems, and components important to safety and looking at some detail of the design of those SSCs. This should be familiar to anyone who has been through NRC's work on other major engineered facilities. It follows that sort of pattern. We see the same thing in the YMRP.

Next slide. Following permanent closure, the way that the system is assessed is through a performance assessment model. As I said, most of the interactions between DOE and NRC have been in this area. And this covers system description; the multiple barriers requirement, which is in Part 63; again, a scenario analysis and event probability, which is part of the risk triplet approach to it.

And then the real, the heart and the longest sections of the report are the 14 model abstractions of performance assessment. And these are familiar topics that had been discussed many times, things like degradation of engineered barriers,

mechanical or disruption of the engineered barriers, climate and infiltration. And there are 14 topics. I won't list them all. They're on the first backup slide if we get to them.

Can we just go back for a sec? The other thing I wanted to say is that the model abstractions in the IIRSR, each of the 14 is reviewed following the 5 review methods that are outlined in the YMRP. And those are on the second background slide. They cover model integration, data and model justification, the uncertainty in the data, the uncertainty in the model, and the support for the model. So those are the areas, again, from the YMRP. As I said, each one of the model abstractions is reviewed following that pattern.

So now we can go to the next. Just to summarize what I have said, this is a broad overview. The IIRSR is an informational document on interactions between DOE and NRC. The information is current through March of this year. We will be publishing it as a revision of NUREG-1762, but as soon as the report is finalized, we will be providing informational copies to DOE, the stakeholders, and the committee. And it's one of our review tools to be used along with the review plan and the risk insights baseline report

in reviewing a potential license application.

And the note is just to remind us that even though we froze that information in March, we are continuing to review material submitted by DOE. I believe they made all of their submittals that they intend to do this year. And we're providing feedback to them on these submittals, and we will be until the potential license application is filed. Our current schedule calls for having that completed by the end of this calendar year, that feedback.

So that's it. And I'm happy to answer any questions.

CHAIRMAN RYAN: Thank you. I guess the footnote caught my attention. How are we doing on resolving KTIs and so forth? We had seen a couple of charts of that type before, and we talked about a bow wave, I guess, four or five months ago. How is the bow wave looking?

DR. RUBENSTONE: Everything is in. Correct me if I'm wrong, but I believe everything that DOE expected to submit is now in. It didn't follow the exact schedule. There were always things sliding around.

CHAIRMAN RYAN: Sure.

DR. RUBENSTONE: But they are now all

in-house. We are reviewing them. We have been reviewing them. And last month we sent our response letter to DOE that stated that we will get feedback to them on all of these issues.

Our focus is going to be putting the highest priority on those items that have been identified as having the highest risk significance. So we're doing those first, but we intend to get feedback on all of them to DOE before the end of year.

CHAIRMAN RYAN: It sounds like the bow wave went away a bit.

DR. RUBENSTONE: Well, the bow wave came in, and it loshed over us. And we stood up and kept working. So it's --

CHAIRMAN RYAN: That's great. Questions?

DR. RUBENSTONE: Anything else?

MEMBER WEINER: Yes.

CHAIRMAN RYAN: Ruth?

MEMBER WEINER: I have just a couple. Is NRC staff using this PCSA tool that was developed by the center to identify hazards and so on?

DR. RUBENSTONE: At the time this report was prepared, the PCSA tool was just being wrapped up. So we're going to be using that, I believe. And I don't want to get into the details because that is not

my area of specialty. But we have gotten the final PCSA tool.

I believe for this report, the PCSA tool was not specifically used to develop that because of the time frame on which we developed it. I think the PCSA tool was just delivered in its final form in September, if I'm not mistaken. And much of the development of this report preceded that. But we do have that PCSA tool now.

MEMBER WEINER: I'd be very interest in your future assessment of its usefulness and ease of use, how well it works because I think it is a very interesting approach to preclosure safety analysis.

The other question deals with one of your backup slides. It's the 14 model abstractions.

