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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 STAKEHOLDERS MEETING

5 RISK INFORMATION IN THE REGULATION OF

6 MATERIALS AND WASTE DISPOSAL

7 CASE STUDY ON URANIUM RECOVERY

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9 WEDNESDAY

10 JUNE 13, 2001

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12 DENVER, COLORADO

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14 The Stakeholders Meeting convened in the Forum

15 Room, Executive Tower Hotel, 1405 Curtis Street,

16 Denver, Colorado, at 7:08 p.m., Lawrence Kokajko,

17 Facilitator.

18

19 PANEL MEMBERS:

20 LAWRENCE KOKAJKO, Facilitator

21 PATRICIA RATHBUN

22 MARISSA BAILEY

23 ROBERT BARI

24 MICHAEL LAYTON

25 ED GROVE

I-N-D-E-X

P-R-O-C-E-E-D-I-N-G-S

MR. KOKAJKO: Good evening. I'd like to welcome you this evening. My name is Lawrence Kokajko and I'm the section chief of the Risk Task Group in the Office of Nuclear Material Safety and Safeguard.

I would like to welcome everyone to this stakeholder meeting on uranium recovery and thank you for wanting to participate. I recognize that some of you were at the earlier meeting today, perhaps all of you, and I do appreciate you coming out and spending your free time to be with us, because I believe this is an important activity.

The NRC is focused on safety, and we view the use of risk assessment techniques to be one tool to help us achieve our goal of maintaining our focus on safety, and to help achieve this the Risk Task Group was formed and is responsible for efforts related to risk informing the materials and waste activities, and it reports directly to the office director, and so that should give you an indication of how important we think it is.

As a result of our workshop in April 2000, it was suggested that we consider case study approach to determine what areas in the materials and waste arenas could be amendable to risk informing. These

case studies would cut across a spectrum of regulated activities within the materials and waste arenas. It would be used to do several things.

The first is to test the draft screening criteria that would enable us to determine if a proposal was amendable to risk informing. The second is to tease out any possible safety goals that were embedded in any staff action and determine the feasibility of developing broader draft safety goals. Additionally, the staff will use the case studies to gain insights on risk informing regulatory processes and will identify tools, data, and guidance needed to support a risk-informed approach.

I hasten to point out that we do not intend to make or consider a regulatory decision or position tonight. We only intend to gather input on these topics as they relate to testing or screening criteria in the development of safety goals.

Moreover, I would like for you to think broadly when we say risk informing the framework. Risk informing the framework could involve changing rules, but it is also and perhaps more likely to mean using risk information in licensing, inspection, and enforcement processes and decisions. In doing so we

will focus our resources on the most safety significant items.

When the case study plan was presented in September 2000 one comment that we received was we should have early stakeholder involvement before we reach any conclusions regarding the case study area under consideration. Tonight's meeting is one of several planned meetings, and this is your chance to provide your input on the uranium recovery case study.

Dr. Patricia Rathbun will be our facilitator tonight and will coordinate our discussion. Ms. Marissa Bailey of the Risk Task Group will discuss how we got to where we are today and where we intend to go. She will be followed by Dr. Robert Bari and Mr. Edward Grove of the Brookhaven National Laboratory, who are our contractors working on this particular case study.

This meeting is open to everyone, including but not limited to NRC staff, licensees, applicants, federal, state, and local government organizations, non-government organizations, public citizens groups, manufacturers, users, industry and trade association representatives, and anyone in between. Everyone is invited to provide any thoughtful insight or commentary on this case study as

applied to our objectives. While we will provide early information regarding our review to date we are seeking your comments on what we have done, but more importantly, your thoughts on what we should do related to implementing the case study action plan.

I would like to add that we will have an integration meeting on or around October 25, 2001, to provide our feedback on our work on all case study areas, with a final report due out around the end of the calendar year. I encourage you to sign the attendance sheet since all who do so will be contacted prior to the integration meeting.

Also tonight we will be seeking your feedback on what you thought about the meeting. One way of doing so is a feedback form that you can mail in to us. Also at any break you can see a member of the Risk Task Group -- and for those people who are representing the Risk Task Group please raise your hands -- and provide any comments directly to one of us.

With that in mind I'd like to turn it over to Dr. Rathbun to help us facilitate our meeting.

Dr. Rathbun.

DR. RATHBUN: Thank you very much, Lawrence.

I'd like to join Lawrence in welcoming you here tonight to the public meeting put on by the Risk Task Group. I realize that there's many things you could be doing tonight. You could be sleeping, you could be going to the ball game, but we really appreciate your being here, because this is how we make progress. We make progress by taking your feedback and listening to it and moving on.

My name as he said is Pat Rathbun, and I'm in charge of a number of the communication activities that are going on in the Office of Nuclear Materials Safety and Safeguards. As Mike Weber pointed out earlier today, we have a number of strategic goals, and one of them is to improve the way in which we communicate with the stakeholders and thereby hopefully engender more confidence in what we do, so my job is to be sure that everyone gets to talk, everyone gets to speak, gets to get their two cents worth in.

Before we start let's take a look again at our meeting objectives, and the primary objective is actually number two. We're here to take your comments. We're also here though to brief you on the status of our case study work, particularly our case study on uranium recovery.

I'd like to take a quick look at the agenda. If you would just run through the agenda with me so you know where we're heading and will know how we got there once we get there. You've heard from Lawrence. I'm just going to do a little bit of brief administration here.

Ms. Marissa Bailey, who is the project manager for the cast study approach, will be bringing you up to date on the status of where we are, and then Dr. Robert Bari and Mr. Ed Grove from the Brookhaven National Laboratory will do the briefing for you on what they have found to date.

I guess the next thing I want to just talk about is a few of the ground rules. I've been at this meeting all day, and this is not a group who needs ground rules. You are all doing beautifully, but I think the most important thing is if you could hold your questions until after Dr. Bari finishes speaking? When you come to the microphones to make your talk -- and we'll have people in the audience that will have microphones -- it's very important that you say your name and say your last name really clearly because this is not a transcribe situation.

Again, I don't really need to say this, but we're going to try and finish and 9:00 so when it

comes time to talk we'll just all need to watch our time. Other than that, after what I've seen today, you're fine.

Marissa, if you could take the stage now.

MS. BAILEY: Good evening. My name is Marissa Bailey. I'm a senior project manager in the Risk Task Group, and my purpose here this evening is to give you background information on the case study. Basically what I'd like to do is explain to you why we're conducting the case studies, how we're conducting them, and also just talk to you about where we're going to be heading with the case studies.

Before I begin with that, however, I'd like to repeat our objectives for this meeting. The first objective is to basically inform you of the status of the case study. The second objective and really what's more important is we would like to get your comments and feedback on how we're doing with the case studies, how we should proceed with them, how you think we're doing with applying our screening criteria, any input that you may have as far as what needs to be changed with the screening criteria. Also if you have any just general comments on how risk information should be incorporated into the waste and

materials regulatory processes, we're also taking comments on those.

So why are we conducting the case studies? The primary purpose for conducting the case studies is to test the draft screening criteria and also to examine the feasibility of developing safety goals for the nuclear materials and waste arenas. Other reasons for conducting the case studies is that we hope it will give us insights on how we can risk inform our regulatory processes and also gain insights on the tools, data, guidance that we would need to implement a risk-informed regulatory approach.

