UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

***

RELEASE OF RADIOACTIVE MATERIAL WORKSHOP

***

Palmer House Hilton

State Ballroom

17 East Monroe Street

Chicago, Illinois

Tuesday, December 7, 1999

The Workshop commenced, pursuant to notice, at 8:30 a.m.

ANN RILEY & ASSOCIATES, LTD.
Court Reporters
1025 Connecticut Avenue, NW, Suite 1014
Washington, D.C. 20036
(202) 842-0034

PROCEEDINGS

[8:37 a.m.]

STINSON: Welcome, everyone. I am Barbara Stinson. I am with Meridian Institute. I know many of you have had the opportunity -- Mike or I have had the opportunity to talk with many of you in advance of this meeting. I want to welcome you to the fourth in a series of workshops on Control of Solid Materials sponsored by the Nuclear Regulatory Commission.

I am going to start by turning it over to Dr. Don Cool for some introductory remarks, and then we will go through some introductions.

COOL: Is that it?

STINSON: That's you.

COOL: Usually she gives me a little better hint than that. Good morning. Welcome, each of you, to Chicago. Glad that we can be up here and get together with you to continue the series of workshops that we have been holding over the last few months to explore the possibilities for the NRC in looking at the control of solid materials.

For those of you whom I have not had an opportunity to meet before, I am Donald Cool. I am the Director of the Division of the Division of Industrial and Medical Nuclear Safety with the Nuclear Regulatory Commission. While that title doesn't sound like the title

you would expect the Senior Manager to have who is responsible for this particular rulemaking activity. One of the things that my organization in fact takes care of the Office of Nuclear Materials, Safety and Safeguards in the NRC is to oversee and look at all of the different rulemaking activities that apply to the various materials programs.

As many of you know, there are no national standards in the sense of a formal regulatory requirement in the Code of Federal Regulations which articulate the appropriate levels for controlling different solid materials in order to assure public health and safety. On the other hand, we all come in contact every day and have to deal with a variety of materials in our environment which do contain radioactivity either as they exist in nature, as a result of various activities that we conduct just moving the dirt around, processing activities of various industrial ventures, as well as the more specific uses to make use of material for its radioactive properties.

In this age of increasing environmental consciousness where we are beginning to look more and more closely at the impacts of all of the things that we do, providing for public health and safety is given a new meaning and a great deal of new complexity to the task of specifying how much material, whether it be radioactive

material or any other kinds of materials can be in the different kinds of products and materials that we use in our daily lives.

There are currently many facilities in the United States that potentially possess valuable materials that have small quantities of radioactivity that may still be associated with them. At present, licensees determine whether such material can be returned to the general market by applying guidance for surface activity that has been in place for many, many years. In other cases, particularly those with our power reactors a criterion is basically applied as to whether or not activity can be detected.

The result of this has been what amounts to the continuing redefinition and continuing debate over what should be considered as appropriate levels.

Thus, this particular process is an attempt to have a national dialogue and discussion on the issues associated with controlling material in order to answer the question of whether and under what conditions such material should be disposed of in an appropriately licensed facility or the circumstances under which it could be safely reused or recycled within the more general marketplace.

In this sense I think we probably share a common purpose -- yes, I think there is actually at least one -- and that is applying appropriate controls at each stage of

the process to assure that the risks posed by any of the activities are taken care of and the public health and safety is protected both for us as individuals and for the global society and the environment.

As part of determining the appropriate controls, a lot of questions have been raised about who are you looking at, who is this individual or who is this society, and those are some good questions and there has been quite a bit of discussion on that topic in the last several meetings.

One in particular seems to revolve around the question of who is a worker, who is a recipient, who is a consumer, who do you do the modelling for, who do you do the calculation for, how does all of these particular sorts of systems fit together. Let me assure you first that we are going to look at all of these individuals, and we will be having discussions a little bit later today that will talk about the different kinds of modelling that gets done, how we look at some of these activities, but one of the particular questions related to a worker.

In that sense there are two categories that we most definitely look at. The first is of course a worker who may involved in a licensed facility. There are already standards in place dealing with occupational exposure including training, monitoring requirements, a variety of things, and those would obviously remain in place.

If you are in any other kind of facility and the material has been released, it really doesn't matter whether you are working there, visiting there, or whether the material has gone on someplace else. We will consider you as a member of the public and apply those types of criteria. Thus we will look at those sorts of individuals as some of the potential exposure scenarios just as we would look at some of the scenarios for an end-user, someone who receives a small quantity in some other product, people who are in various foundries or activities, people who are involved in manufacturing activities and otherwise.

As you are probably aware, this is the fourth meeting on this subject over the last several years. We had originally hoped to be up here much earlier in the fall, but for a variety of very good reasons -- to allow people enough time to actually think about the issues and look at the issues paper and background documents that are available -- this ends up being the last of this particular series of activities.

While the discussion topics that we are going to be looking at over the next day and a half or so are essentially the same as those that we have used in the other workshops I am in hopes that we can move these discussions forward, try and fill in some of the areas that have not gotten a whole lot of attention yet, try to leverage and

build upon the information that we already have available.

Having said that, that is not in any way an attempt to try and limit the discussions, limit the particular issues that you want to bring to the table, but rather to try and make sure that we have availed ourselves of the opportunity to hear from each of you on as many of the subjects as possible so that we can prepare a good and complete summary of the issues and comments and viewpoints when I take the results of these meetings back to my Commissioners in March of 2000.

This and the other meetings and opportunities for interaction are part of an enhanced participatory rulemaking process to try to define the appropriate regulatory vehicle for establishing a national standard. We have facilitators here whose job it is to try and keep us in line, help us think through our thoughts, make sure we have captured them appropriately.

The meeting is being transcribed so that we can go back and remember what it is that has been said and the arguments and discussions that took place. I would like to encourage you to be open with the ideas, the reasons and the approaches. Let me go back and re-emphasize just for a moment that word "reasons" -- there are a lot of views and opinions and positions and ideas that are out there, and one of the things that will be very important to us as an NRC

Staff as well as the Commissioners in considering this issue is the rationale and reason behind particular positions as well as those reasons.

While this is certainly an opportunity to hear from, ask questions of the NRC Staff, and we have a number of people who are part of the various NRC organizations, in order to be able to try and do that, this is also as much or more importantly to us an opportunity for you to interact with each other and try and build upon ideas and look at the ways that this problem could be moved forward.

Let me spend just a little moment or two to talk about a couple of things that have come up in the previous meetings, try to deal with some of those early-on in the process.

First, there have been a series of questions that have been raised about the supporting contracts, documents and other activities that the Commission Staff has been moving forward with in an attempt to support these activities. In particular, there have been some questions raised about some of the contractors, some of the activities of those contractors, and whether or not there are any potential conflicts of interest. That is on the public record from the last meeting.

I was very much in hopes at that time that the results of our review would be available so that we could

answer those questions. That is not the case. It is being carefully examined by our Office of General Counsel and our Division of Contracts and I think in the interest of all of the parties and fairness in terms of conducting a fair, thorough and honest review of all of the issues that this probably isn't the forum to have a great deal of additional discussion on that topic now until the legal details have been sorted out.

There has also been considerable interest about the specific activities in the state of Tennessee, some specific licensing actions with Manufacturing Sciences Corporation, and particular recycle issues on particular kinds of materials.

Many of you may be aware that Congressmen Dingell and Markey and Klink provided to the Commission a rather long list of questions and issues looking at jurisdiction as well as technical issues in this particular arena. The Commission Staff has taken a very hard look at that and is in the process of preparing a detailed response for the Congressmen which will be provided later this month. Once that has been provided to Congress, that will also be publicly available and you will have an opportunity to see that.

Finally, there have been questions raised for very obvious and good reasons about, well, this is very nice --

you have had four public meetings, we have all had a chance to sit around the table and talk a little bit. That's great. Now what?

The Staff continues to plan to move forward as the Commission has asked us to do and bring them a summary of the information and options on how to proceed to the Commission in March of 2000. That is just a little over three months from now.

We plan to try and provide that paper to them and to develop that paper in such a way that you will have an opportunity to continue to interact with us. We can talk about some more of the details a little bit later on. Those of you not particularly familiar with Commission papers, the actual paper tends to be very short and there's lots and lots of attachments which contain all of the details. A lot of that drafting work is going to be needed to be done and examined by the working group. We are looking at having some of those working group meetings be open to the public and drafted materials available to look at so that you have an opportunity to continue to interact with us and look at the documents as we are developing them in preparation for the Commission.

What is the working group? That's probably a fair question as well. For a project of this size I have a number of individuals on the Staff, most of whom are here

today, representing various technical disciplines. They get together to prepare these documents, review the materials, draft up the individual pieces that would need to be written, perform technical analyses, oversee contracts -- those various activities.

Frank Cardile of my staff leads that working group. It includes a number of other individuals.

We also have a management group of folks including individuals from the Agreement States. Pleased to see Steve Collins here, who has been working with us on that to provide some immediate feedback to them when they have questions that are raised and some management considerations before we actually finally send the documents to the senior management of the agency and the Commission.

All this having been said, we continue to welcome your interest and we look forward to your participation.

There have been a variety of background documents that have been made available now for a number of months including an issues paper which can serve as a starting point for our discussions today. That issues paper doesn't represent the end of all the options and we have heard lots of variations and additions to that already over the last three meetings, so I would encourage you once again to feel free to elaborate, provide additional options.

Part of what I hope we will be able to do over the

next day and a half is to put together proposals -- I am not going to say a singular one because I am not at all convinced there is a singular one -- that you believe could work to move this issue forward, either for a particular kind of material or in general for all types of materials.

As I mentioned a little bit earlier, Barbara Stinson and Mike Lesnick from the Meridian Institute will be serving as our facilitators for the next two days to help us achieve a successful dialogue on all of these topics.

I think I have probably talked about long enough. You have probably already gotten tired of hearing from me. Let me again welcome you. I look forward to these discussions and activities and I am going to turn it back over to Barbara for the introductions.

STINSON: Thank you, Don, and we will have an opportunity for anyone who has comments or questions for Don as we move into the opening discussions this morning.

Let me just say a few introductory remarks on the procedural side of my own. Again, I am Barbara Stinson. This is Mike Lesnick on my right. Sarah Walen is in the corner and you have probably heard the name Tutti Tischler more than about any other name from Meridian Institute. She is our administrative support for this project.

Meridian is a nonprofit -- that is your team, your Meridian team -- and we are a nonprofit mediation and

facilitation organization.

As Don mentioned, we have been asked to assist in convening this process, trying to identify relevant stakeholders, bring folks to the table for full and balanced discussion of a full array of issues and concerns and to explore ideas for further development by the NRC Staff as they develop the Staff paper that Don mentioned -- so we are here to support you in whatever way you need to make this an effective dialogue and discussion, so don't hesitate to ask us about anything.

What I would like to do is take a round of introductions at the table here and then around the audience, and then we will walk through groundrules and review the agenda. Before we start those introductions though, let me just ask Lea Foushee -- who else are we missing? -- Cliff Honnicker -- neither of you are in the audience, are you? Lea or Cliff?

Why don't we take a round of introductions and give -- many of you may know each other, but just mention your name, the position that you serve in your organization and then your affiliation and we will just go around the table and then take a quick round of introductions in the audience as well.

This will be the first time I will say something you will hear from me endlessly in this discussion, which is

please speak directly into the microphone so that the transcript accurately records all that you have to say. We will have to do that for every comment made.

LESNICK: Good morning. I am Mike Lesnick with the Meridian Institute.

LIPTON: I am William Lipton. I am Principal Engineer with the Radiation Protection Department at the Fermi 2 Nuclear Power Plant.

WILK: My name is Charles Wilk. I am at the Portland Cement Association. I am responsible for promoting the use of cement for waste management activities.

STINSON: Great. That is helpful, just to hear that little bit of how does what you do in your life relate to what we are doing here -- just in a few words.

GENOA: Good morning. Paul Genoa. I represent the Nuclear Energy Institute. I am a Senior Project Manager at the Institute responsible for public radiation issues such as this. The Institute represents users of nuclear technology worldwide in 20 nations, over 280 companies, and includes every nuclear power plant in the United States -- clearly the clearance of material is important to our industry.

STINSON: Thank you.

HERNANDEZ: Good morning. My name is Peter Hernandez. I am Vice President, Employee Relations, for

American Iron & Steel Institute, which represents 38 domestic steel producers that account for two-thirds of the U.S. carbon steel production and employ about 125,000 in their operations.

Our members would be the primary customers for the scrap material that would be released from the various sites.

STINSON: Thank you. Mike?

MATTIA: Mike Mattia, Institute of Scrap Recyling Industries. I am the Director of Risk Management and ISRI is the trade association that internationally represents approximately 1400 companies who process, broker or consume scrap material.

CONKLIN: I am Craig Conklin, with the Environmental Protection Agency. I am the Director of the Center for Radiological Emergency Preparedness, Prevention and Response. The EPA has several requirements or several regulations or statutes that we operate under, most importantly the Atomic Energy Act with regard to radiation and we are responsible for issuing generally applicable environmental regulations dealing with the radioactive materials and their release.

I am over seeing the international radiation source management effort within EPA that is working with the State Department and other agencies -- Gwendolyn Bauer is

part of that group -- and I am also working with the Orphan Source Program initiative that we have with the CRCPD.

STINSON: Tom?

CIVIC: My name is Tom Civic. I am Manager of Safety and Industrial Hygiene for Bethlehem Steel Corporation. I serve as the Chairman for the Radiation Task Group for the American Iron & Steel Institute and today I am representing that task group.

LaMASTRA: Good morning. Tony LaMastra. I am a Radiation Protection Consultant and I am serving as a consultant to the American Iron & Steel Institute.

CARDWELL: Cindy Cardwell. I am with the State of Texas Bureau of Radiation Control and Deputy Director of Standards there. I am here today representing not only the State of Texas but the Organization of Agreement States.

COLLINS: I am Steve Collins. I am with the Illinois Department of Nuclear Safety and I am basically here to represent the management concerns of that organization and to make sure we keep up with the issues that are involved in this particular subject area.

I am also here representing the Resource Recovery and Radioactivity Committee, hereinafter referred to as E23, of the Conference of Radiation Control Program Directors, hereinafter referred to as CRCPD --

[Laughter.]

COLLINS: And I will try to make clear when I make remarks, if I do, which hat I am wearing at the time.

STINSON: Good. That will be helpful. Susan.

LANDAHL: Good morning. I am Susan Landahl. I am the Corporate Radiation Protection Manager for Commonwealth Edison and my background is that I have a Bachelor's and a Master's Degree in Nuclear Engineering from MIT. I am a certified Health Physicist and I have over 15 years of experience in nuclear power, ten of which were directly working at a nuclear power site, so I have a lot of experience in the practical aspects of what it takes to release material.

Also, importantly, I am a wife and mother of a beautiful little girl.

STINSON: We're going to have to share the mikes like this throughout the day.

TURNER: Hi, I'm Jim Turner. I'm with Ameristeel Corporation. I'm Director of Environmental Affairs. I'm here on behalf of or in conjunction with the Steel Manufacturers Association which represents the minimill steel industry in the United States and North America.

HORTON: Hi, my name is David Horton. I work as a civilian in the Army in the Rad Waste Office. I'm the Health Physicist, Project Manager.

KOENIG: Bill Koenig, Radiation Protection Officer

for ISPAT Inland, Incorporated, as steel manufacturer in Indiana. I work out of the Health and Safety Department.

THICKMAN: Good morning. I'm Stu Thickman from Northeast Utilities. I work in the Licensing Group in Millstone Unit I, which is a unit that we are in the process of decommissioning.

ERICKSON: Good morning. I'm Kristin Erickson. I'm a Radiation Safety Officer at Michigan State University, and I am probably the only one representing a bunch of academic and medical RSOs where we have, for example, 2,000 people badged and 500 faculty and labs and big accelerators and lots of things going on that are across the board in the industry, and also extremely difficult challenges with our public labs and our turnover of people.

So this affects our program right across the board.

CROOKS: Good morning. I'm Kelly Crooks. I also work in the Army's Rad Waste Disposal Office. We're located at the Rock Island Arsenal in Rock Island, Illinois.

We manage the disposal of the Army's rad waste, and we have generators in every state, and virtually every continent, so we have a worldwide program.

LILLY: My name is Judd Lilly, and I'm with the United States Department of Energy. I'm out of the headquarters office. I'm the staff person responsible for

decommissioning work in the state of Tennessee, specifically the Oak Ridge Reservation.

SZWED: My name is Dan Szwed. I'm Director of Environmental Affairs with AK Steel Corporation, here representing the specialty steel industry of North America, the Metals Industry Recycling Coalition, which consists of specialty steel producers, steel producers, nickel, copper, brass, and many other metals producers.

We are potential customers for scrap metals and alloys that may come from these facilities.

DEVGUN: Good morning. My name is Jas Dergun. I'm representing Consumers Energy, and I'm involved as a Senior Project Engineer and a Project Manager in the decommissioning team at Big Rock Point, a restoration project.

I also am the Chairman of the American Nuclear Society's Special Committee on Cleanup Standards.

ROGERS: Good morning. My name is Alice Rogers. I'm with the Texas Natural Resources Conservation Commission, which is the Texas Agency responsible for air, water, and waste management.

I also serve as Secretary-elect of the Organization of Agreement States, and also as a Committee member on the CRCPD's E-5 Committee on Low Level Radioactive Waste Management.

HUFFERT: I'm Tony Huffert. I'm the Health Physicist in the Division of Waste Management for NRC. I'm a member of the Working Group and I'm working on the technical basis development for this initiative.

CARDILE: Good morning. I'm Frank Cardile. As Done mentioned, I'm part of the Working Group team that's working on the technical basis and also developing the Commission paper.

HOLAHAN: Good morning. I'm Trish Holahan. I'm a Section Leader in the Division of Industrial and Medical Nuclear Safety, responsible for this activity. Thank you.

STINSON: Dan, we're just taking a round of introductions, if you don't mind, just your name and affiliation into the microphone.

GUTTMAN: Dan Guttman, with PACE.

GNUGNOLI: Georgio Gnugnoli, USNRC.

STINSON: Okay, that's the round of introductions from the table. These individuals preregistered for this process, and that was -- we didn't have a sense of who else would be in the audience.

They have a variety of expertise, obviously, but so do you all. So we're going to structure the agenda to give you all an opportunity to participate in the discussion as well, and I'll describe that in a moment.

Maybe rather that using the microphone, we'll just

ask all of you to shout our your name and affiliation,, and we'll start with Sarah.

STINSON: Okay, great, thanks. There are a couple of things. Let me just walk through a few basic ground rules and describe the format for this meeting:

Many of you have asked questions about it, and the format has evolved over the course of the four meetings.

For this discussion, what we hope to do is move through a series of topics in a different way than we have in the past. We're going to talk material-by-material, largely. We'll have some introductory comments from the NRC and walk through some basic background.

But the majority of the meeting will be spent, hopefully focusing on the activities involved with specific materials for different licensees, and what the implications of control of those materials might be, and the alternatives for control.

So, that's a little bit different focus than we've had, and that's an attempt to get a little bit more in-depth discussion on each of these materials.

It will be largely a roundtable discussion, so we'll be focusing on the comments within this group. But I think it would be helpful, after each section of the agenda, to offer the audience an opportunity to make comments as well.

The way that we will recognize each of you as you'd like to speak is by using your name cards, flipping them on the side, and what we'll do is, for a particular topic, we'll basically take the cards in the order they go up, but we'll also try to focus the discussion on particular topics.

So if you have a comment to make that's very relevant to something you've just heard, if you can be brief, we'll insert people into those comments in order to have, like I say, a more focused, in-depth discussion.

So that's the way we'll run the discussion at the table. At the close of the session, we'll turn to the audience and then go on to the next topic. We'll see how that works.

Let me just say a little bit about ground rules: The primary ground rule is going to be speak into the microphone. And hopefully, if any of you can't hear in the back at any point during the meeting, let us know, and that will be probably an indication it's not getting on the transcript either.

The primary thing that we ask you to observe as a ground rule for this discussion is to respect the fact that there are going to be significant differences of viewpoint around this table and in the audience. And by respecting that, we ask you to, a) try to avoid any personal attacks

against the views that you hear; to try to respect each other's time.

That means make your comments brief and to the point. And to take any specific arguments that you may have with individuals to the side of the room during breaks, and not to act them out here at the table.

We're going to try to stay very focused on the substance and the issues, and try to understand what some of the reasons, as I think Don referred to, rationale and reasons are behind some of the positions that people are assuming on these various issues.

We will ask you to use your cards and we'll ask that you give us license, Mike and I, some license in directing this discussion. As I say, we're going to try to make sure that it's a balanced discussion and that the variety of the views around the table do get an opportunity to come forward.

So, you may see us call on someone that you hadn't thought was in the queue for the discussion, when, in fact, maybe we've heard from three steel representatives or three states representatives in a row and we'd like to insert somebody else to get a mix of discussion going for the transcript and for the health of the discussion, so please give us that license.

If there aren't any questions about any of that --

and I will refer to ground rules again as necessary.

Every time you make a comment, you're going to have to mention your name and affiliation, or at least your name so that it's accurately recorded in the transcript.

And if you haven't had the blessing of enjoying one of these transcripts, you, too, can have your own stack of probably six to seven inches of paper at the close of this meeting, verbatim transcript of everything that was said.

It makes for some interesting reading. You'll want to see how you really sound, how you come across.

Let's just walk through the agenda quickly, and we'll give you a sense of how we hope to conduct this discussion. Of course, we look forward to your comments as we go through.

What we've done is, if you've seen past agendas, we've compressed a lot of the introductory material that was in eight sessions into two sessions, which we will move through rather quickly this morning, basically.

So the Session 1 is now the first -- what as formerly the first two sessions, compressed into an introductory material on how the issues that we're discussing fit into the overall regulatory picture.

We'll take a break this morning, and following some comments on all those introductory remarks, largely

from Trish Holahan, we'll take a break and then move on to Session 2, where we'll talk about some of the technical bases for discussion.

Again, there will be opportunity for comment, et cetera. I'm thinking that at the close of each session, we will spend at least five minutes just seeing if there are any audience comments on the topics of that session.

We'll break for lunch, and lunch is on your own today. Of course, the beverages during our breaks are complimentary, so help yourself. They come with the room.

During lunch, we'll take a break and send you off on your own. There are a number of good restaurants in the area, and we can point you in various directions.

At 1:00 we'll come back and just see if there are any closing comments on the studies that are currently underway or contemplated for this decisionmaking process, and at 2:00 talk about alternatives on control of solid materials.

This is the point at which we will turn to the table of alternatives that you have been sent in advance of this meeting, hopefully from Meridian, or have picked up off the table. Let me know if you need a copy of it.

Just take a look at this table for a moment, and I'll come back and refer to it.

At 2:00 we'll have a round of presentations, brief

presentations on the case-by-case approach and some other alternatives that are contemplated.

We'll talk about how materials, control of materials can be assured under various alternatives, and then I think what we'd like to do is brainstorm the material part of Column 1.

In terms of this table, the first column lists a range of materials that either are currently under study, have been designated to be studied by the Commission to the NRC Staff, and are the subject of current NUREG activity, or have been suggested during the course of the last three meetings.

This is not a comprehensive list, so the first thing we need to do is think about a comprehensive list for Column 1. So we'll do that before our break at 3:00 today.

And then we'll come back and talk a little bit about the current methods of control for each of the materials. What we'd like to ask the folks at the table is to please bring your real-world experience forward as to what you see going on currently with the control of these various materials where you have that experience.

We're going to have more experience for some materials than others, but again to try to push the discussion to a little bit more depth.

By 4:00 today, we will turn to discussion of

environmental -- well, alternatives for control and environmental and cost impacts.

What I expect us to do is to focus first on aluminum. We haven't talked much about aluminum in past meetings, past workshops, and we have talked a lot about ferrous metals, iron and steel. So we'll draw on some of the knowledge that we have from that material, but try to focus on aluminum if some of you have some experience to lend on that.

We'll move across the table for aluminum and talk about the potential alternatives for control, the health and environmental impacts, and then the cost impacts. What kinds of studies are needed to really understand what further control of those materials, other than the case-by-case method, would mean?

And then we'll talk about possible institutional and other kinds of controls to assure control over the long term under those alternatives.

So, just to reiterate, our plan is at 2:00 to hear some presentations, then to bring -- and have a little bit of discussion of the information on those materials in that presentation, and then secondly to brainstorm the material and make sure we've got a comprehensive list, talk through the current methods of control, and by 4:00 focus on aluminum for the other five columns of the matrix, of the

table. Does that make sense?

And then we'll start -- we'll see how that goes and evaluate that discussion format at the end of the day, and then start on Wednesday, tomorrow, with copper, concrete, soil, et cetera, and then move through some fairly quick discussions on each of those materials.

We may end up compressing some of these, and it may make sense to talk about materials for reuse and trash at the same time, or something like that.

Take each of these in turn, and final comments, probably more by 2:30. I understand some folks, several critical participants need to leave by 3:00, so be forewarned that we're going to end our meeting tomorrow at least by 3:00, and we'll see how the discussion goes.

If it looks like it's going to be even earlier than that, we'll let you know. So that's the plan for the discussion. I'd like to give anybody an opportunity to give us some input on the way that we've structured the agenda and the table of alternatives.

GENOA: Paul Genoa with NEI. Just a comment.

STINSON: A little bit closer, I'm sorry.

GENOA: Just the comment that we have to be careful when we break down these material by material. I mean I think it is appropriate, but the real world, we have to deal with items. A welder contains copper wrappings,

contains insulation, is made out of metal, has, you know, rubber leads. You know, that is the real world. A computer screen, a terminal, you know, it is a whole composite of materials. You don't separate them out and survey one at a time. So in the real world most materials are complex mixtures of these things. And so I hope that we would spend a fair amount of time talking about the release of reasonable materials or trash because they tend to more represent the real world.

STINSON: That's good. That's fine. Again, it is not meant to be artificial, it is meant to try to get us to focus on some of these other materials and maybe it makes sense to talk about some combinations of them as well.

Any other comments on the agenda? Okay. Yes, Dan.

GUTTMAN: Dan Guttman. I am disturbed there doesn't seem to be on a feedback on a lot of the basic questions asked last session, particularly there is nothing here about the institutional competence to do what is supposed to be done. At the last session there was a considerable presentation about the evidence. We are not looking a question of the laws of nature, that is, is radiation or safe or not, but the laws of human beings.

STINSON: And, unfortunately, Dan, we had -- I wanted to mention this to you directly. We had an

introductory, a set of fairly comprehensive introductory remarks from Don Cool and he did address a number of those issues. So at the break, perhaps you can get a look.

GUTTMAN: I am not talking about conflict of interest. I am talking --

STINSON: No, I know. But there are a range of issues that he responded to that you raised.

STINSON: Well, I would just like to know whether he can tell us about the evidence that the AEC, the agency's predecessor, historically sponsored the release of materials that is already floating around, nickel. And whether we are going to talk about the aluminum experience that is ongoing now at BNFL. And, also, the whole essential prejudgment question, which appears to have been locked in now by the SAIC contract. This is plainly a prejudged proceeding by contract.

And, also, finally, as a basic piece of information, we still don't even have the contract. As far as I can tell, either the NRC has destroyed, or lost, or will not provide to the public the basic contract document underlying the regulatory proceeding here. The statement of work for the 1992 SAIC contract, you all know, because we have told the NRC General Counsel's Office for some time, is not a matter of public record, and I am wondering why that is being kept secret.

The basic point here is it sounds like a lot of the people that have got questions are talking to people who are appearing to be receptive, but are not providing any responsive information. That is not acceptable in a public dialogue.

STINSON: And I said I think that a number of those issues, Dan, were specifically addressed in the introductory comments. So we are going to ask you to hold, we are not going to revisit that.

GUTTMAN: Okay. Fine.

STINSON: We are going to ask you to hold those questions until the break. You and Don can talk.

GUTTMAN: Pursuant to the guidelines, it sounds passionate, but it is a friendly --

STINSON: No, I am saying you and Don can talk.

GUTTMAN: Thank you.

STINSON: You and Don can talk at the break and then if you have further questions, you can raise them here.

Okay. Let's start then with our Session Number 1 presentation, and we are going to ask you to be patient with this first session. It is fairly lengthy, but, again, we are trying to compress the information together so we can get into the discussion. Trish.

HOLAHAN: Thank you, Barbara. Good morning, again. As I mentioned, I am Trish Holahan with the NRC. I

would like to, in particular for those of you that did not have the opportunity of being at some of the earlier meetings, to walk through somewhat quickly as to why are we here today and how does what we are trying to do today fit into the overall picture. So I am going to walk through some slides. I will pause part way through to see if there are some questions of clarification before I continue with the last. But, as Barbara mentioned, if you will please bear with me, I will try and be relatively brief, so we can at least then get into the dialogue.

The basic premise for why we are here is it is to fulfill NRC's Congressional mandate and responsibility to protect the public health and safety, and the environment. And I would like to start off talking a little bit about why we are here. You have heard some general statements from Don Cool, and I would like to build upon those.

As we know, there are solid materials currently at licensed facilities that will need some form of disposition. These materials range from large amounts of radioactivity to no activity at all. All of this material will ultimately need to be disposed of by some safe means. Therefore, the principal question that we are asking is, how should these materials be handled? What should be done with them, in particular, that material with small amounts of radioactivity?

Should it all be buried in a licensed low level waste disposal site? Or, alternatively, is there a safe way to reuse or recycle some or all of these materials if the radioactivity levels are low enough? Although there are currently standards for disposing of material with large amounts of radioactivity at licensed burial sites, there are currently no generally applicable NRC regulations for control of most of these materials with small amounts. We know that there is a growing interest in the country today in terms of recycle or reuse for those materials, where possible, to conserve resources.

Licenses are still -- although there are no regulations specifically for this material, licensees are still coming in and seeking to release materials when they are obsolete or when they are no longer useful, or when the facility is being shut down or decommissioned.

In the absence of a standard, NRC has developed guidance as to acceptable levels that are used by both the NRC and licensees. So, currently, decisions are being made on a case by case base. Although the guidance is considered safe in and of itself, the lack of specific criteria causes inconsistent release levels and, therefore, that results in non-uniform levels of protection. You will hear more about the current case by case and the existing guidance that is out there is not based on doses, but was developed based on

detectability.

In order to address the limitations of this case by case approach, NRC wants to consider all these issues in an open, public forum and that will include a full analysis of all the health and environmental impacts involved with the situation, as well as evaluation of the related economic aspects.

Let me go on to the next slide. Why NRC? Not all the radioactive material is under NRC jurisdiction, but only that material that is related to fuel cycle or that is made radioactive in a reactor. The states regulate that material that is naturally occurring or accelerator produced.

What is NRC's role and authority in setting these standards? The NRC authority and responsibilities was established in the Atomic Energy Act of 1954 and that was then amended in 1975. And NRC issues regulations which provide for the protection of public health and safety from the use of radioactive material by its licensees. NRC regulates and inspects the safe use of radioactive material by its licensees to ensure that it is being used in a manner that is adequate to protect public health and safety.

How does NRC interact -- what is NRC's role in relation to where EPA, as Craig Conklin mentioned, what EPA does, a little bit earlier, is that EPA does not regulate licensees directly, but EPA sets generally applicable

environmental standards that NRC implements for radioactive material under the Atomic Energy Act. However, EPA is not currently considering rulemaking in this area, and in the absence of an EPA standard, NRC has the authority to set radiation protection standards for its licensees in this area.

One of the questions that is being posed is, has NRC made any decisions to date? Well, with respect to that question, in terms of what we are going to do, the answer is no. However, there has been some direction and some guidance from the Commission over the last 18 months. In June of 1998, the Commission issued direction to consider rulemaking to establish a dose-based standard for clearance of materials and equipment with residual radioactivity and provide for enhanced public participation.

Subsequently, in June of 1999, the Commission approved publication of an issues paper that includes several alternative courses of action, which we will hear more about a little bit later, and announced a scoping process in the Federal Register for public comment.

As part of that, the NRC is holding these public meetings, such as this one today, to solicit early input from a variety of interested parties.

In September of 1999, the Commission directed the staff again to proceed with the enhanced public process and

hold public meetings to solicit early input from the interested parties in a collective forum and come back to the Commission in March of 2000 on the results of the public meetings, to include all the stakeholder reactions and concerns, the status of the ongoing technical analyses, and recommendations on whether to proceed with rulemaking or other staff actions.

In addition, in that direction, the Commission said that if a decision is made to proceed with rulemaking, that the staff will then hold additional informational stakeholder meetings on a preliminary version of a Generic Environmental Impact Statement.

The one other question that we have raised, is NUREG-1640 a standard, a draft NUREG-1640? And you will hear more about that later from Bob Meck, but I just wanted to pointed out at this point that it is not a standard, but it is calculational tool and it is out as a draft currently for public comment. And, as I say, you will hear more about that in more detail later.

What process are we going to be using for this decision-making? Well, let me compare a little bit first with the steps in a typical rulemaking process. Typically, following -- we seek early and substantive input from the agreement states by development of what we call a rulemaking plan, which sort of lays out different options as to how one

might proceed. Following Commission approval of the rulemaking plan, we would develop a proposed rule, and as part of that proposed rule, we would look at the environmental aspects in accordance with the National Environmental Policy Act, or NEPA, and also look at cost benefits in accordance with a Presidential direction -- Presidential Order.

Following development of these documents, we would publish the proposed rule, the environment analysis, or Environmental Impact Statement and the regulatory analysis, all for comment, and then consider all the public comments, and we would prepare a final rule.

How does that differ in terms of what we are doing now for an enhanced present? What additional steps for early and continuing input are we looking at? Well, as I mentioned earlier, we published the issues paper in a Federal Register Notice. We have also put it up on the NRC web site with the intention of providing an opportunity for dialogue on all the alternatives. We are holding these facilitated public meetings to discuss that paper and to allow opportunity to share ideas and concerns amongst all the interested parties.

We are going to be placing all the follow-on documents and we have been with the transcripts, they are currently up on the web site. Any other documents

associated with what we are doing are all on the web site, and we have a web page for control of solid materials. And if you are interested, I don't know if the web site is out there, but we will make sure that you have the web site address for that.

Also, there is public comment capability by e-mail, through the web posting. We now have a dedicated list server for this effort and there are, again, specific instruments if you want to sign up for the list server. And, again, that allows an opportunity for dialogue.

Also, we are going to be holding periodic open working group meetings. As Don Cool already mentioned, from here we are going to be looking at summarizing and analyzing the public comments and preparing the Commission paper that is due to the Commission in March. So some of the working group meetings between now and the time that the paper will be going forward will be open to the public and given opportunity to hear how the comments are being summarized and analyzed, and give additional input, opportunity for input.

Also, there will be a Commission briefing in March of 2000 and that Commission briefing is open to the public and, again, will allow an opportunity for individuals to provide input. One of the things that we are doing is seeking other ways, if there are other suggestions that

people may have to enhance public input. We are open to hearing other possibilities.

At this point, I think I would like to just make sure, before I continue on, is if there is any questions of clarification. You know, as I say, we would like to have more discussion later, but at this point I am just looking for clarification.

STINSON: Yes. So, specifically, any questions or not getting into a lot of comments and registering of your own views yet, but questions of clarification on either the history or the process that is envisioned from this point forward.

Tony, and then Dan and Charles.

LAMASTRA: Tony Lamastra, AISI. Trish, is the NRC going to, or Meridian or someone, make some of these public, like the Commissioners' briefing or some of the workshop dates known ahead of time, as opposed to just putting it in the Federal Register? Because a lot of times when we finally get the Federal Register, it is like one or two days before the meeting. Have you given any thought to how you would publicize that perhaps by notifying the people that have been involved in these meetings?

HOLAHAN: Yeah, I think one of the ways that we could do that is through the list server that we have got up. We could put on that, plus it would go onto the NRC's

public meeting web site to notice public meetings, that is 10 days before the meeting. And so as we are proceeding with those specific meetings, again, the Commission briefings, once the date for that is set, that would also be put up on the Commission web page.

Frank, did you have something?

CARDILE: I would only add that, also, and we will put the exact address, we have tried to simplify the web site address, but we will try to keep that web site address, the one specifically related to this effort, up to date and well ahead on when any actual activities will take place. We will put that address up on the screen at the break.

STINSON: What we are hearing so far is that this web site is an improvement over NRC's general web site, and it is a little quicker access, a little more accessible. But, generally, the approach that is contemplated is to get information out through the list server so people can access it easily.

Now, you may want to make a recommendation of some specific milestones in which, you know, a specific group of people, say, the database for this group, be notified of particular meetings. You know, assuming it doesn't get into orders of, you know, 20-30 meetings that have to noticed, you know, maybe NRC would entertain that kind of idea.

Dan.

GUTTMAN: Yeah. Following up on this transparency question.

STINSON: Dan, you are going to have to mention your name.

GUTTMAN: Dan Guttman from PACE, with PACE, on the transparency question, Trish. First, as we understand --

STINSON: A little bit closer. I'm sorry.

GUTTMAN: As we understand it -- is that better?

STINSON: Yes.

GUTTMAN: God, it sounds like I am --

STINSON: I know. You have to echo or it is not working.

GUTTMAN: -- involved in some indecent action with this microphone.

GUTTMAN: As we understand it, in fact, the regulatory options paper and the issues paper here were not prepared by you folks, but pursuant to the contract with SAIC, were prepared by a private contractor, if they complied with their contract, and I assume that's the case.