DR. RUBENSTONE: Right.

MEMBER WEINER: You list as one of the model abstractions volcanic disruption of the waste package. Does that include chemical interaction between the magma and anything in the waste packaging material, the cladding, and so on? Does it include the chemical interaction?

DR. RUBENSTONE: It includes it in the broad sense, but, as I understand it, DOE is not going into any details on that and is adopting a

conservative approach, what they are claiming is a conservative approach.

Again, this review is in process. And the final review will depend on what is in the LA. But my understanding is that they will be basically stating that there will be no change in the chemical form of the spent fuel due to interactions.

And, again, that's my understanding as current of the DOE approach. And that is certainly subject to their change in how they are doing it.

MEMBER WEINER: I would just encourage you to take a look at that, as I'm sure you will.

DR. RUBENSTONE: I agree that it is worth looking at.

MEMBER WEINER: That's it.

CHAIRMAN RYAN: Mike?

MR. LEE: Yes. As you have noted, the title of this report is "Issue Resolution Status Report." And if a member of the public were to pick up this report and read it, would they get a sense for the status of issue resolution as it's defined? I mean, if the Combustion asked the Committee, "What is the status of issue res.," I mean, if they --

DR. RUBENSTONE: Right. One of the appendices -- and I didn't reproduce it here because

it's 50 pages long -- is a line by line status of each agreement. So that information is in there.

The main body of the report is written more in a narrative style about the technical information. So the focus is on the technical information. It's not a checklist of issues.

MR. LEE: Right. But a reader can review the document and get a sense as to where --

DR. RUBENSTONE: I think that information is --

MR. LEE: -- issues may remain open or --

DR. RUBENSTONE: Yes. That information is summarized in the appendix A.

MR. LEE: Thank you.

CHAIRMAN RYAN: I guess just to follow up, that is really the $64,000 question, I guess. You have said that everything has been submitted and you plan to review everything by the end of the year. So if my memory serves me right, all of the previous graphs of things that are hanging all over the LA time frame into the next year are things that are previously planned to do that, but nothing is left hanging you had planned to do this year. Is that a fair summary?

DR. RUBENSTONE: I'm going to walk

carefully here. What we have said is that we will provide feedback to the Department of Energy on everything they have submitted. We are not specifically going into the open/closed.

CHAIRMAN RYAN: Ah. That's the $64,000 question.

DR. RUBENSTONE: Right. And I may want to defer to management and some of our --

CHAIRMAN RYAN: Well, I guess from my perspective, that's the interesting question. I mean, this is an interesting update, but the real question is, what is open and what is closed and what is in front of us and what is behind us?

DR. RUBENSTONE: I mean, getting back to what Mike said, I think in reading the report, we have not tried to -- let me put it this way. Areas where we think DOE has provided information that covers the issue are identified. And questions that the NRC has raised are also identified.

MR. LEE: I guess what you are saying is in reading the report, the reader would have to do some type of analysis, I guess, to kind of walk that fine line or read between the lines, I should say, to get those answers.

DR. RUBENSTONE: We're not trying to make

it cryptic, but --

CHAIRMAN RYAN: You've done that. Frankly, I don't know where you are.

DR. RUBENSTONE: I guess I want to go back and emphasize that we are not reaching any sort of finding in this and that this is an information update. We're not saying that such and such an issue is now closed and we have decided that it is covered because that is not the purpose of the report and that is not the role of NRC in the prelicensing arena. It's basically to generate information such that the license application is the best that it can be.

MR. STABLEIN: Could I add to that?

DR. RUBENSTONE: Yes.

MR. STABLEIN: Maybe I could provide a little more clarity as to where we stand because I think I know what you are looking for. The fact of the matter is that all of the agreements will not be closed at the time of the license application. I am not sure what the number will be that remains open, but it will be more than a handful. It will be substantial.