As Lawrence mentioned in his presentation earlier today -- and I think he also alluded to it earlier -- NRC has been in the process of developing an approach for using risk information in our regulation of nuclear materials and waste. One of the handouts that we've given you that's attached to the agenda is a definition for risk-informed regulation. To us that really is simply a way for us to focus our resources on safety to help us improve our regulatory decision-making process, to help us be more effective and efficient in the way we regulate, and to reduce unnecessary regulatory burden.

We also see risk information as a way to focus or to identify and address any shortcomings in our current regulatory system, so in some instances it may be that a risk-informed approach means an increase in regulatory requirements in regulatory burden.

The framework for risk-informed regulations in the nuclear materials and waste arenas is detailed in a June 1999 commission paper that's known as SECY 99-100. That paper basically introduced a systematic five-step process for implementing -- for moving towards risk-informed regulations in NMSS. Those five steps are to identify the candidate regulatory applications that would be amendable to risk-informed regulations; to decide how to modify those regulatory applications so that they are risk-informed; to change the current regulatory approach to implement the risk-informed approach; and to develop or adapt risk-informed tools to move toward a risk-informed approach.

In this five-step process we're on step one. We are very early in the process of identifying those regulatory applications that might benefit from using risk information.

To help us identify what regulatory applications would benefit from using risk information

we drafted the screening criteria. The screening criteria once they're finalized is really a decision-making tool. What we're asking ourselves is where in the regulation of materials and waste would risk insights provide a value, and we're hoping that by applying the screening criteria we can make those decisions in a consistent manner.

Our draft screening criteria were developed in a fairly interactive public particpatory process. Back in August of 2000 we had a workshop to solicit comments and recommendations on how we should incorporate risk-informed approaches in NMSS. During that workshop we introduced a strawman for the screening criteria, and as a result of that workshop we -- the screening criteria were refined and developed to their present state, so that today the screening criteria basically comes in the form of seven questions that we would ask to help us determine whether an activity can be risk-informed.

The first four criteria basically ask whether a risk-informed approach would support the agency's performance goals of maintaining safety, improving efficiency and effectiveness, reducing unnecessary regulatory burden, or helping to improve public communications. The fifth criterion addresses

the availability of quality data and models to support a risk-informed approach. The sixth criterion addresses the cost of implementing a risk-informed approach: could a risk-informed approach be implemented at a reasonable cost, and the seventh criterion addresses other precluding factors. Given that the first six are met, is there something else out there that should or could prevent us from moving towards a risk-informed regulatory approach?

Another outcome of that April 2000 meeting was the general consensus that case studies would be a good way to test the draft screening criteria. The case studies would be a retrospective look at a spectrum of activities in the nuclear materials and waste arenas, the uranium recovery being one of those activities. And individually and cumulatively each of those case studies should illustrate to us what's been done in materials and waste and whether they were risk-informed and to what extent they were risk-informed.

The second objective of the screening criteria is to examine the feasibility of developing safety goals for the materials and waste arenas. I think one of your handouts also is the definition of safety goals, but basically what we're trying to

1 determine in this case studies is whether it's
2 feasible for NMSS, given the diversity of activities
3 that we regulate, is it feasible to try to broadly
4 define an acceptable level of risk, a level of what is
5 safe enough?
6 So what we're trying to do in the case
7 studies is we're trying to determine whether there are
8 safety goals or elements of safety goals that are
9 imbedded in those past decisions that are related to
10 the case study activities and whether those elements
11 of safety goals have a common thread, and then whether
12 those elements of safety goals also could be expanded
13 broadly to cover other nuclear materials and waste
14 activities.
15 The overall structure for how we're
16 conducting the case study is described in our case
17 study plan, and that's one of the handouts you have
18 this evening. This plan was also developed in a
19 public participatory process and was issued back in
20 October 2000. The draft screening criteria that I
21 described to you earlier can be found in section four
22 of the case study plan, and as I've mentioned -- and
23 if you look at them those are really a series of
24 questions that we would ask to determine whether an

activity could be risk-informed or should be risk-informed.

The areas that we are conducting the case studies on are also identified in the case study plan. Those are gas chromatographs, static eliminators, fixed gauges, site decommissioning, which is focused on the decommissioning of the Trojan Nuclear Power Plant, transportation, which is focused on the transportation of the Trojan reactor vessel, uranium recovery, storage, which is focused on the seismic exemption that was given to the independent spent fuel storage installation at INEEL for the TMI2 fuel debris, and gaseous diffusion plans, which -- that case study is focused on the seismic issues associated with the Paducah GDP.

The uranium case study is really looking at the overall process for uranium recovery. However, we did decide to choose White Mesa and Smith Ranch as examples for the case studies so that we would have some real sites that we could apply our screening criteria on and also look at. I'd like to point out that White Mesa and Smith Ranch were chosen really for no particular reason other than it was convenient and it was accessible, or they were convenient and accessible.

As I've said before the purpose of the case studies are to test the draft screening criteria and to derive safety goals and to gain insights in risk informing our process and the tools needed for that. They are retrospective studies. The intent of the case studies is not to look at -- not to reopen or reassess previous decisions that were made by the staff or by the commission in those particular areas.

The case studies basically involve answering three sets of questions for each case study area, and those questions are identified in section seven of the case study plan. Those are screening criteria analysis and risk analysis questions, safety goal analysis questions, and then the questions that we would ask once some draft safety goals were developed, and Dr. Bari will be going over those questions in detail in his presentation.

I'd like to emphasize that what we've planned to do today is to present our preliminary answers to some of those questions, preliminary answers and observations, and I want to emphasize they are preliminary answers, and our observations also are just that. At this point we've made no decisions and we've come to no conclusions about the case studies.

1 We're really presenting you with this information so
2 that we can get your feedback.
3 And finally I'd just like to go over our
4 schedule for the case studies: where we've been and
5 where we're going. As I mentioned, we had the
6 workshop in April 2000 and out of that workshop came
7 the draft screening criteria and the idea for using a
8 case study approach to test the draft screening
9 criteria. In September 2000 we drafted the case study
10 plan and we presented that at a public meeting, and in
11 October 2000 we issued our final case study plan.
12 In November we began our case studies and
13 last February we held our first case study meetings on
14 the gas chromatographs, static eliminators, and fixed
15 gauges, and last May we held our stakeholder meeting
16 on decommissioning and transportation.
17 This evening we'll be discussing uranium
18 recovery. In late July, probably July 31, we'll be
19 holding another stakeholder meeting to discuss our
20 case studies in storage and the GDPs. We hope to put
21 out draft reports for all the individual case studies
22 in September, and as Lawrence mentioned in October we
23 hope to hold an integration meeting where we can pull
24 together the results of all the case studies and

present that to our stakeholders and discuss that with you.

The final reports for the case studies are scheduled to be issued in December, and in March of 2002 a final consolidated report which would pull together the cumulative results of the case studies and have findings on what the screening criteria looks like, what the feasibility of the safety goals are for NMSS, and in summer 2002 if we find that they are feasible we hope to present our first draft of the safety goals. And that concludes my presentation.

Bob?

DR. RATHBUN: Thank you very much, Marissa.

Now I would like to introduce Dr. Robert Bari from Brookhaven National Laboratory, who will present the results. Bob?

MR. BARI: Thanks, Pat.

My name is Bob Bari. I'm from Brookhaven National Laboratory, and in the study that we did have underway actually I was working with Ed Grove, who also is of Brookhaven National Laboratory.

What I'm going to do tonight is tell you about the study as it currently exists. I'll go through a little bit of the background. It will be

perhaps redundant with what you heard from Marissa a few minutes ago -- go through our preliminary impressions of the draft safety questions, the case study questions, and then go into the draft screening criteria, which are really the heart of the case study plan, give you some preliminary observations and then also some conclusions.