Two, you mentioned last time that you had not prejudged this issue, but as you know, it now turns out that the August, 1999, renewal of the SAIC contract locks in the June 30th staff memorandum, and I want to know if you've changed that and when you've changed it.

Three, as you know, in October, you received a

letter, the NRC did, from a number of Congressmen, PACE, and the Natural Resources Defense Council wrote to the Tennessee Authority about whether the ongoing recycling, your major, current recycling in Oak Ridge has any lawful basis.

This was two months ago, nine months after the license. As far as we know, there is no response.

So in terms of the process, the basic question is, when are we going to get some transparency as to what is -- who is doing the basic work here, and whether, in fact, the Commission has the ability as a matter of competence, to construe its regulations so that we should know whether we've got and what the playing field is.

CARDILE: Just for a point of clarification, I prepared the issues paper that you see in the office, assisted by the Working Group members that you see here today, and then reviewed by the Steering Group members.

GUTTMAN: Well, then, you have false claim because SAIC was paid, apparently, by your contract office to prepare it, and I think that you should -- and I would like to ask that that be added to the General Counsel's investigation, why they were contractually hired and presumably paid to do it if they didn't do it.

STINSON: We may be talking about two different items here.

GUTTMAN: I'm talking about the issues paper

underlying this whole NUREG business.

STINSON: Okay, Don, do you have some comments?

COOL: I think I have a couple points of quick clarification that are probably important.

Dan, I'd like to suggest we get together at the first break.

GUTTMAN: I'd be happy to.

COOL: There are maybe a couple things that we can sort out where we don't need to involve a lot of other folks' time.

As I mentioned a little bit earlier, the Staff has prepared and the Commission is currently reviewing, a response to Congressmen Dingell, Markey, and Klink, and I expect that that will be delivered to the Congressmen and made public within the next couple of weeks.

STINSON: Okay, why don't we take a moment to allow Cliff Honnicker to introduce himself. He has joined us, and then we're going to continue with the comments on the process.

Cliff? If you don't mind, Cliff, we're asking you to mention your name and your affiliation.

HONNICKER: Sure. My name is Cliff Honnicker, and I'm the Director of the American Environmental Health Studies Project, and we're based in Knoxville, Tennessee.

We work with a number of the workers in Oak Ridge

who have worked around this radioactive nickel powder that's part of the barrier recycling effort.

And we bring to this meeting, a firsthand knowledge of the human effect, not the theoretical, not the proposed, not the future effect, but the actual ongoing effect to humans right now as a result of these operations.

And it's not good, to tell you the truth. I also come representing Jeanine Honnicker, who is my mom, who any of you old timers around here probably remember her from the 1970s when she fought what was going to be the world's largest nuclear plant, and with a $50 calculator, pretty much brought it down to a standstill.

But about 20 years ago, she was here with the Nuclear Regulatory Commission when you had NUREG 518 in 1980, proposed recycling of the radioactive nickel. So I brought her comments from 1980 to share with you guys, a sort of Ghost of Christmas Past.

And then I brought my attempts, my futile attempts to get the information from you guys, the very basic, simple information that goes into how these proposed regs were done. My request to you guys that were like my mother's request, and the 5,000 other comments from 1980 that went un-responded to, my requests for information have gone unanswered.

And I brought that, and then for the Ghost of

Christmas Future, I'm going to give all this to my kids, and so 20 years from now when you all bring this effort up again, they'll be able to have the materials and say, hey, it looks like about every five or ten years, you guys keep trying to trot this dog out, and this dog is just not going to hunt.

But anyway, that's what I bring.

STINSON: Okay, we are at the point of taking questions of clarification on the introductory remarks made so far about history and process. It's Charles and then Mike Mattia, and then Jas.

WILK: I'm Charles Wilk with the Portland Cement Association. This is probably a very basic question.

Trish, you mentioned who are the licensees of the NRC. Could you repeat that? I assumed it was power plants, but there are some other things including accelerators, or not including accelerators, and how does that relate to the Department of Energy activities in taking apart their facilities?

HOLAHAN: Okay, well, if I can ask you to hold part of that question for actually my next slide, I'll get more into the specifics of what the licensees are.

But NRC has specific licensees. We do not regulate DOE facilities. And then the agreement states -- I'm sorry, all the states, regulate naturally-occurring and

accelerator-produced materials.

NRC regulates reactor-produced material, and material regulated under the Atomic Energy Act.

STINSON: Okay, quick questions, just the cards that are up. We're moving on in this discussion. We've got more presentation and information to provide.

MATTIA: Just a quick clarification: I understand that this rulemaking was first in the hands of the EPA who then declined, and then it passed on to the NRC.

The question is, what authority and responsibility in this process is retained by the EPA, as well as the agreement states?

COOL: This Don Cool. Very briefly, the EPA continues to have its authority under the Atomic Energy Act to promulgate what are referred to as generally applicable environmental standards.

If they went through a rulemaking process and did so, the NRC, as other federal agencies, would be obligated to look at those.

With respect to the agreement states, the agreement states will be working with us, and will have to look at corresponding regulations within their particular states, and part of the issues that are, in fact, on the table, are what are referred to as adequacy and compatibility in terms of the designations of how close, how

similar to the NRC activities, and should a rulemaking be done, the states' individual standards would need to be.

STINSON: Okay, Jas?

DEVGUN: Jas Devgun. I think my question is related to where the outcome of all this exercise will show up. Would it be part of the 10 CFR 20, somewhere as a revision to that? For example, as the license termination rule ended up as 1401 to 1406 in 10 CFR 20, so where would you see it fitting in?

Ultimately, the criterion is going dose-based, whether it's going to be one millirem or whatever you come up with. That's going to be a dose-based criteria.

ERICKSON: I think that at this point we're still not -- we're at the point where we're trying to make the decision as to whether or not we would proceed with rulemaking.

So I think that in terms of saying that it would be a dose-based criterion is premature because at this point, we are still in the exploration stages of what we should be doing and whether or not we would go.

If we did choose to proceed with rulemaking, most likely it would be in Part 20, but that this point, that decision hasn't been made.

STINSON: Kristin?

ERICKSON: Kristin Erickson, Michigan State

University.

First part, I have a comment on the input process itself, and I think that could be enhanced by utilizing some of the groups that are already existing in the country, an example being the academic and medical. It's a very informal group, and there are 150 of us all over the nation on that focus.

And there are other groups in the Environmental Group Center. Utilizing those groups via e-mail lists or through a representative who channels the information to that group, like I will do with our group, that's one good way. It reaches a lot of people of the affected parties, in a very cheap, quick manner.

My second comment has to do with comments that I have been making for years. In fact, here in Chicago during the strategic initiatives, direction-setting issues a few years ago, I complained, as to many of my peers, about two parts of the way that NRC rules typically take place.

We laugh and we call it the ready, fire, aim, approach, which means you make a rule, you set it out there, and then let the chips fall where they may, and then fight through the problems.

And that has been difficult. I commend the NRC and the whole process this time, in that it's not done that way. We're bringing all of the comment and the groups

together before we actually have made a rule and before you say, okay, this is out for comment now, and everybody just come in here and tell us what you think of what we've already decided, without including the groups and the industries.

So we're very happy about that. Finally, related to that, the comment that I made back then and that I see an improvement on already, is the mixed message issue where you say, for example, these things are very safe at these very low levels, whether it be liquid, solid, or air.

And then at the same time, we have a huge knee jerk reaction at some small release of amounts that are even less than we naturally have in our own bodies, many times. So I think that this whole process, in the direction that it's going, and if it's kept open and healthy like this, will ultimately improve on some of those problems.

STINSON: Could we have a comment on the comment made on EPA authority?

CONKLIN: Yes, I just wanted to add that it's true that we got involved in this process several years ago, and as going through some of the technical evaluations and the assessments that we did, and in our working with the folks in the industry and the environment and other groups, other regulators in DOE, it came to our attention that a lot of the risk associated with the recycling of metals and

reintroduction of materials into commerce, that one of the bigger risks was from materials coming from overseas.

And what we've done is make basically sort of a risk management decision. We have limited resources, limited people, limited funding to do contracts and to do these technical assessments, and have decided to put our efforts towards that arena. That's why we're working with Gwendolyn Bauer and the State Department on an international level and in the IAEA and others to take a look at the international scene where we think more risk may be coming our way, if you will.

STINSON: Okay, thank you for that clarification.

Okay, let's move on and hear the rest of Session 1 presentation, and then we'll open it up for further comments or questions that you may have, and then comments around the table.

HOLAHAN: Thank you. I'd like to now move into the question, actually, that Charles raised? What NRC licensees and what types of solid materials are we talking about?

Most of NRC's licensees are users of sealed sources in which the radioactive material is encapsulated. These licensees would typically have, or sources would typically have no radioactive contamination associated with them.

This would include the small research and development facilities, industrial users such as gauges, radiography sources, and so those sources would be disposed of appropriately, but the materials around which they are used would not be contaminated with small amounts of radioactivity.

For other licensees such as reactors, research laboratories, hospitals, manufacturing facilities, the materials would generally fall into three types of categories:

There will be areas that will have no contamination. This would include clean or unaffected areas, equipment in clean warehouses, hospital waiting rooms, university office areas, metal ventilation ducts in a control room in a reactor, for example.

Secondly, there would be process or storage areas that may have materials with small amounts of radioactivity, and these would be low because of contamination control procedures, primarily, as well as just the uses in those areas, and decontamination activities as well.

This would include certain lab areas in a university, for example, or a research facility; certain reactor buildings.

Finally, in the third category that's not listed on the slide -- and I apologize, but it's material that's

used for radioactive service where there could generally be higher levels of radioactivity, and these typically wouldn't be considered as candidates for release unless there is some significant decontamination activities that would remove the bulk of the contamination.

The types of materials, and one of the questions we have been asked is what materials should be considered and should they be considered now, or should we address certain materials now and then continue to look at other materials later, such as wood, glass, sewage and sludge.

The amount of radioactivity that a material has -- let me go back a second. I'm jumping ahead of myself. So far NRC has developed the technical background information for metals, specifically steel, aluminum and copper, concrete as well as soils, and these seem to be the most likely to become available and represent most of the volume of the slightly-contaminated materials that might be available for release.

These materials would found on facility equipment, piping, furniture, buildings onsite, and therefore that is currently what our focus is. As I mentioned when I jumped ahead of myself is should there be other materials that we should be considering now or look at it later, such as glass, sewage, trash, we have heard at several other meetings. What other materials are really out there? As

Barbara mentioned earlier, these are the types of questions that we really want to focus on and look at exactly what materials should be looked at, what materials are out there and look at a variety of different materials.

The next slide tries to put in some context what types of doses we are talking about and how it compares to the doses received from other sources. In the issues paper that I mentioned earlier that was published in the Federal Register, one of the alternatives discusses potential dose criteria of zero, .1, 1 or 10 millirem per year.

How does this compare with other doses that are currently allowed or considered by various agencies? NRC's public dose limit is 100 millirem per year, and that is a limit at which we believe the public is adequately protected from licensed activities. In addition, EPA allows the use of coal ash recycled into concrete blocks at 10 millirem per year. For a point of reference, NCRP -- or the National Council on Radiation Protection and Measurements -- considers 1 millirem per year as a negligible individual dose or a level below which the dose can be dismissed for consideration in risk calculations.

One millirem per year is also consistent with the international community -- that is, the International Atomic Energy Agency as well as the European Commission, which established 1 millirem per year as a criterion for

exemptions and for release of limited quantities of material.

How does this compare -- we heard Kristin talk about some of the natural background and what is in our bodies -- and other man-made sources, and in the next graph, as you can see, it is a bargraph. The orange bars are what is naturally occurring and the blue bars are man-made background radiation. What the bars don't show are the variability amongst each of these.

As you can see, the bulk of the background radiation does come from naturally occurring and is on the order of about 300 millirem per year. Radon is a large component and varies greatly depending on where you live and the type of building and things you live in. There is also an internal dose received naturally from foods that we eat and drink, primarily due to potassium, and that is on the order of about 40 millirem per year -- and that is pretty much a constant steady state.

There is also natural exposure from soil and building material which again varies greatly on the type of house you live in, whether you live in a brick house -- because of the natural occurring thorium and uranium -- and that is on the order of again about 30 millirem per year but will vary.

In addition, there is exposure to cosmic

radiation, which again varies. It is much higher in the Rockies, for example, rather than at sea level. On average across the country though it is on average about 30 millirem per year.

For the man-made radioactivity, a large component results from x-rays and nuclear medicine and depends on the type of medical studies that you may get. Again there is a range. The average for all medical procedures is about 60 millirem per year, but depending on if you have a certain procedure you will get a much higher dose. If you are just having a diagnostic x-ray the dose will be much lower.

There are also a number of useful consumer products that we have in our homes -- smoke detectors, watches, for the campers a thorium mantles and the Coleman lanterns that all are associated with radiation and have small amounts of radiation -- so I just wanted to give you some idea of the other sources of radiation that we are exposed to on an ongoing basis.

Some of the other questions that we have related to and we have touched a little bit on, EPA and DOE, is what are other countries, agencies and our states doing with regard to the control of solid materials? Well, as we have heard already, and I will just skim over this again quickly because we have heard about this, is EPA is not currently considering rulemaking.

They have completed technical studies on the environmental impacts of recycling, but as Craig Conklin mentioned they are working with the IAEA and the Department of State, the import/export issues associated with materials coming in and out of the country.

NRC and EPA however do have coordinated efforts in this area and we are working closely with them.

The Department of Energy operates facilities that are facing similar issues regarding the disposition of solid materials and DOE has developed criteria that is in line with NRC's existing guidance.

Also, what is happening on the international front is also important as we go forward and consider what we are doing because we need to consider the consistency with standards set by other nations and international agencies because of the important export considerations, and that different standards could create confusion and economic disparities in international trade.

As I mentioned, the IAEA and EC as well as individual nations are all considering setting standards and the European Commission plans to implement a 1 millirem per year standard by May of 2000 for clearance of metals.

The states, as Steve Collins and Cindy Cardwell and Alice Rogers, all representing different states here, but individual states have responsibility for naturally

occurring and accelerator-produced material and there is an Organization of State Radiation Agencies that has established a committee -- and I will just say CRCPD. Thanks to Steve -- he has already said what that is.

All states have the authority to release what we call NORM and NARM, Naturally Occurring and Accelerator Produced, solid materials that are not regulated by NRC.

In addition, 31 states have assumed regulatory authority for Atomic Energy Act material and NRC has relinquished their authority by agreement, and these states can also approve release of AEA solid materials.

As we are looking at this issue, we need to consider what is the need for consistency among state standards and the fact that there may be material that is available for use in one state other than where it was actually released.

At this point now I would like to again see if there's any questions of clarification on these last few slides that I have gone through and then maybe open it for dialogue amongst yourselves to continue the discussion of some of these issues.

STINSON: Okay, Cliff?

HONNICKER: Yes. I brought with me the 1980 or 1981 comment by the EPA. I wanted clarification. Are they not considering rulemaking or is it because in the past at

least they have soundly rejected the notion of recycling this radioactive metal, and they rejected it on the basic principle that underlies the foundation of the nuclear industry in health physics, which is the principle of ALARA.

For all of you who are not nuclear people, ALARA means As Low As Reasonably Achievable, and radiation exposures in the workplace, in the community should be as low as reasonably achievable.

If you are disseminating any radioactive material, however slight, and it is preventable, then that violates the principle of ALARA. That is one of about a dozen reasons why EPA rejected this effort to release this material 20 years ago.

I am wondering, has EPA's position changed on this or when you said they are not considering it, had they in fact rejected it?

STINSON: Let's let EPA answer to that question. Craig Conklin?

CONKLIN: We have not taken a position on this issue as of this time. We are sitting here going through the public meetings and listening to the comments.

One of the other things I need to bring out is that I only joined the agency back in 1989 so what we did in 1980 I am not fully versed in, and in order to really answer that question I would have to go back and look at the 1980

comments that we made and responses to that activity.

HONNICKER: I am going to pass that out later. I brought that with me.

CONKLIN: All right. I'll be glad to look at the history there and then make a response after that, once I can take a look at that.

STINSON: Mike and then Paul.

MATTIA: Just a two-part clarification. How does what the NRC is proposing, a rulemaking, how would that affect material that could be released under the control of the DOE and also material that is under control of the Department of Defense or the military.

The second part is we have heard a great deal about what has happened in Tennessee and their decisions. In theory, if a rule were to be passed tomorrow by the NRC on release, how would this rule affect the decision of a state such as Tennessee or any other state that up until that rulemaking has made a decision on release?

STINSON: Don?

COOL: To try and very quickly answer those questions, while we do not have direct regulatory authority over the Department of Energy I would expect that they would look at this standard as they look at EPA standards and what is going on internationally, otherwise -- in setting what would be done within the Department of Energy, so there is

clearly an influence although not a direct eight-chain line that you could draw that says we'll do this, we'll do this, we'll do this.

For the Department of Defense there is actually a split answer. For some of their materials, in the weapons programs and others, that would be worked with the Department of Energy for those activities. A number of the activities within the Department of Defense, and I am sure our friends from the Army would elaborate if you would like, are in fact licensed by the Commission and would therefore be directly impacted by these regulatory activities.

The third -- the state of Tennessee and other Agreement States participating in this process, if you move down to an endpoint, if you assumed for a moment a rulemaking activities that was resulting, then each of the states would need to move to adopt adequate and compatible, comparable regulations. At the completion of that process, that would then establish in regulation in Tennessee, in Texas and Illinois, and each of the other states, the regulation which would then govern whatever licensing action might take place.

STINSON: Okay. Paul and the -- Peter? Do you want to answer to the DOE question? You are going to have to use your microphone though. Pull it a little closer to you and state your name.

LILLY: Yes, I am Jud Lilly, with the Department of Energy. I have two points that can add to I think what Don was saying.

The first part is the DOE oftentimes releases materials to NRC licensees and then in those instances -- or the licensees of Agreement States. In those instances the NRC requirements would be directly applicable if title has transferred to the -- so if the material is owned by the licensees.

On the second point, I believe there is a commitment of the department if the NRC does set a standard in this area the Department will adopt that within the Department's regulatory structure as well, so those are the two points.

STINSON: We're going to take the cards that are up on this issue and then take our break. That ought to take us well past our break time.

GENOA: Paul Genoa with NEI. I would ask for a perspective, to help us with a perspective. I would ask what the agreement states allow, for instance, in the recycling of scrap pipe that has NORM contamination from the oil and gas industry?

Are there standards -- and maybe Steve could address this -- are there standards today?

And of what magnitude are we talking about?

STINSON: Cindy?

CARDWELL: Many of the states have already addressed this issue in that as Patricia said earlier, for NORM materials and accelerator-produced materials, the states have that jurisdiction in terms of setting the standards for that.

And many, many of them have, and they do vary from state to state. So I can't give you a blanket answer as to what levels those are.

I think there has been a table prepared, if I'm not incorrect here, by NRC, that sort of shows a rough outline of what the different states have done in terms of setting those standards for those materials for release.

And a lot of times the states don't really refer to them as recycling, but as release.

GENOA: That would be helpful if that was made available to us for perspective.

STINSON: Okay, Peter Hernandez?

HERNANDEZ: Thank you. I'm Peter Hernandez, AISI. Trish, I wanted to ask for a clarification. You mentioned standards that are being set by a number of organizations. You mentioned IAEA, you mentioned the EU, the European Union, individual countries.

Could you explain if those are legally binding standards, the way NRC's standards would be legally binding?

HOLAHAN: The standards set by the EU are --

STINSON: Just say your name first, Trish.

HOLAHAN: I'm sorry, it's Trish Holahan.

-- are legally binding for the countries that are in the EU. The IAEA just sets standards for consideration for adoption by the other countries. Maybe can Don can add to what the IAEA standards are.

COOL: Very briefly, because we could spend a long time. This is Don Cool.

The International Atomic Energy Agency sets what they call their basic safety standards and a number of safety guides which actually bear some similarity to NRC Regulatory Guides.

Those standards are generally available to all of the members of the IAEA. There are some 161 countries. It's a UN organization.

For those countries referred to as member states that are receiving assistance from the IAEA as part of those programs, their adoption of the basic safety standards pretty much becomes mandatory for those countries.

Most of the large, developed nuclear program countries, the United States and many of the countries in Europe, are not directly receiving assistance, so while those are out there as reference points, they are not legally binding to the U.S.

The EU that we referred to just a minute ago, that is actually by treaty, and then each of the countries by treaty adopt their national standards which have to be in conformance. And that is, in fact, the treaty date in May of 2000 when each of the members of the EU have to move to adopt the new set of European Commission standards.

HERNANDEZ: Thank you. I had just a quick followup. We have been participating in the State Department IRSM as well. And at the last meeting, a representative from the IAEA indicated that their governing board had decided not to move forward with any standard, if you will, but instead to adopt simply a consensus type document that would be very voluntary.

That's why I was asking for the clarification. Does IAEA, in fact, set standards, or are they simply recommendations? Thank you.

STINSON: Alice?

ROGERS: I'm not quite sure --

STINSON: Name and affiliation.

ROGERS: I'm Alice Rogers. I'm with the Texas Natural Resource Conservation Commission, which is probably the agency with the longest name ever known.

I'm never quite sure when to make comments, so if I have already missed it or it's coming up later, I do apologize for that.

But the tone of this conversation, this talks, seems, at least to me, with ten years experience in hazardous and solid waste management, to have forgotten that when you release materials under the NRC's jurisdiction, that they are still solid wastes and they are still subject to state and federal solid industrial and/or hazardous waste planning and other regulatory concerns.

So I would urge you to continue to work closely with EPA, but also to bring the Association of State and Territorial Solid Waste Management Officials, also known as ASTSWMO, to the table.

There are some significant issues, especially in the municipal solid waste landfill business, because those landfills are usually run by small local governments who have insufficient funding -- something they will always tell you -- to do put in radiation detection monitors and to know what to do when they have incidents.

And also they would have to change the groundwater monitoring suites and would have to do different kinds of groundwater monitoring.

And then I think that other states do this, but Texans believe that Texans should take care of Texas, and so as part of that, we have significant solid waste planning to make sure that we have the right number of landfills, not too many, not too little, to take care of Texas waste.

And so when you start releasing these materials from the NRC's jurisdiction, then one could assume a good portion of that would be going to the solid waste management facilities, and/or landfills, and so that would change our statewide solid waste planning.

And then lastly, I'd just like to say that I really do believe in rulemaking because that gives you the opportunity to do the analyses, the very complicated analyses that you've asked all these questions about in the Federal Register.

STINSON: Thank you, Alice. Let me say specifically that ASTSWMO has been -- that's the acronym for the association that she mentioned -- has been actively engaged by Meridian to participate in these processes. And they did have a representative from Colorado, Jeff Deckler, at the last meeting.

And we're so happy to hear that you're interested in the solid waste issues and can represent those concerns for this meeting. That will be very helpful, and we can tell you who we've talked to from ASTSWMO if you want to report back there.

Bill Lipton and the Kristin Erickson.

LIPTON: Okay, Bill Lipton, Detroit Edison.

The concept of ALARA has been invoked here, and I just wanted to clarify that that is as low is reasonably

achievable, and that is to prevent any radiation exposure that you possibly can; it implies --

If you read the definition, it's economic and social factors that are taken into account, and it implies reasonable risk versus benefit analysis, not just the prohibition of all radiation exposure.

STINSON: Thank you. Kristin?

ERICKSON: I second what Bill said. This is Kristin Erickson, Michigan State University.

I would like to expand upon that just a little bit, because that was going to be my comment, that ALARA, as applied, is actually a process. It's a professional standard of excellence, and it's tied into our license. We committed to ten percent of any limit.

What this means, though, for those of you who are, I guess, not doing this every day, is like on our campus where we have several thousand people and 800 or a thousand rooms.

Let me give you an example: We decommissioned an entire building, and in that building, we found finally in one lab, underneath a refrigerator, a spot of Carbon-14 with about 1/10,000th of the amount that we find in any normal human body who has no uptake of manmade.

Under the preventable, we would have to secure that room, and not release it. As applied in ALARA, we can,

because we can look at the amount, we can look at the risk, and we can look at the ultimate outcome.

Now, we didn't do that, in fact, in that case. It came out easier for us to chunk out that tiny piece with a screwdriver. So we do ALARA, even when it's not necessary because we were concerned about the contractors who were going to come in. And if they heard by the grapevine that anything was there, they would be terrified, partly because of our message of any radiation is deadly, any radiation is dangerous.

Part of what I think this whole process will achieve, if it's done right, is to come up with some numbers that are reasonable risk, acceptable, and usable in a practical way by anybody, and also understandable by the public. That's a critical factor.

Then, finally, my two short things I would like to add a couple of things to this list, and I think we should add activation products, mixed waste and lead. Where's lead?

I spent two weeks in my waste building last month, literally surveying tons upon tons upon tons of lead that has been stored and squirreled away there for 14 or 20 some years because nobody knew what to do with it. And this is problematic.

STINSON: I think we've heard now the addition of

nickel and lead to our potential list of materials to explore.

I stated earlier that we would take the cards that were up, and I think Dan and Jim were the ones left. We want to hear your comments, but maybe we'll go ahead and stick with the break time, and then come back, if you still want to make your comments.

Dan?

GUTTMAN: Thank you. I'd like to follow up on what Kristin --

STINSON: Dan, just mention your affiliation, please.

GUTTMAN: Dan Guttman from PACE. First of all, PACE represents the workers, is the primary representative of the hourly workers at the Department of Energy Nuclear Weapons Complex, as well as many industrial sites where radioactive materials are used. It's probably true, and this isn't a boast, but it's unfortunately reality, that PACE members work as near to all kinds of levels of radiation as any population in this country, and probably any population outside of Russia.

So we're not talking about a group of people who have an innate hysteria about low-level radiation. Having said that--

STINSON: Just stay close to the mike, if you can.

GUTTMAN: Having said that, my question is, it appears to me, Trish, with due respect, the chart and graph you presented here are fallacious and really should be corrected promptly.

How does a potential radiation dose from a standard compared with the dose received from other radiation sources, and then we have the bullet, comparison with natural background.

As you folks from the Academy presented correctly, of course, the point is that we all experience natural radiation. The reality, as we have now heard, is one way or the other, by hook or by crook, by laundering, as the BNFL folks did, or by actual lawful activity, the NRC rule is going to govern the Department of Energy, which is the lion's share of all the junk we're talking about.

Secretary of Energy Richardson has courageously just announced repeatedly that after 50 years, our workers, as well as folks in the communities, have been misled, lied to, and have no clue as a result of what doses they have been exposed to, and the exposures are pretty clearly above and beyond what was said.

Mike Mobly, who many of you know from Tennessee, who just retired, repeatedly said, as the person with the primary state oversight for Oak Ridge, that monstrous source of radioactive materials, that letting stuff offsite, sure.

The folks at DOE and the contractors, a little hot spot, that would pass unnoticed, what's the big deal? It gets lost.

So here is my question, Trish, and I'd like you to think about this over lunch: Are you going to retract the statement that how does a potential radiation dose from a standard assume that, in fact, the standard will be honored and complied with?

We know for a fact, the Administration, the President of the United States' Secretary of Energy has said you cannot make that assumption in the case of the waste we're talking about here.

The head of Tennessee has made that statement. We all know as common sense, he has made that statement. It's really misleading to tell all these folks that a standard will equate to background radiation when I could tell you it would be 50, 60, 100 times what the reality is, and we don't have a clue.

So when you make this presentation in the future, can you say that at least I can't talk about the fine folks who are running nuclear power plants at Detroit Edison or Consumers or whatever the name is today --

STINSON: You've got to talk into that Mike, Dan.

GUTTMAN: It's still Detroit Edison or it used to be anyway. But it's clear that you can't make that

presentation for the bulk of the waste. We have no idea what the relation of a potential standard to be the potential dose; isn't that correct, in reality?

STINSON: One of the things we are going to talk about --

GUTTMAN: Unless you've got some data that you can present, which you haven't.

STINSON: One of the things that we're going to do is talk later this afternoon about control mechanisms for trying to assure that the controls are in place, and reduce the reasonable occurrence of accidents and other kinds of activities, but maybe -- do you have anything specific you want to say?

I mean, we're going to get to the questions that you've raised, Dan, and maybe there will be questions that you have after that, that will take the NRC towards further investigation.

GUTTMAN: I would just like to request that this be withdrawn and not used in further presentations because it's extremely -- unless there is a footnote saying we have no clue as to most of the waste.

STINSON: Jim Turner?

TURNER: Jim Turner, Ameristeel. I have a question that is probably pretty simple and basic, and then I have a comment from my own experience.

The question is -- and you may have answered this before -- is there a direct relationship between concentration and dose? And my comment is, I think the steel industry cleanups, at least the ones I have been familiar with, are based on concentration.

And instead of ALARA, I'd say it's ALUHA, as in unreasonably achievable.

I'm familiar with incident-related material cleanups that are down to the two picocuries per gram for concrete, soil, dust, and so forth.

So I just wanted to point that out. They've taken, the last one, five years and $15 million to complete. I'm interested in the relationship between dose and concentration.

HUFFERT: That will be discussed in the next session with Dr. Mack.

STINSON: Okay, good. Steve, you're going to save your comment. Cliff, if you'd like to do the same, we can come back. Is that okay?

COLLINS: Yes.

STINSON: Okay. We'll take our break now, and return for a little bit of further discussion and the opening of Session Number 2.

[Recess.]

STINSON: Okay, let's get started, if we can,

please. Let me just call your attention to the slide here. It does contain the new modified, highly improved address for the Web site. You should be able to download documents, even such as NUREG-1640, which is quite extensive, but a lot of historical documents: all the meeting summaries from these meetings; all of the technical information submitted in support of these meetings. If there were comments submitted electronically, they're posted. Obviously, those in paper weren't posted and all the transcripts for the meeting, as well.

What we want to do now is take Steve's comment, see if there are any other very brief final comments on session two, and then take any opportunity for members of the public or the observers in the back of the room to offer some observations or ask any questions they might have. Steve?

COLLINS: Steve Collins, CRCPD. Actually, my comment was for Peter Hernandez. I believe -- and he's out of the room -- he asked a question about norm criteria and stuff.

STINSON: That's right.

COLLINS: I was going to mention that there is a private consultant, Peter Gray of Peter Gray and Associates, who puts out a little newsletter roughly quarterly, which actually has a listing of the norm criteria for each one of

the states and then every quarter, he kind of provides an update or summary of the changes that are occurring or being proposed in each one of those states. So, if it's in the naturally occurring way -- I mean, that's a good source of the information that he was asking about. I'll try to catch him during a break and tell him that.

STINSON: Great. He'll probably appreciate that. Cliff? And then we're going to move to the public comments and ask you all to move up to the microphone, if you'd like to offer any observations or questions.

HONNICKER: Okay. I made that comment. First of all, you all don't jump on me. It wasn't me that said the ALARA thing. It was the -- it was the director -- William Hinman, director, Office of Environmental Review for EPA. So, don't slay the messenger, okay. That's a general request.

What he said was -- the following is a quote from summary section Chapter 8, NUREG CR-1775, "In the case of both decorative glassware and glaze ceramic products, some exposures to the public to ionized and radiation will result. In some instances, these exposures may be significant. The promulgated philosophy is that all exposure should be kept to levels, which are as low as reasonably achievable and that no exposure should be incurred without commensurate benefit, NCRP-75. Since the

use of uranium in these products result in little or no benefit, in terms of the health or well being of the public, and since suitable substitutes for uranium exist for this application, it can be concluded that the exposures incurred, as a result of product distribution and use, while low in most cases, are unnecessary and unwarranted."

And he was making that in response to the -- on page 415 of this earlier draft, that while most of the doses listed for both individuals and populations are indeed extremely low, there are individual cases which are not in keeping with as low as reasonably achievable philosophy. The worst case scenario shown are for copper bracelets, 300 millirem a year, and bone prostheses, 200 millirem. These are relatively high end, themselves, no matter how limited the area of exposure. So, that's what the EPA was saying. That's not what I was saying, number one.

Number two, I just wanted to react real quickly to what Mr. Guttman was saying, which is you have -- at least earlier in this earlier draft -- in this draft, the NUREG 518, the draft environmental impact statement, at least you can read it and understand, okay. At least you can read it and read the calculations and read the assumptions, read the scenarios, and understand it, and you have a basis for making intelligent decision.

The material that you all sent me on this proposed

regulation that's going on today, it's incomprehensible. It's incomprehensive for the average public to make a public comment, because it is to poorly written, the science is so poorly elucidated that how can anyone make a comment on is. And I -- you know, I read it -- frankly, Dan, I read it and I said, well, damn, I would write something like this, if I didn't want the public to comment on it. I'd write something so obscure, so fuzzy, so inarticulate, that the public would either be bamboozled and say, gosh, it is -- it's so -- wow, this is rocket science; it's way up here and I'm way down here and I don't get it, so I'm not going to say anything.

Now, that's kind of a jaundiced kind of look at it. But, then, I read Dan's thing and it said it was SAIC that wrote this thing and SAIC that has a direct economic impact or benefit from the passing of this regulation. See, if it gets passed, they make millions of dollars off this BNFL contract going on in Oak Ridge. So, hey, that would be a great idea, write something so obscure that nobody could -- a human -- a regular human being walking off the street, a science teacher, I wouldn't take this to my kid's high school science teacher, because I don't think they could get it.

And one last thing, the head of the nuclear program for the Nuclear Information Resource Services, Di

Derego, I asked her, I said, "Di, I've been out of analysis of this kind of stuff for a couple of years" and you've gone to milli-sieverts and baccerals and microbaccerals -- and, by the way, you all showed on your presentation earlier millirems, which is what I learned, rems, rankins, reps, and that's what this earlier thing was in. This other thing that's in sieverts and baccerals, it's over my head. But, I asked her -- she has a chemistry degree -- I asked her, I said, "could you sit down and with this proposed rule and do the calculations? Could you do a critical dose response from any particular thing?" And she said, no. And she said that she was laid over in an airport with a senior NRC scientist and they sat down and tried to sit down and do the dose calculations on it and they couldn't do it. So, my first response -- and that's why I'm not going to respond today on anything in your proposed rule, because I don't get it.

STINSON: Well, and hopefully, two things: the next presentation in session two, Cliff does walk through NUREG-1640, and I know Bob Meck is definitely willing and interested in having this document addressed, be able to be absorbed and address concerns that the public might raise. So, I'm sure he'll be open to your suggestions for making it more readable.

HONNICKER: Well, I am -- I mean, I'm probably the

only Southerner here. I'm the only -- I feel like I'm the only --

STINSON: No, there's more Southerners here.

HONNICKER: Okay. Well, thank God. Well, let's get together in a little bit.

[Laughter.]

HONNICKER: No offense, no offense to Northerners. I mean, this is -- you can take the boy out of the country; you can't take the country out of the boy.

I would like to, also, see if we can make the issue a lot more fundamental to understand, rather than getting lost in any minutia in the scientific analysis of this proposed rulemaking. It's probably more important that we go back to the basic fundamental issues, which is -- the very easiest one to do is the economic cost benefit analysis. And if the only -- there's 100 reasons -- at least 100 reasons why this is not a good idea to put this stuff back into the community. But, there's only two reasons why it's good to recycle this stuff and those two reasons are: it's economically beneficial to the corporation that has the contract; and it's economically beneficial to the DOE and to the private nuclear concerns to get this stuff out the door.

So, if you want to get it down to the economic benefit of getting this stuff out versus the economic loss

that the radioactive -- or the radioactive -- that the regular recycling metal industry has or even the perception -- you know, if you look at the stock market, you look at how many hundreds and billions of dollars are lost in a single moment on perception, that those are the things that I think that we need really focus on and that will make this meeting and this rulemaking issue much more realistic.

STINSON: Okay, good; thank you. Kristin and then we're going to see if there are any comments from the observers.

ERICKSON: I'd like to respond to Cliff. This is Kristin Erickson, Michigan State University, and I want to agree with you about the way that this is communicated. I talked to people -- I train thousands of people a year and they are most of them not radiation people. Many of them haven't a clue; they don't know a rad from a rat. But, we have to communicate to them in plain language.

I would like to explain to you that I know this and I understand how difficult it is for the person on the street to understand any of what we talk about. But, I want to, also, defend it, in some justification, because if they didn't publish it that way, I could guarantee that the NRC would be throttled by those in the industry -- of our industry, who would say, this wasn't right; you know, where's .4392 grams of shielding, not .5; mia culpa. This

kind of things goes on.

HONNICKER: No, I think it could have read -- you know, I've been reading science -- radiation-related documents for 20 years now and I have a fairly good grasp of these issues and I can tell you that this one was not clearly written. It was not clearly written. And we can sit down all day and go over the technical faults of it; but before we go down over the minutia, let's talk about the big picture.

STINSON: Good. Both points are well taken. You certainly need to be technically accurate and you certainly need to have it be understandable to the public.

Speaking of the public, anybody from the observer area that would like to make a comment? Yes, ma'am, please come forward to the microphone. Anybody else plan to make a comment? Sir, you could step forward, as soon as she is done. Go ahead. Your name and affiliation again.

BAINUM: My name is Sydney Bainum. I'm part of the National Coalition of Organized Women. I'm, also, part of NEIS, Nuclear Energy Information Service here in Chicago, Dave Craft's group.

STINSON: If you could speak directly into the microphone.