And we put letters in the public record back to the State of Nevada about the fact that they don't all have to be closed when DOE comes in with the

license application. What we have said in those letters is for the ones that are hanging open at that time, we will review the license application on its own merits. And that's when we make licensing determinations.

So as far as this document is concerned, we consider it contains an awful lot of valuable technical information that will help the staff be ready to review the license application. It does not bring closure to all of the 293 agreements that were crafted with DOE.

CHAIRMAN RYAN: Sure. And I appreciate that clarification. In previous meetings, though, we have actually seen that chart and understood a little bit more clearly than we're seeing it today. I'm just wondering why the change. What is going on?

MR. STABLEIN: Well, Jim's presentation wasn't actually intended to deal with the agreements themselves and kind of is emphasizing that this document is more than an attempt to summarize the agreements.

When we crafted the key technical issues in '96, we forged the nine major issue areas. And what this document does is provide all of the technical information that we have gathered together

over the last eight years on those big key technical issues.

And while the individual agreements are discussed to some extent, this document really goes above and beyond what we have been running day to day in our program as our technical teams work on the individual agreement responses and our reviews of those and the letters that we're sending back to DOE.

If somebody wanted to see the entire record on the agreement responses, they would need to take this document and capture the letters we have been sending back to DOE as a complete body of work on the agreement responses.

If you are interested in the updated chart on the agreements themselves, I have Dan Rom working on that. And we can provide that to you probably before the end of the meeting.

CHAIRMAN RYAN: Okay. That would be a nice adjunct to kind of complete the picture here because I think you have given us a snapshot of your report without any of the detail. And that is good, but in going to the other end of it, if we see that updated chart, once we read the report, we can see the beginning and the end. That would be real helpful.

DR. RUBENSTONE: Thank you, King.

MR. LEE: One other question.

DR. RUBENSTONE: Yes, Mike?

MR. LEE: Earlier you made reference to the license application toolbox or review toolbox or whatever.

DR. RUBENSTONE: Yes.

MR. LEE: You have the IIRSR. You have the risk insights report. You have your PA capability and insights from that. And you have the Yucca Mountain review plan. Are there any other tools in the toolbox that are going to contribute to that review capability? And if so, what are they? And when might they be available?

DR. RUBENSTONE: I think you have hit the big ones. I mean, in my mind, certainly the PC underlies everything for certainly postclosure. So that is a very broad tool. But the three legs, as I envision it, are the IIRSR, the Yucca Mountain review plan, and the risk insights baseline report. Ruth mentioned the PCSA tool, which is another one with preclosure.

MR. LEE: Sure.

DR. RUBENSTONE: There is some more in-depth risk assessment that is being done currently to update some of the aspects of the risk insight

report and go into some more detail. If there is anything else that I am missing? Like I said, those are the big ones. And then we have a number of other accessory tools that we're using.

MR. LEE: Thank you. Snap-ons.

DR. RUBENSTONE: Yes. There you go.

CHAIRMAN RYAN: Okay. Any other questions or comments? Yes?

MR. STABLEIN: Could I just add Mitzi Young from the General Counsel's office, who is here, reminds me to mention that the chart that we will provide you today on the agreements will be right up to date; whereas, as Jim has mentioned, this report here goes to March '04. So the chart will be more up-to-date.

CHAIRMAN RYAN: That's very helpful. That way we can get a snapshot of what has happened in the last number of months and see how that is working. Great.

DR. RUBENSTONE: Mike, that summary table that I referred to that is in the appendix is actually intermediate between March and today.

CHAIRMAN RYAN: That's okay.

DR. RUBENSTONE: And it goes into more detail, but King will get you the one that is up-to-date.

CHAIRMAN RYAN:

That's great. Terrific. Thank you. Anything else? Going once, going twice.

(No response.)

CHAIRMAN RYAN: Okay. Thank you very much. We appreciate it. Okay. Next on our agenda is our 2005 action plan. We're not taking any new information. So we can go off the record at this point. And I think we're concluded on the record today. Is that correct? Okay. Yes. We're concluded on the record today. And we'll start back up.