We started this study just about two months ago in April, and the focus has been both on an uranium mill and an in situ leaching facility. We wanted to be as broad as possible in this study and thought that we needed to look at both types of facilities. I'll emphasize that this is a work in progress and we're going to complete this study at the end of the year and hopefully it will be available to you at least in draft form some time in September or so. There is a website that the Risk Task Group maintains, and you can already find some preliminary information such as the case study plan itself on that website, and I encourage you to stay tuned there. As other information becomes available it will appear on that website.

The case study draft questions themselves were designed to meet objectives related to current and potential information that exists in a risk form

that could be useful in this area. The feasibility and usefulness of safety goals in the area and also information needs for risk informing the uranium recovery area itself, and these are categorized into three broad areas, two of which we'll be chatting about tonight.

The first are screening criteria analysis questions and risk analysis questions, secondly safety goal questions, and third, questions upon developing safety goals. These we will not be discussing tonight. We're too early in the study to do that.

The uranium milling area is being studied with a focus on the White Mesa facility in Blanding, Utah. This is being done because it's, as Marissa pointed out, it's a convenient study for us to use for example purposes a facility that was licensed by NRC in 1979 and has processed 4 billion tons through 1999 of uranium. It has mill tailings on site and it happens to be the only operating mill and is currently scheduled for transfer to DOE in 2025.

On the in situ site we're focusing on Smith Ranch in Wyoming as our example. It was licensed in 1992 by the NRC. It has a demonstrated annual production capacity of 770 tons of uranium. Current annual production capacity is 580. The site

has inactive and active wells, and it has recently been granted a license renewal by the NRC. We did visit the White Mesa site yesterday and we plan to visit Smith Ranch on Friday.

There are several screening questions if you've had the opportunity to look at the case study plan. You will see that there are several questions that are posed that help to guide this study, and what I'm going to do now is take you through many of them. I paraphrased them in each of these view graphs and I'll give you some of our preliminary impressions of where we are on those various questions.

The first one deals with risk information that's currently available out there to help us determine to what extent we can risk inform the uranium recovery area. On document that's been very interesting to look at is NUREG-1531, which is the environmental impact statement for the Atlas Uranium Mill. There they really took to hear the risk-based concepts and seemed to have used it very well in understanding the doses that folks would receive, the possible accidents that might occur.

And also as a follow-up to that the people involved with the Atlas also produced a paper at the ANS conference in 1996 where they were looking at

alternatives for disposal of the tailings. One was reclamation, another one was do nothing, and a third one was to move it, and they used risk information to help make a decision or to at least come to a conclusion on their part.

Another environmental impact statement that we found interesting for its risk information -- in the risk information area was NUREG-1508, the Crown Point in situ leach facility, and another study that is underway is one by the Center for Nuclear Waste Regulatory Analysis on in situ leaching. This study is not currently available but I believe there is a sign-up sheet for that. If you'd like to get a copy NRC can provide it to you when it does become available.

The next question deals with the quality of studies. As I mentioned, Atlas seems to -- the EIS seems to be a very interesting study in terms of risk information, both in terms of looking at risks from accidents and also risks which they call incident-free risks, which are really the normal chronic releases that one would have in any enterprise, and one has to measure this and assess it, and this is exactly what they did. They were interested in particular in looking at alternative disposal options.

Also the ANS paper on Atlas was an interesting one and it supported the conclusions that it came to. It was not an in-depth paper. We could not really assess the methodology per se, but it seemed to be well posed in terms of the questions it asked and the conclusions it came to. The regulatory analysis center's paper also looks at radiological releases, worker risks, and environmental impact, and hopefully it will be a document that you could also review.

We did not see the document yet. We did have a chance to chat with a member of that institute to get some preliminary impressions of its content.

The next question in the case study plan asks about the need for additional studies in this area. There are two general areas where one can benefit from the strengths of the risk-informed approach. One is in the realism of scenarios, and this is really a general strength of a risk-informed approach. One tries to be as realistic as possible, not conservative in the analysis. One wants to get the best possible analysis to the fore in these studies, and hopefully this is the type of thing that we will see more of as studies are done in this area.

Another strength of risk assessment is that it expresses uncertainties. One first assesses uncertainties and tries to quantify them as best as possible. It helps you to understand what you know about what you don't know.

The next question deals with the use of risk information by NRC and the licensees. NRC has considered risk in the transportation area connected with uranium recovery. The EISs for Crown Point and Atlas both have used risk information. More generally and broadly in the uranium recovery area there has been use of risk type information to the extent that dose equates -- chronic doses equate with risk and also as I mentioned the study by the center. The NRC-sponsored study by the Center for Nuclear Waste Regulatory Analysis considers risk.

The next two questions are lumped here. One deals with societal benefit of the current operation and the other is with public perception. The societal benefit is clear for this case study. It provides an energy resource of uranium, important for nuclear reactors, which presumably are important for electricity generation.

Public perception depends upon the site. Factors to be considered are environmental impact and

public health on the one hand and economic and social value to the community on the other hand, in which the facility sits.

The next question deals with the basis for the current regulations. There's quite a bit here. It starts with -- not necessarily starts with, but a major document is the Act of 1978, the so-called UMTRC. The standards set by the Environmental Protection Agency figure in very strongly, the working understanding with other agencies that -- such as the mining agency, MSHA, is important here, and then a slew of pieces of the Code of Federal Regulations come to play here.

Singled out is 10 CFR 40, Appendix A, which was congressionally mandated and not a risk-informed document, very deterministic and prescriptive in its presentation. NRC was embarking or considering embarking on 10 CFR Part 41, and this has now been discontinued.

Explicit or implicit safety goals in regulatory documents -- as Lawrence mentioned earlier, part of this activity is to tease safety goals out of the documentation that we review and come across. One very elegant statement of a possible overarching safety goal for this area, uranium recovery, would be

one that we found in the generic environmental impact statement, NUREG-0706, and I'll just quickly read it to you.

"Operation of uranium mills and the management of mill tailings -- they are appropriately short. The public health and safety and preservation of environmental values. So this is a top-level statement for uranium mills at the time. This is a more than 20 year-old document now. And also in the framework document for risk informing the materials and waste area SECY 99-100, the commission notes that both public and worker risks are important, to be dealt with, and in fact they do put forth four strawmen risk metrics to be considered broadly again the waste and materials area.

One relates to fatalities. A second relates to a frequency of a large dose perhaps on the order of 25 rem. A third relates to possibly setting a dose cap as a goal, and a fourth, which is not easily related to this area but perhaps relevant to others is one related to criticality within an operation.

The next question relates to the basis for the development of strategic goals, performance goals, and measures. Of course, the current approach is 10

CFR 40, Appendix A, the standards set by the Environmental Protection Agency, and individual state standards.

The next question in the safety goal area deals with safety goals, limits, or other criteria implied by decisions for evaluations. We do have NRC's radiological concentration for air and water effluents, the EPA standard for groundwater, and occupational protection guidelines and standards.

The next question relates to tools and data needed for validation of safety goals. If one were to formulate safety goals in this area how do you know that you've met the safety goal? When do you know that you're there? And on this area models and data for risk to workers during operation would be important. These would have to be developed. They've been partly developed, but these were the types of information and tools that would be needed. Models and data for both long-term and short-term environmental impacts would be very important too.