BAINUM: I would like to say that I am just completely in a state of shock that the idea of releasing

any more radiation into this already over-radioactive pollution; just appalls me that you could even consider having a radioactive frying pan or a radioactive metal surrounding a window.

Now, on top of all the radiation that's come from the bombs, which are still pulling around stransium 90, from all the releases of the 400 nuclear power plants, from all the waste, from all the dumping -- and not only that, British Nuclear Fuels, one of the most polluted corrupt nuclear industry companies, is in charge of doing this in Tennessee. It already has a contract sanctioned by Gore to take 100,000 tons -- yeah, 100,000 tons -- it's already been done and it's been reprocessed, going to Albionics. There are already radioactive pots and pans out there. The Navy promised to take them, but the pots and pans made all the instruments of the submarines go off the wall, so they said no, we don't want these pots and pans. So, now, they're up in West Best -- I think they're in West Best, Wisconsin, because that's a pot and pan factory place, and they're being sold now to consumers. Now, would you want to cook soup in a radioactive frying pan? This is what's going to happen.

How can you measure this radiation? There are hot spots. It's never equal; we all know that. If you have a rad alert and you take it in a room, over there, you'll find

radiation; over there, you might not find any. And that's going to be the same thing wit these metals. You might have five spoons that are okay, then one spoon with an ounce of plutonium particle. You're not going to be able to measure this stuff when it gets all mixed up into a potpourri.

Now, I would like to say what Carl Morgan has said. You know the famous Dr. Carl Morgan, the father of health physics, who just died last year, who was deeply respected by everybody. He was the one that said, no, you should not radiate children's feet. Remember when we all used to get x-rays? Okay, he was one of those types, you know, concerned about health and safety, not profits, okay; not profits -- for polluting for profits.

That's what this is all about, it's to save money. That's all it's about. Instead of spending so much per cubic meter and shipping it out to Utah in a safe place with no radiation -- zero release of radiation, you're going to mix it all up, so our grandchildren -- I'm worried now. I'm going out and buying pots and pans for my grandchildren, because when they get married 20 years from now, there won't be one pot out there that's clean. There will be nothing out there that's clean, if you let this happen.

STINSON: If you can, ma'am, can you please keep your voice down?

BAINUM: I'm sorry; I'm sorry.

STINSON: Stay calm with us. Thank you.

BAINUM: All right. Now, I want to just say what Carl Morgan said. You all know that he is a Ph.D, he's a professional, and he has been nuclear peer -- he's been peer reviewed by all the scientists. Okay, this is from -- I must say that the most -- the magazine that does anything on nuclear issues is the Progressive Magazine. They're the only gutsy magazine and they put this out last October. It's an article called Nuclear Spoons.

"Carl Morgan, known as the father of health physics, shutters at the idea of more and more radioactive metal entering people's homes. He is particularly worried about dental fillings. You certainly don't want people going around with radioactive teeth, he says. Some of the most dangerous radioactivity around the homes, says Morgan, will be the metals people unintentionally ingest. Some of these find their way directly into the human body, especially copper forks -- in forks, he says -- cooper knives and so forth. It doesn't help any cell in the human body, if you send an alpha particle through it."

"Now, Richard Clapp, who is associated professor of the Department of Environmental Health at the Boston University Schools of Public Health says you may soon need to fear household products you have most contact with. If you're sitting on it or if it's part of your desk or in the

frame of your bed, where you have constant exposure and for several hours, you will be in most danger. Clapp, who published the study on the increase in Leukemia and thyroid cancers associated with low-level radiation exposure among people living near Massachusetts Nuclear Power Plant says radioactive metal recycling will raise over all radiation levels."

So, we're going to add all radiation levels. It's going to affect everybody's health, right. It's going to be out there.

STINSON: One minute, please.

BAINUM: Okay, fine. It says, "recycling will -- what is their right -- who is in the right mind would want to do that," he asks. And then he says, "this is the legacy of an industry gone mad."

Now, I just want to bring one last thing -- I'm sorry I got a little excited. But, you know, I've been doing this for 20 years and you feel like you're up a stone wall, okay. This already has happened. This was radioactive scrap in building materials found in Northern Taiwan. Remember we had the earthquake there? Well, it's the same town, Taipei -- yeah, Taipei, I can't pronounce it, in Taiwan. They buy -- it's a very corrupt military government and they did -- they released contaminated materials in the '80s. So, those apartments are all

radioactive -- you know, the window frames, the cement, the roads, everything. And this boy -- a boy's illness was the direct result of his sitting next to a heavily radioactive window cage at his kindergarten and this boy got Leukemia. So, we're talking about inflicting more -- many, many more health problems.

Thank you, very much, for letting me talk.

STINSON: Thank you. Sir, your name and affiliation? You are limited to five minutes, if you don't mind. We'll have other opportunities for input.

LOEB: Rob Loeb, First Energy. That was a hard act to follow. But, I want to try to focus on the process. And one thing I would like to comment on, with regards to the process, is kind of an expansion on what the NEI representative said, in the mixture of materials.

STINSON: Can you speak a little more directly into the microphone?

LOEB: Okay. It seemed to me that the intent was to try and decide what to do with all these materials that are stored in various facilities. But, then, there's a statement that the proposal will be comprehensive for materials and equipment. And to me, that means everything: the tools that we use everyday; the trucks that we drive in and out of the radiologically controlled areas; the shipping containers that are used to send for burial. And I found

that there -- I felt that there need to be some clarification with regards to exactly what would be covered by this rule. Because, when I look at the values, the screening levels that are proposed, there just is no technology in existence for releasing a bulldozer from a radiologically controlled area to those kind of levels. So, I'd really like clarification on that.

STINSON: Okay. Is that your question?

LOEB: Yes.

STINSON: Okay. Don or Trish? And this is a subject of one of our discussions after sessions two, which materials should be considered versus which one are already definitely under consideration by NRC.

COOL: This is Don Cool with NRC. I think there's two answers. The first, I hope we will get to, as part of these discussions, in terms of whether or not there is technology, how you would go about validating and verifying whatever kinds of criteria might be put in place.

Your first question, which is what is the scope of the rule or potential rule or guidance or whatever action the Commission may further direct the staff to do, that is, in fact, a question, which is open for discussion here. Certainly, there is a view that if the Commission moves forward, it would be nice to be as encompassing as possible. Part of the issues, which we are laying on the table, is to

what extent that is reasonable; to what extent a single approach will work across a variety of materials; or whether there are different approaches, which ought to be used. And so, I appreciate that statement and would, in fact, ask, as we continue with this, that you come back and find -- provide some further reflection to us on that exact scope question, as we proceed through this day.

LESNICK: Thank you, very much. Let's move on to session two. If you look at you agenda and, also, some of the background slides, as we proceed. As you know, where we're heading later this afternoon and tomorrow is to spend a great deal of time with this chart, to talk about particular materials and to talk about different ways of managing solid materials and the implications therein. But, before we get to that point, we want to make sure we've got some good solid discussion and grounding and background.

This morning in this first session, we spent time on NRC's authority, why are they even considering a possible rule, the time line they're looking at, and some of that kind of background information. We'd like to proceed in session two, to give you a little bit idea of what kinds of studies the NRC is currently pursuing, has pursued, and what it will be looking at in the future. This is going to cover some about technical basis, about soil. It's going to, also, address issues of environmental and health

implications, as well as cost.

Similar to the session one, we're going to have some background presentations first and slides. You can come along and look at your hard copy, if you can't see the projected image. And then, we'll talk about this probably technical basis first and then environment and health and then cost issues. We have three presenters: Tony, Bob, and Giorgio. Tony, you're going to start this off.

HUFFERT: Yes. Thank you, Mike. As Mike just mentioned, the purpose of this session is to give you --

STINSON: Tony, mention your name.

HUFFERT: I'm Tony Huffert, NRC headquarters. The purpose of this session is to give you an overview of the technical work that the NRC has been doing over the past several years and, also, to summarize the current and future activities that we'll be working on under this clearance initiative.

The past several years, the staff has focused on developing a technical basis for estimating the radiological dose that an individual may receive from the release of certain solid materials of low levels of residual radioactivity that is either on or in the volume of the materials in the equipment. The staff limits its analysis to only iron, copper, aluminum, and concrete, as these solid materials were considered the most likely candidates for the

release for unrestricted use.

The results of these staff efforts were published in a report in March of this year, which is NUREG-1640, which has been discussed so far. Copies of this document are available and the public comment period is still open until the end of the year, so we welcome your comments for that time. And certainly after the beginning of the year, we'll consider your comments; but, we appreciate getting them as soon as possible.

NUREG-1640 is limited in scope and is only one of several analyses that are needed to support decision making. Additional analyses are needed for us to do any environmental impacts and the costs and benefits of alternatives associated with solid material releases. The staff is currently developing a more comprehensive inventory of materials that could be potentially released from nuclear power plants, as well as materials facilities. We are, also, in the process of analyzing collective doses to populations and the potential for radiological exposure to multiple items that may be released.

Another consideration is the ability and the cost to survey or measure low levels of residual radioactivity that is on the surface or in the volume of material and equipment that can potentially be released. Implementation considerations such as this will be addressed in the draft

regulatory guide, if we decide to go forth with the rulemaking.

One of the materials that was not included in NUREG-1640 analysis is soil. As part of the technical basis development for soil, the staff is currently completing a literature search on the uses of recycled soil, which I will discuss after Dr. Meck discusses NUREG-1640.

LESNICK: Tony, can you get that even closer? We're having people point to their ears.

HUFFERT: Okay. For now, I'd like to turn the session over to Dr. Meck, who is the project head in the development of NUREG-1640, and will explain the technical approach of that report. Bob?

MECK: Thank you, Tony, and good morning. I'm Bob Meck and I am with the Nuclear Regulatory Commission, in the Office of Nuclear Regulatory Research. I'd like you to recognize that we note the positions that we've heard already this morning and expect to hear more this afternoon and we will certainly consider those positions.

But, for the moment, I'd like you to step back from your positions and put yourself in the situation where the staff is, and that is, if the Commission were to set a standard for the release of solid materials into the general commerce and equipment, what should be the approach to take to ensure adequate protection of individuals and the

environment? How would you go about that? That's the challenge that we took on with the development of NUREG-1640 and it's only the first piece of the development of tools to help the Commission make such decisions.

NUREG-1640 has two volumes and it's out on the table across the hall outside this room. And just so that I know who my audience is, how many people have a copy of this?

[Show of hands.]

MECK: Lots of people have. How many people have tried to read it?

[Show of hands.]

MECK: All right. And how many people feel pretty familiar with it?

[Show of hands.]

MECK: Okay. People have tried to read it and that's where it ended. I hope that I can give you some -- and I'm going to be very fast, so my colleagues, who are familiar with this, don't fret. I'll go through it. But what I can tell you is that I will make myself available for one-on-one or however many on one, over in the corner on breaks or at lunch time and so on, if you want some more details; I'd be happy to go over that with you. But, I'll give you the general approach of what this tool is about.

Now, I want to emphasize that this is not a

regulation, but rather it's a method to convert a dose, and it could be any dose that the Commission might decide on, to an individual to the amount of radioactivity that would be associated with that dose. But, that still doesn't get to the initial question that is posed to the Commission: how -- what approach would you use to ensure that there would be adequate protection of the individuals?

Well, the approach is that if we look at all the kinds of things that can reasonably be expected to happen to such materials, if they were released, or equipment, if it was released, with associated radioactivity, and we analyzed those situations and found which individuals were then likely to get the highest dose, and if we protected those individuals to a set level, then the other situations that we would look at would be -- have even less dose. And so by protecting the critical group, that is those individuals most likely to get the highest dose, we're, also, protecting other individuals in the population.

That's what this document basically does, it provides a conversion factor to go from a dose to the implementation, where people actually have to measure this and say, well, how much on -- how much radioactivity on a particular gram of scrap or a particular square centimeter or scrap would be permitted and still keep those to the individual less than that amount.

How did we actually go about it? What does this document actually do and why does it take two volumes and why is it so thick? At the outset, we don't know who the critical group is. And so what we had to do is to analyze for the four materials that were mentioned -- steel, aluminum, concrete, and copper -- the reasonable scenarios or outcomes that would happen. And the total number of those scenarios is quite complex, reflecting American society, and there were 79 of them that we analyzed. And the dose differs for each radio nuclide that we have, because each radio nuclide has its own unique characteristic of radiation that it emits, and so we had to go through all of those. And there were 85 of them that we could reasonably expect to be released.

And so -- then, in addition to that, there's variability. How can we say that in these scenarios, we have -- we know exactly what people are going to do with this material and we can calculate it precisely? The answer is, of course, we don't know exactly. There's variability. The surface to mass ratio, some pieces of scrap are thick; others are thin. It makes a difference of how much radioactivity could be associated with that piece of scrap. And so, we used a probability approach. We take into account the range of virtually all the parameters that go into these scenarios. How people behave -- a truck driver

may drive a hollow load two hours or six hours a day, and we take all of that into account, in a probablistic way, and we sample that.

And so to get these conversion factors from concentration to dose or dose to concentration, what we ended up with was some distributions. And what's reported in NUREG-1640 is the mean and the uncertainty associated with how well we know those means for the situations. And from that, basically, what we got, if we say this is the number of times that we got a particular value for the conversion factor and we look at a particular scenario for a particular radio nuclide, it turns out, for example for Cobalt 60 in steel, that the scenario that gave the highest mean dose was for the person who transports the scrap. Okay, so this is a truck driver, right.

The other scenarios that we looked at, for example a small object worn next to the body, like a belt buckle, or a person who, in turn, cuts the scrap, or somebody in the slag pile after the metal is melted, then those conversion factors came out -- if this is actually zero down here, as it turns out for this situation, all of these other scenarios were far, far below. And so going back to the philosophy on how do you ensure protection at a certain dose, if you protect the truck driver, then all of the other scenarios would indicate that the other groups associated

with the release of that radio nuclide would be protected even more. So, that's basically what NUREG-1640 does.

LESNICK: Thank you, Bob.

MECK: I can -- let me just add one more thing. There's ongoing work. This is the protection of the individual. There is, also, the question, in terms of rulemaking, of what's the overall societal effect, and that's what we look at when we accumulate doses for -- across the whole population. That work is ongoing and we'll report on that when it's done. Thank you.

LESNICK: Let's keep going with some of the other background studies, then we'll come back and we'll have discussion for the rest of the morning and the early part of the afternoon about this. Tony?

HUFFERT: Sure. Thank you, Bob; thank you, Mike. As Bob pointed out, soil was not one of the materials that were included in the NUREG-1640 analysis. Early this year, the NRC staff began working on the technical basis of soils clearance, because it was identified as an additional solid material that may need to be disposed of. Specifically, we're looking at the recycling or the reuse of soils that could be released for unrestricted use.

The goal of this effort is to perform a dose assessment of potentially recycled soil, similar to the dose assessment methodology that Bob just pointed out in

NUREG-1640. And as part of this effort, the staff is working with the National Agricultural Library of the U.S. Department of Agriculture, Agricultural Research Service, to conduct a comprehensive literature search of recycled soil use in the United States. The National Agricultural Library was chosen, because they possess the world's largest collection of literature, data bases, and information sources on agriculture and have developed and maintained the preeminent agricultural literature search system, called Avercula. And the objective of this effort is to identify and to retrieve citable references for identifying and characterizing recycled soil usage scenarios and for the parameter values for conducting dose assessments of the predominant scenarios, which, in turn, will be used to identify the critical group and the potential doses. The comprehensive literature search was completed last month and we're currently working to develop a condensed listing of the relevant literature and supplemental information sources for retrieval and review.

Following our literature review, the NRC staff will identify and characterize recycled soil usage scenarios and estimate the parameters for the dose assessments. We are requesting public input to identify citable literature and data bases pertaining to the recycled soil use that is relevant to clearance. We are planning to publish a draft

report on this subject in the next month or two and to hold a public workshop at NRC headquarters in March, to present not only the findings, but to obtain the public input on soil uses.

At this point, I'd like to turn over the session to Giorgio, who will discuss the health, environmental, and economic impacts that should be considered for decision making. Giorgio?

GIORGIO: As many of you are experiencing, I'm having a little bit of trouble with my name today. Let's see if I can do this. Good morning, I'm Giorgio of the Special Project Section in the Decommissioning Branch, in the Division of Waste Management at the NRC. That's the long name. I'm, also, part of the working group that was mentioned earlier.

In this part of session two, I will be following the discussion on radiological evaluation of clearance pertaining to the potential health and environmental impacts associated with the various alternatives being considered for clearance. For those of you following the issues paper, this session relates to issue two, item (a).

What are the potential health and environmental impacts that should be considered? First and foremost, the basis for NRC's consideration of any action related to the release of control of solid radioactive material is

protection of the public health, safety, and the environment. NRC will evaluate impacts of all the alternatives being considered. For each alternative, one of the attributes to be considered is the potential radiological impact, and the first step is to assess the potential dose to an individual. For each alternative, we consider the potential exposure for individual and multiple sources; so not just one thing: eyeglasses from recycled metals, steel girders in housing and office construction, etc.

We use a two-step process in picturing how this exposure can occur. First, we examine how the material is released and comes into contact with people. This is scenario analysis. And then we look at the ways in which the biological impact is delivered by inhaling, eating, etc., and this is called the pathway analysis. One can look at this whole process as part of the material flow, from the licensed activity to the generally affected environment. Much of this is explained in NUREG-1640, which was just discussed.

In order to better reflect the impacts of the various alternatives, we, also, perform a collective radiation dose estimate of population groups. Different scenarios may associate with different indicator individuals. The collective dose allows a more common

denominator for comparison. In effect, we can better account for different materials having different pathways and resulting in different individual doses to different people. Some age groups may be more radio sensitive than others to particular materials. So, in order to smooth out, and we reflect the impact of these materials and the flow, we use a collective dose.

Next slide. Other attributes for evaluating impacts to the environment, also, include those to biota, that means other animals, and how land use is affected. This is required by the National Environmental Policy Act. We would include assessing impacts to public use areas, swing sets and playgrounds, wetlands, preserved habitats, endangered species that may be more radio sensitive, etc. Another attribute to consider is the impact of mining and processing of new metals to replace recyclable metals that are instead disposed of in a low level waste site. This involves the incremental contribution to pollution, increase potential for occupational injuries. So, in effect, although it may seem that it wouldn't hurt anybody to take this material and put it in a low level waste facility, the fact that you may have to indulge in greater industrial effort to replace it may have its negative side. So, in effect, we have to consider all of this when we look at the potential effects.

We continue with this listing of attributes for health and environmental impacts and point out that the attributes are not cut and dried, because trying to minimize one impact could be offset by the increased potential of another. Some of these impacts may be competing. The value of sending more recyclable material again to a low level waste disposal site may be offset by the increased pollution. There are issues of concern in trying to balance these choices.

One of the attributes that is very difficult to quantify, but places a strong role in decision making, is the concept of environmental justice. We don't want to have one sector of society bearing a disproportionate amount of the burden in the allocation of impact. By this, we mean children, who would be more likely to have dental braces that may be made from recyclable material, or low income housing being the recipient of recycled material more so than other houses -- housing. Some of this carries into the reluctance to postpone to the future the difficult decisions for ultimate disposition -- bridge trusses, reentering unrestricted commerce when future demolition terminates and authorized restricted use, for instance.

There are, also, impacts we have in common with non-radiologically driven decisions: occupational injury, transportation, noise, road construction; so, in effect, the

radiation label doesn't make this aspect of consideration unique. Part of what we're looking for today are other impacts that we should consider and we encourage any comments from the public.

The other side of the equation that we need to balance for decision making relates to the potential economic and cost benefit considerations associated with various alternatives. For those again who are looking at the issues paper, this is issue two, item (b).

Why do we consider economics and cost benefit? Basically, the federal agencies must consider cost benefit in their evaluations of alternatives for major rules. Executive Order 12291, which was mentioned earlier, directs all executive agencies to prepare a regulatory impacts analysis for all major regulatory actions. It should be noted that this executive order directs that action should not be undertaken, unless they result in a positive net value to society.

NRC guidance for conducting this cost benefit analysis is documented in a document called NUREG-BR-0058, Regulatory Analysis Guidelines of the NRC. This document goes into some detail addressing the attributes and preparing environmental analyses. Basically, this provides a tool to help balance health, safety, environmental impacts with cost required to achieve or preserve them.

We next address some of the economic impacts. I should point out that these items are an aid to help focus our discussion today. They are not meant to be so exhaustive that we wouldn't consider anything else; so, by no means is this all we look at.

Radiological surveys will play a role in verifying that permissible levels have been met. The costs include instrumentation, labor, training, analysis of results, survey time. The lower the dose and concentration number, the higher cost associated with the necessary accuracy for the readings. Many of the alternatives will have an economic impact on certain commercial sectors. Scrap dealers and other industries would need to tailor their operations accordingly. If the total prohibition were to take -- were to the ultimate regulatory strategy, then scrap dealers and melters would need to strongly invest in detection technology to preserve their radiological clean bill of health.

The cost impact may affect the manufacturing process, also. This is most keenly observed in the potential to responding to false contamination alarms or for rejection of materials that melt through scrap and scrap yards. This would entail costs for having the material sent back. In order to minimize liability, scrap dealers, melting operations, and other types of operators and

preprocessors will need to weigh the cost associated with more precise and reliable monitoring for both incoming and outgoing portal monitor stations. Again, the metal replacement reduction costs need to be addressed in this analysis.

We continue with a list of the potential cost impacts. Depending on the alternative, this would impact the cost of disposal. The tradeoff is whether we send these materials to a public landfill or to a low level waste disposal facility or neither; in effect, recycle it. There are, also, costs for other industries, such as producers of film and certain electronic products, which might have to retool to avoid sensitivity problems.

Another concern is the potential for buildup of radioactivity in commerce over time. It's not -- it isn't clear to us, at this point, how we should estimate this. This is part of our study and research effort to try to get a handle on this kind of problem. The socioeconomic impacts have to be weighed, as well, as in any environmental impact statement analysis: jobs lost, created, quality of life in communities, increased noise, traffic accidents, etc. There are the costs that should be considered. We expect to hear suggestions today what they might be.

Okay. What is involved in a cost benefit analysis. Now, this is a fairly simple slide. For each

alternative, we evaluate potential health, safety, and environmental impacts against costs required to achieve or preserve them; what benefits come from each alternative; what detriments result from each alternative. Effectively, we need to select an alternative, which yields that net positive value to society. If this indicates a rulemaking, what should the rule be: concentration limits, dose limits, etc.? If not, do we go with clarifying or improving existing guidance and continue with the case-by-case approach?

This, in effect, ends the formal part of the presentations in session two. I'll turn over the microphone back to the facilitators to begin the discussions of the subjects covered in this session.

LESNICK: Thank you, very much. Thank you, gentlemen, for those overview presentations.

As I said at the beginning of this session, the intent here to provide some background, so you have a sense of what's been studied, what's being studied, what's intended to be looked at. At this stage, it would be very helpful to get some feedback from you all about what is being looked at, what should be looked at. As the NRC goes forward to examine possible alternatives, we're going to look at different implications and study different aspects of this. It would be very helpful to hear from you about,

I've heard you said in your environmental study, you're looking at these four things, have you thought about this fifth kind of category, or make sure you look at this aspect, or in the cost analysis. So, that's what we'd like to do for the remainder of this session until lunch and then we'll come back again after lunch, as well.

Given that we've had several presentations in a row, may I suggest we take this in maybe three chunks: first, any comments, suggestions about the NUREG-1640 and the soil, first; and second, let's talk about environmental and health; and then thirdly, let's move on to economic and cost and see if that will work. So, let's open it up first for your comments about NUREG-1640 and about, also, the soil analysis.

Dan?

GUTTMAN: Yeah, thank you.

LESNICK: And don't forget to introduce yourself, please, and get close to the microphone.

GUTTMAN: Dan Guttman from PEIS. Mr. Meck did a terrific job of explaining how complex this is and why we all are pleased that multimillion dollar contracts are available. And I don't even think that Cliff could have done a complex job like that with that money.

But, at the same point, the complexity highlights the essential role of all the judgmental decisions. So, one

can sit here and not require a great bit of imagination to know that someone like Mr. Honnicker or the gentlewoman, who spoke out there so eloquently, might have a different view of the judgment factors than someone that had a multimillion dollar interest in getting this as a done deal rule, like SAIC does.

And so what would want to look at before one comments thoughtfully on this is what was the scope of work that the NUREG-1640 contract had. And as I think we now know, that's a secret. And I don't know whether it's -- that you're withholding information intentionally or somebody inadvertently destroyed the document or what it is, but that's not available publicly. So, that's a secret, the scope of work for the 1640. It's very interesting that we don't have that on the public record.

Now, we're told -- we keep on hearing from the staff that this is what staff is doing. But, in fact, the contract -- the 1992 SAIC contract makes plain, it isn't staff. Staff is not the real party in interest here. The terms of the 1992 contract, as we quote in our paper on the SAIC, say that it is SAIC that will submit draft issues, papers, submit resolution of comments, and revise draft issues paper, submit final issues paper, submit draft regulatory options paper, submit final regulatory options paper. So, if we read what is in the public reading room

and we assume that SAIC was doing what it was told and got paid for it, and there is no false claim here that this was done, then it looks like that it's this contractor that is doing that, which may have some interest.

And the question I have, then, is not so much what your general counsel will decide, as to whether or not this contractor should be slapped on the wrist or perhaps debarred, but what possible reason can you give the public here for withholding any scrap of paper that SAIC produced under this contract, including, to start with, the scope of work, all the options papers and the regulatory papers, which make the public perhaps believe that it's staff, not an interested party that is doing this, and everything else. Until you give us -- is there any reason that you're withholding -- can you tell us now why you won't immediately release this, other than you've lost it, which we can understand; or you can't get it from the contractor, which we know it happens, because they take it and they say it's not the government's, it's not --

LESNICK: Dan, let's allow folks to respond.

GUTTMAN: Well, the question is: where is all the documentation? Why haven't you put in the public reading room the basic contract that is supposed to, by your own regulations, be there? Where is the options papers they've drafted? Why can't you make those public?

LESNICK: Don, did you want to comment?

COOL: Well, you've made a lot of statements there. Let me just answer is quickly, two items. One, I have asked the folks in our Office of Research, who had that contract, to assure that those documents are in the public document room. Statements of work are nominally made public and I quite frankly do not know why that isn't already available to you.

LESNICK: Bob, do you have anything you want to add?

MECK: Yeah, just briefly. The short answer to your question is that the scope of work is to provide technical assistance to the staff. The staff has to take responsibility and we're well aware that we can't have contractors doing our work. And so the second part of the answer is that the entire files for that contract have been turned over to OGC and I think your requests have already been forwarded to them. And I've been out of the office; I don't personally know what the hold up is. But, the files are complete and they should be -- you know, able to get to them, too.

GUTTMAN: Well, I'm entitled to respond. This is not --

LESNICK: Briefly, Dan.

GUTTMAN: This is not an ethical, legal matter.

This is a public participation. You've got people here. I understand that they did the draft and the final regulatory options paper. That's what it says in the signed contract. That's what they get paid for. We're entitled, as taxpayers, to see it. It's not a matter of turning it over to OGC. You are dealing with us here. They may or may not, OGC, want to fine or sanction SAIC. But, we, in this process, are entitled to see that, irregardless of any conflict issue. And what I want to know has that not been made public, the options papers they've drafted and the regulatory issues papers, which were done by a company that apparently has --

LESNICK: Let's get another comment from Don and then I'm going to move on and take other cards.

COOL: Mr. Guttman, as I indicated a minute ago, I have asked to make sure that that is made public. However, the staff is ultimately responsible for preparing its recommendations to the Commission. It uses contractors to provide input to those documents. That is the document you wish to see. We will provide it for you. You may agree or not agree with the issues in the paper; however, those are the issues that are on the table and the Commission is looking for the considered input on how to proceed with those issues.

GUTTMAN: Is that the same, Mr. Cool, that we have

now gotten the statement, you will provide us with materials provided by SAIC? I understand that's what you said, is that correct, you will provide us with the regulatory options and the issues paper?

LESNICK: Dan, I need to move on. I think you've got the answer --

GUTTMAN: No, I want to know.

LESNICK: -- twice.

GUTTMAN: What's the answer to the question? Will you make all of these things public that SAIC provided, yes or no?

COOL: Yes.

GUTTMAN: Thank you.

LESNICK: Can we move on. Paul Genoa, please, and then we'll go to Mike Mattia, and then to Cliff.

GENOA: Paul Genoa with NAI. And I wanted to add --

LESNICK: Can you get closer to the microphone, please?

GENOA: I wanted to add some perspective from the international community. As was stated earlier, the IAEA, as well as the European Union and other individual countries, are all looking at the same issue: what is an appropriate criteria to determine when materials from nuclear facilities can be released and when do they need to

be controlled. And each country has their radiation experts and their economists and others developing similar models and regulatory technical basis documents; all have used the same types of an approach, as in 1640. They all are very smart people, looking at complex problems, have come up with very credible results. But, what is understood in international debate on this, in international symposium, that when you get down to extremely low levels and you go below those levels, that the uncertainty among these deliberations increases and that it is not unexpected, when you get down to levels that are a small fraction of natural background, that the different assumptions put into the models will change the results significantly, perhaps even an order of magnitude.

And so when you see criteria such as NUREG-1640 for a certain isotope under a certain condition and you look at what the Germans do or you look at what the French do or you look at what other countries do, you will see that there are some changes in the actual activity, but that those changes are well within the range of uncertainty in those models. The bottom line is that it may not be so important as to the exact concentration number you select, but it may be more important that within the range of numbers found by international experts in studying this, that you select a reasonable implementable number across the board, so that

there is consistency with the international community. And I just wanted to offer that perspective.

LESNICK: Thank you. Let's go to Mike Mattia. Mike, about 1640, technical basis, soil.

MATTIA: There's a section in 1640, specifically 2-5 in the summary, a paragraph that is a four-part paragraph and elicits four questions. The key sentence is residual radioactivity in consumer products rarely yields any critical groups, such as were explained, and the four reasons why, according to this paragraph, that consumer products rarely yield critical groups, one is because of radioactive decay over time. And the question arises, when we're talking about isotopes that have a thousand plus years of decay, is this a valid argument?

The second statement is that generally mixing, taking small quantities of release material and mixing it with large quantities of uncontaminated material, will dilute what comes out of the mix. And I guess my question is, I haven't heard of studies that have validated this, except for computer models.

The third is the issue of partitioning, since it's assumed that many of the isotopes will go to the slag or the to the flue dust, then, we're not talking about consumer product exposure. My question is, in today's scientific processing, slag and flue dust that comes from mill

generally isn't considered an end product. There is still some refining that is done to remove the material or the metals. Some of this material, such as slag, can be used in road beds and for other processes. But, then, there's, also, the issue of disposal, where if the slag or the flue dust does have a significant concentration, there's a disposal problem. So, now, we have an exposure potential to individuals involved in the handling and the disposal.

And the final of the four I have to read. It says, "the relatively small size of consumer products limits the amount of radioactivity to which any individual could be exposed in these scenarios." Now, I absolutely do not understand the validation or the justification for that statement.

LESNICK: Bob, did you get all four?

MECK: I think so. The answers to your questions reflect the complexity of the issues. Certainly for long lived radio nuclides, those with long half lives, decay is not an issue here. But --

STINSON: Bob, why don't you just stick to the question --

MECK: Okay. First of all, my name is Bob Meck -- the transcriber is over there looking at me. The first question was, what about decay and why isn't -- or how does decay factor in to low doses or low conversion factors for

consumer products, and that statement applies only to those radio nuclides that do have short half lives. For those that have long half lives, it -- that wasn't a factor.

The second question, Mike -- the second statement?

LESNICK: Mixing.

MECK: Mixing. The approach that we took was to model U.S. industry, as we understand it and as it is in existence today. And this is reflects somewhat to Dan Guttman's previous comment, and that is what -- when we had to make judgments about the processes that were going on and of general commerce, we went to industry and if it took a personal communication, those are cited in the document. So, that's where that information came from. And so, our understanding was that -- of the general practice, if something goes to a scrap yard, it's likely to get mixed, depending upon the steel manufacturer's specifications for that scrap yard and particular load. And so, we included mixing with scrap, say, from other sources, and so, that, in itself, would tend to dilute the radio -- the concentration of radioactivity.

The next are -- had to do with --

LESNICK: Partitioning, slags --

MECK: -- partitioning, thank you. The partitioning is a physical chemical reaction. We follow the physics and chemistry of the form of the radioactivity and

where would it likely go. And, indeed, we did consider the dust, the slag, and so on, for byproducts that were, also, used, and followed scenarios about what were the likely uses of those byproducts, the dust, and did follow those on out to, say, road bed worker or a landfill disposal -- not a person. And so, we tried to chase those byproducts down, as well.

And the fourth one --

LESNICK: The fourth one, you'll have to repeat.

MECK: -- was -- oh, the size. The consumer products, in general, are not large massive objects, like a huge industrial lathe or a battleship or something like that. And if the criterion for release is limiting the concentration in the first place, then the amount of radioactivity in any one item is -- has a total limit. And if you have, you know, something that's really huge, tons -- you know, tons and tons, then the total radioactivity in that is going to be greater, than if it were in an household appliance, for example. Okay?

LESNICK: Thank you, very much. Cliff, I want to get to you, but I -- since the microphone is already down at the end, Craig, did you put your card down or do you still have a comment?

CONKLIN: I put it down for now.

LESNICK: Okay; great. Let's come over to Cliff

and then we'll come over to Jazz, on this side of the room.

HONNICKER: Okay. You know, I really -- there are so many things going on inside me right now. There's such a richness of issues right here, that it's very hard to untangle them all and know exactly where to begin. But, I would assume that a scientist looking at all of this would say that we have to go back to the very first variables, if you want, the variables that go into the equation. And if the variables that go into the equation are incomplete or wrong, then you can sit here all day long talking about models and theories and this number and that number -- but if the basic variables that went into the equation are wrong, then the whole thing is moot. It doesn't mean anything.

Now, I have talked to Mr. Guttman maybe twice this year for about a total of five minutes. I knew that he was involved in these issues, but, I -- basically, it was, you know, maybe two minutes I've talked to him. I've not really talked to him at all about this whole process that's going on right now. But, it's interesting, and I've got to say that I respect this man deeply. He was the executive director, chosen by the President of the United States, to head a presidential advisory committee on human radiation experiments a few years ago, and I deeply respect both his intellect and his tenacity.

GUTTMAN: See, that's what I told Cliff, in the two minutes, make sure he mentioned that.

HONNICKER: No; no, you didn't. I've been invited to the San Francisco meeting, the Atlanta meeting, and this meeting. I'm incredibly busy on trying to help the affected workers, who have been poisoned in the ongoing process of what's going on right now, and so this is the only meeting that I could come to. It's very important that I try to get back to the fundamental equation and the fundamental equation is that you have to have all the information at the front end, in order to make a reasoned real scientific judgment of whether or not that NUREG-1600 is a valid document.

Now, SAIC, there's a big building about a quarter mile from the DOE federal building in Oak Ridge and about a five-minute drive to K-25. And my reading of NUREG-1640, I said, you know, there's all these assumptions in here, but I don't think that the gentleman who wrote this took the five-minute drive down to K-25, to look at the real working conditions that these folks are exposed to. I don't think that they went down and they looked at the nuclear powder that we're talking about and made any kind of judgment of the classified alloys that are in that material, of the classified chemicals that are in that material, of the radio nuclides that are in that material, and looked at the

synergistic affects. The synergistic affects of that material is going to put it into a whole new ballpark. I don't think the people at SAIC went down there and looked at what the real working conditions are that the people have to deal with.

Now, our working with nuclear whistle blowers in those facilities, where a worker comes across and says, hey, they're not following the EPA regs, or they're not following DOE regs and handling materials safely, and that worker is taken out of his job, stripped of his job, taken and put in a toxic waste room and made to sit there for six months in a toxic waste room, at a desk, no job, no telephone, no job duties, and as punishment for bucking the system, when the system goes this way and he says we're not complying with the regs. You know, that sounds kind of crazy, but that was actually the first environmental whistle blower suit that we filed.

LESNICK: Cliff, let me make a suggestion.

HONNICKER: Now, let me finish; let me -- please, please, let me finish.

LESNICK: I'm going to let you finish. But, I urge you to think about, given your experience and what you're doing on the ground, and given that they're taking comments on this --

HONNICKER: I would like to --

LESNICK: -- you are able to pursue that.

HONNICKER: -- make a -- I came ready to make a presentation. At some point later in the day, I'd like to do that. But, that was the first environmental whistle blower lawsuit that was ever filed in Oak Ridge, the scenario I just told you, and DOE fought it tooth and nail and it went for years and I can tell you all about it. But, that's the context. That's the real political, sociological, scientific context that we're working in.

Now, Mr. Guttman has asked you, I want the very beginning of the equation, which is: what is it -- who is doing this and what are their motivations for doing the study in the particular way that they've done it and what would be the pressures mitigating against those people from bringing in all of the variables, okay? I had that same question and I wrote you guys on October 7th, to Chip Cameron. I wrote him and I said, I don't --

LESNICK: Cliff, I need you to press on with the points on the table.

HONNICKER: Okay.

LESNICK: There are other folks that want to speak.

HONNICKER: I wrote Chip Cameron on October 7th and I said from my participation in this process, I need the marching orders. I need to find out who wrote this report.

I need to find out what were the contracts that said why are they writing this report; what are their marching orders from the NRC, in order to make a report clear for the public to understand. I would like those papers. And I said for my participation, I have to have that. You guys have not responded with one single piece of paper.