Well, actually, John, we're writing letters tomorrow. So yes, we do need to have the recorder at about 8:30. Okay. I'm sorry. We're done. Thank you very much.

(Whereupon, at 1:28 p.m., the foregoing matter was adjourned.)

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 154TH 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.

Rebecca Davis

REBECCA DAVIS
Official Reporter
Neal R. Gross & Co., Inc.

United States Nuclear Regulatory Commission

Accomplishments and Plans for License Termination Rule Analysis Actions

Advisory Committee on Nuclear Waste

October 20, 2004

Robert L. Johnson, *Senior Project Manager*
Division of Waste Management and Environmental Protection
U.S. Nuclear Regulatory Commission
Washington, DC 20555

United States Nuclear Regulatory Commission

Outline

- Background
- Accomplishments in FY 2004
- Plans for FY 2005-2007
- Site-specific examples of implementation
- Potential ACNW reviews

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Background on Past LTR Analysis Activities

- LTR analysis of 8 issues, 5/02/03
- ACNW briefing on 8 issues, 5/28/03
- Commission approval of actions for 8 issues, 11/17/03
- LTR analysis of intentional mixing of soil, 3/01/04
- Commission approval of actions for intentional mixing, 5/11/04
- ACNW briefing on intentional mixing, 7/20/04

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Accomplishments in FY 2004

- Commission paper on intentional mixing of soil (SECY-04-0035)
- Commission approval of recommendations (SRM-SECY-03-0069 and SRM-SECY-04-0035)
- Regulatory Issue Summary
- Site-specific implementation for institutional controls and realistic scenarios

United States Nuclear Regulatory Commission

Regulatory Issue Summary 2004-8, 5/28/04

- Informs licensees and stakeholders of LTR Analysis
- Identifies opportunities for stakeholder comment; invites early feedback
- Summarizes staff analyses of 9 issues
- Includes Commission approval and comments from SRM
- RIS is final action for 2 issues
- Commission approved recommendation to begin implementing approved options for institutional controls and realistic scenarios

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Summary of Commission Approval/Comments

- Institutional controls:
  - Approved recommendations: risk-informed graded approach, options for NRC monitoring and enforcing role (legal agreement, Long-Term Control (LTC) license)
  - Requested public comments on draft guidance be shared with Commission
- Unimportant quantities: approved recommendation that 0.05 weight percent is not to be used as a decommissioning criterion
- Separate U/Th unrestricted release standard: approved recommendation not to develop a new standard

United States Nuclear Regulatory Commission

Summary of Commission Approval/Comments

- *On-site disposal standard:*
  - Approved recommendations of using current practice of a "few millirem" and up to 100 millirem with sufficient financial assurance
  - Commission added option of 25 millirem without financial assurance for short-lived radionuclides
- Relationship between LTR and control of disposition of solid materials
  - Approved recommendation of including description in the RIS
  - Requested staff to clarify the reduction in conservatism in LTR analysis and impact on off-site removal of material after license termination
- Realistic Exposure Scenarios
  - Approved recommendation of using reasonably foreseeable land use

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Summary of Commission Approval/Comments

- Changes to financial assurance to prevent future legacy sites
  - Approved recommendations; specific comments to be addressed in rulemaking/guidance
- Changes to licensee operations to prevent future legacy sites
  - Approved recommendations for operating facilities to minimize contamination and increase licensee monitoring and reporting for high-risk sites
  - Approved enhancement of NRC inspection and enforcement of high-risk operating sites
  - Commission requested that guidance include "how much is enough" monitoring
- Intentional mixing
  - Approved current practice of mixing to meet WAC
  - Approved mixing to meet LTR criteria in limited circumstances, case-by-case

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Planned Implementation Actions in FY 05-07