The next question deals with who are the populations potentially at risk? I've separated this out into two areas. One is during normal operations, and this seems to be mainly the workers, and then during off-normal events. Well, this would include

the nearby population in the area, and then one would consider after operation ceased there would be those who would come in contact with the site, either directly or via liquid pathway exposures.

What would be the potential consequences to the populations at risk? Well, for workers there would be various consequences. One would be in the industrial -- normal industrial accidents, transportation, chemical risks at some of the facilities, exposure to radon and other radionuclides. For the public it would be exposure to effluents from off-normal events, for example, wind-blown particulate, yellow cake, groundwater contamination, and transportation accidents.

The next question addresses the parameters to be considered in formulating safety goals. There are a range of parameters to be considered in this area. One is related to the populations at risk: workers versus public; individuals and individual goals be formulated and/or societal goals; off-normal events, normal events should both be considered, one or the other; acute fatalities/latent fatalities, serious injuries for the uranium recovery area. It would be hard to see acute radiological fatalities at

this point in our evaluation -- and environmental damage and property damage.

These are all valid risk indices or risk categories for consideration in formulating safety goals in this area. Our minds are open right now as we proceed through this.

So what's the feasibility of developing safety goals is the next question in the case study plan. We believe this is something that is worth pursuing. It would help to focus regulatory oversight. We very much would like to get your input to this and hopefully during the next phase of this meeting tonight we'll get some of that.

The next question focuses on methods, data, results, safety goals, or regulatory requirements to risk inform similar cases. Thinking broadly, there may be in the low-level waste area some issues, challenges that could benefit from similar approaches, and also closer to home for the uranium recovery industry are byproduct material disposal, which could be risk-informed in a similar way.

The next set of questions relate to developing safety goals. Once they're developed -- and we don't have those yet, so this is deferred.

The draft screening criteria themselves as you heard a few minutes ago are really there to be tested by these various case studies, and we've done this in some of them and we're proceeding to others now. But the whole idea ultimately of why do we want to do this -- we'd like to ultimately have final screening criteria so that in the waste and materials area when one considers a challenge -- an issue a safety issue and one wants to know whether risk-informed methods information could be useful we'd like to be able to turn to the screening criteria and understand how to efficiently and effectively use them in regulatory application, so that's our ultimate goal in this.

So the draft screening criteria -- the first four are very thinly disguised statements of the NRC's high strategic objectives: maintaining and improving safety. Here the risk-informed approach could be helpful in balancing various risks, understanding radiological and non-radiological risks in the uranium recovery area.

The next question relates to improving efficiency or effectiveness in the regulatory process. It could be helpful to the regulator in reviewing

submittals by licensees. It could be helpful to inspectors in prioritizing resources for inspections.

The next question relates to reducing unnecessary regulatory burden. It could be helpful very much here in understanding the importance of various issues, trying to separate the important from the unimportant and working together with the regulator in focusing on those issues.

The fourth of these questions relates to communicating regulatory decisions. Putting these various regulatory decisions in a risk context could be very helpful. Understanding risk effects on workers and public could be a very effective way to communicate how a decision has been made.

The next question relates to sufficient information models that would exist or would they have to be developed to support a risk-informed approach. There are bits and pieces of models out there that can be used. Some would have to be developed depending upon the exact applications, and as Marissa said, we're very early in this process but I think this is a very valid question.

The next question is can a risk-informed approach be implemented at a reasonable cost and provide a net benefit? One thing to observe here and

recognize is that there probably should not be a revolution towards a risk-informed approach. Rather we should do this in a very evolutionary way. There are some tools in place. There's information from other areas where risk-informed approaches have been tried, so I believe that we need to move in a deliberate way, understanding what we're doing, gaining from lessons learned. I think this is a potentially positive approach to take.

And do other factors exist which would preclude implementing a risk-informed approach? Again, we'd like to hear from you about that here tonight. In our studies so far over the last two months we haven't found any show stoppers in this area.

Observations, very preliminary observations: the Atlas risk studies showed how risk information can be used to provide additional perspective. I think they've done that very nicely. ALARA principles have demonstrated to be useful in regulation in this area, and the current study by the center suggests a potential efficacy of risk-informed approaches, but again, we haven't seen that full study, but it promises to be a useful one.

Preliminary conclusions: expanded use of risk information seems possible in the uranium recovery area. Safety goals may be feasible here. It seems to be rudiments of them already in various documents; the question of being able to craft them effectively and putting together a cogent story in this area.

We found in this study that the screening criteria have been effective for us in terms of trying to understand how to proceed and this may be also a case in some of the other studies that have been done and possibly in the ones that remain, but it's too soon to tell, but so far the questions seem to be reasonably posed.

That concludes my talk. Thank you for your attention.

DR. RATHBUN: Thank you very much, Bob.

We're going to have to ask your indulgence now as we need to take about a five-minute break so we can reset up the microphones, and then when you come back from your break you can ask all the questions you want. So I think somewhere around 8:00 we should have it done.

(Whereupon, a short recess was taken.)

DR. RATHBUN: Before we start taking your questions and comments I want to clarify something that I probably did not make clear earlier. This meeting is being recorded and it will be sent to a transcriber, so we are on the public record, so I just want to make sure that I didn't make that too complicated, but she just isn't doing a regular transcriber thing, but that will get done next.

Okay. What kind of questions do you have for the risk group tonight? Sir?

MR. MACKIN: My name is Pat Mackin for the Center for Nuclear Waste Regulatory Analyses, and I have a couple of comments and questions. The first dealt with Dr. Bari's discussion of ALARA, and finding that ALARA principles were useful in your assessment so far.

I guess I'm asking for a little clarification on that, because I'm wrestling with the same issue in the assessment we're doing of ISL facilities; there are a number of instances where risks are extremely low for certain kinds of things that can go wrong, and if they're low how does ALARA come in? How much extra effort should you put into tackling something that isn't much of a problem to

begin with? And I'm wondering if you had any success dealing with that question.

MR. BARI: Well, as I indicated, we're early on the study. What we're really trying to say here is that you should recognize both the benefits and the cost of implementing ALARA, and to the extent that you can do that of course you should.

MR. MACKIN: Can I ask another one, make another comment?

MR. BARI: Yes.

MR. MACKIN: You said -- I was trying to make notes -- I think it was on slide 16 and 25 you mentioned that there were bits and pieces of tools and models available for doing risk assessments. One of the things we think we have found is that there is an overarching technique for looking at risk, the integrated safety analysis process, which I think was originated by the chemical industry and it's now used by certain NRC licensees and programs as well, and that's a fairly well-established step by step kind of process.

What we found is that since that process exists the only question is whether there are techniques available to look at your particular problem, and for the NRC's mission it seems like there

are accepted techniques for looking at things like doses that are generated from dispersal of materials either in air or the water or the food chain, and that there are computer codes available to assist with that kind of assessment, so in fact the tools might already exist in many of these areas.

The place we found the need to be a little creative maybe is it might not be efficient or cost effective or even useful to do a by the numbers integrated safety analysis of some problem. If you look at a specific problem and its nature, the materials involved, the kinds of operations that go on in a facility, you may find that the best thing to do is to tailor that approach to the specific problem you're doing, and you might be able to streamline things and actually avoid unnecessary effort, because some of that process can be quite expensive and time consuming.

MR. BARI: I agree with that. You're exactly right. In fact, what I would advocate is a screening type approach where you look at the various initiators of events, things that can go wrong, and then try to bound them in some way, get a sense of their relative importance, and then you focus on the

big rocks that are still sticking out of the water and put your emphasis there.