So, is this process that we're sitting here right now, is this a legitimate process or is this a pro forma process for which you guys march through your own regulatory process? Do you really want the answer or are we just here to fulfill your obligation to say that you've had your public meetings; you've had your public comment; thank you, let's move on?

LESNICK: Thanks, Cliff. Thanks for you comments. Jas, we're going to move to you and to Susan.

DERGUN: Okay. This is Jas Dergun. I think my comments are probably not in the same thread as Cliff, but more in line with Paul Genoa's thread. I have three brief comments on this; one for Bob Meck and Giorgio, both. I have not so far seen ANSI standard mentioned. So, I'd like to hear comments on that, because it's already out, ANSI and 13.12. As you know, Bill Kennedy made a very strong case for it in the San Francisco meeting. And I'd like to say, as 1640 is still a draft document, are you considering other input into it? I'd like to see your thoughts on that. Are

you going to include something, which is from a pretty -- organization out there.

Number two, I think the comment is related to something -- echoing what Paul Genoa said, that when you talk about these type of levels, basic uncertainties in any model, it doesn't matter what you use, whether it's res, rad, DOD, or any other pathways analysis models, when you talk about changing some of the critical parameters, you can change these values quite substantially. So, that has to be recognized and that has to be communicated, too. Then, maybe, I guess one other things that we have difficulty in reaching a rapport with the public, that we don't seem to communicate that well; that when we're talking about those type of levels, one really knows what they really mean.

The third comment is basically related to -- I've heard you mention in the presentation, some of the European and international criteria. They all have -- pretty well a lot of the countries have come out and fixed some kind of levels. I think we are still far removed from it. We are shying away from it. 1640, for example, does that dose conversion factor, but doesn't give you any real dose value, which we should have as a target. The European Community has already come out with 10 microsievert per year, which is one millirem. But one thing, which I would, also, like to elaborate on, that they do make a distinction between when

it comes to recycling; they make a distinction between recycling in the nuclear field -- in the nuclear industry and the general trade. So, that's maybe something to look into.

And, also, I have a report here from a German radiological commission, Commission on Radiological Protection. The values they have given out, which are being applied, and I've seen in the literature a couple of papers already applying this to nuclear science, they have distinguished, on the mass based standards levels, four different scenarios: like unconditional values are different from the clearance for disposal and they are different, also, from clearance for metal recycling.

I'll give you an example. For example, Cobalt 60, these are units now in bacarrels.

LESNICK: Briefly, please.

DERGUN: Yeah. Unconditional is .1 bacarrel per gram, but for disposal it is four bacarrel per gram and it is .6 for the metal recycling. You may need to look into it, because, in some says, it makes sense, because for disposal, obviously, you have an engineer facility or a closed cap on it and the risk is going to be different.

LESNICK: Let me ask before anyone responds, Jas, some of the issues I think you've raised, and correct me if I'm wrong NRC staff, some of them, I think, might relate to

subsequent discussions about alternatives; for example, ANSI and I think some of the international standards. There may have been other components of your comments that do relate to some of the technical basis of the NUREG and I guess I would ask Bob or Don to -- if they care to comment on that, if they saw that. Otherwise, some of that, Jas, I think let's hold until we're getting into kind of preferred alternatives, people's suggested alternatives.

Bob or Don, did you hear anything in there that you want to comment on, specifically to 1640 and the technical basis?

MECK: This is Bob Meck. I just have a brief comment about the sensitive of parameters and the choices of that. I failed to mention that we've been working with EPA over the last five years and comparison is their view of industry in the U.S., the same view that we have. And we've, also, included DOE in these discussions. So, we've made quite an effort to be careful about those and make sure that they were representing what we believed to be representing. I can add more to that one-on one.

LESNICK: Don, did you have anything you want to add or I'll move on?

[No response.]

LESNICK: Okay. Let's take a few more comments about NUREG and about soil and then we're going to take our

lunch break. And we're going to come back after lunch and continue our conversation and move on to environmental health and cost considerations. Susan?

LANDAHL: Susan Landahl, Commonwealth Edison. Regarding the NUREG-1640, my first issue is that the pathway analysis, as was pointed out, or the validity of the pathway analysis is, of course, critical. And I understand the approach. I approve the approach, as far as being very conservative. I want to make sure we don't lose sight of the fact that this approach does, also, mean that the vast majority of the population is not in the critical group and gets a dose of zero. So, the entire approach is very conservative.

My other issue is just that, while I appreciate that it's a reasonable approach, when I look at all the data, my concern is that the end result could be something that would be too complicated to practically implement, at least in my business, and one of the reasons that we are here today is the issue of inconsistency in the application of what exists today for regulation. We spend a great deal of time attempting to release material to prove that it has no licensable material; and as a result, we're putting material into the waste stream just because we can't prove that it doesn't have any license material in it. So, I would just offer that whatever rulemaking, if rulemaking

does result from this, it needs to be in a form that can be simply and consistently applied and evaluated, you know, by the licensees and by outside agencies, in a consistent manner.

LESNICK: Thank you, Susan. Let's go to Tony, Peter, and if we can do this, Alice, and then we'll take our break for lunch. So, you can move with some vigor.

LaMASTRA: Tony LaMastra. I have detailed comments that I'm going to submit on NUREG-1640, where it looks at the facts that are presented and, also, some of the assumptions. But, one of the things I'd like to make as a general comment is that the authors do not always use commonly used terminology and when that happens, it makes it difficult for affected industries to really do a review of the -- to determine what the impact is. So, I would recommend that when you come out with your final document, that the authors essentially be asked to look at what the terminology that's used by the recycling industry, by the metals industry is, and try to restrict their comments or to basically use that terminology, so that we can do a better evaluation of it.

GIORGIO: Could you give us just an example?

LaMASTRA: Yeah. They use terms like "refiners" or a "refinery," and it's difficult to tell whether that speaks of a single furnace or an entire plant. That's just

one right now that comes off the top of my head.

LESNICK: Let's move on. Bob, did you want to -- I'm sorry.

MECK: Yes. It would be very helpful in your formal comments to include as many specific examples as you can and we very much appreciate getting that kind of comment.

LaMASTRA: Basically, I'll break it down by section and give you the section reference.

LESNICK: Obviously, everyone is encouraged to please not only comment publicly like this, but to the extent you can, please put it down in writing, as well. I think that will be very helpful to the agency. Peter, you've been waiting very patiently. Can we get a microphone to him and get close to the mic, please.

HERNANDEZ: Peter Hernandez. I had a question about the impact analysis that was done, health, societal, cost benefit, and I can save it for after lunch.

LESNICK: Yeah, can we do that, Peter, when we focus more in on that? From the Republic of Texas?

[Laughter.]

ROGERS: With respect to NUREG-1640 and the fact that you have not yet looked at soils, you might, also, want to consider looking at other demolition debris that are not suitable for recycling. You should model low concentration,

high volume in landfills, as at a very large commercial landfill that receives high volumes of released material. You should consider modeling the long-term implications of the hazardous and the non-hazardous landfills separately, because they have different liner requirements. You should look at the formation and collection of leachate and, in particular, it's the effect it has on the workers at these non-radiological facilities. You should look at the implications of land spreading, or some people call it land farming. You might want to consider if this soil or other demolition debris meets these very low release criteria, that they might want to be left in place, instead of being shipped across the country. And then, lastly, you should consider defining clearly dilution in your rules and put a clear prohibition, if you believe that to be appropriate in the rules.

LESNICK: Thanks, Alice. Mike Mattia, we'll hear from you and then we will take our lunch break.

MATTIA: I'd like to go back to the comment that I made on that section in NUREG-1640 that deals with the issue of consumer products. That doesn't mean that there is concern over the exposure in steel mills and scrap recycling industries from this material coming in, you know, residual exposure, exposure to equipment. But, the issue of consumer products literally is, I think, the driving factor, because

the material that is being proposed to be released has to go somewhere, if it's not going to landfill. And it's going to go to companies, like scrap recyclers and steel mills, who are going to convert it into a product that is going to become a consumer product. And by trying to address the issue in one paragraph that I think has some flows -- some significant flaws, is walking away from the majority of the concerns that we have heard over these meetings, from consumer groups, from the general public, from those individuals who are saying I'm concerned about the frying pan and the dental filling. It's not addressing their concerns.

You know, I go back to the four points, the concept that it's not a problem, but that doesn't address the long-term decay. So, we don't talk about the long-term decay and getting into consumer products.

There is an issue of mixing, and, again, the question is: what kind of modeling was done. If we're talking about a pound of this material going into 100 ton melt, mixing dilution might make sense. But, what if we're talking about 10 tons of this material in 100 ton melt. Does that change the equation of what's going to come out as a consumer product?

Again, the concept of partitioning, I don't think that the issue of this material, as it's partitioned, if it

truly becomes partitioned, has been addressed; nor has the concept that much of this partitioned material, such as slag and flue dust, will continue to be reused and refined. And it definitely doesn't raise the issue of the partitioning becoming a problem, such as flue dust not being able to be landfill, because of the concentration of radioactive material is too high and it's a mixed waste and prohibited for landfill by the EPA.

And the final sentence, the fact that consumer products are small; therefore, they don't pose an issue skirts the concept of what if you do have 10 tons of contaminated nickel that goes into a 50 ton melt. If we're only talking about a small -- does that dilution really matter, if we're talking about a small consumer product that will have a high concentration.

I don't think that NUREG-1640 has addressed what is truly the most potent issue here, and that is the consumer products, the consumer perception, what is the hazards that could occur, when this material is released in larger quantities.

LESNICK: Thanks, Mike. I think Bob wanted to make a very quick comment before we take our break.

MECK: Right. Remember NUREG-1640 is just a tool for conversation factor. But the philosophy that we've talked about is whoever is in this critical group gets

protected to some level; and if that happens to be a consumer, then they get protected to that level. So, they would be protected, just like the truck driver would be protected. And so, in that sense, you know, that's the philosophy of the application of the results. But, that application of the results of NUREG-1640 is a Commission decision and not the purpose of this document.

LESNICK: Okay. Cliff, quickly.

HONNICKER: I have 30 seconds and then -- now, thank you. Did you, in 1640, take into consideration the other alloys that are mixed in with the nickel powder, the several million pounds of nickel powder from K-25, the chemicals that are mixed in with it, and the other radio nuclides, besides the ones that may be listed that have been recently uncovered in this billion dollar lawsuit down in Paducah, that there are other contaminants in there that were not prior -- previously disclosed to people? Did you take that into consideration, in looking at the effect on the first concentric circle of exposure, the workers?

MECK: NUREG-1640 analyzed steel, cooper, aluminum, and concrete, and in the context of the processes that general commerce uses to process those. And to the extent that there are various ferrous alloys, yes, that was taken into account. We did not analyze nickel. And I would just simply have to look -- or look with you on the list of

radio nuclides that we analyzed and see if those are included. So, that's the short answer.

HONNICKER: Well, that -- I didn't mean to give you a trick question, but that is -- you can't, unless you have a Q clearance, because that material is -- millions and millions of pounds of that material is in the hopper to be recycled, if they're not melting it already down, and the substances that are contained within in are classified. So for you guys to do an assessment of what the health impact is, you've got to know. And we don't know and the workers don't know.

LESNICK: It sounds like you've got a recommendation, maybe.

MECK: Yeah, I want to clarify that this is an NRC rulemaking, okay, and --

GUTTMAN: But, actually, Cliff has an excellent point. How are you doing deal with the classified nature of a lot -- as an NRC rulemaking --

LESNICK: Can you get closer to the mic for a second, Dan, and then we're --

GUTTMAN: Dan Guttman. It's an NRC rulemaking; but it's been pointed out one way or the other, we're talking DOE waste and it is pretty well known that a lot -- the nickel, in particular, is highly classified. And as I said, BNFL, which is theoretically going to dump it into the

public's, you know, frying pans, doesn't know what's in it. That's what they testified. Do you guys know what is in it; and, if not, how -- you know, I mean, how do we know that everything is covered? And I understand you didn't study nickel, but all the other stuff that is classified.

LESNICK: Let me -- Barb is going to make a comment about this, because this is an important issue, about the relationship with DOE, NRC, and these activities. Barb, before I go to that, I want to just say, as we break for lunch, folks, we're going to come back. Thank you for the conversation about NUREG-1640 and all. This has been extremely helpful, I think, to the agency.

Barb is going to talk a little bit about NRC, DOE interface here. But, when we come back, we're going to continue on our discussion about health and environment and about economic costs, as well. So, we're going to continue this session two for a while longer, when you come back from lunch; so, keep that in mind. Barb?

STINSON: Yeah. And on the continuation of this discussion, keep in mind we're talking about future analysis and, so, there will be recommendations that you all can make to the NRC that they can factor in to the development of their future analysis; not that they can't take a lot of that information in constructing, you know, future analysis with gaps, as you're making recommendations on the

NUREG-1640 analysis.

I just wanted to lay something clearly on the table, that I think we've circled around so many times in these discussions, from the past workshops, and we're there again for this workshop, and that is the relationship between DOE material and NRC licensees. And it's a bit of a perspective on it and then a question for all of you all.

I mean, I think what we're hearing is: (a) you hear from DOE, they are going to either use as guidance or adopt whatever the NRC does with regard to rulemaking on this issue. So, they're paying a lot of attention. It's clearly going to have impact at DOE facilities. That's on the table.

On the one hand, you have, I think, the environmental community and the worker community, the unions, very concerned about protection of the workers in the environment. And they are going to be looking to the NRC -- they're going to be looking for any avenue they can find to increase the protection for workers in the environment, and that includes placing pressure on NRC to be protective and to influence the future DOE process. I think that's one force that we're seeing.

On the other hand, you have NRC, who has NRC licensed facilities. They're not responsible directly for DOE facilities and the material that is utilized at DOE and

you're not going to see the NRC taking responsibility for DOE past actions and problems that have occurred. I mean, I'm trying to just kind of clearly articulate some of the differences here, so -- and maybe it's not very clear.

So, these two forces are at play at the table every time we get into the discussion. And, you know, really both forces and both perspectives are reasonable. And the challenge I put to you all around this table is to try to find, if you can, comments and questions that both provide the kind of protection that people are seeking and fall into the jurisdiction of the NRC and to -- I just want to lay this question out, Dan. I don't want --

GUTTMAN: Yeah, but I think you just contradicted the --

STINSON: -- I don't want to have further conversations --

GUTTMAN: -- you contradicted the NRC's statement.

STINSON: Dan --

GUTTMAN: You contradicted directly --

STINSON: That's fine, and we'll hear -- we should hear from you and hear from others. I just want to put that question on the table for consideration.

GUTTMAN: Excuse me --

STINSON: And we're going to take our lunch break -- Dan, we're going to take our lunch break --

GUTTMAN: No, wait a second, Barbara.

STINSON: -- and allow people to --

GUTTMAN: The NRC has told Congressman -- and this is Dan Guttman. The NRC has told everybody --

STINSON: No, Dan, I'm going to cut you off, because --

GUTTMAN: Barbara, you're making a statement that is a directly contradictory statement. If the NRC has no jurisdiction, then that Tennessee license is unlawful.

STINSON: Well, that's a question that is up for debate.

GUTTMAN: That's an unlawful license and that's what I will take back.

STINSON: At this time -- at this time, we're going to --

GUTTMAN: We will take back that you have just declared the Tennessee license unlawful and you can think about it over lunch.

STINSON: Okay. We will think about it over lunch.

[Whereupon, at 12:13 p.m., the workshop was recessed, to reconvene later, this same day.]

AFTERNOON SESSION

[1:24 p.m.]

LESNICK: Gentlemen, let's continue our discussion about studies. We are going to move on to a discussion about environmental and health assessments and studies.

Giorgio provided an overview of the kinds of categories of topics that NRC would intend to pursue. We want to make sure that you have some input into particular areas you think that they might want to emphasize or things that weren't mentioned that you think they ought to take under consideration of evaluating.

And let's just talk about environment and health now for the moment. Then later on we will move on to economics, Peter. Okay. Or do you have something on environment, Peter? Okay. Let's go to Peter Hernandez.

HERNANDEZ: Peter Hernandez. I was curious if the analysis that NRC is doing on potential impact relating to -- and it was broader than just health and safety, but the economics and that, including the potentially adverse impact on affected recycling industries, or industries, metals industries that recycle metals, including potential job loss within those industries. And, if not, why not?

GNUGNOLI: We basically have not begun doing the cost benefit analysis. Part of our efforts right now in the studies is to pull together what we would need to do, what

kind of information would need to be gathered. A lot of it, a lot of information we are not sure is really collated and available, easily available at this moment. So we have a number of folks helping us try to go out and query and find that kind of information.

It would be an initial blush that we would try to look at benefits and costs of any nature resulting from these decisions, whether it would be a direct impact on a recycler or a melter, or people who might be exposed to materials coming from them, as well as the sort of once removed kind of impact, like the film industry, how it might affect them. At first blush, you wouldn't think -- they wouldn't feel that they were being treated fairly. We had nothing to do with it. All of a sudden we have to retool our film production and stuff.

So we don't, at this point, where to draw the boundaries and constraints on it. But we are trying to keep an open mind about what to do with that.

HERNANDEZ: Peter Hernandez. Thank you. The reason I asked is, of course, we would appreciate you considering those factors on affected industries. And the steel industry in the United States, sales are about $40 billion a year. If just 1 percent of the public decides it is going to deselect our material because of a perceived concern about radiation, that would translate to 1 percent

of sales, which is a significant amount and should be part of the cost benefit equation we believe.

LESNICK: Thank you, Peter. I see a card. Mike Mattia.

MATTIA: Just a basic question on Reg. Guide -- I mean NUREG-1640 that I have asked in the past, and that is, is there the potential of equating dose for release, a dose, to what the material may measure if you were to put a detector to it? This is an issue that has come up in the last several sessions, that if you release material based on a dose and that material, when it got to a detector, would set the detector off, it might bring up a whole new school of problems where it would be rejected. Is there a way, in this document, or does the document exist that equate a dose of released material to what that material would read if you put a detector to it?

HUFFERT: Tony Huffert, NRC. We are working on that right now, and this is implementation consideration that would go into a Regulatory Guide if we were to do a rulemaking. We are working with two contractors to help answer this question. NUREG-1640 does not answer your question, it simply gives the concentration of the radioactive in and around the material and translating it to dose.

You are asking a question about measurability, and

that is independent of 1640, so we are currently looking at that. And we are looking at the impact that might occur if materials were released at the NUREG-1640 levels and would they set off alarms at scrap yards or landfills? And that is a practicality that we have to consider.

LESNICK: So it sounds like that will be forthcoming.

Let me open it for your comments and observations, not just about environment and health, but also the economic and cost considerations, George, if you don't mind, because it sounds like some people want to go back and forth between them. Kristen.

ERICKSON: Well, I would like to address the combination of these issues in a sort of bigger picture way. First of all, looking at the capabilities we have, and I know this jumps ahead into surveys and measurements, but it is all related, the capability we have to determine the amount, first of all, of the isotope, its energy, the amount right down to 10 to the minus 10th, 12, 15th, microcuries per gram levels, we do this in our institution, we do it routinely.

Then to be able -- there is technology that is done and has been used for many, many years, very well, to actually do in situ measurements of radioactivity, either in soil, water or a big piece of equipment. We have

sophisticated dose calculation equations and abilities that we can take, and we have done this, again, a very complex arrangement of metal and parts.

For example, our cyclotron has detectors that are bigger than a train engine, four stories tall. To be able to take an instrument and evaluate what is in there, and calculate them, what isotopes, what levels, you are able to translate that to doses. That is part of what -- how physics does on the higher end. It is so accurate that you can look inside, like we have done, a big drum full of heavy lead and metal, and all kinds of metals, and determined what elements are there, what ones are activated into radiation, how much of each kind. Well, does that translate into DPMs and microcuries, not just what I count?

And then you can take that and translate it over to risk. This is science that is there, science that has been used. And taking that one step further, I recommend and suggest that this whole process needs to go and use a lot of data that we already have. We have been using for many, many years, limits for air and limits for water, and we have 30, 40, 50 years' worth of data for those releases. Many populations of people over many years, many scenarios, many uses, many chemical forms and many pathways.

That data is already there. That can be used to start determining the risk and applying that towards a

solid. There is very little difference if I put this liquid into the water and it goes to the sewer, and, ultimately, is in soil, which is ultimately in a plant or an animal, and then finally in us. This is the same kind of scenario that we do and know how to do in radiation safety and health physics, environmental risk, biological effects, that is what our jobs are really about. And this is certainly able to be done and can be done.

So I think that, as I say, in the bigger picture, people need to keep that in mind and also use that data that is already there.

LESNICK: That is helpful, Kristen. And, also, I guess, as you and others leave this meeting, and you might reflect upon what else you think would be helpful for the NRC to look into, further studies, analyses, I think they would probably welcome as specific recommendations as you would like to offer, either about categories or past and existing studies that exist. I think that would be helpful to the agency.

Can we move on? Paul, particular suggestions about studies, either environment and health or economics, cost side of this?

GENOA: Paul Genoa, NEI. I think what I was trying to capture, actually, --

LESNICK: Can you get closer to the mike, please?

GENOA: Yes. Paul Genoa with NEI. And my comment has to do with -- in response to some of the issues brought by Peter regarding impacts on not just the environment, but on businesses, companies and so forth. And I am trying to differentiate between a real measurable impact such as setting off a false positive at a landfill or a metal detector at a scrap metal dealer, and the impact of a perceived stigma associated with a product that would cause harm to an industry. Both are real, and I think how one deals with them maybe different.

In a real, measurable impact, if the NRC were to move forward in the rulemaking and were aware that there would be a real impact on an industry such as the sensitive film industry or whatever, those impacts I believe have to be avoided or mitigated.

When we talk about perception of the public, that is a difficult challenge that you are faced with, and I am a little empathetic, and I am empathetic with the industries that could be affected because I am one. But I think that the NRC has huge potential to influence that perception by the way it conducts the rulemaking process and in its activities in advocating, unequivocally, the safety of an determination they ultimately make.

It is absolutely critical that if you move forward with any standard for the release of this material that it

is then communicated to the public in terms with there is no uncertainty that that standard is protective and that you are absolutely behind that, and are willing to say so every time it is questioned. Without having that type of unequivocal support for the standards you set, the public can reasonably be concerned, and the public trust and confidence can be undermined and industries can be harmed. And I think you need to be very serious about the soft side of the science when you proceed with your technical regulatory evaluations. Thank you.

LESNICK: Thanks, Paul. Jim, I know your card has been up, but I would like to try and get in Charles Wilk from Portland Cement Association, an industry that hasn't, I don't think, participated as of yet. Maybe you have some concrete suggestions about impact?

[Laughter.]

LESNICK: I couldn't resist that, I apologize.

WILK: Yes, I am Charles Wilk with the Portland Cement Association. What I am about to say is probably really an echoing of what Mr. Hernandez had to say, but to really add our voice to this. What the NRC does could have a profound effect on a number of different industries, and one of those is the economic impact it might have, these rules might have on the recipients of this material comes from decommissioning of various facilities.

I think it would be important for the NRC to conduct some sort of economic impact on the market, detriment to the market of what people -- of the people who would receive this material. It is somewhat obvious what the economic benefits are to people who have this material to put back into commerce, and it obvious they are going to offset some disposal costs. But you should be looking also at the injury or the costs to another industry of having to receive this material.

It is clear from today's earlier discussions, that it is quite an emotional topic and that emotion actually may transfer into a real effect, that people may not be inclined, whether it is based in science or emotion, they may not be inclined to want to use these materials in their everyday lives. And the NRC should include really a cost and benefit -- include that under cost and benefit work.

I am just looking through my notes here. I understand what Mr. Genoa said about it is important for the NRC to somehow reassure the public of the safety of their standards, that this is not going to cause them endangerment. Having worked as a U.S. federal employee with the U.S. EPA, I have been on the receiving end of the public's distrust of different rules, and I don't really see the federal government, or most agencies within the federal government being very successful in gaining the trust of the

public any time soon, certainly not in the timeframe that it would take for the market to feel -- for certain industries to feel the effects, detrimental effects of what happen as a result of the rulemaking.

The thing is there are emotions and there is since and the science may be with the NRC as far as what the health effects might be, but what will happen in reality is economics, in economics, where the market forces are the equalizers, really, in U.S. life, and it would be very -- I think it would be very important, really, for the NRC to factor in what the negative perception is of people and how that will affect the market for these different materials that are the recipients of this waste material from decommissioning. Thank you.

LESNICK: Thanks, Charles. Let me continue on. Jim Turner, thank you for waiting.

TURNER: Jim Turner from U.S. Steel, Steel Manufacturers Association. I have been to all four of these meetings, and I have got a couple of questions which I am looking at. I probably should have asked them at the first meeting, not that I wasn't paying attention. But I think my concern all the way through has been the perception by our customers of our product, or the stigma that it might have, all of these recycled products, business interruption, health and safety and so forth. Job loss, as Peter said.

LESNICK: Can you get a little closer, Jim? I'm sorry. So we can hear you.

TURNER: I can't see around it. All right.

My first question is this regulation, to whom will it apply? Is it just going to apply to "official nuclear facilities" or will apply to industrial facilities, recycling facilities that handle this released material to them, or will it apply to industrial facilities that inadvertently process a radioactive source and become a nuclear facility, although they don't want to? That is the first question.

And the second question has to do with economics.

LESNICK: There we go.

TURNER: And just on a rough calculation, I have heard numbers of 300,000 to a million tons of steel scrap, and if you assume $100 a ton of scrap, that is $30 million to $100 million in benefit to somebody. And my question here is, the economics, who are they -- who is going to benefit from them? In other words, is it the nuclear facilities, that they are going to sell the recyclable materials to the recyclers? Or is it the recycling industry and the public? Are they going to discount the materials? Are they going to be free? And I would just like to hear how that is going to be addressed.

LESNICK: Is that it?

TURNER: That's it.

LESNICK: Thank you, Jim. I don't know, on the first matter, who would this apply to, if there were such a rule? Trish, did you want to comment on that?

HOLAHAN: I think, as we discussed a little bit earlier, this would apply to NRC licensees, and then in those states that are agreement states, for the agreement state facilities. Now, one of the issues that we have discussed at some of the other meetings, and we will probably get more into this as we get into the alternatives, is depending on -- if we proceed with rulemaking, and what alternative is selected, for example, there is a restricted release, the question is, is how do you restrict that, and would there be a need for some type of license or something for ongoing work? So in that case, then you might have other impacts down the line that would have to be considered.

Did that answer your question? In terms of the -- you asked the question I think, also -- I'm sorry.

LESNICK: Does that help clarify that?

TURNER: I am not sure. I guess my real basic question would be, if a company processes a source and irradiates some of its materials, say a steel company processes a radioactive source, now they have to hire a remediation company who is a licensed contractor, and

becomes a licensee of the material possibly, will these regulations apply to that release of those materials? Even though it wasn't a nuclear facility previously.

HOLAHAN: You are asking the question that if the facility becomes contaminated and you clean it up and what you are doing with the material that is then going to be taken offsite.

TURNER: Do these regulations apply to that?

HOLAHAN: I would think that it terms of trying to find out where it would be going, yes, those limits could be used to dispose of that material.

TURNER: Thank you.

LESNICK: On the second question, Paul did you want to --

GENOA: To ask a clarifying question.

LESNICK: Yes, if you would pull the mike --

GENOA: I have talked with the good-looking Turner before.

LESNICK: Even closer.

GENOA: Paul Genoa, NEI. I think what they are saying is in the past there have been orphan sources that have been melted down. That has caused a harm to the industry and they were held to certain standards when they wanted to release the fly ash or whatever else, so NRC regulations were imposed on a non-NRC licensee.

The question is, looking to the future, if there was a standard in place and one of these unfortunate events occurred, would in fact the standard provide at least a decision point for the release of materials from such an incident?

HOLAHAN: Yes.

LESNICK: Thank you for clarifying that. The other question, if I understood it, you said there are some assumptions about tons of steel and who might benefit from that activity. Georgio, I don't know if that kind of analysis has been done or not yet.

GNUGNOLI: At this point I would say that there's a number of benefits. One benefit would be to the company if they had the option of disposing of it at a solid waste disposal site instead of having to pay for the higher disposal costs at the low level waste disposal site. There would be an economic benefit there.

If the material could be recycled, perhaps steel is highly desired in terms of recycling, but other metals that may be more valuable like titanium, there would be an economic benefit to be able to recycle that if it were possible so it's both in effect cost avoidance as well as cost benefits or taking advantage of it costwise at this point.

There are a lot of tendrils in terms of who

benefits from a decision on that. The question was both is it a cost avoidance the benefit, or actually cost acquisition the benefit and the answer is "yes."

LESNICK: Okay. Let's move along here. I would like to try and stay as close as we can to the original agenda so as close to "2" as we can. I think we ought to be moving on to Session 3, so let's try and move with some vigor through these cards.

Bill, let's go to you for other issues you want to make sure the agency looks into.

LIPTON: Bill Lipton, Detroit Edison.

The NRC already sanctions the distribution of radioactive materials without control, things like self-luminous devices, smoke detectors, and I don't think it's a NRC licensing issue, but people talked about radioactive material in dental work. The industry already adds uranium to false teeth -- otherwise they would be discolored and people accept this. These are all legal and people accept them.

You know, the lady who was concerned about radioactivity in the window frame didn't express any concern about radioactivity in the exit sign next to the window frame, and these all can lead to a public dose if there is a mishap.

Has anybody looked into benchmarking these already

established practices and using that as the basis for extending rulemaking to other recycling or other distribution of radioactive material?

LESNICK: In terms of the health and safety issue?

LIPTON: Yes. These are risks which are accepted by the public and the benefits are clear and the risks are clear and they are acceptable.

HOLAHAN: Yes. There will be further discussion on this in Session 3 if I can just ask to --

LESNICK: Yes, that would be great. Jud?

LILLY: I have --

LESNICK: Get close to the mike, please.

LILLY: Okay. My name is Jud Lilly, and I am with the Department of Energy. I have two recommendations for both your health effects study and your economic analysis.

You have included the impacts of mining replacement metals in both the health issue and the economic issue. I would encourage you to also include the energy requirements of converting native ores into valuable metals and also the increased land that would be taken out of production if all the material that we are talking about is disposed of as low-level waste, the environmental and economic impacts of removing that land from the economy should be included in the analysis.

It is expanding upon your already broad-based

examination of those two issues.

The other point I wanted to make was I wanted to go back to a point that Mr. Cliff I believe was wondering if the analysis that had been done of the classification issues of the nickel would make the limits that have been proposed, if that would skew that.

I have talked with Bob Meck. I don't think the classification issues will have any effect on the ability to apply these limits to the nuclides that are in the nickel for free release, so I don't think that is an issue.

LESNICK: Thank's for clarifying that.

HONNICKER: If I could respond just for one second to that, I think that would be fine, I would accept your answer 100 percent if you would tell me exactly what was in that nickel, if you would tell the workers exactly what was in that nickel and if you would explain to them right now, people who are suffering from chronic fatigue, who are suffering neurologic problems, brain lesions, a whole host of health problems right now from exposure to that nickel, to which Secretary Richardson has already apologized for, to what we are meeting with the Secretary of Health, Environment & Safety tomorrow in Oak Ridge to deal with these issues.

I don't accept it when you say this pro forma "I don't think there's a problem." There is a problem.

LESNICK: Okay, gentlemen, this is an issue that sounds like for you all to talk about in Tennessee between DOE and the folks there.

HONNICKER: No, it is a bigger, it is a much bigger issue and I hope -- I mean you all paid a thousand dollars for me to come up, to fly, to be here at this meeting, and I hope that I can have maybe 10 minutes of your time to give a real overview of the nuts and bolts of what is going on right now, because what is going on right now, the reality affects the theoretical.

What you guys have right now -- theoretical, hypothetical. We are dealing with reality and I hope that we can make a presentation and inject the difficulties of what we have to deal with right now that will shed maybe a little bit of wisdom on your rulemaking.

LESNICK: Thanks, Cliff.

GUTTMAN: -- Is Mr. Lilly making a statement on behalf of the Department of Energy, in which case we will follow it up vigorously, because we understand you are basically clueless as to what is in nickel at Oak Ridge, and if you are telling us now it doesn't matter what is in there, that is a very interesting statement -- are you speaking personally or on behalf of the Department?

LILLY: No, I am speaking on behalf of the Department and I was not saying that we are clueless as to

what is in the nickel.

GUTTMAN: Then I would like to know right now when you are going to give us the data on what is in that nickel.

LESNICK: Gentlemen, you might want to get together during the breaks and -- again, this is something between you all that is different from what is at this table at this moment.

GUTTMAN: No, it is not different. This is most of the metal in this -- it is an issue --

LESNICK: Let me move on.

GUTTMAN: I don't mind if you are shutting us off. You can't shut us off by saying things that are directly at odds with the realities -- we are talking about most of the metal here is DOE metal is not true.

LESNICK: I am suggesting that the issue that you all have been going back and forth on is something that is extremely important to both sides and you ought to pursue it. I am not saying not --

GUTTMAN: -- very important to the country if you are going to get the benefit of having your [inaudible] come from this material.

LESNICK: Thank you. Dan

SZWED: Dan Szwed for AK Steel and the special steel industry of North America. Just a couple of comments to follow up on the economic issues.

I've heard a lot of commentary about how our scientific procedures are very wonderful and we can analyze things down to minute details with limited or no uncertainties.

I think we need to apply the same kind of detailed analysis on the economics but recognize we have to deal with the uncertainties on the economics. We are dealing with the perception of the consumer here, and it is going to go from the consumer that says I want to buy a new car to the car company that says I don't want radioactive steel or radioactive metal in my car, and it is going to come back to the main producers of those products. It's going to deal with product deselection. It's going to mean retooling for many major industries and there's three other things we need to consider here that we have learned from the environmental protection regulations that have been out for the last 30 years now.

One is you can't transfer the problem. Two, dilution is not the solution -- and the way to deal with it is through pollution prevention at the source.

LESNICK: Tony, you have been waiting for awhile.

LAMASTRA: Tony Lamastra. The slides seem to give me an impression that the NRC is only intending to factor in the economic costs to the regulated industry and I am really hoping that that is not true.

GNUGNOLI: Not at all. I mean we were talking about the costs that may not be reflected in dollars, like construction of roads, noise. I mean we are not looking just at what it costs the industry but what it can cost the community and what benefits could come to a community.

In effect, we have to look -- if we are going to get the net positive value to society we can't take that limited point of view.

LAMASTRA: Tony Lamastra again. Over and above the net or the general society, are you also going to take into consideration what Dan just brought out and what the steel industry has been saying all along and the metals industry, that essentially will you try to work up some way of evaluating the public perception of risk and how that affects the potential for deselection, and then what that means to the industry, because I think if you don't do that you are really -- I can't see how you are doing a real economic impact.

GNUGNOLI: Georgio Gnugnoli, NRC. That may have to fall into a qualitative assessment. It may be difficult to put numbers on that kind of thing and if we do it might be somewhat suspect.

I mean if in our development of the methodology of doing the cost benefit analysis we can quantify, we will try to do so because it makes the decision more logical, more

approachable, but in those cases where things like environmental justice is involved it is just very difficult to quantity, we will still try to factor in a qualitative fashion those factors that will affect the decision of whether it is of positive net or not.

I can't be that specific at this point because I am not exactly sure at this point how that cost benefit analysis is going to function, but that comment as well as a number of other ones we have heard we will have to look at. we are very aware of the perception as well as the reality that the perception can't drive decisions, so yes, that is something we are going to try to effect -- to include in our evaluation, but at this point I don't know if we can do it quantitatively.

That is the problem I am having at this point. It may be that we can do that but right now I really don't have the vision of that.

LESNICK: I have seen several cards go up there so let's take the remaining cards before we move on to Session 3, okay?

Steve, I am going to get you in here because we haven't heard from you during this session.

COLLINS: Steve Collins, the Illinois Department of Nuclear Safety.

Two items. One of them is if you back off and

look at this as a regulator you have got to say why am I subjecting myself to this? I mean the metals industries don't seem to want to have any part of it. It is a few years before there's too many utilities that are going to have a great need for it. The regulators have been doing these kinds of approvals or granting on a case by case basis for decades with small amounts occasionally going out there.

There is nothing in this world that is not radioactive. Every frying pan and every brace is currently -- and every hip replacement is currently slightly radioactive, so someone, and I think it is the Nuclear Regulatory Commission's responsibility along with the EPA to initiate a process, which you are doing.

Someone needs to come up with is there a level below which we don't need to regulate it, and hopefully we are collecting data to get to that point. I know that also from the State of Illinois perspective, no matter what level you come up with, Illinois and a lot of the other states that we have talked to want to have the authority to continue, regardless of what the NRC puts in its regulations to continue case by case evaluations and to be more restrictive if we so choose.

It would be nice if we could address this on two different levels, which I think we have been, but we have kind of been ignoring one of them, and it is the primary

authority in the Atomic Energy Act and most state statutes to address radiation protection issues as one of health and safety.

The independent scientific organizations that all make recommendations, whether it is international or national, even U.S. EPA -- U.S. EPA calls 1 millirem a year a trivial dose; NCRP calls it a negligible individual dose; and ICRP and IAEA basically I think use the same negligible individual dose, so scientific bodies have given the regulators some guidance.