- Revise decommissioning guidance in NUREG-1757
- 4 issues: institutional controls, onsite disposal, realistic scenarios, intentional mixing
- Stakeholder involvement
  - Explore Agreement State participation in development
  - Early stakeholder input/workshop
- Draft guidance for public comment in 9/05
- Final guidance in 9/06

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Planned Implementation Actions in FY05-07

- Inspection and enforcement procedures for operating sites
  - Enhance monitoring, reporting, and minimize contamination
  - Develop risk-informed and performance-based approach
  - Identify high-risk operating sites and activities
  - Develop revised inspection and enforcement procedures by 9/05

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Planned Implementation Actions in FY05-07

- Rulemaking and supporting guidance to prevent future legacy sites
  - Changes in financial assurance
  - Changes in licensee operations
  - Proposed rule and draft guidance for public comment in 9/06
  - Final rule and guidance in 9/07

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Example of Implementing Institutional Control Options at Shieldalloy

- Potential restricted use site in Newfield, NJ; large volume of U/Th slag
- Example of risk-informed graded approach and Long-Term Control (LTC) license
- Interim guidance in 05/04; input to draft guidance in FY 2005
- State of New Jersey letters and Chairman response
  - Objection to restricted use and LTC license
  - Chairman response
    - LTR allows restricted use option
    - Federal oversight enhances long-term control

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Key Concepts in Interim Guidance for NRC's LTC License

- Current license amended, NOT terminated
  - Continued NRC role
  - Maintains Agency records in single docket file
- All LTR restricted use requirements must be met
- LTC license provides legally enforceable and durable institutional control
- Licensee role: access and land use controls, surveillance, maintenance, monitoring, reporting, records retention, stakeholder involvement
- NRC role: oversight to assure licensee controls are effective, including inspections, five-year renewals, enforcement, maintaining records

United States Nuclear Regulatory Commission

Key Concepts in Interim Guidance for NRC's LTC License

- Maintain current site boundary with both restricted and unrestricted use areas
  - Allows reuse of unrestricted area (60 acres); maintains value
  - Restricts use on smallest area (8 acres)
- Sufficient financial assurance and trust
- Maintaining ownership and control
  - NRC prior approval of ownership/control transfers
  - NRC enforcement, trustee use of contractor, court appointed custodial trustee
  - Value of unrestricted area is an incentive to future owners

United States Nuclear Regulatory Commission

Key Concepts in Interim Guidance for NRC's LTC License

- Risk-informed graded approach to institutional controls
  - Durable institutional controls for long hazard duration
  - Tailor controls to mitigate potential failure of institutional controls and engineered barriers that are significant to meeting dose criteria
- Engineered barriers
  - Evaluate contribution to compliance, long-term effectiveness, degradation
  - Do NOT rely on ongoing active maintenance and repair
  - Encourage robust engineered barriers to simplify and minimize reliance on maintenance/repair (NRC's guidance in NUREG-1623 for erosion protection)
- Finality

United States Nuclear Regulatory Commission

Examples of Implementing the Realistic Scenario Approach

- Currently implementing at 11 decommissioning sites
  - Fansteel
  - Kiski Valley Water Pollution Control Authority
  - Shieldalloy
  - AAR
  - Michigan Department of Natural Resources
  - SCA
  - DOW Chemical
  - Cabot Reading
  - West Valley
  - Big Rock Point
  - Rancho Seco
- Completed examples serve as lessons learned

United States Nuclear Regulatory Commission

Fansteel Example of Realistic Scenario Approach

- Example of industrial scenario as reasonably foreseeable land use
- Staff review supported licensee's industrial scenario
- State of Oklahoma challenge industrial scenario and proposed resident farmer
- Atomic Safety Licensing Board upheld staff's decision for industrial scenario

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Kiski Valley Example of Realistic Scenario Approach