And you're quite right about the chemical industry. There are approaches there, the so-called HAZOP approaches, which I think can lend itself very nicely to this area, particularly -- we were at White Mesa yesterday and I could see HAZOP approaches being used there along with as you say, the back end looking at the doses, the emissions and effluents, and there are standard approaches there. And there again, you might -- don't want to use a full-blown transport theory for effluents --

MR. MACKIN: Right.

MR. BARI: -- where a simpler analysis might be best applied.

MR. MACKIN: I have one more comment if I can. One of the screening criteria is that it would help communicate a problem or a decision --

MR. BARI: And maybe the problem too.

MR. MACKIN: I agree with you, except one difficulty I see is if you end up using some sort of probabilistic approach it may be very difficult to communicate results of that nature to some stakeholders, to some members of the public who are not familiar with those approaches. So I think those

of us who are engaged in that have to be careful about how we use the results, make sure they're translated in terms that are readily understood.

MR. BARI: That's quite correct as well. I didn't mean that -- didn't want to imply that one would present the arcane results of some statistical analysis to let's say the uninitiated in that area. However, there are simple very qualitative statements of risk that people can understand in terms of their every day lives if one presents that rather than a rule that they might not understand, may in fact also be presented in some arcane way it may be better to have a simple measure of risk against some understandable safety goal if one such thing were formulated.

MR. LEACH: My name is Melvin Leach, NRC Licensing Branch.

Marissa, you gave the five-step process that came out of SECY 99-100. The first four of those appear to be sequential steps. I'll just go over them for everybody's ease of reference: identify candidate applications; decide how to modify the approach; change the approach; and then implement risk-informed approaches. Those seem to be sequential steps. The fifth one concerns me if that's viewed as the last

step of the sequence, which is develop or adapt risk-informed tools.

In the reactor side of the house I think we got the tools after some of the approaches were in place, and I'm thinking of the significance determination process site specific work sheets. I don't know how much you're familiar with that, but the fact that those were not in place a year earlier or so made a lot of work for the inspectors and enforcement specialists within the agency and made our process somewhat vague for licensees and members of the public, because it wasn't clear how we were doing business.

So I'd encourage you to get the tools in place at the right time to support whatever approach we take.

MS. BAILEY: I think you're right, and I think really if you look at those five steps that are presented in SECY 99-100 they look like they're supposed to be sequential steps, but if you really look at them the only thing that really needs to occur step number one is the first one, is to identify the application, the regulatory applications. The other four steps can occur I think in parallel, or step five

could occur before step two, so I think we do recognize that, but thank you for the comment.

DR. RATHBUN: Lawrence has a comment.

MR. KOKAJKO: Mel, I know you know this, but for other members of the audience who don't you are correct that it is not a sequential thing. In fact, even what you think is a sequential probably is not because we're looking at a number of programs within NMSS and the NRC. They could be portable gauges all the way up to decommissioning: spent fuel transportation, spent fuel storage, so we're looking at a far broader range of things than just uranium recovery.

Uranium recovery is just really a relatively small subset of what we're looking at right now, and it's because of that diversity -- each program is starting off at a little different level in terms of risk assessment and risk management, and because of that that's why you see this sort of stilted view of the approach. In an ideal world I think we would approach it a little bit differently, but even if you go back to NRR and the reactors WASH 1400 came out with very little information when you think about it, yet it was a very effective and a very good predictor of plant behavior over the long haul.

So we do recognize that, but SECY 99-100 was developed because it was looking at a broad range of regulatory applications, not just uranium recovery.

MR. LEACH: Mel Leach again. I would ask that when you look at your screening criteria at the end of this you look at what got kicked out in the process, because if the screening criteria never kick anything out they're not really doing much for you, and if criterion five never does anything then maybe we don't need criterion five for example, and if none of them as a group kick anything out then perhaps we don't have the right screening criteria.

MR. KOKAJKO: Thank you for your comment on that. You also understand that besides these case studies Risk Task Group is also doing other work in systems of four divisions, and in fact, either on other applications we are using the screening criteria now, and it has in fact kicked things out. So we think the screening criteria is working.

Does it need refinement? We think so. There's a couple of questions that I think probably need to be changed, but in general we think it's been effective, and other divisions are using it now, IMNS being one of the more notable ones, particularly in the application regarding rulemaking.

1 DR. RATHBUN: Marissa, did you want to add
2 to that?
3 MS. BAILEY: I was trying to tell Jim to
4 put that on our --
5 DR. RATHBUN: Thank you.
6 Next question. Sir, in the red jacket.
7 MR. WIATZKE: Gerd Wiatzke, Senes
8 Consultants.
9 We were one of the authors of the paper on
10 Atlas and as I mentioned at the break we have the
11 information that we presented at the PSA '96 meeting,
12 and we certainly could provide that to you to give you
13 more detail on that. Also, we've been involved in
14 risk assessment for a long time for the mining
15 industry, and several of the initiatives that we're
16 aware of were in fact University of South Carolina
17 Medical Center.
18 I believe they've done a major risk
19 workshop in around '95-96 at which the German Ministry
20 of Finance presented their risk-based approach on the
21 decommissioning of the former East German uranium
22 mines, and I can provide you information when I get
23 back on that material, but it was an enormous
24 challenge for them to deal with 6,000 contaminated
25 objects that was transferred to them all at once, and

they had to come up with an approach under their law and the risk-based approach was the one they selected for moving ahead, so I can provide you separately with some information on that.

MR. KOKAJKO: Thank you very much.

DR. RATHBUN: Another question?

MR. CARSON: Louis Carson, NRC Region 4 inspector. I was noticing on slide number 18 on potential consequences to the populations at risk you point out the chemical risk to workers. However, when you get to the public section of it we don't seem to be looking at chemical risk to population groups, and that could occur as a result of transporting material from say Atlas to wherever the material is going to be resent. There's going to be chemicals associated with that. I'm not sure -- informed the NUREG for that address.

Those chemical issues are for an operational ISL or traditional mill. They're what are called hazardous bulk chemicals that are under the 29 CFR 1910 standard for bulk hazardous chemicals, the PSM standard for which possibly your organization could identify through those type of operations what type of chemical operations that if released would not only injure or potentially injure occupational workers

but if they released off site presents a hazard in terms of the general population.

It seems that the only area whereby chemicals -- where you seem to be addressing or recognize have to do with stationary situations whereby you're looking at groundwater chemistry or groundwater chemicals affecting the environment, for which I'm not sure how you really look at the risk there in terms of risk assessment really having hazard to anything but the environment and what level it is. However, if you have a chemical release that harms the population and that falls to the EPA domain and potentially something called a chemical safety board for which -- assesses blame and potential corrective actions of not only the operator but the regulatory agency.

So I seem to notice that your slides are necessarily just chemical risk to populations.

MR. LAYTON: Yes. I'm Mike Layton with the Uranium Recovery Program at NRC, and Louis's point is well taken, and I would like to maybe expand a little bit on what Bob presented when he referenced the report that the Center for Nuclear Waste Regulatory Analyses is working on.

Chemical hazard to both worker and public impacts was considered as a part of that analysis, and the report is in the final stages of being completed and should be available for public review very shortly. And Pat Mackin, who presented the first couple of questions has been working rather closely with Brookhaven in bringing them up to speed with what types of analyses and concerns that they evaluated in their effort, so that is being caught and encompassed in the effort that Brookhaven is pulling together on this.

DR. RATHBUN: Louis, does that answer your question or did you want to give us some more suggestion?