Some people still do not find that level or that number, if it would be chosen to be acceptable, so from our perspective I am glad the NRC chose to come up and take all the heat from proposing something, but some kind of a scientifically-based number is needed to be used by the regulatory agencies that all of the different parties, whether they are current licensees or somebody that might get this stuff dumped onto them, can be aware of upfront and it is not set by policy but that it goes through a formal rulemaking and administrative procedure process to be developed.

LESNICK: Some of those conversations, maybe as we talk about alternatives and your sense and your colleagues about what you think is appropriate.

Let's just go down this side and finish up Session

2 here. We'll go Tom Civic and then Mike, Pete, and who else have we got, down here, Charles and Don.

CIVIC: Tom Civic from the American Iron and Steel Institute. And perhaps after I talk, maybe the next person who would add to my comments would be Pete Hernandez on the issues regarding public perception.

However, I'd just like to make a comment regarding the NRC's statement about coming up with only qualitative economic impacts of the effects on the industries that are going to be affected from the use of this material.

It seems to me inconsistent that we can make all kinds of assessments and assumptions for risks that we can't measure, come up with that say one millirem is insignificant, based on data.

We can make all kinds of assumptions on how a pound of this material was going to flow through the process, and how many people are going to be exposed to this with different risks, and we can't come up with some reasonable assumptions that will be made and from studies that can be done to determine the economic impact of this releasing of this material.

It seems to me that if the NRC does not have that information, perhaps they do have the wrong consultants advising them, and they may need to get some people that have some expertise in developing economic impacts.

LESNICK: Thanks, Tom. Also, I think we'll hope that different industries might provide information, the best that you've got available as well in this kind of circumstance.

Mike?

MATTIA: The one word we've heard a lot over the last at least hour, is the concept of perception. In a consumer-driven market, perception is reality.

A steel mill won't buy scrap if they perceive it's a problem. An automaker won't buy steel if they perceive it's a problem.

That's because a buyer won't buy the auto if he perceives it's a problem. Consumers, whether it's in the United States or abroad, they buy based on emotion and perception and rarely on fact.

And that's been one of the problems because this material, if it's going to be released, is going out into the marketplace, and the marketplace has been saying for a long time, we have a problem because of consumer perception.

We can -- we'll listen to individuals who will cry about frying pans and dental fillings, and those of us who may be in the know will say, well, that's not going to happen. But they don't know that's not going to happen. Consumers don't know that's not going to happen.

The problem is that you, meaning the NRC, meaning

the DOE, or meaning anyone who is sitting on this material, want to release it, but you want to release it into industry, and industry is saying, but I'm not comfortable with that.

However, there are some facts that we know are there. We know there's material there that isn't contaminated, that's never been near contamination. How do we know that's what we're getting?

How do we know that we can assure ourselves of what we're getting?

There is material that might be decontaminated that some consumer would be willing to accept because he has a market for it. And there is material that no one would accept, and how do we know that that's not going to get into streams that are unacceptable?

But that's the bottom line. We do not understand what the facts are, because they're garbled or they're not there, and you're thinking about making a rulemaking that will affect stakeholdres, without the stakeholders having an initial buy-in to accept the premise.

So, before you can even think of having a rulemaking -- and we've said this time and again -- you need to allow the stakeholders, the steel industry, the recycling industry, the consumers, the special interest groups, those that will be releasing the material, whether it be the power

industry or medical, to be able to agree on what the facts are, to agree on what the parameters of dealing with this material is, how much is it?

What does it look like? How do I know what it is when I see it or measure it? What industries will accept what material? What consumers will tolerate what?

And then when you have that consensus, then you can make a rulemaking to enable that to happen. But in essence, you're putting the cart before the horse, you're trying to make the rulemaking to issue the material out, and then we've got to figure out what are we going to do with it once it gets out there.

Let the stakeholders, the consuming public, the industries, agree on what they will do with the material, what they will accept, what parameters they can agree with, and what parameters they cannot.

And once that is achieved, then you do a rulemaking to make sure that those wishes happen.

And that's why we've said that there needs to be convened, an interest group that studies that problem, gathers the facts, and issues recommendations so that all the groups that will be affected will have some agreement on what is tolerable, what is acceptable, and what isn't.

LESNICK: Thank you, Mike. Let's move on to Pete Hernandez, and then Charles and then Dan.

HERNANDEZ: Peter Hernandez. I want to bring up some material information that might be useful to the participants, and also I have a question, a followup question.

We asked the Worthland Group to poll four focus groups regarding the free release of metals. Participants were told that several facilities that previously used to produce nuclear material or generate nuclear power were being decommissioned.

It was explained that these facilities were very carefully regulated by the NRC, which ensured the safe handling and disposition of any unsafe radioactive materials.

Considerable effort was taken in the description to avoid prejudicing responses. For example, the word, contaminated, was never used. Words like safe and negligible were used to describe the materials.

Reaction to this concept nevertheless was overwhelmingly negative. Over 80 percent of the respondents felt that it was a bad idea.

Uncertainty, risk aversion, and skepticism of government oversight all underlie the strong negative reaction to releasing and recycling any materials previously used at nuclear facilities, regardless of how safe the Nuclear Regulatory Commission or the Department of Energy

deem the material to be.

Perceptions of all steel would be negatively impacted, and consumers would actively de-select products made with steel, according to Worthland.

I wanted to just communicate those findings to you.

Secondly, as a followup to a point that Paul made, which I think was a valid point, that if you're going to set a clearance limit, the public has to be assured that it is absolutely safe.

But my question is, what role does ALARA or would ALARA play if you set such a standard? I see this is as if you say that one millirem is absolutely safe, and you also say something about ALARA, you're sending a mixed signal.

LESNICK: Some of the most recent comments have almost moved us into this third session, so I want to ask NRC, do you want to answer this ALARA question or issue now, or do you want to wait till we move into further analysis?

Can you hold off with that, Pete, because I think that's an important ingredient of having that discussion. So let's quickly move on and see if we have other things about studies so we can jump into the stuff that you all seem to want to talk about in more detail.

WILK: My comment is not that different than Mr. Lamastra's or Mr. Hernandez.

I think I would still like to reiterate that it's important to do a cost/benefit study, factoring in the effect on the market for the recipients of this material.

The gentleman from DOE stated that it's difficult to measure perception. At the Portland Cement Association, we measure perception for a number of things, including concrete for residential homes.

And either our market research department and their contractors are bamboozling us, or, indeed, you can do perception studies, and quantify those perceptions.

LESNICK: Let's move on. The last word on Session 2?

GUTTMAN: Dan Guttman from PACE. I think this is actually a followup. I think it's germane, and it's instructive, so therefore it may not be relevant.

The question is, on the question of quantifying perceptions, if I may, I've been here now --

LESNICK: Get closer to that microphone or you're not going to be on the record.

GUTTMAN: There was something that was screwed up in the last transcript to my betterment, not to my detriment, so I'm not upset about not being correctly quoted.

LESNICK: Maybe it will cut the same way this time.

GUTTMAN: On the public perception issue, as I understand it, we sat here through this session and the last session, and a number of people remarked the last session that there didn't seem to be anybody at the table that was a proponent of let's make it simple without the metal industries being offended by volumetric recycling. Let's make it simple.

I think the utilities folks, Mr. Genoa, said that you've got no interest in making money from volumetric recycling. Obviously you have a very legitimate interest in dealing with your waste problem, and you don't want to have it cost money.

But you're not in the business, at least at present, of volumetric recycling. The state people have said you've got the responsibilities of regulators. You want to assure health and safety, and part of it is having the best, most expert, well founded standards.

The steel people, the environmentalists, the special interests, have made their positions clear. The scrap folks, I think their position is, look, you know, if it's ethical and legal we'll do it, but it ain't obvious.

My question is, on the quantifying of perceptions, can you please tell us, since I know that Mike and everybody else, Barbara, did their best to get representative groups here, where is there anyone in this room -- let's make it

simple -- is happy to get up here and say why they think there should be volumetric recycling for unrestricted use, not simply for a labeled watchband or an exit sign, with unrestricted reuse, and without recall. We don't know what it's in, so you can't recall the exit sign.

Is there anybody in this room in favor of that? I mean, that would be a nice, simple, quantitative measure.

Was there anybody in the room last time? Not to my knowledge. And if there is nobody in the room, isn't that a measure of public perception?

LESNICK: I think that's an important point.

GUTTMAN: And if there is nobody in the room, can you tell us what comments, because we all want to be educated. What comments have been filed before you folks saying, gee, what a great idea. We've been sitting here for the whole two millennia waiting for the opportunity to recycle volumetric material. If there's some way to sneak it in before Y2K, you know, is there anybody we can look to? Who do we look to to find out why this is a publicly good idea?

LILLY: Dan, if you recycle surface material, the first thing you do is melt it, and as soon as you melt it, you have volumetric contamination, so all you have is the difference between surface releases and volumetric releases, and that's one step.

GUTTMAN: I'm not asking -- okay, if that's an answer, my question is, so Secretary Richardson, as I understand you, is in favor, he is an advocate of the recycling for unrestricted reuse in consumer products of any kind, without any recall mechanism. Is that what you're telling me, so we can convey that back to Washington?

Are you speaking for Secretary Richardson now?

LILLY: That's the policy that we have, the policy that we had when we awarded the BNFL project has not changed. We think this makes sense. We think it is safe, it is regulated, and that's why we're pursuing it.

GUTTMAN: And do you know of anyone else that likes that policy except for the BNFL SAAC folks who get a quarter of a billion dollars for it? Anybody else you've got that can support that?

LILLY: Anybody who has a surface release process is eventually going to get into a volumetric issue.

LESNICK: Gentlemen, actually, Dan, this is a good segue, because I think you raise the point that we want to get to, which is what -- given what people now know and understand and have heard, to have some discussion about thoughts about alternatives.

What are some ways of managing and controlling solid materials? And that's, as you heard from the Agency at the beginning, it's a topic they're going to want to talk

about for the rest of this afternoon and tomorrow.

We've got to get into understanding some of these alternatives first. Barb, we have an obligation for quick public comment availability, and then we can move on to our session.

Is there anyone who would like to make a quick comment or ask a question that's not around the table before we jump into talking about some of the alternatives?

Sir, if you would move to the mike and identify yourself.

VOICE: From the Illinois EPA. The other constituent group that doesn't seem to be here is the people who run the solid waste landfills. In Illinois, unlike Texas, almost all or our landfills are run by private companies.

I don't know if you've ever been to one of their siting hearings where local government and local people get to comment on whether this is a good thing or not. But when they're told they can't put their grass clippings in the landfill, but radioactive waste can go there, that might not go over too good. I have a feeling it's going to have a big impact on the siting of new landfills, at least in this state.

I recommend that somebody from the waste industry be involved with this.

LESNICK: Just so you know, the Solid Waste Association of North America has been monitoring, and they had an individual come to one of the meetings, and I know they have an interest, and the Environmental Industries Association, I think, which is the private sector version is monitoring as well.

I think they intend to write comments. But the point is that they're not here today, necessarily, those organizations as organizations.

Can we move on to Session 3? I think people are keen to start getting into this.

Who are the folks who are going to be doing the presentations on Session 3?

BARNETT: Could I make a comment? I missed my chance.

LESNICK: Certainly. Would you introduce yourself?

BARNETT: Jack Barnett, Radiation Chief for Region V.

About a month ago, DOE was planning to send about four ounces of mixed MOX fuel, plutonium/uranium fuel from their facility in New Mexico up to the Chalk River reactor up in Ontario.

And the route would have taken it through the south side of Chicago, through the state of Michigan, and

then across the Mackinaw Bridge up into Ontario. And the Mayor of Mackinaw City wanted to lay down on Mackinaw Bridge to stop this from going across, four ounces.

So I guess my point is that we're talking about perception here, and there are very few things in this earth that are more provocative than the idea of radioactive waste, radioactive materials, or radioactive substances.

And the perception, as somebody said earlier, can be reality. And I think that if we're really thinking about releasing these things, we better make sure that we have the right stakeholders at these meetings.

As I look around this room, you know, one of the strengths of our country is our cultural and racial diversity, and, frankly, with very few exceptions, I don't see too much of that here at this meeting.

EPA, Region V, which is very similar to NRC Region 3, has 29 recognized federal tribal groups, many of whom would be impacted by this, certainly Prairie Island, which is up in Minnesota, which is a power plant on an Indian Reservation on the same island. Those folks aren't represented.

And I think the gentleman from the Illinois EPA mentioned, too, I don't see the municipalities, the great cities of Chicago, Detroit, Cleveland, et cetera, represented.

So is this a workshop or is this a public meeting? I just don't think we're really reaching the full breadth of the stakeholders that should be here.

LESNICK: Thank you very much. Okay, folks, let's move on here.

CARDILE: Okay, I want to introduce Steve. There are several of us who are going to be making this presentation, myself, Tony Huffert, Steve Clemenowitz from the Office of Nuclear Reactor Regulation at NRC who has joined us at the head table.

What we're going to try to do in this session is to try to take the rest of today and tomorrow to try to focus our discussion on alternatives for control of the various materials and the costs and impacts and benefits associated with each of the alternatives that you're probably thinking of.

We've talked a lot about various things we can do, what we should do, and we'd like to try to at least focus that a little bit.

What should we do to control these materials? We could continue our current case-by-case approach, or we could establish criteria for control of solid material so a formal rulemaking process with analysis of health and environmental impacts and cost impacts --

Specifically, we could do several things: We

could not permit release of materials from radioactive areas, or we could establish restrictions limiting release of solid materials to certain authorized uses, or we could set acceptable dose levels which must be met before materials could be cleared for unrestricted use.

As I will describe in some more detail later, and we have this on the flow chart, these alternatives differ in how much they tighten the controls on release of solid materials from licensed facilities.

We will also consider other possibilities. There are other alternatives, some of which have been suggested here today, and some of which have been suggested in earlier meetings. Tony will discuss the first alternative, which is to consider our current case by case approach.

HUFFERT: Thank you, Frank. The current NRC case by case approach, as pointed out earlier in Trish's session, the NRC does have regulations for the disposal of solid materials containing relatively large amounts of radioactivity. But the current NRC regulations do not contain generally applicable dose criteria for the control of solid material with relatively small amounts of radioactivity that is either on or in the material and equipment.

Even though we do have such criteria in place to cover the release of solid materials, it is likely that

licensees will continue to seek to release solid materials for small amounts of radioactivity, when that solid material becomes obsolete or otherwise unusable during operations or when their facility is being decommissioned.

We do have regulations that require licensees to survey materials to evaluate their radiological hazard. One set of criteria licensees use to evaluate solid materials before they are released is Regulatory Guide Number 1.86. This is entitled "Termination of Operating Licenses for Nuclear Reactors." A similar guidance document is Fuel Cycle Policy and Guidance Directive Number FC-8323. This is called, "Guidelines for Decontamination of Facilities and Equipment Prior to Release, for Unrestricted Use, or Termination of Byproduct Source or Special Nuclear Materials Licenses."

Both documents contain a table of acceptable surface contamination criteria. The tables of surface contamination criteria do not apply to solid materials with contamination spread throughout its volume, such as soil.

For some situations, NRC allows releases of volumetrically contaminated solid material, if the survey does not detect radioactivity levels above background radiation levels, and this is sometimes referred to as a "no detectable" policy. This does not mean that material is released without any radioactive material on or in it. It

simply means that the material may be released with very low levels of radioactivity that is not detectable with radiation monitoring instruments, and detection sensitivity levels under this policy are consistent with those of the average values given in Regulatory Guide 1.86.

The NRC also evaluates specific requests for the release of solid materials on a case by case basis, which is discussed further on the next slide.

First, I would like to discuss Regulatory Guide 1.86 and its equivalent, Fuel Cycle 8323, further. In 1974, the AEC published Reg. Guide 1.86 and in 1982, the NRC published Fuel Cycle Directive 8323. The Table of Acceptable Surface Contamination Levels are applicable to various radionuclides and surface contamination levels are stated in terms of measurable radioactivity levels and were based principally on the detection capability of readily available survey instruments at the time the guide was developed about 25 years ago.

Some of the limitations of this guidance are that it is only -- it only contains numerical limits for the amount of radioactivity that can be present on the surface of solid materials, and it, therefore, does not apply to solid materials with volumetric contamination. Also, these surface contamination levels were not based on the potential dose to an individual that could come in contact with the

release of materials, rather, they were developed primarily based on detectability. In addition, both documents were not established under a rulemaking process, which would be conducted under the Administrative Procedures Act.

Another limitation of this guidance is that, although surveys provide licensees with reasonable assurance that elevated levels of licensed radioactive material is not being released from their control, not all licensees survey materials with the detection sensitivity. This can lead to differences in the amounts of licensed material that is released and non-uniform levels of protection.

One regulatory option that is available to licensees is to request approval of alternate disposal procedures. Under this regulation, licensees are allowed to seek NRC authorization to dispose of material with low levels of volumetric contamination. These requests typically involve the burial of solid material on a licensee's site or disposal at a nearby landfill. Examples of these materials could be soil, sludge, roofing materials. Licensees are required to identify and describe the waste, the disposal site, the pathways of exposure and calculate dose to members of the public and to workers.

The guideline that is typically used is that annual doses should not exceed a small fraction of the annual public dose limit, which is currently set at about

100 millirem per year.

And to illustrate this, I would like to discuss two examples of solid material releases that will clarify our current case by case approach. The first example is a case of a licensee requesting approval of an alternate disposal procedure involving the offsite disposal of septic tank waste from a power plant.

In 1990, the Yankee Rowe Power Plant requested NRC approval to dispose of septic tank waste which contained very low levels of licensed radioactive material at a local public sanitary wastewater treatment facility. The total amount of radioactivity in this septic tank waste was about 2 microcuries, or 2 millionths of a curie, and it included cobalt, cesium and manganese radionuclides. The calculated dose from this disposal was about one-tenth of 1 millirem year to a person exposed to the waste during transportation or by burial.

The NRC staff coordinated this review with the Massachusetts -- the Rural Massachusetts Board of Health, and based on the projected radiological doses, and the controls for surveying the material prior to its release, this disposal request was approved.

A second example is a case of a license requesting solid material releases during decommissioning. For nearly 30 years SentaChem, Incorporated in Tuxedo, New York,

produced radionuclides for medical, research and educational uses. After radionuclide production operations stopped, the licensee conducted a comprehensive characterization of the residual radioactivity that remained in building structures, in the materials appropriation system, laboratory equipment, buried pipes and also soils. Radiological surveys and process knowledge were used to document the radiological status of the facility and to develop a plan for dispositioning the structures and the materials.

During the decommissioning of this facility, solid materials containing low levels of surface contamination were surveyed and released for unrestricted use. The criteria that were used for releasing these materials was the more stringent of NRC or New York State criteria, and in this case the NRC criteria was a "no detectable" policy and Reg. Guide 1.86, and New York State criterion was its own version of Regulatory Guide 1.86.

Solid materials that exceeded the site-specific release criteria for unrestricted use were either disposed of as radioactive waste in a licensed low level radioactive waste disposal facility, or was transferred to a licensed radioactive waste processing firm.

So, as you can see from these examples, solid materials are being released in the absence of NRC regulations in this area, which, in turn, raises the

question, how much of this material has been released so far?

As I noted earlier, licensees are currently required by our regulations to perform a radiation survey and to keep records of those survey results. However, these survey records are not required to be submitted to the NRC. Therefore, the NRC does not track the amount of solid material that is released from all of its licensees, which makes it difficult, if not impossible, to estimate how much solid material has been released so far.

The NRC does not currently track these releases for several reasons. NRC inspects licensees' radiation protection program and the survey records. The solid material releases that are made by licensees are in compliance with licensee programs, which, in turn, are consistent with existing NRC regs, and the exposures that are associated with the release of solid materials are estimated to be low. In general, it is projected that the amount of solid materials, such as metal and concrete, that have been released to date are small compared to the amount available in future decommissionings.

This graph is based on data contained in an EPA report from 1997. It is a technical support document entitled, "Evaluation of the Potential for Recycling of Scrap Materials From Nuclear Facilities." According to the

EPA's estimate, the total amount of recyclable steel from nuclear power plants is right about 600,000 tons. That is assuming a 15 millirem per year dose level. The graph also illustrates EPA's projection of when the steel may be potentially released as the nuclear power plants undergo decommissioning over the next 50 years.

It should be noted, however, that the 600,000 tons of steel potentially available from nuclear power plants is a very small fraction of the total amount of scrap that is recycled by the steel industry. Over 50 years, the steel industry could recycle hundreds of millions of tons of scrap steel and, as indicated in this graph, the amount of potentially available steel from the nuclear power plants ranges from less than one-tenth of 1 percent to 1 percent of the steel industry's annual use of scrap.

Currently, NRC is researching the total amount of materials that could be surveyed and released under a potential clearance rule at various dose levels. The amount that could be released depends on the radiation dose level and associated radionuclide concentrations that would be established.

This concludes my presentation on the current practice alternatives, and Frank will continue this session with a discussion of other alternatives for addressing the control of solid materials. Frank.

STINSON: We are going to move through each of the slides that you have left in front of you, three more, and then comments and questions and discussion following that.

CARDILE: The best way to discuss the alternative is to use -- the various alternatives is to use this diagram. To start the discussion, -- am I talking into this? To start the discussion, as noted this morning, materials are generated at licensed facilities, that would be over here.

The solid materials are generated the whole range of NRC licensed facilities, at reactors, at university laboratories, at hospitals. These materials can be in radioactive areas, for example, pipes or tanks, and plant process systems, or in lab equipment, or chairs or furniture at a hospital or university laboratory. The material can also be in unaffected or clean areas that are unaffected by contact with radiation. These might be, for example, administrative offices, ventilation ducts in control buildings, or site fences, which are nowhere near any of the radioactive materials.

So the question we are addressing, we are trying to address, is what should be done with these various materials when it is no longer needed or is obsolete? The diagram also shows that any materials leaving a facility would be subject to some form of a survey. Either the

radioactivity level would be monitored using a detector, or a decision could be made about what to do with this material based on some administrative knowledge of its history, that is, where it had been in the facility, what it had been used for, and if it had contact with radioactivity.

So the question we continue to pose is, what should be done with the various materials after they received some survey?

One alternative is to establish in the regulation that solid materials from areas in a licensed facility where radioactive material was used or stored would not have to be monitored, but would rather, based on knowledge of its location in the facility, be sent for disposal at a licensed low level waste site.

This is what we have referred to a few times today as prohibition. And, basically, what that is is that material goes from here to survey, based on knowledge of its previous use, and then sent to licensed low level waste disposal. The rationale for this alternative is that there would not be release of certain solid materials, thus, removing concerns associated with allowing solid materials into products for public use.

The question open for discussion is how and whether such a limitation would apply to unaffected or clean areas of the facility, for example, items in the

administration building or site fences, or similar types of materials.

A second alternative is to set a dose level in the regulation below which materials would be surveyed and then cleared for unrestricted use by the public. The rationale for this alternative is that it would allow some productive use to be made of these materials rather than simply throwing them away. Before any material is released from the licensed facility, it would be monitored to assure that it met acceptable levels. Material that was above the acceptable level would also find it way to low level waste.

Material, however, below the acceptable level would no longer be subject to NRC licensing and could go to any unrestricted public use. This could include a recycle process and then into consumer products. It could also be reused in its current form. I think someone mentioned today use of trucks or bulldozers and what to do with them. Or the material could simply be thrown away in a public landfill rather than licensed low level disposal, assuming that it met these acceptable levels.

None of the members of the public in this box, or using the material in this area, would have an NRC license, of course, not the scrap dealer using the material, not the steel manufacturer, and not the end user, and not the landfill operator.

Well, what would be an acceptable level to send the material on this path? The purpose of a rulemaking would be to try to set an acceptable level which could be agreed upon, at which all of these members of the public would be protected, including the worker handling the scrap, the worker in the steel mill or concrete facility, the truck driver transporting the material, the person working in manufacturing, and, of course, and certainly not least, the consumers of the end products.

The purpose of a regulation would be to ensure that none of these members of the public got more than the limit from the material. And as Bob Meck noted earlier today, the results of the studies of the 79 potential scenarios indicate that if the scrap worker is protected to a level, for example, like a millirem, then a consumer would get well less than that, potentially well less than that level. To assure that no member of the public got more than an acceptable level, the material would be monitored before it left the facility.

A compromise between these two alternatives is that shown in the middle, in which we could set a dose limit in the regulation allowing some material to be surveyed and released, but restricting where this material went to only certain restricted uses. These restricted uses have been referred to several times as authorized uses. An advantage

of this alternative would be that it would make some productive use of the materials, but would limit uses to those which were less likely to cause public exposure.

Now, this seems like a good idea, but we have heard discussions at earlier meetings that to make this alternative work, by which I mean to ensure that the material only goes to the restricted use, that is that is definitely goes here and not here, a question for discussion is, is it necessary for NRC to license some part of the process taking the material to its restricted use? And a further question for discussion is, who, if anyone, in this box, and along this path, taking the material to a restricted use, should be licensed by NRC and whether a licensing scheme would work to assure that this process was followed?

For example, one possible restricted use of this material is to use the material in an already licensed facility. For example, using it as shielding blocks in a nuclear facility or as shipping drums. But a question is, should the people who make these shielding blocks or make these shipping drums be licensed by the NRC?

Other possible uses of the material are in some use that would normally be licensed by NRC. These could include, for example, girders in a bridge, or they could include another possible unlicensed use where the material

would be restricted to only going to a certain place, would be if you said this could only go to a landfill. It would not be recycled into any public consumer use.

Here again the question is should the people who collect the scrap metal and transport it to these locations be licensed by NRC and even whether the bridge owner or the bridge manufacturer should be licensed by the NRC and perhaps whether the person running that public landfill should somehow be licensed by the NRC to assure that the material wasn't scooped up out of that landfill and sent back into some public use which would jump across this line here, and back down in this direction.

Of course a bridge with girders in it only lasts so long and eventually the lifetime of this restricted use will end, and the material will then become available for unrestricted use. Thus, what restricted use essentially does is defer the ultimate decision about what should be done with these materials while allowing radioactive decay to occur over the lifetime of the restricted use.

For some radionuclides like Cobalt-60, which is a prime radionuclide at power reactors and at a number of university facilities, this decay could cause substantial reduction in the radiation levels.

For example, if the Cobalt-60 levels at this point are about a millirem, then after the lifetime of the

restricted use, perhaps 30 or 40 years, the dose level when the material left it might be less than that, probably a hundredth or a thousandth of a millirem.

Now in earlier meetings and today people have suggested other alternatives, all of which we are open to and all of which we will consider. One of these alternatives is recapture of the materials that have previously been released. This alternative deserves to be evaluated on its merit. However, it is not an option by itself because it does not address what to do with the materials that are over in the generated facility.

Another alternative that has been mentioned is the use of ANSI N13.12. This is an industry standard that we could discuss some more that has been developed and which sets an acceptable level for release of material into an unrestricted usage.

Another alternative that has been suggested is to segregate different requirements for different material types, possibly using different alternatives for different materials.

Another alternative that has been suggested is use of a dedicated licensed recycler to ensure material only went to its authorized use, so you would insert a licensed recycler or smelter into this process to assure the material went to where you intended it to go.

Another alternative that has been suggested is use of a specific licensed disposal facility like this. However, it would be one that only handles material with small amounts of radioactivity.

Each of these alternatives has its pluses and minuses. For purposes of our efforts and for the purpose of why we are here today and listing to your comments is to evaluate all health and environmental impacts and economic impacts and evaluate the tradeoffs between the alternatives.

In summary, we would like you to provide us with input on the table that we are I guess going to move into shortly as to what should be done with the materials at this point and specifically whether it should go on this pathway, on this pathway, on this pathway, and of course in discussing those alternatives and what you think about them, we would like your further ideas as to why you think this alternative is the best approach or an approach that could work. We have heard some of that already.

As you discuss an alternative, you don't need to give, say for example an environmental and economic reason. Someone else can follow that up with another rationale.

In addition, as we talk through those boxes about different potential alternatives, the idea is not to narrow in on an alternative that we all agree upon, but to put down what some of the different alternatives that people think of

might be useful for the different materials, and we would like to focus, as Barbara mentioned, on each of the different materials. Thank you.

STINSON: Before we get into an exploration of some of the alternatives, the ones up there and the other ones that Frank mentioned, would it be okay if we heard just a brief presentation? This will conclude all of the presentations for our two days together on assuring controls and some of the methodologies that NRC has in mind if they pursued this. Would that be okay?

Dan says what is the alternative, if the answer is no?

[Laughter.]

STINSON: Tony, then do you just want to cover those last two slides?

HUFFERT: Yes. How should controls be assured under various alternatives?

STINSON: Can you speak up just a little bit? If you are not hearing an echo of yourself, you are probably not being heard.

HUFFERT: Okay. Earlier NRC regulations require licensees to make surveys of solid material to evaluate the potential radiological hazard that could be present and is part of the licensee's Radiation Safety Program. They develop procedures for controlling solid material at their

facilities. This includes radiation monitoring procedures to evaluate any solid materials before they could be released.

Presently there are some issues with existing survey programs at licensed facilities. Not all licensees use the same survey instruments and procedures to monitor materials, which can lead to variations in detection sensitivities and equipment. Another issue is that existing guidance on conducting surveys is geared toward the release of solid material with surface contamination -- for example, the use of Regulatory Guide 1.86.

There is not an established procedure for controlling the release of solid materials containing volumetric contamination.

There are also physical limitations for measuring volumetric contamination because it is difficult to measure radioactivity contained in a solid object using the typical hand-held survey instruments that are used at most facilities.

An overall consideration in controlling solid materials of volumetric contamination is how to measure radioactivity in the material itself and then compare the results to a predetermined release level.

It is likely that the survey method that is chosen for controlling solid materials will depend on the

alternative chosen for regulating these materials. Currently we are considering a range of alternatives which in turn requires the technical evaluation of a variety of survey approaches because the alternative chosen determines that survey method that should be used to control the solid material release.

It follows that if a dose criterion is chosen that is very low or zero above background, very sensitive survey methods and equipment would be needed. There are associated measurement costs and practicalities for each alternative.

Another consideration in controlling solid materials is restricting the release to only certain authorized use. For the restricted use alternative, what other controls are needed?

Some of the options for restricted use have already been discussed by Frank in this session or I'll bring it back to you. What other options for restricted use should be considered?

STINSON: Okay, good. Thank you. So let me kind of go over the things that are on our agenda for this afternoon. First, we have already heard, and let me just tell you there is a giant party going on next door beginning at 4 o'clock, so if you are at all bored, just feel free to join Bank 1 because at 4 o'clock they are going to unleash music and all kinds of stuff. We may want to strategically

have a break then. We are doing what we can to modify the sound.

Two materials have already been mentioned to add to the list, nickel and lead. What we want to do first is see if there are -- these cards that are up probably relate to questions or comments related to the presentation. Then we want to be sure that we have all the right materials in mind that we need to cover for the rest of this meeting and begin to talk a little bit about the current methods of control.

At that point in the meeting what we would like to hear from you all are some real world experiences of some of the issues, problems and ideas around the current methods of control and I am sure there is a lot of good experience to relate on that. You know, that takes us up to 4 o'clock and at 4 o'clock we would like to -- well, what we are going to do is just before 4 o'clock Cliff is going to make a short presentation that he referred to earlier, some discussion, ten minutes or so, on some of the history and issues he is most concerned about. He can only be here today, so we will give him that opportunity before the close of today, and by 4 o'clock talk about aluminum specifically and the alternatives for control of aluminum -- what makes the most sense under the potential control items and then specifically look at what might be some of the health and

environmental impacts as well as economic impacts that would be specific to that industry and move across the table, if you will.

So everybody is going to have to speak up a lot as these guys get started and we will just ask your patience and tolerance about that. Tony, do you have a suggestion? Can you use the microphone? I'm sorry --

LAMASTRA: Tony Lamastra. Could you please explain what you mean by current methods of control?

STINSON: Sure. I mean how is the material handled currently, today? You know, within NRC licensed facilities what is the method of release, the criteria for release? I am looking at the explanation that is written here for that specific material and there may not be real significant differences between the materials but for some of them, there are.

Are there any other questions? Let's go ahead and take the cards that are up regarding questions, comments, et cetera, around the information that has been relayed kicking off Session Number 3.

I think that if my notes are right Jim has been waiting and Paul Genoa. Hand him that mike.

TURNER: Jim Turner, SMA. I think Paul just is going to clarify what I say.

I guess the question of what are the alternatives

is a very good question, because I don't think, I haven't seen where you have any alternatives for restricted release or otherwise because you don't have -- what you need to do is a market survey of some sort and see who wants this material, different types of material. I haven't seen or heard anybody that does want it, so that might be the first step.

The second has to do with protocol for methodology. Again I think you are maybe jumping the gun in looking at a release level and should look more at the method of release. Like I say, I think the protocol and the release methodology used by the licensee is critical and they must be uniform and consistent across different entities. I don't think that the NRC or the DOE can assume that those protocols or their licensees are going to follow those protocols. The licensees are human, after all.

In particular my company in the last year has had actual experience with actually two issues. We received material at one of our facilities from a nuclear facility and it was three loads. One or two came directly from the facility and -- or one or two came through a scrap dealer. They set off alarms. They were rejected and we cut off the supplier.

Another example is more recently, during our remediation efforts with the insulated material, material

that was sent to the disposal facility -- well, with material that was sent to the disposal facility in Texas they located a radioactive source. It turned out that the source was put there improperly by the licensee that was doing the remediation. It was taken care of, but I just wanted to point out that these things can happen and I think that it is premature to look for a level that can be released until you find out or determine how it is going to be released and to whom. That's all.

STINSON: With that you really hit on, you know, a number of the columns for your industry in particular -- controls and in the cases you brought up where they have failed, and the concern that you have around any alternatives and what level of materials, so this is going to be a little hard to sort of push into the boxes, if you will, or direct in a particular direction, but at this point if you don't mind let's talk a little bit about any general comments that you have and hold yourself back from getting into the specifics of your particular industry until we can talk a little bit about current methods of control.

We will see if this is working. Paul? I like totally confused you now.

GENOA: You have. I wanted to address a comment on the presentation on the boxes.

STINSON: Good. That is what you should do now.

GENOA: That is what I want to do now. Okay. The slide, if you could put it back up, it has the pretty colors.

Paul Genoa, representing NEI, and I would --

STINSON: Just pull the mike a little bit closer. It is just going to get harder and harder to hear.

GENOA: I would offer a recommendation that the agency pursue unrestricted release at this time, that it is premature to address restricted release criteria. The reasoning is as follows.

Fundamentally, no matter how many cycles of restriction you apply, and I can think of many, you ultimately have to come to a decision or you have to have the decision criteria in place before you allow a restricted release scenario. That ultimate decision is when is this material safe and acceptable for release to the public without conditions.

If you don't have that answer in front of you, you can't make reasonable decisions about how to restrict release criteria.

Now I believe that restricted release scenarios do make sense. The French are proposing a fixed-space facility that will receive all of the metal from all of their facilities in France, mix it with material from non-nuclear facilities, and manufacture industrial springs. That works

in France. That is a pseudo-socialistic system.

We in this country cannot dictate where companies send their material or how they control their material in such a fashion. However, the free market does control those things, and if after you set a health and safety based limit that is acceptable for the unrestricted release of material, if the market forces show that there is a market, then someone will step forward and you could postulate a fixed-space facility that might even be regulated in its operation that would receive material from these facilities under certain conditions and will manufacture a certain product that would be used in the future, whether it is industrial springs or whether it is pipes for oil and gas or whatever.

But for you to sit back today and try to envision that I believe is an impossibility. I just don't think you can do it.

STINSON: You are saying set a level low enough to end restricted release, and then work towards or understand what's necessary to conduct a market for restricted release.

GENOA: Yes.

STINSON: And do a fixed-based -- explore the use of a fixed-based facility. I don't want to extend your comments, I just wanted to make sure we had it.

GENOA: I think I just said that it's premature to

try to do both steps at the same time. It is a sequential activity. I suppose you could do it in one rulemaking, but it may take forever.

You need to get to the first step first. And then I would offer that in the United States it will be impossible for you to try to try to dictate what will be acceptable by the economy, by the market.

Rather, you set the criteria and allow the market to come to you with suggestions for approval, for a restricted scenario.

STINSON: How many people -- of the cards that are up, how many people want to comment on what their favorite alternative for control is?

Honestly, I mean, is that what your comment is about? Okay, because what we're trying to do is hold you back from commenting on which alternative you prefer at this point, and structure it by material a little bit.

GENOA: My comment was basically on the presentation in this section. Aren't we commenting on the presentation?

STINSON: Right, right, but you were commenting on unrestricted release versus restricted release, et cetera, and I'm just wondering if this is going to be --

DEVGUN: That's part of the presentation. I'll take my card down here. I think that on restricted release,

my comment is to Frank, similar or on the same basis that in the first place, you're trying to -- what is it that requires us to go through this exercise?

If I am a licensee, I'm required under 10 CFR, Subpart K, to show the absence of licensed material. That's what forces me to go through this route or any other route.

So, because of that, if you go restricted use scenario, you are going to create, continue creating further licenses. If you've got 20,000, you're going to have 50,000, 100,000, and so it's a -- I would say it's a contradictory in itself.

What we are trying to do is actually a licensee is trying to release this material because even if he had the equipment, you know, you don't have the lab analysis, when you're talking about 50 million pounds of concrete material. You don't have the lab analysis methodology available to you.

You're trying to process this on a bulk assay system, and you cannot show the absence of licensed material. That's why you need to do that in the first place.