- Example of onsite and offsite use
- NRC staff dose assessment
  - Reasonably foreseeable land use scenarios
    - Onsite in place, no action
    - Removal offsite disposal (position of Pennsylvania)
  - Less likely uses assessed to bound the uncertainty of future land use
  - Recommendation to Commission for no further decommissioning action
- Commission approved staff's application of realistic scenario approach

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Potential ACNW Reviews During FY 2005

- Draft guidance on institutional controls, realistic scenarios, and intentional mixing
- Risk-informed approach to identify high-risk operating sites and activities to focus inspections and enforcement

Integrated Issue Resolution Status Report

An Update of the Report Issued in 2002

James L. Rubenstone, Ph.D.
301-415-5019 jxr5@nrc.gov
Division of High Level Waste Repository Safety
U.S. Nuclear Regulatory Commission

154th Meeting of
Advisory Committee on Nuclear Waste
October 20, 2004

Purpose

The Integrated Issue Resolution Status Report (IIRSR) provides information about the status of prelicensing interactions between the U.S. Department of Energy and the U.S. Nuclear Regulatory Commission concerning a potential high-level waste geologic repository at Yucca Mountain, Nevada.

A Brief History

- Key Technical Issues were formally identified in 1996.
- Issue Resolution Status Reports were prepared and updated for individual issues beginning in 1997.
- As Issue Resolution progressed, the value of an Integrated Report became apparent.
- The first IIRSR was published as NUREG-1762 in July 2002.
- The report covered both preclosure topics and postclosure issues.
- The current report updates NUREG-1762.

The IIRSR as a Review Tool

- Summarizes technical information from:
  - DOE documents
  - Technical interactions between NRC and DOE
  - Independent analyses by NRC staff
- Information current through March 2004
- Structure follows review methods in the Yucca Mountain Review Plan (YMRP)
- Incorporates risk information from the Risk Insights Baseline Report (RIBR)

The IIRSR in Prelicensing

The IIRSR is informational, not decisional.

- It is not a safety evaluation.
- It does not address regulatory compliance.

Areas Covered in the IIRSR

- General, Programmatic, and Administrative Topics
- Preclosure Safety Analysis
- Postclosure Performance Assessment

Example Topics in the IIRSR

- General, Programmatic, and Administrative Topics
  - General Information
  - Site Description
  - Performance Confirmation
  - Quality Assurance

Example Topics in the IIRSR

- **Preclosure Safety Analysis**
  - Identification of Hazards, Initiating Events, and Event Sequences
  - Consequence Analysis
  - Identification of Structures, Systems, and Components (SSC) Important to Safety
  - Design of SSC Important to Safety

Example Topics in the IIRSR

- **Postclosure Performance Assessment**
  - System Description
  - Demonstration of Multiple Barriers
  - Scenario Analysis and Event Probability
  - Model Abstractions (14 areas)

Summary of the IIRSR

- Informational document
- Current through March 2004*
- Will be published as revision of NUREG-1762
- Will be used along with the YMRP and RIBR in reviewing a potential License Application

** The NRC is continuing to provide feedback to DOE on their Key Technical Issue Agreement submittals until a potential License Application is filed.*

Backup Slides

Fourteen Model Abstractions for Performance Assessment

- Degradation of Engineered Barriers
- Mechanical Disruption of Engineered Barriers
- Quantity and Chemistry of Water Contacting Waste Form and Engineered Barriers
- Radionuclide Release Rates and Solubility Limits
- Climate and Infiltration
- Flow Paths in the Unsaturated Zone
- Radionuclide Transport in the Unsaturated Zone
- Flow Paths in the Saturated Zone
- Radionuclide Transport in the Saturated Zone
- Volcanic Disruption of the Waste Package
- Airborne Transport of Radionuclides
- Concentration of Radionuclides in Groundwater
- Redistribution of Radionuclides in Soil
- Biosphere Characteristics

Review Methods for Model Abstractions

- Model Integration
- Data and Model Justification
- Data Uncertainty
- Model Uncertainty
- Model Support

from *Yucca Mountain Review Plan, NUREG-1804*