MR. CARSON: I guess the principal suggestion that would give me some comfort is to know that in your assessments that you're looking at, uranium recovery against the -- I think it's NUREG-1501 standard for PSM chemical safety analysis that the field cycle group has and that you're using that type of protocol to look at chemical risk, because even within that one of the documents referenced was a risk assessment process that the chemical industry uses, and I'm not sure NRC is necessarily using it, particularly in the area of uranium recovery.

DR. RATHBUN: Thank you very much.

Next question? Gentleman in the blue shirt.

MR. WEAVER: Ken Weaver, State of Colorado Department of Public Health and Environment. And I waited until the end because this is really a side note or a footnote even to this, but it relates very much to the uranium recovery facilities, the operating uranium mill which we do have in Colorado, so there's more than one.

These criteria seem not to be zero based. They seem to begin instead with the current regulatory framework as it would apply to existing regulated facilities, just reading through that, and there's an irony that might seem to appear, which is that the safety goal might be what the doctors say, First do no harm. In other words, don't change something that, from an ALARA point of view, might be working.

In Colorado we've had decommissioning of a nuclear power generating station. We've had megacuries of cesium at our IO-tech facility and C&D commissioning of that, so we know that magnitude of risk.

But we also have a licensee, a public water treatment plant required to remove uranium and

radium decay-series material to make people's drinking water safer. The external radiation from the water treatment residuals requires the treatment plant operator to be a radiation worker, perhaps tens or hundreds of millirem per hour in some places, and yet a regulatory requirement or a piece of the framework that we have, the regulatory approach that we have really right now would prevent that radium-bearing material, uranium series material, from going to a tailings impoundment that is designed to withstand a maximum credible earthquake.

It has a thick clay liner. It will be covered with a thick cover that's designed to withstand a probable maximum flood series, and has a volume now or capacity of 1.8 million cubic yards, and yet isn't able to take a few thousand or even tens of thousands of cubic yards of this hundreds of picocuries per gram radium material from several drinking water supplies that want to treat and remove that from the water.

And so the irony is that from the ALARA point of view, there's something that would make the water safer, and it would enable that radium-bearing material to be away from those treatment plant operators, perhaps not needing a license for that

facility, and the material would be sequestered permanently out of -- clearly out of harm's way.

And so it might be a reasonable safety goal to have first in mind that you not stand in the way of reducing risk in the spirit of reducing exposure to individuals and releases to the environment as low as is reasonably achievable.

I wanted to leave that logic here, but I think it's a way to come to ground with some of the decisions we make when we do radiation control through our licenses, and the control is a little different from the dose risk harm considerations. The regulatory approach should enable that additional control and support that and at least not interfere with it.

DR. RATHBUN: Lawrence, do you have a question?

MR. KOKAJKO: I want to thank you for your comment. We appreciate what you're saying. You are correct in your initial assumption that we are assuming that the current regulatory framework is intact. That was the guidelines that was given to me, but however, within that hopefully we will look at whether or not we need to change that, whether or not

we need to take a look at the rules or licensing inspection or enforcement processes as we go on.

And this is not a -- we're not going to get there in a couple of weeks, but hopefully this time next year we may have something that may provide some meaningful guidelines for just what you're talking about, and if I'm invited back to the next, maybe I'll have something to say to you then. So thank you for your comment.

DR. RATHBUN: Okay. I guess that is our last -- I'm not trying to cut you off.

MR. HAMRICK: My name's John Hamrick, and I have something to share with you and also a comment, and then a comment of another who was not able to make it here to the meeting tonight.

But in part of what you're talking about tonight you're talking about estimating risks for workers, mill workers, that type of thing. I'm not sure that you're aware that NIOSHA is undertaking an epidemiology study, and they are close to proposing their model that they're going to be using to analyze their results with. I believe they're looking at some time possibly in the next three months to have the results of this epidemiology study available, so that's something you may want to -- and I can

1 certainly provide you more information if you need
2 contacts. Dr. Thomas Bloom out of Cincinnati is
3 heading that up for NIOSHA.
4 Also, slide 18 -- focusing on one that was
5 talked about previously where we're talking about
6 chemical risks and perhaps industrial and
7 transportation risks -- in the nuclear industry we're
8 all familiar with the ALARA principle, but there is
9 not everyone agrees and there is some controversy
10 about whether ALARA is appropriate for chemical risks
11 where exposure thresholds may exist and that type of
12 thing.
13 The comment that I have from Anthony
14 Thompson is -- deals with slide 27. It says, Do other
15 factors exist which would preclude implementing a
16 risk-informed approach? And his comment has to deal
17 with an in situ leach situation where interveners
18 essentially in an informal atomic safety and licensing
19 board procedure were able to really throw a monkey
20 wrench into the system and into the process, and so
21 there are other factors that exist that would preclude
22 implementing, and in an informal process where
23 interveners were allowed to present many thousands of
24 pages of documents that then had to be considered in
25 an informal process is certainly such a factor.

DR. RATHBUN: Thank you very much.

Next question?

MR. KOKAJKO: Thank you for your comment. I appreciate it. I'd like to address your latter comment from your associate who's not here.

In fact, the seven screening criteria has been noted as perhaps being a little bit flawed just for something you said. Adverse stakeholder reaction would be something that could perhaps make it very difficult to do. However, just because someone goes before a hearing board it doesn't necessarily mean that you shouldn't do it.

When we were thinking adverse stakeholder reaction we were thinking something much broader scale, such as a public outcry on below regulatory concern, which the NRC tried to adopt back in the early '90s. There concerned citizen groups, environmentalists, and others banded together and spoke with one voice, which doesn't happen very often, and were able to get the ear of the Congress in a way that got our commissioner's ears, and so that would be a much broader scale type of thing.

We have identified the fact that we will need to look at adverse stakeholder reaction in terms of the seven screening criteria with a little more

fine eye. Just because one or two people are against it doesn't mean that we can reject it, and we are sensitive to that, and we will probably modify the seven screening criteria just so that doesn't happen.

MR. WEBER: My name is Mike Weber from NRC. I had a question and a comment. I'll start with the comment then I'll go to the question.

My comment is I was struck by your presentation on the availability of the risk information and the techniques because you focused on Atlas, and I think that's a good focus because there is a lot of information available, somewhat recent information in that area that can inform the analysis of the case study per uranium recovery.

My comment is given that you want to consider Atlas as part of your case study because in fact there you have a case in pont where perhaps we did fairly elaborate, fairly effective risk analysis but ultimately came to a conclusion that differed from a conclusion reached by the US Congress, or at least potentially reached by the US Congress for a variety of reasons, and I think those reasons tend to be informing to us in terms of how the process may work outside of our little -- sometimes our technical sphere address the outrage factors in a different way

than we as technical folks typically approach a problem.

And indeed, that might be something you want to look at in terms of defining risk: Is risk just the technical risk, the hazard, as Dr. Saman [phonetic] would refer to it, or is risk really broader and includes outrage factor and how do we factor that into our risk-informing decision making?

My question is in looking at health risk, for example, from one vector alone, release of radon and radon daughter products from uranium milling and in situ mining what's the population and what is the time frame over which we're considering the health effects?

MR. BARI: In the study we're not exclusively looking at White Mesa and Smith Ranch. Atlas, to the extent that we have information to enrich the case study, will be part of it. That will definitely be the case. What we did find on it very intriguing and interesting, and if we do find information on other ISL's or mills, whether they're operating or not, we'll include that where it's relevant to the study.

As far as the risk parameters, with radon goes -- from my point of view it's too soon to tell in

terms of the risk study, but maybe I'll let Mike Layton talk about what they do.