So if you go ahead and use the restricted use type of pathway, you are going to continue on. It doesn't matter where this material is used or reused, if you're going to control each end use, you're going to have a whole slew of

licenses.

Before you know, everybody in the room may have a license, and it doesn't matter whether you have anything to do with it or not.

STINSON: Mike?

MATTIA: A quick question and a quick comment: The question goes back to one that I have asked in previous sessions, and that is, looking back at Reg Guide 186, can we obtain an understanding of what would the levels that are mentioned in 186, how do those convert to milli or micro roentkins, which is the standard, at least here in the U.S. that we use for measuring material?

And the second is a comment that goes back to the fundamental of error, I think, in these presentations.

And to use an example, the Environmental Protection Agency regulates the amount of hydrocarbons that the public can be exposed to from internal combustion engines, meaning automobiles.

That level is not zero, and the reason it's not zero is because the public wouldn't tolerate removal of all automobiles, even though anything above zero is hazardous.

If you were to ask industry and the general public how much exposure to materials to be released from nuclear facilities they are willing to tolerate, you may find across the board, the answer is zero.

Understanding that, that means none of this material gets released. So before you can consider making any type of rulemaking, you need to work on what is acceptable to the public, because right now that acceptance level, almost across the board, is zero.

And we may even go so far as to say that acceptance level also applies to non-contaminated material because it's contaminated by association.

And let's not take the chance. So you have a perception by industry and the public that you can keep the stuff because nobody wants it because there has not been a buy-in, there has not been an acceptance or an understanding of fact, there hasn't been an agreement as to what the stakeholders outside of the government are willing to understand or willing to accept or willing to deal with.

And before that can happen, you don't have a reasonable chance at a rulemaking.

STINSON: Peter?

HERNANDEZ: Peter Hernandez. In the discussion in the simplified diagram of alternatives, you have the arrow that contemplates going from restricted use ultimately then cleared material for unrestricted use.

We've encouraged the NRC to take the material from this contaminated material and limit it to restricted use applications. Part of the reason for that recommendation --

and we really didn't contemplate it going into free release.

The magic of recycling is that the material objects going in to be recycled completely lose their identity, and so a steel plate, a bridge girder, a pipeline, can become a car, an appliance, the steel frame in the chair you're sitting in, a child's toy.

CARDILE: Can you clarify the question? All this chart is trying to say is that you can develop a restricted use, you can put this material into a bridge.

Eventually, presumably, the bridge comes down. Now, two things will happen: If it's Cobalt 60, you will have 30-40 -- I don't know how long the bridge will last -- years of decay.

The material will go very low. In addition to that, as you say, the material can go anywhere at that time, and that's the point of the slide, is that once the material comes down, especially if this is an unlicensed bridge, we don't know where it's going, but nevertheless, as you point out, between decay and between mixing, any further exposure will be very, very low.

So, I'm not sure what the question was, or if there was a question.

HERNANDEZ: My point was that a suggested alternative would be not to permit material that is restricted use, to be ever rereleased, because not

everything is going to be contaminated only with Cobalt-60. You may have contamination from Plutonium or some other material that have extremely long half lives.

CARDILE: And that's a good point, and what you're advocating or what you're talking about perhaps is a licensed form of the material, because if it was in some unlicensed form, some unlicensed use, then NRC unlicensed means NRC is out of the ball game.

And if it's an unlicensed bridge, NRC only knows that it went to the bridge to made and that's it. We're done. NRC is done with that material.

Once 30, 40 years later, somebody tears that bridge down, what happens to it later, especially, as you say, if it's a long-lived nuclide, if that's where it was, then it can go anywhere.

So perhaps what you're talking about is some licensed use where, as you say, especially for long-lived material, it never goes out of licensed use. This perhaps might be different than something with short-lived nuclides that, you know, perhaps would decay away.

So you're perhaps talking about combining two different types of alternatives here.

HERNANDEZ: That's correct. Again, I understand that your diagram is a simplified diagram and doesn't necessarily reflect all the options that you're considering.

I just wanted to make that point.

CARDILE: Okay.

STINSON: Kristin, did you still want to speak?

ERICKSON: The first one, I want to comment again on the diagram. I think that what you've done by putting the restricted concept in there, you have completely muddied the issue.

What we're trying to achieve here is a limit beneath we say it's safe, it's not governed, regulated, monitored, surveyed, the risk is not there anymore in any substantive form, and that we have lots of science and good communications to show that.

And then you don't have this continuing licensing, because that's not unrestricted. The other comment has to do with the commenting and the working on the public, and communication with the public and public acceptance.

Being in this business every day, and dealing with people from every walk of life, every culture all over the world, I run into people, of course, who have, just you name the word, radiation, the outrage factor is monstrous. That's what we're talking about here, outrage factor.

There is a whole profession that works on communicating risk, all kinds of risk, including radiation being one of them. It can happen, it does happen, and it could with this also, that people communicate with the

public about this risk in such a way that they not only understand it, but they accept it.

And, in fact, they do. Everyone accepts that my t.v. may give me some small amount of ionizing radiation. I may receive two or three or five millirem flying across the country on a jet.

I may receive some dose from the background, and, in fact, why did they deregulate graveyards, cemeteries, crematoria? They had to because the amounts in our bodies are above the limits.

Now, if you communicate in these kinds of ways about plain, everyday things such as eating a banana with Potassium-40 gives you as much dose as some things we release, a handful of Brazil Nuts can give you your public dose limit in one handful, those are the kinds of things you can do to communicate with the public.

And that's what needs to be done. You look at the perception, the public perception has to be at least half of the effort here if this is to be achieved. A well-done campaign, a well-done communication, well-done assessments, well-disseminated information, that's what needs to happen.

STINSON: Craig, and the Dan Guttman.

CONKLIN: I had a question about the chart in relationship to the NUREG document here. The restricted use scenario or line there, was that modeled in the NUREG here?

Were there any dose assessments done or economic assessments done for that particular one?

CARDILE: The NUREG did not do economic assessments, and I don't believe that the NUREG looked at restricted uses. The NUREG focused on unrestricted uses, various unrestricted scenarios.

The NUREG focused on this box here, recycle, reuse, and landfill.

CONKLIN: Do you have any plans for doing a similar type analysis for the green box?

CARDILE: Well, if we proceeded to do that type of regulation, we would have to.

CONKLIN: I will just make one last comment. It would appear that if you're going to go with any sort of restricted use, whether it ended up with licensed or unlicensed types of activity, would have a pretty significant regulatory role at the federal and state levels.

And that would have an economic impact and a cost to it that would need to be really analyzed closely. If you're going to do a cost/benefit, it's not only to the end users and the suppliers, but it's also going to be to the state and local governments and the Federal Government that are going to have to implement it.

CARDILE: All right. I was just going to say that I hear a couple of the participants talking about moving

towards an unrestricted scenario or an unrestricted alternative, and trying to develop what is an acceptable level. That is the type of thing we talked about in the presentations. We also hear Mr. Mattia talking about that the public will only accept zero.

I guess that presents a real conflict and two difficult things that don't seem to want to mesh. I guess the question I would ask Mr. Mattia is, in listening to what other people are saying and in talking about the types of dose levels that we're potentially considering, like one millirem, which is, as is mentioned here, is a fraction of what you would get in flying back and forth across the United States, or a fraction of what -- a small fraction of the difference between the dose that a person in Colorado gets, for example, compared to the person at sea level.

What is the -- and as someone else mentioned, what the National Council on Radiation Protection calls a trivial or negligible dose. What is the science or perception that needs to be developed to get away from -- not get away from, but to discuss that in public perception?

STINSON: Steve was in the queue. I'm sorry, Dan, I will ask you -- I apologize for skipping over you.

But, Mike, do you want to respond to the question?

MATTIA: Yeah. Not only would I like to respond to that, but to your assertion, and you raise some valid

issues. I think that when we look at the consuming public, we are looking at a perception of risk versus benefit and risk versus alternative. You know, the risk of getting an X-ray is there, but the alternative is you don't get your broken leg set. The risk of flying in an airplane is you get exposure, but the alternative is you walk.

The problem with this material is the risk is exposure, and what is the alternative? Well, the alternative to the public would be you don't release it. What is the benefit to the general public if you release this material for reuse? Do we get cheaper products? Does our life improve? Does the recycling industry benefit? Do we get cheaper cars or better bridges?

That is the problem. You have a public that says I will accept a risk if there is an alternate benefit. If I have --

CARDILE: I am sorry, go ahead.

MATTIA: The question is, if you cannot provide an alternative benefit, if the public is willing to do without to eliminate the risk, to make it zero, then you have to start at square one to be able to get public acceptance of what they will accept, in what parameter, before you can release it. No one is going to turn down an X-ray or a cross-continental flight, or even chemo radiation, given the alternatives.

But if the benefit for us is nothing over and above what I am getting now, and the risk is additional radiation, you are going to have the public saying, where is my benefit? I would just as soon take zero exposure additional there, because I am not getting anything for it.

CARDILE: Perhaps we could ask the generators, the utilities, the nuclear industry representatives to elaborate on that benefit. I have heard some of that elaboration being, well, if the material goes here rather than there, then, you know, the cost of a product, the cost of -- I think at the last public meeting, one of the gentlemen talked about the cost of medical procedures being higher because it cost more to dispose of the waste here versus there. So it is not that there is no benefit, it is just that perhaps it is harder to see.

Obviously, you know, the public may not see that, oh, I am getting a benefit from this piece of stuff. On the other hand, what we heard at the last meeting, or perhaps some of the utility or medical people can expand upon, is what this impact is on their cost of doing business, which cost is then passed on to the public.

STINSON: Let's continue on this particular vein, because I saw a few kind of heads nodding and people curious about this issue perhaps having some comments. Steve, did you have something on this?

COLLINS: Yes. With regard to the restricted use category, I am one of the people a few months ago that suggested to NRC that that should be one of the items to be discussed, not in any way because I am in favor of it necessarily, but because we needed all this input and comment to know what problems it might create and that sort of thing.

One possible restricted use that could be made of some stuff that certainly you would accept maybe a higher contamination level than for a lot of other uses would be for construction of a high level waste disposal facility and the waste containers that would go into such a facility, as well as a WIPP site. I mean you are planning to put stuff there forever and leave it. Why shouldn't you use contaminated materials to build the waste containers? You wouldn't care how much radioactivity was fixed in those as long as it didn't cause an exposure concern for the workers handling those containers or transporting them, and so the level could be low enough so there is no exposure concern from that, but still use the material.

Even though I am a regulator, I do not have a trust -- faith, if you want to call it that, in some of the institutional controls I have seen in the past with regard to restricted use. So, in that sense, I am pretty much against what we would call most of the restricted use,

because I don't believe that it can be controlled. Like the steel people said, once it gets to that first user, it is gone, no one is going to be able to track it after that, and not even for what happens to it in that first user's facility.

So, those are -- that is two of the things, but I am glad that we are getting all the input on it.

CARDILE: You are leaning more towards a licensed type of restricted use, where the material never leaves a licensed use, is that what you are saying?

COLLINS: I am sorry, the background noise level --

CARDILE: So you are leaning towards a licensed type of restricted use, where the material never leaves a licensed environment?

COLLINS: It would either be a licensed type use or it would be a container that, even though the container was not licensed itself, all of the people that use it would be. It would be a specially designed container only for one use and no one else would use it. All the users would be licensed, you know, like waste containers, they have a certificate of compliance from NRC. The container itself it not licensed, but all of the users of it would be. Does that answer your question?

CARDILE: Yes.

COLLINS: Okay.

STINSON: I know it is only getting harder and harder to hear. We are going to have this noise level until 4:00, when it is going to get louder. Anybody who would like to sign my petition for getting a refund on this room?

Let's try to keep going if we can and we will still plan to give Cliff an opportunity, 10 minutes or so, and take our break well before 4:00, and maybe we will miss the big noise in here.

Anybody else have a comment on this risk versus benefit, versus what alternatives are there? Okay. We have got four hands up. Dan, you were next in the queue.

GUTTMAN: Yeah. I would like to pick up on what I thought Paul said, which I thought was quite elegant. He gave us -- obviously, he will tell me whether I misconstrued him -- a thought experiment. What he is saying is in the real world we know none of this stuff is going to be restricted forever, it is all going to end up --

STINSON: Pull the mike a little closer, we really can't hear you.

GUTTMAN: Dan Guttman. It is all going to end up somehow, out there somewhere, and the ultimate question is how the market will adjust, and that is an elegant way of looking at it. And let me just play that through.

What is different about the situation we are

talking about here than, you know, bedspring sales or, you know, hula-hoops, is, one, there is a special feedback problem of several sorts, which also addresses what Kristen has pointed out. We are talking about substances whose affect is (a) latent and (b) long-term latent. You don't get cancer till 30 or 40 years, and (b) it isn't directly traceable. You get cancer, who knows what it is from?

So, to respond pretty bluntly to the science folks here who say, what is the big deal, it is no problem, I agree with you. I have been tutored by the country's leading nuclear medicine people. They, some of them say, those people who were injected, the American citizens, in secret, with plutonium, it was no big technical deal.

Two problems, nobody told them they were injected with plutonium and, therefore, we had to pay them, as a country, money and the President of the United States had to personally apologize. Two, it turns out, as Cliff knows well, some of those moms who in their childbirth stages were given, quote, "tracer amounts" of radioisotopic iron, which technically, according to standards were "no big deal," it turns out that 20 or 30 years later, a couple of them get cancer, or their kids get cancer, and we can't find out who those folks are.

Those are instances where there were actual people with name tags, experimental subjects, workers. Secretary

Richardson says we have no idea how much they were exposed to. We don't --

STINSON: Get to your point, Dan.

GUTTMAN: So the first point is, what do you all think the feedback mechanism is going to be if you are thinking about a rule? The second related point is we have the liability concern. Who is going to be stuck, when that mom has a child who gets cancer, on the other end of the litigation? What is unique about the industry we are talking about, as opposed to the steel industry, or any legitimate industry in this country, including tobacco, is the Department of Energy can't get sued. And those people who are under it in the nuclear biz have Price Anderson. To follow through, I assume, in your rulemaking, if you are thinking of one, you are going to think about feedback and who is going to have the liability at the other end.

And when you begin to think about it, the third thing that comes immediately to mind, from Paul's elegant thought experiment, is, gee, when the public sees that the people who are thinking about it have a grotesque conflict of interest, I would like formally to add to the letter that we made about conflict of interest, and punctuate it, it isn't BNFL that is the only problem, we now find out that the real driver here may be the Department of Energy. The only publicly stated promoter in this proceeding of

recycling is SAIC, I am told tens of millions under untold contracts, and probably didn't even go tell its sister agency, you have got our man, or our guy, or our girl hustling this advice.

So the question is, where is it in all of your studies and analysis on the risk analysis? You are looking at the feedback mechanism.

STINSON: Right. I think we got the three, and the liability.

GUTTMAN: Legal liability, and you are looking at 20 years from now people are going to say, well, it was just Mr. Lilly and SAIC promoting it, and they were in bed with the NRC.

STINSON: Okay. Who else just raised their hands? Susan, Cindy. Okay. Cindy, why don't you go, and then Susan and then Paul.

CARDWELL: Cindy Cardwell, State of Texas. And speaking as a regulator now, I just want to reiterate what Kristen had said earlier, and both -- Mike had mentioned the same thing, too. And it is on the issue of restricted use again, and the benefit perception -- perceived benefit with that. I agree, as a regulator, it has muddied the waters, to the extent that in the State of Texas we are right now proposing our decommissioning rules and are not proposing the alternative for restricted release or whatever it is

with the institutional controls. That is because we don't trust the institutional controls.

An analogy that Steve pointed out just this morning is the GL devices. Those are out there as GL devices, supposedly being controlled by institutional controls. That has failed. And we have a committee -- CRCPD has a committee right now working on it. Several point around here are involved on it, trying to somehow fix that problem.

Therefore, as a regulator, we don't trust that issue. And one of the reasons why is, as one of the people who has to develop our rules, I can't really attach a cost to the benefit because I don't see the benefit, as Mike pointed out. There is that alternative, we can do this, but what is the alternative? The alternative is unrestricted use. That is what people have bought into over the years. It is either licensed or it is unrestricted.

STINSON: Or they haven't bought into unrestricted release.

CARDWELL: Have not bought into the restricted release.

STINSON: But I get your point. Susan, and then I think Kristen and Paul.

LANDAHL: Susan Landahl, ComEd. In response to the question about the benefits from, you know, that the

upside, if you will, of going with unrestricted release, there is no doubt that there is a money savings, and there is a money savings to the nuclear power plants because they don't have to pay to survey to the same level of extent. We don't have to pay to dispose of the waste.

But that is not my platform. My issue is that there are millions and millions of pounds of material going to rad waste disposal facilities right now that has minimal risk and, as a result, on the other end, there is an environmental impact because we have to recreate more steel, more plastic, more chemicals, to take the place of that material, which, in my mind, is completely useable, and that is the upside. That is the benefit that I see to going to an unrestricted released. Thanks.

THICKMAN: There is a low level radwaste facility but the issue here in terms of benefit, as Mike was trying to say, is the fact that there is no societal risk essentially in material that has this low a level of radiation. If there is no societal risk, then the societal benefit for recycling this material is essentially the same as the societal benefit for recycling any material, right? So if the recycling system itself has a societal benefit, then this would share in it, and that is the point that we are trying to make here is that we ought to be able to put our material into the same process with the societal gain

that everybody else is using.

STINSON: Kristin?

ERICKSON: Kristin Erickson, Michigan State University, and I want to address the benefits from a completely different angle than anyone has here, maybe because what we do is different, being a research and educational, biological research and development institution.

I am going to name some benefits that none of you have heard of, and which are falling away and being lost because of the over-regulation, the cost of regulation, the cost of disposal. We are seeing businesses, researchers, uses, all kinds of things, stopping because of this kind of problem and that is my interest. It is not money.

Our waste program only costs us $20,000 a year at Michigan State. That is because we decay in storage. We do everything we can ourself down to nothing, and it is a good program, so it is not money.

Think of pharmacology and toxicology. What do they do? They develop new drugs for the benefit of people. What does civil environmental engineering do? They develop and they have done and in fact we just finished a project using bio-remediation for destruction of methanol in an isotope, which made it a safe waste when previously it was a mixed radioactive waste which couldn't be disposed.

They also develop biological organisms that go and clean up your monster oil spills. That is being done now all over the world due to that kind of technology and we are a leader in that.

How about the medical cyclotrons? How many of you know of those? Those were developed at our institution. They are now built and used all over the world to treat cancer. We all know all of the other medical uses.

How about biochemistry? Finding the genes that cause Alzheimer's, and I could on with a whole list of things.

How about plant biology, botany, pesticide research? I could go on and on and on with this list of departments -- microbiology, virology. We have about 70 departments at our university which utilize radioisotopes in peaceful ways in research.

Now what about the students? Over 70 percent of the degrees we confer, both undergraduate and graduate, entail some use of radiation to get that degree. Either they are using directly or collaborating with someone who does. These are our future people. There is no dollar value you can put on that. If we lose people, if we lose research, if we lose students who will not come to our university to get the degree because we can't do the technique, and I have begun to see some of this.

If we make it so difficult for them to dispose of their waste or do their research due to regulations or whatever have you, it impacts and it spreads fast. It only takes one angry PI hopping around the department, kind of, you know, swearing and yipping about the zealous regulators, which they consider me -- that affects. It affects now and, worst of all, it affects the long-term future. This is our future.

I have difficulty right now because we have high school students who come from all over the nation doing a national program in the summer, and they do real science in real labs. They use a little radiation sometimes or chemicals. We have to go through massive training, massive parental consents. There are so many ways that it impacts that no one really sees directly when we sit in a meeting like this.

You can't put a dollar value on that. It is monstrous the cost -- to lose any of those researchers, any of those research applications, any of that future science, much less our students and our future citizens of the world today. With the problems they will encounter, it is going to make our life look like duck soup in comparison -- easy -- and we have to remember that aspect.

STINSON: Thank you. Bill, you have been waiting -- if you don't mind -- Paul.

LIPTON: You have been talking about a restricted alternative involving staying within the licensing system. I am a little confused because why do we need rulemaking on that? That is already allowed. I mean if I want to transfer something to another licensee, that is allowed right now so I am not sure why that is a rulemaking alternative.

STINSON: Frank, you have an immediate thought on that?

CARDILE: That is a very good point.

[Laughter.]

STINSON: Paul?

GENOA: Paul Genoa, representing the Nuclear Energy Institute.

I want to take just a minute to acknowledge that we haven't done the job we need to do in talking about benefits and I wish I had Kathleen on our staff, but let me give you some comments that we will submit in writing to the NRC.

Nuclear technologies provide significant economic and employment benefits for the United States. An economic study conducted in 1995 by the Management Information Services, Incorporated, found that these benefits nationally produced 4.4 million jobs, 421 billion dollars in sales, gross national product, and 79 billion dollars in tax

revenues to Federal, State and local governments.

In addition to these significant economic benefits, nuclear energy provides 20 percent of our electricity without producing SOX, NOX or carbon dioxide and other chemical compounds that could contribute to acid rain, ozone, haze, greenhouse effects, and other current environmental concerns.

On a more personal note, medical diagnosis and treatment using radioactive materials is used annually to help 10 million Americans. Researchers also use radioactive materials to find cures for debilitating diseases such as AIDS and cancer. This is factual. These are the significant benefits that our society gains from the use of these technologies.

I recognize that there is a perception gap. We need to do a better job, but fundamentally avoiding an appropriate regulatory response or taking the wrong regulatory response doesn't help address the concerns. Fundamentally we can survive with the status quo, but if you establish a regulatory regime that is more restricted, significant portions of these benefits will be lost.

STINSON: Mike, we will give you a chance to add to that and then, Cliff, if you are ready we will turn to you.

MATTIA: Again -- and the reason why I argue the

way I do is because we are an industry. We are an industry that, much like the steel industry, has to sell its materials, and there is no argument, there is no argument at all that the nuclear industry has provided a great deal of benefit and service. There is no question on that to anyone.

Again, look at the public perception. Nuclear industry -- you have done a great service. You have provided us power. Now the question is you want to do what with your contaminated material? No, we really don't want -- thanks for the power, but we don't want the radioactive material coming out into commerce because you provided us the power. The power wasn't radioactive when you gave it to us, but the scrap material that you want to release is and the consumer is thinking I don't want it. If I wanted radioactive material I would go buy it, but I don't want it if I don't have to have it.

The same applies to any industry, whether it is university or whether it is medical. The benefits there are tremendous, but again the general public would ask do I want something that I don't need, that I am not asking for, meaning radioactive material, regardless of how low level. If you never released an ounce of radioactive material from a power facility, who would it hurt? You could indirectly say that the consumer would be hurt, but the consumer

doesn't see that. He has gotten the benefit. You have to dismantle and, quite honestly, what the general public is going to say -- "that's your problem" -- we have probably paid for the power facilities to begin with.

Same thing with waste that is from a research facility or material. You want to dispose of it? Fine. You want to sit on it? That's fine. You want to put it out for general use? That is not fine, because the public would feel what benefit am I getting from adding that amount of radioactive material to my environment when the alternative is "don't."

I am not necessarily arguing that that is a valid perception, but that is a perception, and for those of us in industry who are being looked to to take material, whether primarily a metal, and to use it to recycle into another product, we have to look at our consumer in the eye and say it's okay, you can take this little bit of additional radioactive material and use it, and the consumer will inevitably say "But if I don't want it, I don't want it and can you not put it in there?"

That is what we have had to face. An auto industry would say I don't care how many nanoroentgens are in there. If someone gets out and says, hey, you know, Ford made a bunch of Tauruses from radioactive materials, Ford Taurus's sales will go right into the toilet and Ford will

stop buying from that steel mill, who will stop buying from that scrapyard. That is public perception which is a reality and if we don't address that upfront then the material that wants to be released ain't gonna go anywhere.

I would venture one more comment is that the material -- yes, I know material has been released, and it is being released under Reg Guide 1.86, which is still potentially able of setting off a detector, which answers the question for the last few years why all this radioactive metal has been showing up in scrapyards that has nothing to do with the source. It is all this stuff being released under Reg Guide 1.86.

Again, the question is it is out there but it is not wanted because the perception is if it sets off the detector, if it has a radioactive designation, it is deemed as hazardous, as dangerous, and we have to address that first because unless you want to put it all into a landfill, you have to accept that the steelmakers and the recyclers and the consumers need to be able to tell you what they are tolerant with, what they will accept, how they will accept it, and who will accept it.

STINSON: Thank you.

MATTIA: And then you can have a rulemaking as to how to get it into that form.

STINSON: Okay. Do you have just quick comments?

Charles and Steve, Cindy. Do you have just quick comments? Charles, go ahead.

WILK: It's basically a question. Doesn't the permit or the license granted by the NRC include a closure plan and don't those closure plans include financial assurance that should cover the disposal costs of this material?

STINSON: Go ahead, Tony.

HUFFERT: I'll try to answer your question. What you are talking about is decommissioning and I think what we are talking about is something a little bit different.

This proposal would not necessarily be limited to decommissioning. It would be included with normal operations.

STINSON: The release of material would be included with normal operations, not just decommissioning. What you are talking about, those kind of parameters I guess are spelled out in decommissioning or licensees under decommissioning.

HUFFERT: 10 CFR, Part 20.

WILK: So the license is never -- did not cover financial assurance for disposal of normal production, waste from normal production.

STINSON: In the interim --

HUFFERT: It is my understanding the answer is no.

STINSON: Okay. Steve?

COLLINS: Steve Collins of the State of Illinois and the CRCPD.

The actual evidence from the states responding to the monitor trips is that most all of those responses are not the result of releases under Reg Guide 1.86 criteria. There are a few, but across the nation about half of those are due to naturally occurring radioactive materials that are and always have been totally unregulated.

Another one of the high percentages comes from those generally licensed devices where institutional controls have broken down. Whoever the general licensee is did not keep track of it the way they were supposed to, and send it back to the manufacturer for disposal. Basically all they had to do was keep track of it and when you are through with it, send it back, but their controls did not work and so it shows up at a scrap dealer. That's the majority, not Reg Guide 1.86 releases.

STINSON: Thanks for the clarification.

CARDILE: Could I just follow up? I just want to clarify one thing. We talked a little bit, and I don't know the gentleman's name, but we mentioned about the restricted use, the license restricted use, that maybe you should just take it off the table as far as any rulemaking.

I guess before we take it off we want to at least

think about and make sure we are doing the right thing, because I guess you mentioned about transferring material within the license and that is already okay, and so there's no need for rulemaking, but as we talked about earlier, the material we are talking about is potentially a tank or a pipe or some piece of equipment. If what you are talking about at this end for restricted use is a drum or a shield block, well some process has to take that material and convert it from the tank to the shield block or the drum, and I guess the question I would have is is that process licensed? Does it need to be licensed? How would we get the material from here to here?

LIPTON: There are licensed facilities that do that.

CARDILE: I was just going to say -- you may talk later or even in your comments you could present us with some more comments about that --

LIPTON: Ever hear of Metal Note -- I mean --

CARDILE: Excuse me?

LIPTON: There are licensed facilities that do that. I mean it stays within the licensing system. I mean I don't want you messing with that.

CARDILE: Okay.

STINSON: That was Bill Lipton -- for our transcriber. Cliff Honnicker. We are ready for your --

sorry to ask you to scream but that is basically --

HONNICKER: We are at 4 o'clock in the afternoon. Right behind us there is a party and it is not the best of times but it is not the worst of times either, and I am really grateful that you invited me to come.

I have been exposed to this nuclear issue since about 1973 when my mom first got involved in dealing with this issue and I don't have time to get into the whole history of it, but I wanted to bring this -- discovered in my mom's old files -- a 1980 letter that she wrote to the NRC that was dealing with this issue, this same area of rulemaking is shall we release this material into the open market and what is the environmental impact and what is the human impact of all that?

So I wanted to share with everybody here at the table a copy of that letter and you can even maybe get a chuckle or two, a little bit of deja vu, and a little bit of the industry response to well how would we deal with increased cancers, for instance.

Also, I want you to look in that letter and note that it was discovered that there were 5,000 public comments to this issue in 1980. My mother made a FOIA for NRC to provide her those comments and to provide her the responses that NRC made to those comments and that was never provided, so the interpretation of that is that the NRC made no

comment to those responses, but the endpoint was that the NRC denied in 1980 the ability to freely circulate this into the economy.

As I understand it, over the last 18 years there's been five attempts to circulate this into the economy, circulate new rulemaking and each time it has been turned down, so one suggestion that I would make would be that next time that you try this, and I have a suspicion, I mean I just have this kind of itchy feeling in the back of my neck that it is going to be rejected this time around -- I just have that feeling, so maybe 20 years from now when you try it again that you compose a historical record of the scientific studies that were done -- this SAIC piece that was done, this piece earlier in 1980 that was done, all the scientific record that was done, and to have that as the institutional memory.

It is like your fellow over here at EPA had no institutional memory of the earlier EPA positions, so that might actually save time and money and bring a scientific history to the whole issue and at the same time include the public's comments, the public reaction, the public response, so that you have a full picture of what is going on with all of this, okay? So that is the first thing that I am going to hand around.

The second thing I am going to hand around is the

letter from the EPA from 1980 that voiced the position of why the EPA took a stand against this. I think that the position that they took is remarkably similar to the gentleman in the metal recycling industry. It is just very calm, very straightforward -- here is the pragmatic problems that we face in dealing with this. It is not the full letter because I didn't, I didn't have enough time to copy their full page by page response to the EPA thing and that is where the ALARA comment came in, but I can get a full copy to you guys later, and then you all can distribute it as part of the public record.

Finally what I want to pass on is that my own participation -- we take full circle. The son steps in where the mom 20 years earlier was dealing with this issue. And I was, I've been involved in dealing with affected nuclear workers at the K25 site who'd moving thousands of drums of substance.

Okay, I'm not even gonna get into the issue of what they were moving. It may have been nickel; it may have been lithium; it may have been other materials. But the whole thing is sort of clouded in classification issues, and I just don't want to go there in this meeting. And I don't want to go where that material went, because some of it went off-site after hours, unmarked, etc., etc., etc. I don't want to go there. But that's one of the perception problems

that we're, we're gonna have to deal with all of this is the past record of, of the Department of Energy and its credibility problems.

The Nuclear Regulatory Commission -- these people down here have been incredibly polite, I thought, in not pointing out that the proof of the pudding is in the practice. And the proof of the pudding for the metal recycling industry is that the Nuclear Regulatory Commission historically has had to regulate license control nuclear material out there in the form of these medical source materials.

But you failed -- obviously, utterly, you have failed because it keeps winding up in their cauldrons. And it keeps costing them millions and millions and millions of dollars to replace cauldrons, to have these facilities cleaned up, to have workers' lost hours, lost wages. So the proof of your ability to regulate this material, to oversee it, to have compliance, to have radioactive police making sure that it's done 100 percent effective is not proven in their mind. I think that that was an unstated assumption today, and I think that it needs to be stated, that the NRC has failed in that. And so it's not perception that is the problem; it's the proof of the practice, is in what you've done in the past.

And as far as the Department of Energy, the third thing that

I'm gonna be passing along deals with the, my request for information regarding the recycling of radioactive material that is in part based on a billion dollar lawsuit that was filed at Paducah.

And that keytam suit, it was alleged on page 40, I believe it was, that radioactive metals -- particularly nickel, aluminum, uh, other materials -- were being melted, recycled, sent out the door. Right now -- 1999 -- with no regulatory oversight. That was in a lawsuit filed in July. Okay?

Now we had heard from workers that this was going on. We have heard now from a lawsuit and we have heard from other sources in Paducah and Oak Ridge that that was going on.

I wrote Chip Cameron on October 7th. And I'm gonna give you a copy of that letter, okay, that asks what, here's the scenario. This is what's happened, a rogue contractor, if you want to call it that, is taking radioactive material; they're melting it; it's not being decontaminated. It's being sent off-site; it's being sold to an intermediary. The intermediary disguises the identity of that material and then it's sold to commercial people. I said, who is the, who are the people that I need to go to at the NRC or the DOE to report this? What are the laws that are broken? Who is responsible for the wrongdoing? Who goes to jail if it's proven that this has happened? And

what recourse do the people who have bought that radioactive metal, what recourse do they have once that's been discovered?

Now, I sent that October 7th. And I also said, who the heck are these people who wrote this dadgum thing called NUREG 1640? Because I can't make heads or tails out of it. I want to see what orders they were given in writing this thing. And I wrote that October 7th, and I sent it confirmation of delivery, to make sure it got there. It got there. Cameron got it. He said he gave it to DOE people. I don't know if that was Dan Swede or Judson Lilly. But I would like to know who from the DOE got that.

And I would like to know why NRC nor the DOE responded to, to give us the answers to those very basic questions. The answer in itself may be, your non-response. It may be that there is no one to regulate. There is no one there to oversee. There are no laws there to deal with people who break the law, what we see as a very -- you know, no debate. You should not be selling radioactive metal into the market place.

So if we can't get compliance, regulation, oversight, on the current problems, why introduce a whole new layer, a whole new level of uncertainty into the equation? And I think that that might be part of the unstated but, to me, palatable message that is coming from

the regualtors.

And the last point that I'm gonna make is that, number one, the NUREG thing that you're implying is completely based on hypothetical numbers. What is out there is that the Department of Energy, the Atomic Energy Commission, ERTA may in fact have been involved in the recycling of radioactive metals as part of their operations. And there is ample documention for that, that Mr. Guttman wrote a letter to you guys on November 1, brought that to your attention. This July keytam filed in Paducah brings that to your attention. My October 7 letter brings that your attention. My August 7th or August 20th letter to Leah Deavers, the Head of Oak Ridge Operations -- brought that to her attention, and we asked for information. Give us the information. Tell us. But we get no answer. No response.

So it may be that classified national security issues are going on there that, that under the rubric, under the guise of national security, this material is moving around, either within the loop of government facility or being sold off-site. We have evidence that it is being osld off-site, has been sold off-site.

So that's something that needs to be dealt with, but I don't see anybody at the NRC -- and I mean, Chip Cameron is right up there in the top of the NRC, in the Office of General Counsel. If I can't get relief from him,

then what does the average citizen have in terms of protection?

And the last thing that I'm gonna say is that, that there is not perception that you can make rules on. You could make rules on basic proof. And the basic proof could be tracking down the affected people, both in the distant past, in the intermediate past, and in the current working area of people who are working around this and who are suffering from health problems.

You could look at their health problems and you could determine, number one, before it gets to a little kid with braces or to a woman with an IUD or the person with the frying pan, before you deal with those hypothetical situations, deal the proof. Deal with the real issue right now and look historically at the people who've been affected. That is proof, and that is something that you could make rulemaking on. But if you don't make it completely independent of DOE and NRC and its favored sons and favored daughter contracts, like the collusion between this SAIC issue -- and I see this is as collusion.

If you're unable, unwilling to provide the documentation on the contract between SAIC and the NRC, it's collusion -- then you have no credibility. And until you get credibility, forget it in terms of making this, these broad efforts to pass this stuff off to the public. And let me pass this

around.

STINSON: Great. And if you could start, maybe start one document in one direction and one in the other, people could take them --

HONNICKER: Well, I've got 'em all sorted out.

STINSON: Okay. Great. We are going to take a break. And what I'm gonna suggest is that we break for 20 minutes until 4:15, let these people get started. And we'll continue to work on the noise level next door. At that point, we're gonna come back and talk about aluminum.

Also, if you have any suggestions, Mike and I are both here and, for how to continue this discussion and make it most productive, material, my material, we are open to your suggestions. Thanks.

[Recess.]

STINSON: What a deafening silence. It really helps.

Okay, I understand that the group that is currently convened next door to us will not be here tomorrow. Everybody clap, yay. So that should be the last we have of that interruption.

Why don't we just walk through the table and see that we understand what each of the, what's meant by each of the columns and begin a discussion on aluminum to get a sense of whether we are gonna be able to explore aluminum in any

depth through this method. This is an experiment in itself. We're trying to see if there's a way to tease out some of the distinctions between different materials and what's gonna be necessary to understand the implication of control of different materials.

So first, why don't we see what Dan Swede has to say, and then --

SZWED: I just want to -- speak into the microphone.

STINSON: Yes, start with that.

SZWED: Speak into the microphone. I'm Dan Szwed. Just a few comments on the discussions over the last half-hour or forty-five minutes. We seem to want to take this restricted use issue off the table and go to a full, unrestricted use. And from my perspective, that's what we have today. And that's been unacceptable to the metals industry.

The way the metals industry has responded is we have installed very sophisticated, very expensive radiation detectors -- at the truck gate; at the railroad gate; on the scrap bucket; at the arc furnace, or whatever melting furnace we're using. We currently reject loads. We have rejected loads. And we'll continue to reject loads because of radioactivity.

We've heard about all of the wonderful things that radiation

or nuclear medicine have done for society, how we've controlled things by letting sources sit around for years and decay, but no one appears to have taken the initiative to solve the problem.

STINSON: Can you move the microphone just a little closer.

SZWED: We think the NRC has failed to control the encased sources. Industry again responded by going out and installing detectors. We needed to protect our workers. We needed to protect our product. And we've done so.

So with the inevitable of all the benefits that we've received from nuclear energy, from all the weapons development, the technology boom, clean nuclear power, the day has finally come where we've got to deal with the waste problem. This is not unlike what highly regulated industries like metals have faced over the last twenty and thirty years. Nobody liked the smoky skies; nobody like the polluted waters. Nobody liked the hazardous waste being shipped off-site from our facilities.