MR. LAYTON: I'll try to shed some light on part of the question that Mike Weber had on what kind of time frame we're looking at whenever we're doing these evaluations for impacts from radon.

For in situ facilities which are -- I would characterize more as like an operational chemical facility, the type of exposure that we're concerned about whenever we do the licensing is really a life time risk to workers and members of the public. That's a little bit different with the mill tailings facilities, in which there are large volumes of low activity radioactive material that are going to be around for quite a long time, and the regulations that we work under really consider that risk for quite a long time, given that our design standard for control of the mill tailings facilities are the design standard of a thousand years to the extent practical, but in no case anything less than 200 years.

So it's quite a wide range of time frame as we're considering these risks.

DR. RATHBUN: Dennis?

MR. SOLLENBERGER: Dennis Sollenberger, Office of State and Tribal Programs, NRC.

One thing you may want to consider -- I notice in your reference documents you referred to the EIS for Appendix 8 of Part 40 the NRC issued. You didn't mention the EIS in support of the EPA standards, whether that was being considered, and since the EPA did set a different radon standard than NRC, there is a different risk base there for the radon release.

And also I think in about 1988 if my memory serves me right there was a study done by the National Academy of Sciences that were looked at the risk basis for the uranium industry regulation, and I think that ought be looked at, because again, they had some differences of opinion than those that were used for the basis of the regulations, so I think that would be worth your study, looking at that also.

MR. KOKAJKO: Thank you.

DR. RATHBUN: Do we have any more comment?

(No response.)

DR. RATHBUN: Okay.

MR. KOKAJKO: Pat -- Clifton, do you have any comments tonight? Clifton is from NEI. He always seems to have comments.

MR. FARRELL: Yes. My name is Clifton Farrell from the Nuclear Energy Institute. I just had

three items I wanted to ask you about, but first I wanted to preface the comment on something Mike just brought up, and I'm afraid if we try to start evaluating the political risk associated with decisions related to uranium recovery that's just opening a quagmire. I don't know where in heaven's name we'd ever start to try to provide some guidance there.

My first question is pertaining to the ISO recovery operations, the in situ mines, you made no comments as to how you plan on proceeding to either evaluate the existing risks at such facilities and how to incorporate them into your evaluation of the seven criteria, so I was hoping maybe you could tell us a little about how you're doing that. And I think perhaps there's a paper being presented tomorrow as I understand from the Southwest Research Institute which I gather is under -- has undertaken a study that started before this Risk Task Group was incorporated, and that might be very useful to really get our hands around that.

I have spent the last few years working on the risk informing of Part 70. That's the regulation related to fuel fabrication and the Mox people and so on, and this idea of the integrated safety analysis

was very thoroughly developed, and I think that's the type of study we need, both for a conventional mine or an ISO mine, but granted, the time and the scope of your study will not enable you to do that, but at least perhaps looking at some of the approaches that the integrated safety analysis follows might be useful there, again to get our hands on what are the true risks to the public or the workers from a Part 40 operation.

I guess I would encourage us not to -- to stay with your suggestion, to go for only a qualitative statement of risk. I want to get us away from trying to get a highly detailed quantitative analysis, the PRAs that are used and are very appropriate for reactors at least in Part 70 where we do have a possibility of nuclear criticality the new regulations under Part 70 do enable you to either stay with a qualitative assessment or risk or you can go quantitative if you wish, but I think in terms of -- we have to look at the overall risk of the operation and what is an appropriate level of detail and study, so that poses some just general comments on that.

I was a little curious about your comment on the delay -- or your caution in proceeding too fast with introduction of risk information into regulation

of Part 40 facilities. I think we have very good information in the past from adding this approach to the Part 50, the nuclear reactor licensees, the Part 70 licensees, which is just in progress, and to some extend the Part 35 medical licensees, so I think we've got a lot of good background to work on and I think the impact on Part 40 licensees will be very positive both from the regulatory point of view but also the oversight point of view in terms of inspection, enforcement, and so on to help the inspectors to concentrate on issues of real risk significance as opposed to issues of lesser safety significance, so I think it's to our benefit to look at risk informing performance based approach.

I guess one final comment. I'm just wondering if our -- if the scope of work that you outlined is a little too broad? For example, I'm wondering if we should be spending a lot of time looking at possible models for quantifying exposures to the public or the environment or workers. I think there's a lot of work done as a previous comment is mentioned on that. I wonder also whether we should worry at this stage about the -- I keep calling them societal benefits or public perception. Granted, this is very important, but I think at this first stage we

need to know is there a possible application the risk-informed principle to Part 40 licensees, and if there is then I think we can advance to see if this can satisfy the need for public understanding of what we're trying to do.

Anyway, those are just a few observations from -- I'm sorry they were a little bit disjointed tonight, but things that I jotted down as you were going on, but --

MR. BARI: Yes. Thank you for all of those comments. In fact, I think they're very valuable.

I should clarify the purpose of our study. It's not to do a formal or even an informal risk assessment of any of the facilities that we noted here tonight. Really, we're taking a look at the broader question of can you bring the risk-informed approach to the waste and materials area in some vague similar way to the way it's been done in the reactor area, and that's really the challenge that's been put to us, so we're asking that question.

So we're not really doing risk assessments for each study and for each facility and then reflecting back and lessons learned and how will we use this in some regulatory context. In a perfect

1 world we may do all of that, in a perfect world with
2 infinite time, but this is the approach heretofore, so
3 in terms of the breadth -- the scope and its breadth
4 it's really been fashioned to meet those goals as
5 enunciated in SECY 99-100.
6 So exposure models -- we'll certainly look
7 at those to the extent that we can in terms of
8 understanding how they're applicable. In other case
9 studies we've had we did take a look at how that might
10 play out. For example, the decommissioning area with
11 the types of models that have been used there.
12 In terms of my caution for going forward
13 too quickly, really what I'm trying to say there is
14 that one should not just graft on the risk paradigm of
15 the reactor area into the materials and waste area and
16 say we've got it, let's do it, and let's revolutionize
17 how we're doing our regulation in this area. It may
18 go quicker than I would think, but judging from what
19 has happened in the past one needs to reflect on what
20 one uncovers at each application, but I'm certainly
21 not going to advocate holding it back over many years.
22 So in terms of that question, that would hopefully
23 clarify it a little bit for you.
24 In terms of qualitative statement of risk
25 and safety goals, my personal sense of it is that we

should develop first some overarching goals and then if quantitative objectives are derived they should be really derived with those in mind rather than putting criteria out in the street, so I think we're in agreement there.

I think I could pull together your first few comments, which maybe to you seemed a bit disjointed, but to me one really does follow from another. As I mentioned, we are not doing risk studies per se for each of the facilities. We're trying to rely on existing risk information, and as you correctly pointed out there will be a paper tomorrow as we talked about, Pat's paper, and that will certainly as more information becomes available on that we will use that in our case study. I'm sure it's going to be valuable information to us, so it works in nicely with an absence of information on the ISL side, and now it's being done, so I hope that's helpful.

MS. BAILEY: I think I'd like to repeat again what the purpose of the case studies are, and that's number one, it's the draft screening criteria so that we can finalize our tool for determining whether a regulatory application can be risk informed. The second purpose of the screening criteria is to

examine whether safety goals are feasible for NMSS and what the form of those safety goals would be, whether it's just a quantitative statement or a qualitative statement or a qualitative statement with some sort of quantitative measures. At this point it's too early to tell.

And then the third and fourth goals of the case studies are to look at all these areas within NMSS retrospectively and try to determine whether there's some insights we can gain from them as to how we can risk inform all of the processes in the waste and materials arenas, the arena of recovery being one of them.

DR. RATHBUN: Okay. Katie?

MS. SWEENEY: Katie Sweeney, National Mining Association.

I'm glad you went over that again, because I think I'm still confused. I guess I hate to be like what's in it for us, but what -- how is this going to help industry, or is this solely to help NRC?

MR. KOKAJKO: I was going to ask if you had a question, by the way, because I called Clifton and I was going to ask if you had one, and I appreciate that comment. And I think I mentioned this morning this is a very modest effort compared to what

has been done in NRR in the reactor arena. It took NRR, depending on who you hear it from, 15 to 22 years to develop safety goals. We're going to try to do it in less than two, and it would be across a broad spectrum of activities.

What it will -- safety goals I think it's in the definition that you saw there -- I'd like to when I get into more colloquial term I would rather refer to it as how safe is safe enough? Would that be of benefit to uranium recovery if we could define how safe is safe enough?

MS. SWEENEY: Yes. Provide some definition.

MR. WEBER: -- less than it is now.

MR. KOKAJKO: That's another point. I'm glad Mike brought that up.

I will tell you a risk-informed approach will -- I'm hoping we will get to where we can say how safe is safe enough, but it's a two-edged sword. There are points -- and we have talked this over with other representatives of a number of regulated activities, and I think they recognize that yes, we might be able to reduce burden in one area or more, or a lot of areas, but there may be something where they and we have missed in our regulatory framework. We

said we should have been regulating this a lot more than we ever thought we should have.

And that's why I said earlier that it's just a tool. It's one tool to help us try to focus on safety. And I think you are as concerned about safety as I am, and in fact, maybe even more so, because you ensure safety. I'm trying to assure it by being the regulator, but the miners and the millers and everybody else, those are the people that are ensuring safety, and they're doing it on a day to day basis. You guys know more about what is a real risk and how to handle that than I can, and that's why we're having this meeting by the way, but more importantly, I have to rely upon you to help do that.

If in the regulatory processes you can tell me -- if we can learn together how safe is safe enough we will then have our benchmark by which you can determine how you will go apply your programs, how we will apply our programs.

Does that help?

MS. SWEENEY: Yes.

MR. KOKAJKO: And thank you for saying something.

MR. WEBER: If I could just build on what Lawrence said, even though I'm not up at the table,

even if we never get to some broad, lofty safety goal and even if we don't find that these criteria work -- I don't happen to think we'll come out at that point, but let's say for the sake of discussion we conclude they're not worth anything and throw them away, at least one minimalist application of thinking about risk informing our regulatory activities is that it does change the mindset of the license reviewer, and it changes the mindset of the inspector or at least it should, so that as we go about doing or business, as we strive to become more effective and efficient we can hone in on those things that really contribute to risk, and those things that don't contribute significantly to risk, maybe those we ought to back off on.

And that's -- I think that's the payback to not only the license community but more broadly to the American public, because if there are areas that we don't need to be regulating as stringently then under our performance goals of reducing unnecessary regulatory burden and being more efficient and effective we ought to back off. We're obligated to do that under our regulatory program. So just my two cents.

MR. KOKAJKO: Thank you, Mike.

DR. RATHBUN: Thanks, Mike.

Okay. Gentleman in the tan coat?

MR. PAULSON: My name is Oscar Paulson with Kennecott Uranium Company, and the last two speakers discussed the terms of real risk and what the real risks are, and the fact that the people working in the uranium recovery industry really understand these real risks, and certainly from the perspective of where I work and the things I see as well as being around other uranium operators the real risks, the bad and sometimes serious risks are not the ones that necessarily related to radiological health and safety and things like this, but the real risks for example are things like transportation risks; a worker being injured or killed driving a vehicle or piece of equipment, or a member of the general public being injured or killed in an automobile accident.

For example, when the Susquehanna tailings pile near Riverton, Wyoming was moved to another tailings repository there was an automobile fatality involved during the course of moving those tailings, and certainly that's a real risk, and it resulted in a real fatality.

Thank you.

MR. KOKAJKO: Thank you for your comment. I'll note that same concept has been brought up in another case study. It was the Trojan reactor pressure vessel shipment case study where the licensee in conjunction with not only the environmental groups but the State of Oregon and Washington said, We only want one shipment instead of 44, instead of cutting up and having man-rem exposures and then having 44 additional shipments we want one and no exposure. So we've -- coming across that already.

We also -- I think Lou Carson mentioned earlier this evening that there may be other hazards than radiological. We note that. We appreciate your comment.

I need to add as just a caveat that part of what we're doing -- we have to work within the framework that we're given right now, and so I'm not sure that I'm going to be able to address all the risk associated with all the operations. However, it may be something that requires further efforts on the part of the staff to try to assess better, and we may make some headway there, but I -- once again, we can't solve that problem tonight or in the very near term.

But thank you for your comment.

DR. RATHBUN: I just got the time-out warning from Tim, so we probably have time for one more, if there's one more question or comment.

(No response.)

DR. RATHBUN: If not, then I want to personally thank you for coming here tonight and giving up your evening to work with us. I certainly appreciate it and I know the team members appreciate it. I'd also like to thank you for being such good sports about the microphone.

Lawrence has just a few closing remarks for you and then enjoy the rest of your evening.

MR. KOKAJKO: Thank you, Pat.

I would like to thank you for participating tonight. As Pat said, I realize you have other things to do, and I appreciate your coming and taking the time to spend with us on this cast study stakeholder meeting on uranium recovery. We view feedback from those outside the agency as well as those from within to be an important ingredient in implementing the case study plan. Your input regarding the testing of the screening criteria and possibly development of safety goals is important to understanding what areas we can do to expand the use

of risk information in the materials and waste arenas at the NRC.

Before I finish tonight I want you to note that we have started this back in April of 2000 and we'll continue our integration meeting in October 2001, at which we will provide more information on our review to date. Once again, I point you to the time line here. May 11 we had our last case study meeting in Rockville, Maryland, and if you go to the next slide you see we've just now completed June 13 meeting, and we're going to be moving on as the schedule shows.

Once again, if you did not sign the attendance sheet I encourage you to do so so we can contact you to invite you to that integration meeting in October 2001. We hope to issue the reports at the end of the calendar year, as I mentioned earlier, and if feasible go into development and safety goals in 2002. I anticipate that we'll be having other public meetings as we move through here to try to get more input on these matters.

As I mentioned in my opening remarks, we are interested in feedback on your views of how this meeting went, and the feedback forms are available at

1 the back or you can talk to one of us directly, and I
2 think you can mail it in.
3 I'd also like to thank those involved in
4 coordinating and presenting this meeting tonight,
5 especially our facilitator Dr. Patricia Rathbun,
6 Marissa Bailey, Candace Drummond, also Jim Dana,
7 wherever he went to. Our subject matter expert, Mike
8 Layton and Dr. Robert Bari and Ed Grove from
9 Brookhaven National Laboratory, and I would especially
10 like to thank Katie Sweeney of the National Mining
11 Association for helping us get all this set up. Your
12 help was invaluable and we appreciate the opportunity
13 to be here today.
14 I'd like to seek your comments one more
15 time. Going once, twice.
16 (No response.)
17 MR. KOKAJKO: If there are no other
18 comments or questions this meeting is adjourned.
19 Thank you very much.
20 (Whereupon at 9:00 p.m. the meeting was
21 adjourned.)