We were told, clean up your act, and we did it. And we didn't do it by saying to our customers, for every pound, for every ton of steel you take from us or you buy from us, you have to take a pound of our hazardous waste. The open markets just don't work that way.

It sounds like what we want is we want an open market, a

free market disguised as some type of very stringent regulatory control. And frankly it's just not gonna work.

STINSON: Okay. Peter, did you have a -- opening, closing type of comment?

HERNANDEZ: Peter Hernandez. I had a question. The comment was made earlier that institutional controls can't be trusted. And I believe that that's true. But I don't understand how you can apply that only to the restricted use option. Why wouldn't institutional controls not be trusted for free release as well? Are you saying that in the free release situation, everybody could be trusted to make sure that no material is released above the free release limit? STINSON: I'm sorry -- I'm sorry, you've gotta use a microphone. I'm sorry. I had to consult the -- do you have a question? Who'd you pose the question to?

HERNANDEZ: I did ask the question.

STINSON: To, to whom?

HERNANDEZ: The folks who are advocating eliminating restricted use category because institutional controls can't be trusted.

STINSON: Um hmm. Okay, so we'll give a chance for anybody to respond that would like to.

CARDILE: Can I just add a clarifying remark? When we mentioned earlier about taking it off the table or

not taking any restricted use off the table, we were only talking. And nothing's coming off the table today. Um, we're only talking about getting more ideas. We heard a little bit about how going from a license generator to a licensed product like a steel drum or shipping drum, or a shielding block may not need a regulation to be written because it's, it already can work under the existing procedures.

Nevertheless, it's still on the table in terms of trying to understand what can be done with this material. So -- and it would still be on the table in terms of explaining, I think to our Commission in March of 2000, here's the material and here's various things and here's what we've heard, and we've heard that licensed -- continuing the material in some licensed, uh, procedure or arena is a possible way to go.

The other thing that we want to make sure that we understand from everyone here -- we've heard a couple of different things. We've heard with regard to other types of restricted uses, where the material comes out of a license generator, it's surveyed, and once it's surveyed and leaves the control of an NRC licensee, at which point the NRC has no licensing control over it anymore -- it goes, for example, perhaps to a, a person who handles scrap, perhaps a steel manufacturer who would then send the material to only

certain uses, for example a bridge. Perhaps military equipment, such as a tank. Or it could just be thrown in a landfill, put in a landfill becuaes these exposure levels are much lower to the public.

So the question would become, the person who takes the material and brings it to a unlicensed use, how do we make sure that the material only goes to these uses where people are not exposed and doesn't wind up here. One way to do that is to just ahve some kind of -- I'm just talking off the top of my head -- some kind of tag on the equipment where you knew that, okay, it was only going to go to these restricted uses. Obviously, that's probably not gonna work, but what might work? Does the NRC need to license the manufacturer of the material to be sure that it goes to this military tank? Does the person who builds the tank need to be licensed by NRC in some way?

So you've heard a little bit here today about concern about whether institutional controls assuring that the material would wind up in these uses -- we've heard some questions about whether or not that can be trusted or not. And as I say, we really want to hear what your thoughts are about how to go from, you know, which of these is viable, licensed or unlicensed, and the path to get to them, which of those is viable?

STINSON: Okay, so continuing that discussion on

restricted, let's give Steve to answer the question about trusting institutional controls, at least as a start.

COLLINS: I'm one of the people that made a remark about the institutional controls, so let me clarify in the context of when I made the statement, because it's coming out differently now.

If the regulatory agency issues a license that covers certain material that includes what I'll call institutional controls now, but then they follow up through inspection and other accounting methods to make sure that those controls over a period in time are in place and are being followed through and are being kept. I have a pretty high level of confidence that things will continue just fine and compliance will usually be there and there won't be any problems.

It's when you set up a system that basically relies on institutional controls where it's unchecked, uninspected, unmonitored over a long period of time, that's where I ahve no trust or faith that the system will work. And the general license devices in the situation that we're in now that so adversely affects the metal recycle industries is my main example of that. That's a situation where, for certain categories of materials, generally licensed materials for certain of those, basically a system was set up, people were allowed to receive them, and there

was never any follow-up or tracking or no one ever going, in many cases, to ensure that those institutional controls were in fact maintained. And that's where the system has fallen down.

Some of the states, when we became agreement states, said that's not good enough, and we started going back and trying to rebuild the database and developing an accountability system to get control of that again. And some of the states have already completed that and have good control. The NRC is in the process now of regaining the control over part of that; it's very expensive to do that and it basically is gonna cost fees for all of those general licensees that, you know, prior to this time, never had to pay. But they are gonna bear the cost of this.

I'm sure the steel industry's response is, better them than us. and if they're the ones that's using the gauge and they're receiving the benefit of it, it's only fair that they should have to pay. Does that help clarify and answer the question? Thank you.

STINSON: Okay. Mike and Kristin, you've both got your cards up. Are you taking us into aluminum or are we continuing this discussion either about restricted -- okay. Go ahead, Mike, and then Kristin.

MATTIA: Is there a future for recycling uncontaminated material from nuclear facilities? I would

say the answer is yes, provided that the recyclers, the steel mills, and the consumers all agree on what "uncontaminated" is, meaning that it's not contaminated below a certain level, but it's uncontaminated.

Is there a future for reuse or recycling of decontaminated material or material that is contaminated to a low level, or both? I would say possibly, again provided that the people who are gonna take it and recycle it and melt it are assured that their workers are protected, that their facilities are protected, and they have individuals or consumers that will buy it. And that goes back to the premise of perception, that these things are, can be worked out. These things can be agreed upon.

But until, until you have consumers and producers agreeing on what are the ground rules and who will accept what, under what circumstances, under what definitions, you have almost the situation that you had back some years ago when M&M Mars stopped making green M&Ms, I think it was. Why? Well, because there was a green dye that was associated with having a carcinogenic effect. Now none of the M&Ms that Mars made used that green dye, but M&M sales dropped because you have a handful of M&Ms, you see green, they had to have been dyed, therefore, I'm not buying M&Ms --

COLLINS: It was the red ones.

MATTIA: The red ones, thank you.

[Laughter.]

COLLINS: It was in a red and green package.

MATTIA: I missed out on eating a lot of green M&Ms, then.

[Laughter.]

MATTIA: Again, it's perception. You know, the one thing we've seen in the U.S. market, as well as the world economy market, is that things can be worked out. The last thing I wanted to mention, we talked about global markets and I just came back from a meeting some months ago in Geneva that was hosted by the European, Economic Commission of Europe. And basically that meeting was convened because the steel producers in Europe were getting wind of the deregulation of the free release of material and were saying, in essence, what?

And they got together saying, we have to send a signal to the European Union that your release levels aren't necessarily our acceptance levels. And so now they've got a release criteria that is being passed along and adopted, and you've got steel facilities in that same European Union who are in essence revolting, saying I'll be darned if I'm gonna buy that stuff because you guys did not consider us when you passed this concept.

So I think what we need to do is learn from that

lesson and make sure that all of the stakeholders -- the consumers, the producers, the recyclers. They are in agreement as to what's compatible, what's usable, what isn't, what's acceptable, whose definition defines what. And then when you have that, then you can have a rulemaking that will determine how you take this material and introduce it into those markets that have said in advance, we'll take it.

STINSON: Paul, and then Kristin.

GENOA: Paul Genoa, Nuclear Energy Institute. Just a clarifying remark regarding institutional controls and what I would call compliance with existing regulations, just to make the differentiation. They are two different issues, and clearly one can look at the history of mankind and see that numerous mistakes were made but lessons were learned and we moved forward. You have to acknowledge that mistakes are made. You do your best to fix them and corect them so they don't happen again. But you move forward.

Now, institutional controls is assuming that some extra-regulatory activity will continue and impose a restriction on some activity. Given what we're talking about, we perhaps would allow materials, radioactive materials, to be fabricated into a railroad tie or a bridge girder. And perhaps it would be identified. Perhaps there would be records. Perhaps the railroad industry would take

responsibility to see what happened to. I mean, you could think of any number of restrictions. Whether they're effective or not is a different story, and you have to learn from that.

That is distinctly different from compliance with an existing regulation, which a licensee has a requirement to perform an adequate survey, conduct appropriate evaluations prior to the release of matieral. In this situation again, we have to acknowledge that people are human, they can make mistakes, or they perhaps could even do it intentionally. That's why the regulatory agencies, the NRC and the agreement states have an enforcement branch. They have inspections and they have enforcement and they can impose civil penalties. So I believe that it is possible to set up, and I believe that we currently have, a system that adequately protects public health and safety because of those elements. And I think the compliance, actually, in the industry, is extremely high. And I think that you, you could probably point to very limited applications in the commercial industry where non-compliance has resulted in a real injury to the public.

Now take that a step further and look at long-term institutional controls. That adds yet another level of complexity into the dialog. I don't believe it's possible to get there until you first set a free-release criteria or

an unrestricted release criteria, and that's the only reason I suggested that it may be premature to try to address restricted and unrestricted at the same time. I believe it's a step function; you have to have one before you can discuss the other rationally. Perhaps it can all be done in one rulemaking. I'm not sure.

STINSON: Kristin, and then Tony.

ERICKSON: Okay. I would -- Kristin Erickson, Michigan State University. I think that's what, in my view, this is all about, what we've been talking about here. We're getting to a point where what we need, and I think the problems we have now, are because we don't have a uniform standard that we all have to abide by that's very crisp, very clear, well published, well-known, and easily measured. We have that for air; we have that for water. And we all do that. We know our numbers. In fact, at MSU, we take ten percent of all of that and stick with it easily -- no problem.

Right now, we don't have that for solids. And because of that, you can see some fairly capricious applications and some capricious responses, not because anybody means to, but because if a person goes to NRC and proposes, well, I've got fifteen tons of soil and all I have -- I'll tell you what one person just did to me. "Well this amount of water, the tritium in this activation that we

might have is only the same level as what would go out in the sewer." I said, that has nothing to do with the health and safety and the contamination if it breaks and spills all over and we have to clean it up. They are two different animals. And you can see misunderstandings. You can see mis-information -- again, the other problem that I see that really needs to be addressed and that I will laud if it happens here -- a consistent, uniform defined set of parameters for the equipment and the measurements.

I've seen people take an instrument and say, well I found nothing; it was less than background, I mean it wasn't even background. What instrument was it? Well, it was a beta pancake. And what are you looking for? Iodine 125. That's a gamma; you can't find it. Or, I used that instrument for tritium, which no instrument can detect except a simulation counter.

I've seen these things happen from time to time with people out on our campus that are new learners. They've got a lot of things in place to prevent that from causing a problem. But those things do happen, and without a defined limit, first of all, and defined ways of detecting, you must use the appropriate equipment, calibrated for that isotope or for that radiation.

And you must prove with your measurements and with your calibrations that this instrument does meet this limit.

Right there, that's a big part of what we do at our university, and these are the kinds of standards that we need. And if we had all of that, that would be very easy to show you and the industry or anyone else -- the public or whoever -- what we are doing and how we are doing it. And it would be easy to administer.

STINSON: Okay, and that takes us to -- part of our discussion is, you know -- in terms of the alternatives for control for each of the different types of material, are there certain materials that might be more appropriate for a universal standard, as Kristin is advocating for, and others that might be more appropriate for unrestricted, or restricted release in some scenario where it's directed to a particular use, et cetera. So I want to move into that discussion. I want to experiment with doing it focused specifically on aluminum.

The other three materials that I've heard so far mentioned -- some in this larger group and some in sidebar discussions -- that we may want to add to this list are lead, nickel and medical devices, actually, and whether medical devices would be treated separately. So I pose that question at this point.

Let me just quickly walk through really what Frank's already covered in terms of each of these columns. If that's all right, Frank, I'll just quickly walk us through it. For

aluminum, for instance, if we could just have a little bit of discussion from you all as to what your experience is with aluminum. What are we really talking about in terms of the kinds of aluminum materials that are at decommissioned or at potentially decommissioned facilities, powerplants, or from other types of licensees? What's the current method of release of those? And -- I mean, how does it really work in the application of the case-by-case scenario? And I think that's, you know, that's the primary set of questions for column 2.

For, in the case of aluminum, what are the potential alternatives? Is prohibition appropriate for some reason? Is it a particular area of concern that would lead to prohibition of materials as being a reasonable alternative? And, you know, what about unrestricted release in the case of aluminum? What would be some of the market and other kinds of implications for that material in particular? If you were to establish restrictions on some of the aluminum materials that are currently released in the case-by-case scenario, how would that work?

And then talk a little bit about, well, how should the NRC go about analyzing the alternatives and completing different kinds of analysis to support a particular alternative on control of aluminum, what are the potential costs of those, and how do you ensure, you know, sort of

long-term institutional control, or what kinds of institutional controls might be of help?

Do you see where we're trying to head in getting into a little bit more specific conversation? One of the reasons for doing this, of course, is as much as we know and love and hear about the steel industry, there are other related industries and other materials that would potentially be affected by rulemaking by the NRC.

So we picked aluminum first because we thought maybe it's close to steel and some of the, you know, market impacts, et cetera, and you know, might be able to borrow from that discussion and expertise we've had in the three meetings already.

And I'm gonna ask, at least Paul, and maybe others in various industries, to try to kick us off in terms of talking about what happens in the current case-by-case release of aluminum or how, how might aluminum be impacted in certain industries. Did you have something, Dan?

GUTTMAN: Yeah, I've got a [off-mike]

STINSON: Okay. Let's --

GENOA: Paul Genoa, NEI. And hopefully this isn't unfortunate. I'm gonna give you some very limited experience with aluminum because, quite frankly, I'm not aware of large amounts of aluminum that are uniquely released from our facilities. I mean, you can envision

aluminum being in the carriage of certain types of equipment.

You can envision, perhaps, a little bit of aluminum angle iron used in very specific applications. You can envision aluminum soft-drink containers somewhere in the cafeteria. You can imagine some electrical wiring that might be aluminum, or there may be aluminum components associated with various electronic components. But aluminum is not a -- I'm not aware of it in a unique, pure form at any extent, at least in nuclear power plants where I have my greatest experience. It may be there, but--

But, for what -- and that complicates it because, again, in the real world, the aluminum we would find is probably part of the chassis of a computer or of some kind of radiation detection instrument. And we're not gonna take it apart to survey that one piece. We're gonna survey the entire part.

So the current mechanism would be, one, based on process knowledge. Do we believe there's a reasonable chance that this thing is contaminated at all? Did it ever go into a radiation-controlled area? Was it ever near any free radioactive material or contamination? Could it, through its fan, bring radioactive contaminated air through it in some way where it would collect? So you first do a process knowledge kind of assessment.

If you assessment says, yeah, there is a potential, then you would have to go ahead and survey. Generally, if it's aluminum, a metal, then it's going to be a hand-frisk. If it's a complicated piece of equipment, it may have to disassembled in some fashion. And if it's very complicated and there's a significant chance that it's contaminated, it won't be released because you can't prove that it's clean. And this is the problem.

Oftentimes we are repeating this as if all the material we're talking about is contaminated at this full level universally. And what I'm saying is, the bulk of the material we release may not be contaminated at all, and we're trying to prove that.

CARDILE: You mention --

STINSON: Go ahead and mention your name and affiliation.

CARDILE: Frank Cardile of the NRC. You mention that you frisk it and you say whether it's clean or not clean. What criteria -- I mean, you don't just say it's clean. You must, you measure it against some thing.

GENOA: Paul Genoa, NEI. As you know -- I guess I'm reflecting on a power plant situation. And we go beyond non-detectable; we go to no license activity, which constantly leaves us in jeopardy because someone can always look harder. But you guys have at least have helped by

saying, well this is how hard you need to look. And how hard you need to look is Reg. Guide 1.86, if it's surface-contaminated. And if it's volumetric, then we need to go to using gamma spectroscopy and other techniques to go down to environmental LLD levels, which are not provided for all materials, and certainly not aluminum, metal, or anything else. And so there's a giant hole in the guidance.

Fundamentally, we use the best technology we can to prove there's no licensed material there. And that basically is nothing detectable above background. And you can't detect below background.

STINSON: So, one of these would be helpful. If anybody has any experience -- I think what Paul is saying, it's small amounts of material probably mixed with other materials. If anybody has experience or knowledge of a case-by-case --

GUTTMAN: Yeah.

STINSON: -- application for release of a larger amount of material, that would be helpful. It sounds like Dan does; maybe others as well. Go ahead. You have to pull the mic right up to you.

GUTTMAN: Dan Guttman, PAICE. Yeah, I'm sure Judson --

STINSON: A little closer. Sorry.

GUTTMAN: I only know part of the facts, and

Judson will of course help me fill in the facts here.

Aluminum, of course, is among the materials at Oak Ridge that's contaminated in the compressor blades, and --

STINSON: Compressor blades?

GUTTMAN: Compressor blades, yeah. And, you know -- are you aware of that, Judson? And so, you'll help me. On the health environmental impacts quadrant -- you'll see why I'm going in this order -- there was no worker analysis, as far as we could tell, of any risk recycling. And if there were, it was filed in secret by BNFL with Tennessee, so who knows?

But, and the entity doing the recycling, MSC, was found to have lots of OSHA and other environmental kind of violations. And the Tennessee State Authority didn't look at any of this stuff -- as far as we know, but they're not responding to our letters. And most recently, about a couple of, a week or two ago, some union, president of the local union who was working on the BNFL contract, which is not the union I represent, to be clear, said that somebody's gonna get killed on the job and consumers should be pretty scared about it. So that's the health and environmental impact.

So the interesting question is the alternatives and the cost impacts. As Judson can fill us in, apparently, even though the contract was ostensibly terrifically vetted,

as you'd expect a quarter-billion dollar contract to be, nobody seemed to know much about this aluminum. And it appears to be volumetrically contaminated, and there appears to be some dispute between the Department of Energy and BNFL, MSC, Managed Reactor Sciences -- who's on first. And so, I'd like -- because this was all vetted so well, as Judson has made clear, Judson to tell us exactly how DOE and BNFL viewed this before the contract, the volumetrically, recycling potential, and where that dispute is now, what's going on.

STINSON: Well, one of the things to say up front is that what we -- while I understand that ultimately this material might end up in an, NRC-licensed hands, we want to focus on, I think, materials that are specifically under, right now under NRC --

GUTTMAN: Yes, Barbara. Let me just qualify --

STINSON: Maybe this can still illuminate the discussion.

GUTTMAN: Yeah, but this goes back to the discussion wehre I impolitely -- I apologize -- interrupted you earlier. To be clear, it's obvious that all of this stuff is for practical purposes, whether DOE's gonna default, take NRC or not. What DOE has basically said is, hey, we've got SAIC and BNFL recycling this, but we don't, so we don't want to too directly dump this out on the

market. We'll launder it through the NRC.

So what happens is, once the waste leaves the Oak Ridge facility, as the volumetrically contaminated nickel does, and as I presume the volumetrically contaminated aluminum does, although since there's a dispute, who knows where that's going? Then it is not DOE; it is TETA, Tennessee, which of course an agreement state; if it's got authority, we don't know yet. But it isn't DOE, which, at least according to DOE, would control the waste. It's Tennessee as a licensee of the NRC, so that DOE has calcualted this in a manner so that this is all, in fact, NRC jurisdiction, although NRC apparently is sort of playing along, perhaps through SAIC, saying what's really DOE.

STINSON: Is there anything that you want to say?

GUTTMAN: Yeah. If you can just tell us where that volumetrically contaminated material is, who's responsible or it, who's gonna pay for the recycling? Because that's the cost impact of it.

STINSON: Well, particularly if it relates to NRC having any jurisdiction over it, ultimately.

LILLY: Yeah, if the aluminum is volumetrically contaminated, there is no, nothing has been done to license the release of that as volumetrically contaminated. So that issue is still up in the area right now, as I understand it. There's some issue whether it's volumetric or surface.

GUTTMAN: But is there a plan? Because this was all vetted, the contract, as you were saying, two years ago. Presumably, people had a plan as to what was going to happen to this aluminum. Isn't there a plan?

LILLY: The elements of the contract gave BNFL the option to recycle metals. It did not dictate that BNFL would recycle metals. So it was a fixed-price contact. BNFL is trying to work it so that they get the best cost-benefit bang for the buck for those metals that can be decontaminated.

GUTTMAN: Isn't BNFL, in terms of the cost impact -- aren't they --

STINSON: Okay, this is --

GUTTMAN: Aren't they making a claim of cost impact? This is a case study. Nobody else has got anything --

STINSON: We don't know that nobody else does because they're still part --

GUTTMAN: Well, I just want to -- in terms of cost impact, isn't it true they're making a claim against you for misrepresentation?

LILLY: I'm not aware of any claim on the issue of whether the aluminum is volumetric or surface.

GUTTMAN: No, on the amounts of the material.

STINSON: Okay, I'm gonna ask you two to take this

discussion to the side and see if there are any other examples on aluminum. You know, maybe there's still some illuminating -- illuminating --

[Laughter.]

STINSON: -- elements of that that may be useful to draw out. But let's see if there are any other examples folks have. I don't know who was up first. Tony, go ahead.

LA MASTRA: Tony La Mastra.

STINSON: Speak up just a little.

LA MASTRA: I'm definitely not an expert on aluminum, but as part of some of the work that I've been involved with, with the ENCRP Committee, it appears -- and this will probably go under the health and environmental impact.

It apepars that depending on the process, if, if you have a cryolate-based process where you're essentially refining your aluminum using cryolate, that the cryolate will dissolve just about any metal so that if, if you have contaminated aluminum, it's much more likely that that will become, at least part of it -- again, I don't have partitioning factors -- but that part of it will end up in the aluminum, whether or not it's something that would normally alloy. It would be kind of -- as it was explained to me -- like taking a cube of sugar and dissolving it in hot water. So the cryolate essentially dissolves just about

any metal. And that could be transferred to the aluminum.

So in one respect, I think you ought to be reasonably careful, and probably ought to seriously look into what the metallurgy is and what the real partitioning is, of radionuclides that might be present on, you know, aluminum scrap, whether it's -- it is produced in large quantities or not. I mean, I think it's something I think the NRC ought to look at.

CARDILE: Can I ask a clarifying question, maybe of the group? We've heard at earlier meetings that the steel that can be recycled -- and Tony had a slide on the amount of steel at NRC licensed facilities -- is a small fraction of the total steel recycle, and therefore I think we've also heard earlier, why, a, there's no impact at all, so why, why recycle this material? It doesn't affect the recycling.

Is there any information here -- I guess Paul has talked about the fact that there's very little aluminum at NRC-licensed facilities. Do you have a feel on the comparison of that to the total aluminum recycling industry, whether it's also a small fraction?

STINSON: Mike -- no.

GENOA: Very briefly -- Paul Genoa, NEI. Again, I'll just go back to my own experience. At the last power plant I worked at, the facility had a carbon steel recycle

bin. They had aluminum recycle -- or, excuse me, a copper recycle bin. And they had a stainless-steel recycle bin. And they had a trash copper bin. I don't think they had an aluminum copper bin, but I may be wrong.

I mean, you know, maybe someone else and maybe in a non-electric utility application has sufficient -- I mean, aluminum's, it's out there. It's used in cooling fins; it's used in all sorts of things. But I don't know that we recycled any significant amount of it, and of course I don't know what the national output is, so I can't help you.

STINSON: Sounds like a number will need to be generated, if this is going to be pursued. Mike?

MATTIA: I just wanted to follow up with the question, since it was raised, that there, there is aluminum being, as I understand it, recycled, or is that a true statement? That there's aluminum being recycled from DOE facilities? I would be interested in getting an understanding of what is being recycled. What is the metal in terms of what is it being used as in DOE? Is it being recycled? Is it coming out as low-level contamination from DOE facilities? Is there contaminated aluminum coming out of DOE?

LILLY: This is Judson Lilly from the DOE. If there is aluminum being recycled right now -- if, and I'm not sure what the circumstance is. If it's being recycled,

it's either coming out as surface clean -- that would be the only way that it would be coming out is --

STINSON: Does that mean no detection? Surface clean -- does that mean no detection?

LILLY: No. It would mean, it would mean it meets the requirements of NRC 1.86. And it would depend upon whether it's being title-transferred to an NRC-licensed facility, and that would be, meaning 1.86. If it's being released from the DOE facility, it would be meeting DOE Order 5400.5, which the numerical values are the same as 1.86. That's how it would be done if it is going on right now.

What Mr. Guttman and I were trying to establish is, if it's volumetric, then there are no provisions right now for us to be releasing aluminum.

GUTTMAN: But it could be released --

STINSON: You've gotta use that mic, and you've gotta be recognized.

GUTTMAN: But they could be released to the --

STINSON: This is Dan Guttman from PAICE. Go ahead.

GUTTMAN: But they could be released outside the Oak Ridge fence, taken over by BNFL, and then sent to you guys. That's what might happen.

LILLY: Right. Sometimes the material is shipped

as radioactive materials to an NRC-licensed facility. And then at that point, when the title is transferred, NRC jurisdiction takes over.

STINSON: Go ahead, Mike. Follow up.

MATTIA: Just a follow-up question, just for clarification. If material is released either from an NRC facility or -- excuse me, from a DOE facility, and it meets Reg. Guide 1.86, is it a true statement that if it leaves a facility meeting that criteria, it does not have to go to another facility? It currently can be released right into commerce? Is that a fair statement?

LILLY: This is Judson Lilly, DOE. Yes.

GUTTMAN: I would disagree -- no.

[Laughter.]

GUTTMAN: Under 5400.5, it says that DOE does not have the authority -- obviously we have different positions, so I'm not saying I'm right, obviously, and Judson's not saying that the private citizens' position is right. But I think there's an argument that under 5400.5, Section 11j --

SPEAKER: [OFF MIKE]

GUTTMAN: -- the section having to do with -- as Judson correctly described, the transfer of this material, DOE can't transfer material to someone who's gonna release it for commerce -- you know, free release -- ultimately, without specific approvals, which in the case, say, of this

aluminum, have not taken place. That is, the approval of the Assistant Secretary of Energy, Environmental Safety, and Health. So there's a real question -- one of the questions that I think's gonna be before DOE soon is whether what is happening there in the BNFL situation is lawful, not only from the NRC position but from the DOE position.

LILLY: This is Judson Lilly from DOE again. There is a well-established precedent for materials to be shipped from the Department to an NRC-licensed facility for title to be transferred, and then for the facility to do surface decontamination, verify that it meets 1.86, and then release it into commerce. That's a well-established program that's been going on for years.

GUTTMAN: But you don't have any 1.86 volumetric standard, right?

LILLY: There -- to my --

STINSON: Right.

LILLY: I think the 1.86 --

GUTTMAN: It's surface, not volumetric.

LILLY -- volumetric --

GUTTMAN: There is no volumetric at DOE.

LILLY: There is a volumetric within DOE.

GUTTMAN: Within DOE, but not --

LILLY: Within DOE there's a volumetric; I'm not -- for the 1.86 I'm not sure how volumetric is handled.

GUTTMAN: It doesn't -- there's no, there's no Federal standard currently for volumetric.

STINSON: For volumetric, and that's one of the holes that's been identified. LILLY: What I was talking to was referring to surface release criteria.

GUTTMAN: Okay.

STINSON: Okay. So let's just take a time check here. It's 5 o'clock. We've got three cards that are up. I want to see if there's anything else that folks want to say. Mike has a follow-on, too -- see if there's anything else folks want to say about aluminum, as we've taken it so far. I mean, we'd like to have some understanding of folks' ideas on the various alternatives appropriate for aluminum, especially if there's any distinctions between that and the general conversation that we've already had. At least, get that far. And we've got, already, some thoughts on costs and environmental impacts up on the chart.

Let's see. Mike, did you just want to finish?

MATTIA: I just wanted to follow-up because, for clarification. What is the volumetric release criteria for DOE, and if something is released for volumetric decontamination and it then achieves that, is it correct to say that it can then be released to general commerce?

STINSON: And the line of questioning is relevant because of the precedent that it might set for NRC, and

telling you what material's already out there in the wavestream. Okay, Jud.

LILLY: Okay. The DOE standard that is relevant in this area is DOE Order 5400.5. The primary elements of that are related to surface release criteria. There is a provision within that, that allows for a case-by-case evaluation of any proposed release of materials. And that material would have to be released under DOE ownership and DOE auspices. But the screening criteria for that are one millirem or less. Less than one millirem.

SPEAKER: Per what time?

LILLY: Per year.

STINSON: Okay.

LILLY: And the operations office managers have authority to make evaluations. They need to demonstrate that an evaluation has been done and that ALARA is being satisfied.

MATTIA: So, just so I understand, the volumetric release criteria for DOE is a dose-based criteria, is that correct?

LILLY: Judson Lilly, DOE, again. It's close, but it's a case-by-case evaluation. So you are not able to say it's one millirem or lower, boom, out it goes. You need to do a case-by-case analysis of each specific proposal to do any recycling. So it's not, it's not a level standard. It's

a case-by-case evaluation that needs to be conducted.

STINSON: But at one millirem.

LILLY: At one millirem is the ceiling for that, where the operations office has the authority. There are releases that could be contemplated at a higher level, but then at that instance the headquarters office of Environmental Safety and Health would have to approve it. Once again, ALARA would have to demonstrated.

GUTTMAN: There is no current federal standard for volumetric release, that's what I understand, correct?

LILLY: We have a process, would be the best way to characterize how we handle that. And it would only relate to materials where we have the title and where it's being done on our sites under our control.

GUTTMAN: What we understand is that at least -- and I'm not sure what DOE is doing is lawful, as we will find out sooner or later.

But what I understand DOE is doing is they are claiming they are transferring the title. It's a little bit complex because the nickel, which is volumetric contaminated, is classified because the transfer title depends upon the declassification, in part?

But when they transfer basically the contaminated volumetric material outside the DOE property, DOE just says not our problem anymore. Then what happens is the entity

goes to Tennessee, say, and says, hey, Tennessee, you can do whatever you want.

And that's what happens. So DOE is sort of handing it off without any responsibility, without any assertion that you can only have it at such and such a level.

One of the issues that I think we'll now see discussed within DOE is whether they can do that lawfully under their regimen, which is this 5400.5, which cross references the 1.86.

STINSON: Okay, can we move on to some other points here?

LILLY: I would like to address one point there. The requirement that we had for BNFL was that they obtain a license and a regulator for how they would handle any materials shipped to their site.

They met that requirement by getting a license for the nickel with the state of Tennessee, so we did not throw up our hands; we required that they demonstrate to us that they had a regulatory basis to do what they have been doing.

STINSON: Okay, I'm conscious of the time, and we're going to take five more minutes, if you're willing, and wind up this part of the discussion.

Kristin and the Paul.

ERICKSON: Kristin, Michigan State University.

First comment: Aluminum is not an issue for most academic and medical institutions. We just don't have it other than little caps on our vials or something. It's typically nothing for us, incidental things.

The second thing is a question on this 5400.5. Is that one millirem per year per gram or for a whole item or what, that DOE limit?

LILLY: This is now a DOE meeting here.

STINSON: Thank you. I don't think you needed to state that, but --

LILLY: The one millirem is based upon the maximally exposed. It's a dose-based analysis. It's the maximally exposed individual is the scenario that's modeled for that circumstance.

STINSON: Okay, Paul?

GENOA: Paul Genoa, NEI. I guess I wanted to just try to help you work through the rest of the boxes, so I --

Again, aluminum makes it difficult. So the current controls are a survey evaluation, as I discussed before.

The premise of that is to allow for what I call process knowledge, or actually what EPA calls process knowledge, and what we would call an evaluation that may or may not include a physical measurement.

So, if you don't think it's contaminated, you

know, legitimately, and you are willing to document that, and willing to take the hit if someone questions you, you don't have to actually do a physical measurement.

And we think that is important, and has been practical.

The potential alternative controls are, you could say that you're not allowed to release aluminum, you have to save it. You could release aluminum only for disposal, either in a Part 61 facility or in a landfill.

You could release it for disposal and/or reuse, so that if you had an aluminum wrench, you could release an aluminum wrench, but you could not release it into scrap for recycling, or you could allow it for disposal, reuse, and recycling.

The health and environmental impacts clearly are directly linked to the allowable contamination associated with the material, and since we're not willing to talk about what that dose is, it's hard to assess.

But in the range that you're offering, which is 0.11 or 10 millirem annually to the maximally-exposed individual, I would say that the preponderance of evidence in the scientific community is that the health and environmental impacts would be very small, if not insignificant, inconsequential, or trivial.

The cost impacts are directly related to the

controls imposed on the licensee to monitor the material. If, as my example pointed out before, if you fly from an airport, you have to metal detector.

If it takes you 30 seconds to get through the metal detector, it's not a problem. If it takes you two days, people won't fly.

So, if the controls imposed on the measuring of the material require such scrutiny and such a level of forensic science that is an inordinate resource to evaluate the material, our business goes down the tubes and you can kiss the $400 billion in gross profits goodbye.

That's the worst case, and hopefully we'll come up with something that's rational.

The type of analysis we do today which is direct risking -- we also, I should say, for small tools, we can use instruments called box monitors, and if we actually had a standard, we could impose other automated tools.

Finally, the analysis needed, obviously you've pointed out how much aluminum is out there, what are the potential dose pathways, and what is the potential risk to the public, and what are the potential radiological and non-radiological impacts on society and other industries in general?

And, finally, controls. I'm not sure what you mean on that. I guess that's what level of control is

necessary to ensure that you meet the criteria that would be established. Again, that depends on the criteria established, and how hard you have to look.

STINSON: While you have the floor --

LESNICK: I was just going to ask Paul, given what you said, for you, for your industry, what would be your preferred alternative for control for aluminum?

GENOA: For aluminum, my preferred alternative would be to establish a realistic pathway analysis that would identify a critical group. I would establish a dose-based standard for that material that would be recognized by the international community as being safe, trivial exposure, et cetera.

I would then develop -- I would pass a regulation that put in place that dose limit, and then I would put in place guidance documents that would determine exactly what the requirements were to meet that. They probably would include, I would say, a stylized list of actual concentrations that we would be supposed to meet, sensitivities of instruments criteria and so forth.

And it would be the same for a power plant as it would be for a fuel cycle, as it would be for a university, as it would be, ideally, for a French radiopharmaceutical company.

LESNICK: May I ask anyone else in the group that

might have a different alternative for control for aluminum, other than the one Paul just suggested?

GUTTMAN: The difference between, I guess, Paul's perspective -- Dan Guttman, PACE.

I'm not purporting to talk about the electric utility industry here, but with the DOE situation, the error, the erroneous assumption in your analysis is that, in fact, the standard has got some relation to what actually happens in the real world.

To take the particularly unfortunate case we were talking about, Tennessee, you've had OSHA controls for workers in effect ten, 20, 30 years.

You had Tennessee regulating, overseeing that MSE facility, and you had the Department of Energy overseeing it, because they had a contract.

And people just kind of walk in after they award this quarter-billion dollar contract to MSE and find zero compliance with basic OSHA personal protective, lockout tag. They weren't even looking.

So basically, if we look at the empirical evidence, the rule of thumb assumption is that there will be no relationship at the DOE between your standard and the actual exposures. And there is no evidence to controvert that, as far as I can tell in this particular proceeding.

STINSON: And I think we've heard at every

meeting, concerns about being able to enforce whatever standard is set. It's going to be a continuing issue, and certainly you bring up experience that points out why that concern is there.

Susan?

LANDAHL: Susan Landahl, ComEd. I think there might be some misperception out there, based on this discussion with DOE and Reg Guide 1.86.

I just wanted to clarify that for NRC licensees, at least in the nuclear power business, we don't use Reg Guide 1.86. I wish we had a clear cutoff like that document presents.

So for us, it's no detectable activity. And that really is different than what I'm hearing from the DOE sites in terms of what they can release.

We would welcome having some numerical value, but we don't have that today, and we don't operate that way in the nuclear utility business. Thank you.

STINSON: Okay, we appreciate your patience as we've continued the discussion. Peter, you're trying to get in right under the wire, aren't you?

HERNANDEZ: Just a quick question for Ms. Landahl. I'm Peter Hernandez.

When you say that there is no detectable activity, can you translate that into a DPM?

LANDAHL: We have some industry guidance or sort of the practice that we've figured out ourselves. If I could use that box monitor as an example, we might set that for something less than 5,000 dpm.

But because of the uncertainty in the measurement technique and our desire to be conservative, it might actually alarm with a value of 4,000 disintegrations per minute.

And even though that's less than what we are calibrated for, set for, once we see that, once we get that alarm, once we know that we have licensed activity, we now treat that as radioactive material.

And when we have small volumes of material that we can't by NRC -- while they may not be regulations but certainly the way we have as an industry have interpreted what the NRC has been telling us, if we have a small volume of, say, an oil sample from a pump, what we do is, we put it on a germanium detector which is not going to quantify the volume for us, and we just look for a Cobalt-60 peak.

And if we can define that peak, we don't release that sample. And in that case, you may be talking about well, well below anything measurable by any other detection device, but we've been told, no licensed material.

STINSON: Thank you. That was a helpful clarification. Okay, let me just say that for tomorrow, you

kind of have a little homework for tonight, and I'm sure this will thrill you.

If you can, take a look at this table. Think through copper, concrete, soil, what kinds of materials, radioactive materials we're talking about for each of these, and how they're currently treated.

Take it across the matrix, if you will, and we'll try to walk through each material in a fashion similar to what we just did for aluminum. We'll do that for lead and nickel and medical devices.

I understand that Charles Wilk will be back tomorrow, so hopefully we'll get into some diverse discussion on concrete.

We need to take public comment, and I also want to find out how many people are going to be here tomorrow, sitting around the table?

[Show of hands.]

STINSON: How many people have to leave before 3:00 tomorrow?

[Show of hands.]

STINSON: Okay, we'll see how it goes tomorrow. We'll be as efficient as we can with your time, because I know some people have great distances to travel.

Anybody from the audience want to offer any thoughts on this afternoon's discussion?

BECHALK: I'm Christina Bechalk and I'm with Collier Shannon, Rill and Scott. We're representing the Metals Industry Recycling Coalition.

I just wanted to offer another alternative, and this is for aluminum. And this would apply across the board to all of the metals.

And we would support monitoring at the point of release. This goes to the whole issue of wanting a market solution and we would also support a market solution, but the real issue here is cost-shifting.

As I understand it, the nuclear power industry wants the metals industry to incur all of the costs associated with monitoring and keeping the radioactivity out of their mills.

We think that this problem is best controlled at the source.

STINSON: Okay, thank you. Any other comments?

LIEB: Rob Lieb, First Energy. I came with great expense to my company to be here. I have read a lot of material to bring myself up to speed.

The materials I received about this meeting did not indicate that I had to contact somebody to be a participant. And I find it very frustrating to be in the peanut gallery and to not be allowed, basically, all day, to provide any of my own input.

STINSON: Are you going to be here tomorrow?

LIEB: Yes.

STINSON: Let's talk after the meeting. Are there any other comments?

[No response.]

STINSON: Okay, great, thank you all for your time today. We start at 8:30 in the morning tomorrow.

[Whereupon, at 5:20 p.m., the workshop was concluded.]

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

***

RELEASE OF RADIOACTIVE MATERIAL WORKSHOP

***

Palmer House Hilton

State Ballroom

17 East Monroe Street

Chicago, Illinois

Wednesday, December 9, 1999

The Workshop commenced, pursuant to notice, at 8:37 a.m.

ANN RILEY
&
ASSOCIATES, LTD.
Court Reporters
1025 Connecticut Avenue, NW, Suite 1014
Washington, D.C. 20036
(202) 842-0034

P R O C E E D I N G S

[8:37 a.m.]

STINSON: Glad you could make it back. We have adjusted the table slightly. Let me just say a little bit about our approach to today.

First of all, be forewarned that all the excitement is not over even though this is the last of the series of four meetings. I do believe we might end with a bit of a splash. I understand there might be some environmental organizations that show up later in the meeting, perhaps with banners or some such accoutrements and also statements read and again, just so everybody is apprised of the situation there, I believe that the boycott of these meetings that was pursued by the environmental community proceeds in some fashion even through this meeting so some group of folks are continuing to express their concerns about these issues through a boycott and so we may have a letter that restates some of the issues that they are concerned about.

I want to start this morning by welcoming Rob Leib to the table. He made some comments during the public comment period yesterday and was interested in joining the discussion and so Rob, would you just mention your name and affiliation and how your responsibilities relate to these issues -- to the microphone.

LEIB: Okay.

STINSON: Now you, too, can be hollered at about the microphone --

LEIB: Okay. Rob Leib. I am with First Energy. I am a Certified Health Physicist and my job at First Energy is to protect the workers and the environment from the harmful effects of radiation while allowing its use for the benefit of mankind. As such, I am concerned about proceeding with some rulemaking so that we can have some reasonable release of materials.

I would like to state categorically that there is a level

and that I understand from listening to all the conversation yesterday that there is an awful lot of public concern and probably not as much really concern about the technical aspects -- that really is a level of non-concern from people familiar with the issues.

STINSON: Okay, great. Thank you.

Yesterday we had the opportunity to talk through a range of issues in a more general approach and I think we got a lot of good information on the record for the NRC. They have expressed that. In fact, there was a lot of good information registered and it was helpful to initiate the discussion material by starting with aluminum.

What we would like to do is continue in that vein, going material by material, and we won't be able to follow the schedule that is laid out here exactly because we have added a few materials, as you may recall -- nickel, lead, and perhaps medical devices, although we don't really have someone, I believe, from the medical industry that can really speak to those issues so it would be incorporated into the -- am I wrong about that? -- incorporated into the record for NRC to consider further, but perhaps we wouldn't delve into it too much today. Kristin?

ERICKSON: Kristin Erickson, Michigan State University. I can try to speak to that. We have a small amount of medical, nuclear med, veterinary nuclear med, but also I interact greatly and often with the 150 RSOs in our group and I will relay the need for them to comment, even written, to you after this meeting.

STINSON: Okay, great. I was thinking of you when I said that. Any questions? Opening comments? Mike, are you passing now? Go ahead.

MATTIA: Just as a follow up on your opening comments about the environmental representatives, I just wanted to note for the record at the Rockville meeting a representative from the Environmental Resource Defense Council did participate in the entire meeting and was I think of great assistance, so I wouldn't characterize --

STINSON: And Western States Legal Foundation.

MATTIA: Pardon?

STINSON: And Western States Legal Foundation.

MATTIA: So I think that there are entities that have boycotted but there are others who have participated, and I think it is important to note.

STINSON: Yes. That is the way that I meant to state it, by saying that the groups -- that there is a boycott that some have chosen to participate in and express their views through that boycott, but not everyone, and we also understand that a lot of folks will be submitting written comments boycott or no, so Tony?

LaMASTRA: Tony LaMastra, AISI. Just wanted to make a couple comments on some comments that were made yesterday towards the end, not so much for the elucidation of the NRC, because I think we have made them in the past, but perhaps some of the people at the table who haven't been to the other meetings and one was, what I heard expressed was again this idea that steel was inherently radioactive, and it really isn't.

I guess if you want to start counting atoms and down to, you know, 10 to the third, 10 to the fourth picacuries per gram, but from data that we have looked at the basic steel as it is made is very difficult to find any radioactivity in it.

STINSON: Why don't we try to take that up specifically when we get into a discussion on steel today?

LaMASTRA: Okay.

STINSON: Because we have heard varying viewpoints on that point in these meetings.

LaMASTRA: All right. The other I guess is a general idea, and it bothers me that in a sense the nuclear industry and also the NRC kind of go along with the idea that using the term "non-detectable" when in fact you are really meaning something less than 5,000 DPM per hundred

square centimeters. As a Health Physicist, that is detectable. I don't care if it is less than 5,000, less than 4,000, less than 2,500 DPM, it is detectable. A good surveyor with a proper instrument can see a definite increase above background, and I think we ought to stop using this concept that we are releasing stuff that is not detectable because you are.

When you look at what is possibly being released either under 1.86 or under -- if you take the guidelines in NUREG-1640, many of the gamma emitters released at those levels in relatively small quantities a couple tons in a load of scrap, will be detectable using today's modern scrap detectors, so if you are under this idea that releasing it at whatever -- 3,000, 2,000 -- is something that is not going to be detected by the industry, please be advised that it will be and it will cause alarms and it will cause rejections.

STINSON: It looks to me like folks want to pursue this topic just a little bit, so Paul, do you want to follow, and then Kristin?

GENOA: Yes, good morning. I am Paul Genoa, Nuclear Energy Institute, and Tony's comments go to the heart of one element of the issue, which is detection of gamma emitters, which is a pretty straightforward process, but it ignores the vast majority of radioisotopes that are not gamma emitters.

You are not going to see Carbon-14. You are not going to see tritium. You are not going to see Iron-55. You are not going to see any of those isotopes under that technology, so the technology that is being used by the steel industry to protect them from orphan sources is one issue, but the release of materials from facilities that may be clean and need a standard to verify or to use for sorting is another issue. I would like to talk more about that issue sometime today.

STINSON: Kristin?

ERICKSON: Kristin Erickson, Michigan State University.

I appreciate the comments but I respectfully disagree with both of what they have just said. That may be true for some facilities, some technology, but Michigan State and at most institutions of our type, we are going down to background or less than background on the proper calibrated instrument.

To release ash, for example, we are going to the MPC program, which is 10 to the minus fifth levels even for Carbon-14, and you can detect those with a good Ludlam Geiger counter. You can calibrate for that. You get about 5 percent efficiency. You correct for your DPMs, geometry, et cetera.

You look at the attenuation of the volume -- as I said, about a drum of metal, we have gamma spectroscopy for those gammas and we can detect extremely low things because we have to. Same for even releasing a pipettor or our lead that I went through a couple of weeks ago, tons and tons of lead, right down to the background, looking at within the statistical standard error or the means for the background. On some of those cases we have to go far beneath that -- Iodine-125 ash we are looking for less than 2 DPM. We prove, we see it with NIST certified standards, spiking the ash, et cetera. We have got procedures for that.

So those technologies with common instruments are capable -- are available to be done, although it is a misperception in many institutions that you can't see C-14 or P-33 or some of the lower energy isotopes. Tritium you don't see with a Geiger counter but we use liquid scintillation techniques, again getting very, very low like that. Thank you.

STINSON: Okay. This is helpful -- bringing information forward in terms of your experience and the materials that you work with and equipment that you work with is I think very helpful to the NRC -- part of what they are looking for. Tony and then Mike.

LaMASTRA: Just as a followup -- Tony LaMastra -- as a

followup to Paul's comment. I think the metals industry is well aware of the fact that it is very difficult to detect beta alpha emitters and they definitely don't make any pretense that they are doing that, but I think what we have a problem with is the use of the term "non-detectable" and when good science shows that it is detectable and the continuing using of that term makes it sound like you are releasing stuff like the materials licensees down to some, you know, really non-detectable level.

STINSON: Tony, do you have any solutions for that? Do you have any alternative terminology acceptable to the industry? Not that we are going to try to turn over the terminology in the industry right now but --

LaMASTRA: Yes, basically state that you are less than some DPM per 100 square centimeters. Admit that you are releasing something that is detectable. If it is a standard, if it is acceptable, fine, but, you know --

STINSON: Okay. We are going to take about another five minutes on this topic. I am seeing Steve Klementowicz standing. Do you want to come up here, Steve, and take a seat with us, if you will -- we have your card here somewhere.

KLEMENTOWICZ: Steve Klementowicz, NRC. I would like to respond to Tony's comments.

Regarding the use of the term "no detectable" we essentially have to use that in the power reactor space because there are no release limits. This is something that has been put forward in the absence of release limits since 1981. We have a circular that addresses how hard you have to look and it essentially equates to the 5,000 DPM, but again since there are no release limits we tell licensees how hard you have to look and therefore it becomes "no detectable" -- if you look that hard and do not see anything.

We realize with the scientific technology you can look lower

and lower and lower, but in the absence of a rule we have no release limits, so until we have a national standard, be it zero or whatever value, we are locked into this, otherwise we would be establish a limit without going through a rulemaking process.

STINSON: That is helpful.

KLEMENTOWICZ: So we are kind of stuck.

STINSON: That is helpful, hopefully illuminating some of the struggle with this issue. Mike, and then I am going to jump to Steve, if you don't mind, Paul, just to let him weigh in here.

MATTIA: I would like to take the opportunity and ask Kristin, because I could use the education, other than medical waste, what kind of material that still has some residual radioactivity is being released from health care or research facilities that is what you would consider recyclable or reusable?

ERICKSON: Well, the common thing would be lead shielding. We get the materials inside of a lead container of some sort or the shielding itself inside of a scintillation counter. We also have a lot of inherited lead waste, those ancient, huge three inch thick lead boxes and so forth -- that is one category -- and then we have, well, let's see -- were you talking medical only, were you asking? Any academic? Okay.

Well, we have an accelerator and our accelerator activates materials, so even the Geiger counter that they left in the vault one time came out radioactive for a few days, so everything from tools to the beam lines to any parts that are in there, screws, nuts, bolts, all of that stuff we have controlled in a room where there are drawers and they can't even take a screw out of there without checking it with our instruments -- so that is another kind of waste.

Then there is a typical what I call biomedical R&D, research and development, type of waste out of our research labs which contain typically paper, plastic gloves but can also contain glass stock bottles

and lead containers for those, sometimes small pieces of metal.

We have one lab there that has soil because that is what they do the research on, so it can really range a little bit of everything and a lot of some things in a big university like ours.

STINSON: Any substantial amount of copper?

ERICKSON: Well, right now I have several tons of copper that I am going to free release on Friday, hopefully.

STINSON: Good. Well we will turn immediately to you --

ERICKSON: They sent it to us as storage material and it probably is not hot. It was part of a cyclotron that they took apart and it is a one-time thing but it is tons, really tons of copper, so we have a lot of odd things in our institution. Thank you.

STINSON: Okay. Steve Collins.

COLLINS: Steve Collins, from the Illinois Department of Nuclear Safety -- mostly in agreement with the comments made about the use of the term non-detectable. Any time we use that, and we do occasionally use "non-detectable" or "not statistically different from background" we always when we use that make sure that we have defined the instrumentation used and the confidence limits with which are talking -- otherwise it is so vague that you can't tell what you are talking about.

STINSON: Paul and then Tony.

GENOA: Paul Genoa, NEI -- and I just wanted to correct a misimpression.

What I was saying is that a portal monitor based system at a steel yard is not going to see those other things, but as Kristin was saying, we do have the technology to detect very small amounts of radioactive material, but the difficulty and the resources needed to check lower and lower and lower, closer and closer to zero becomes exponentially higher and that is the same idea that I was trying to convey with the idea of going through the airport metal detector.

You know, we are all willing to sit there for 30 seconds or a minute or a couple minutes to protect the safety, but if it gets into days and weeks to prove that you don't have metal on you, it is just not an effective tool anymore and the industry goes away.

You can spend an inordinate amount of resource trying to get to those levels, you know. The detection is based on the instrumentation. It is based on the volume of the material, and it is based on the length of time you count so you can count infinitely long if you need to. Obviously that is not practical, so a clear, consistent standard would help define exactly what conditions you have to impose on the counting of various materials.

LAMASTRA: Tony Lamastra. I guess what bothers me is the concept of the double standard.

The NRC is saying that they don't have guidelines for the nuclear power industry, and that, therefore, the nuclear power industry has a certain effort that they have to put forth to find something.

If a reactor releases a piece of metal that has, let's say 2,000 dpm per 100 square centimeters on it, and it sets off an alarm at a mill, it goes back, and there's nothing really done about it.

If Kristin releases some absorbent towels with 2,000 dpm, it goes to a landfill, it gets discovered, she gets fined.

To me, that doesn't make any sense.

STINSON: And I think you're getting at an issue that is a little bit at the heart of some of the misunderstandings, or at least ways in which people are crossways on this issue.

I have heard differences of view on this that reflect Tony's and others. Do you all want to pursue this a little bit? Is it valuable to understand?

LAMASTRA: We have to clear up a misperception.

STINSON: We can do that. I just want to be sure that you all are all behind pursuing this discussion a little bit, and then

getting on with the material-by-material.

We'll give you guys a chance to clarify Ton's point.

Kelly, do you have something related to this, or are you going to take us in a wholly different direction?

CROOKS: No, it's related. Kelly Crooks, U.S. Army. Dave and I have kind of stayed out of the discussion so far, just because it's pretty much all centered in metals and we just don't generate a whole lot of contaminated metal.

In our real-world experience with at least surface-contaminated metals, we found, at least for our typical waste streams, that it's not worth the effort to decontaminate the metals and then verify that they're clean.

It's cheaper just to go ahead and dispose of them. And some of the thoughts I had, listening to the very good discussions from yesterday -- but I really wondered, when you're talking a limit of one millirem per year, you know, what would that equate to in terms of the concentration limit?

I'm guessing it would be fractions of a picocurie per gram. Again, getting back to the real-world scenario, I'm thinking that at a typical Army installation, how would we grab a representative sample of the material?

Who could we send that sample to, to have it read to verify that we've met that fraction of a picocurie per gram limit? How long would it take; what would it cost to do that kind of sophisticated sample analysis?

Then, of course, at the very end is, is it worth it, versus just disposing of it right from the get-go?

So that's just kind of our perspective from an institution that has a lot of generators spread out over hundreds of installation that maybe don't have big volume waste streams at any one, but have a lot of little ones.

STINSON: Okay, thanks, Bill, for letting him jump in there.

LIPTON: Bill Lipton, Detroit Edison. I want to build on what Susan said yesterday. There is a big difference between undetectable with an LLD of like 5,000 dpm or so many microcuries per gram, and saying less than 5,000 dpm or less than so many microcuries per gram.

If you -- that LLD is the 95 percent -- generally taken as a 95-percent probability, meaning if it's less than that LLD, you know, maybe you only have an 90-percent change or an 80-percent chance, but you're still likely to detect it.

And if you detect it, then it doesn't get released.

The second thing is that we use a system similar to what Susan described as used at Commonwealth Edison, and I have found, in general, one thing is that we only evaluate for free-release materials which we would presume to be clean, which have by their history of use, have not come into contact with contamination, but have been in our restricted area.

And we're just confirming the absence of material. I find, generally, that you find very few borderline cases.

If we detect something, generally it's way above any detection limit. It's very rarely that you find activity that's right at the detection limit or just above it. If we find something, there is usually no doubt about it.

So I find the materials that are being evaluated are not really a continuum, but it's more a dichotomy. You have the clean materials, and then you have the materials which generally are contaminated way above the established detection limits.

STINSON: Tom, and then Steve. You need the microphone.

CIVIC: Tom Civic from AISI. I wanted to respond to Paul Genoa's comment regarding the backlog at the x-ray machines at airports.

And mainly because I think this issue of passing on the

detection to the downstream user is not an acceptable solution, either. It does take time to run every piece of steel through a scrap monitor.

You can go see the trucks and the rail cars backed up, running them through detectors to ensure that the radioactive materials are not present.

If the steel industry can do, then it ought be done with that same degree of proficiency at the sources as well in terms of backlog, at least for certain materials.

STINSON: Steve?

MR. KLEMENTOWICZ: Steve Klementowicz, addressing the no-detectable issue: This no-detectable issue, as we can see, is very complicated and complex.

But let me clarify that the NRC does have guidance, and that's Circular 81-07, and the followup information notice, 85-92.

In Circular 8107, it specifically uses the value of 5,000 dpm per 100 centimeters squared, which over our discussions here, is equivalent to what is in Regulatory Guide 1.86.

But again, for power reactors, since they do not have release limits in their license, other materials licensees do have Reg Guide 1.86 values as release limits; however reactors never got that option.

There was always some hope that the NRC would develop a release standard, and that's never happened. So what we're left with is this no-detectable. We establish how hard you have to look, we call that no-detectable below that, and there is a liability.

If a licensee releases a material using that survey and says it's no-detectable, and it's released, if that licensed material is found by someone else using more sophisticated instrumentation, the licensee that released the material is cited. That is a violation against Part 20.

Licensed radioactive material was not controlled, it was

inappropriately released. There are no release limits in Part 20, so we go through this vicious circle. So it drives the detection.

What it is doing is driving the detection capabilities lower for the reactor industry. So what you may hear from some power reactors is that they are doing better surveys using more sophisticated instrumentation than the old guidance said that you should do.

So what we have is the technology-based standard. So when I say no-detectable, that could be all over the place from 5,000 dpm down to people using gamma spec systems to extremely low levels.

But again, if someone comes in with a more sensitive instrument and does a survey, the licensee that released the material is cited against Part 20. And this has happened many times, many, many times.

And that's a problem. It's a technology-based standard right now with no lower threshold, and that's the gap.

STINSON: And from wnat I understand it's a lot of the reason why this rulemaking is under consideration, right there.

I know that we have a couple people that want to make comments. If you don't mind, Kristin, let's wind this subject up, and let Paul and Peter make a couple comments.

Paul? You're on this issue, right?

GENOA: Yes. And, again, we fully believe -- Paul Genoa, NEI. We fully believe that we need to monitor at the source. We do monitor at the source, and our detection capabilities exceed yours, because of the geometry that we use. So we're not expecting you to catch our mistakes.

And the truth is that you're not monitoring because of us; you're monitoring of non-licensed users of radioactive material sources that have let them escape.

They didn't come from the nuclear industry, generally. So we do take the responsibility to sort our materials. We have very rigid

standards, very systematically -- and we have intense oversight by a regulator. They live on our property.

STINSON: Peter and then Robb.

HERNANDEZ: Peter Hernandez, AISI. I believe that the point Tony was making is that from a practical standpoint, the 5,000 dpm, even though it may be part of a regulatory paradigm, is not going to be -- is not going to prevent the material from being rejected at metal melting facilities.

The detection equipment, and that the real detection levels are about half that in these mills. The detection equipment was put in place, as Paul indicated, to try to detect these orphan sources, but they also are used to reject NORM and any other material that is above the detection limit of these instruments.

That includes materials that may have come from any facility that may be contaminated above the background level. The other thing that we've learned is that -- well, I'll hold the rest of my comments till the steel segment.

STINSON: Okay, that would be great, thanks. Robb?

LIEB: Robb Lieb, First Energy. I have a couple of things, one technical, one on perspective. I keep getting back to this perspective issue. I think it's the most difficult thing that I see for the rest of my career to deal with.

At nuclear power plants, we not only monitor materials and equipment to the detection limit of 5,000 dpm per 100 centimeters squared, but we also monitor personnel to that level.

To date, we have had no deaths in the commercial nuclear power industry from contamination, from exposures to external dose, or any other radiological reasons.

On the other hand, for perspective -- and we need to get a reality check here on perspective. There over 800 deaths per week in traffic accidents in this country.

Now, I'd appreciate some suggestions on how to get the public to understand the risks we're really talking about here. We're really not talking about significant risk from radiation when we release items at the detection levels of the current guidance.

On the other hand, I think that the question Tony and Peter were talking about with detection levels, we need to address what the monitors are set for as far as capability for detection.

I don't really understand why they are set the way they are. Maybe separately we could talk about that.

STINSON: Okay, Frank, you wanted to reflect on something that Tom said. Do you still want to?

CARDILE: Yes, it just had a quick clarification. If we were to go back to the -- you made the point about -- and I think the point has been made a couple of times about NRC trying to pass the problem down to the steel industry, or the steel industry having to do their own reviews, et cetera.

If you go back to the slide that we put up yesterday with the flow diagram, no material, as Steve just talked about, and I think Paul also talked about, no material leaves.

If NRC put out a rule about what the standard -- say, for example, a millirem -- no material would leave the NRC licensed facility without the survey at that point to verify that the material had met this standard.

So the idea is that -- so they would have surveyed that material to make sure that it met the standard, and not pass it on to the steel industry.

Now, the point was made, kind of interestingly, here a moment ago, that while the steel industry has its detectors in there to look for orphan sources, and it rejects a variety of things at very low levels, I guess my question, perhaps, back to the steel industry would be, if NRC had a standard, if we put out this standard, and if there was

a survey when the stuff left the site at a level like a millirem, which is still a millirem above background, you know, would the detectors at the steel industry go off, and would the steel industry reject that material that NRC had said, okay, this is safe? It meets our standard.

STINSON: Frank, if you don't mind, at this point, since you offered, Peter, to take this discussion into the steel session, I'm going to ask us to hold that question. That's a great way to initiate the steel discussion.

And just to be sure that we don't again focus exclusively on steel during one of these meetings, I'm going to ask us to take a breath here and shift to copper. Is that okay with you?

There are a number of good issues that have been t'd up for further discussion on steel, an Peter has one he's going to raise as well.

CARDILE: Although, Barbara, I would ask, as we discuss all the materials, including trash that goes to the landfill, the same question holds. If NRC said, all right, this trash is okay at a millirem, and it went to a landfill, would the landfill detectors say, please see it, it's above background, get it out of here, send it back?

STINSON: Yes, that's a good point.

LAMASTRA: Could I just make a comment on that, in general? Tony Lamastra.

Frank, the capability of today's scrap monitors, which is also transferred over into disposal site monitors, landfills, incinerators, although they tend to use smaller volumes of detectors, have extremely low capability -- low sensitive -- not low sensitivity, high sensitivity.

And, again, just forget the fact that they can detect beta and alpha. At the concentration levels in NUREG 1640, assuming about five tons of material that's contaminated not at 5,000, but at 4,000 dpm per 100 square centimeters, or at a lower level in the volumetric.

You're looking at Sodium-22, Potassium-40, Manganese-54, Cobalt-60, Molybdenum-93, Niobian-93M, 94, Silver-108M, Antimony-125, Barium-133, Cesium-134, 137, the three Europeans in NUREG 1640, Radium-226, and its daughters, 228 --

STINSON: How long is your list, Tony?

LAMASTRA: Just one more. Practinium.

STINSON: We really wanted to reserve the steel discussion for later.

LAMASTRA: No, this isn't steel.

STINSON: Well, I understand, but you're also focusing on your own volumes, et cetera. Do you want -- I mean, do you mind if we save this part of this?

LAMASTRA: Basically, you're looking at a detection system that has the capability of finding material at that one millirem per year. So, yes, to answer your question, yes.

CARDILE: You would send it back?

LAMASTRA: Oh, definitely, if it alarms. No -- very few people are rooting through the loads, and it would go back, yes.

STINSON: Detecting all of those materials that you just listed.

LAMASTRA: Whatever it is that causes the alarm, the plant is not going to try and find out what it was. It caused an alarm; it's going back.

STINSON: Bob, you have a card up here if you want to come join us. Charles are you on this point, or do you want to take us into copper?

WILK: Before we go into copper, this is a question concerning procedures. I should have asked this perhaps yesterday. This is Charles Wilk from Portland Cement Association. The comments that you're taking into, that you're recording and transcribing in the past two days, do these become part of the administrative record?

And if they do, do they become responded to in a response to comments in proposed rulemaking, or the final rule that comes out? Are the questions and responses to the questions published in the Federal Register?

COOL: You really have to swallow this one. I hope you don't have a cold, Barbara. The answer to both of those questions is yes, if we get to the point where we have a Federal Register.

First of all, these are being transcribed, and these documents will be public and part of the administrative record. Part of what my next step is -- and we are going to talk about this a little bit later -- is to provide all of this information to the Commissioners so that they can consider what the next step should be.

We will certainly characterize these comments to the Commission as part of that. We will not attempt, on a comment-by-comment basis, to try and provide a response in preparing that document for the Commissioners.

That would be something that we really wouldn't be able to do in the timeframe that we have. However, they continue to be part of the record, and should the Commission direct us to move forward, then we would, at least in general terms, category-by-category, topic-by-topic, need to look at this information in preparing our Federal Register notice.

So if you're looking to the specific answer to the specific question raised by X-participant in meeting number 3, no, I'm probably not going to be able to show you a specific line item in a Federal Register that enumerates it in that detail.

However, it would be our intention to try and deal with all of the types of comments and the assertions made as part of a Register, if we get to that point in the process.

WILK: So, I understand, what you mean by dealing with these questions, would you -- I understand that process that you would want to

group questions that are similar.

What I'm asking is, within the Federal Register -- if there is eventually a Federal Register notice that's published about the plans, would there be responses from the NRC to each of the specific -- the generalized questions, or the groups of questions?

STINSON: Yes, so there would be general groups of issues raised by participants that led the NRC to make the decision that they make in this, so there will be the answers to those that hopefully form a logic train.

WILK: And then the NRC would say why they found those comments persuasive, or why they were not persuasive. Okay, thank you.

STINSON: Bob, we're going to ask you to hold, if you're going to make further comments on Tony's and Frank's discussion. We're going to ask you to hold that to the steel.

Is it something else? I'm going to ask first that you wait.

MECK: That's not the nature of the comment. I have an overarching thing that may help the discussion across all materials.

STINSON: Okay, great.

But first we'll turn and let you -- can you --

CARDWELL: This is a response to Frank's -- Cindy Cardwell, State of Texas OAS.

And it's a response to your question, Frank, and it does cross all lines. It's not just the metals. It's going to apply to soil, trash, construction debris.

From a state perspective, the answer to the question is will they reject it, and they being landfills, scrap yards, steel mills; the answer is yes.

And that is not only when those hits occur will the locations reject it, but typically a state inspector will respond in some form or fashion.

So you're looking at state regulatory resources being used

for those hits, and that experience goes for materials that are contaminated above background, because that's typically where the detectors are set, and I'll point to those states -- and there are many of them that have NORM standards in place right now.

They're also looking, in addition to those generally licensed gauges, orphan sources that are out there, they're looking for NORM. So they are set at background, and even though our NORM limits in most of the states are above that at some level, they will reject the loads.

It is rare for them to sort through a load.

CARDILE: Just for clarification, if NRC -- Frank Cardile, NRC.

If NRC proceeded and did a rulemaking and had a level at a level slightly above background like a NORM, there is a potential that material that was released from the licensed facilities would be rejected at these various locations?

CARDWELL: That's a very good potential, based on our experience in the states. I will speak for Texas now. We consistently get phone calls from companies and facilities that have released NORM materials, in particular, because we do have levels for NORM that are definitely above background.

And they say that we've done all the tests, they meet your exemption levels, the facility -- it set their alarm off, and they won't take it, and we have to tell them that that is their right to reject it.

STINSON: Thank you. Bob, and then Robb.

MECK: Bob Meck, Nuclear Regulatory Commission. A distinction of roles, I think may help the overall discussion here.

If you consider the role of the Nuclear Regulatory Commission to be protecting, providing protection, adequate protection for public health and the environment, then the question about alarms and other considerations may fall into more the economic and marketplace

consideration.

And a construct that may be helpful in this is that the NRC needs to, in considering alternatives, regulatory alternatives, take into account, economics into the cost/benefit analysis.

So there is an overlap between economics and the regulatory role of the NRC. On the other hand, I don't believe it's the NRC's role to drive economics, and the marketplace should sort that out.

So, the circumstance could be that the NRC would find and promulgate a regulation that is protective of the public and the environment, and yet those levels that are protective may well set off alarms.

And the question is then, is this an economic concern and a specification of feedstock specification for industry that the NRC should not be investigating? Thank you.

STINSON: Robb?

MR. LEIB: Robb Leib, First Energy. This is directed toward Cindy. In your experience, have the alarm limits at the scrap yards been set at a reasonable level? Is there a program that helps the scrap yards to determine what the detection levels should be set at?

STINSON: You said they're set at background.

CARDWELL: Our experience is that they set them at background, and typically it's the company from which they buy their detection equipment that comes in and does their calibration and sets their machines for them.

And we -- I can only speak for Texas now because I don't know the answer to the question for the other states that I'm here representing today. We don't necessarily give them any guidance as to what levels they should set their detection equipment at.

STINSON: That was Cindy Cardwell. Cards are just going up. Let's give a couple others chances to respond.

Steve, and then Alice.

COLLINS: Okay, the question specifically was about detection limits and the settings at scrap yards. Our experience in Illinois is that a lot of the scrap yards have them set at a small percent of the variation in the local background, not something equal to background.

If the background just varies, so every time it rains in northern Illinois, the alarms start going on because of the radon perking out of the soil at some of the places. They'll get a hit on a truck going by, and they have to go back and recheck that.

STINSON: Just move that mike a little bit closer.

COLLINS: They have to go back and recheck that vehicle two or three times to make sure that there really might be something in the load.

And then if we get called like we hope we do, then we have to go up and figure out exactly what's in that load and about how much.

And if they want some assistance in getting it sorted, we even assist in doing that.

STINSON: Alice? That was Steve Collins.

ROGERS: Alice Rogers, Texas Natural Resources Conservation Commission.

Several of our commercial hazardous waste disposal facilities, both incinerators and landfills, have in their waste analysis plan that's incorporated into their regular permits, that those detection monitors are set at twice background.

STINSON: Okay, good, that's helpful. We have the attention of the steel and scrap industry, I think.

Mike, Tony, and then Tom.

MATTIA: If I could look in the crystal ball at what's going to be happening in terms of detection, specifically at scrap recycling facilities, I think we can see that even the concept of background is going to go by the wayside.

We've had a number of instances where a scrap yard that maybe has a background of, let's say, hypothetically, 20-30-40, is shipping to a mill whose background is half that. And so something gets missed at the yard, it goes to the steel mill and gets rejected.

What we're seeing, number one, is a move, and because of pressure from the industry to the manufacturers of the equipment, is to start to isolate the area around, in many cases, the scale, so you in essence have background almost neutralized within that zone where the truck moves through, so that they're actually detecting exactly what's coming out of the vehicle.

We're also now seeing that there's a grapple that gets the detector almost on top of the material, and we're going to soon, I understand, going to have a magnet that's going to have the detector built in that will even get the detecting surface closer to the material.

Detectors are being put even closer on the conveyor lines so that even the concept of background is starting slowly to fade away, and we're detecting exactly what's coming out of the material or out of the truck that's shielding the material.

STINSON: Tony?

LAMASTRA: Tony Lamastra. In a sense, speaking as a consultant Health Physicist, one, to answer Robb's questions, why so low?

Paul kind of indicated, Paul Genoa, indicated why. And that's because of the sealed source threat that can essentially shut down a mill, cost it many millions of dollars to clean up.

But to answer your question of how, in a sense, what they can detect, how they work, the better systems, first, are large volume plastic. They have no spectral capability.

As a vehicle approaches the monitoring station, you'll see about a 30-percent reduction in ambient background. Most of the systems

today have the capability of setting an alarm point at somewhere.

If you really want to push it, you can get to about three percent above background, above that suppressed background. But typically you're looking at somewhere in the range of six, eight percent above the suppressed background.

What you have to realize, from an instrumentation viewpoint, is that the false alarm, the real false alarm read is extremely low, to the point where I can think of maybe -- in one facility, I can think of maybe two false alarms in five years, two real false alarms.

What you will see is NORM in the bottom of the vehicle setting it off, a poor distribution of the load where you have a void, let's say, in the center. All the instrument is doing is recording counts per, in some cases, a tenth of a second.

And as it hits that void, the background goes up, the background hits the other hump, the background goes down, the instrument says, ah-hah, I've found radiation.

So, that, to me, would be a real false alarm. But, yes, the equipment has the ability, easily six to eight percent above background with, like I said, an extremely low false alarm rate.

STINSON: Okay, thank you. Let's wind this discussion up and move on to copper before we run out of time to get through all our materials.

Tom, real quick?

CIVIC: Tom Civic from AISI. Tony Lamastra covered one of the main points that I wanted to discuss about the reason why the monitors are set so low.

However, the other issue that we need to be aware of in dealing with responses to alarms at these sites, whether they're downstream users of landfills or steel plants, we are not sophisticated Health Physicists that have to respond to these alarms.

The survey techniques to isolate and separate materials that

could be potentially hazardous to employees that have to deal with it, is a real problem.

So, the response to send materials back to where it came from, is very real, and it's not done for selfish reasons. We just can't take the risk of screwing up and exposing individuals. That's not their strength. Their job is to handle materials and process materials. That's what they're there to do, and not to guard against radiation hazards.

So that's a very important point, I think, that the NRC needs to keep in mind.

The other point, again, we have to keep going over and over and over and emphasizing is that the metals industry does not want the material. And most of the people around the table are saying there is no economic benefit to them to release the materials to be recycled where it can get into consumer products.

So, let's just keep that in mind in any type of rulemaking that's going on, and consider the economics as a very strong driving force here in addition to the health and safety that's could be affected downstream, not necessarily because it's a released material, but you jeopardize the measures that are in place by putting all these materials out there that are just going to cause more confusion.

STINSON: Okay. Trish, as a quick follow-on and then we're going to

HOLAHAN: Trish Holahan, NRC. I just want to clarify -- or ask Tom to follow up on that. And perhaps as we walk through the table, if there are some materials, that there is perhaps a benefit, in terms of costs or economics and in terms of recycling, and I'll use copper as an example, is perhaps on those and, as we walk through the table, if we could look at unique impacts or benefits from certain materials.

I think we've heard that from the steel industry, that perhaps there may not be for steel. But, I guess I'm asking the

question: are there some that perhaps there may be, in terms of recycling, for other metals.

STINSON: Rob, we're going to let you wind up this discussion. Where we're going to move next, just to prime people for our -- the rest of our morning discussion, is to talk about copper, in particular. So, if you have any specific experience with a volume of copper, such as what Kristin raised -- what we'll do is you can see we're starting a table for each item and Giorgio is diligently trying to record the general topics and discussion that go on for each of the major materials. And what we want to talk first about is getting some experience with controlling the material currently, what our folks -- what kind of detectors are they using; what kind of volumes are they experiencing; is it mixed; it is pure; where does it go, etc. So, be thinking about that.

We'll let Rob make his final comments and then move to that discussion.

LEIB: Thank you. Rob Leib, First Energy. Tom, there's two points that you raised. First, I used to be -- before I got into learning about radiation, I was very antinuclear and your point about -- you know, raises a thing about perception again, that you guys don't want this recycled materials --

STINSON: Stay close to your mic, Rob, sorry.

LEIB: You just don't want the recycled materials from nuclear facilities and there's no economic benefit. One of the things I learned, as I study more and more about radiation, when I was working for an anthropologist, doing studies of fetal alcohol syndrome, radiation is a huge benefit to society.

And then just to switch over to something that might benefit you is that 20 percent of electricity in this country comes from nuclear -- commercial nuclear power plants. And when we can't get rid of our materials, that drives up the cost and reduces the potential for us to

continue operating, which would eventually make you rely on electricity from the remaining 80 percent of the suppliers. And as you can see, your costs for arc machines and so forth are going to go up. So, there is a direct benefit, I believe, to the metals industry of supporting getting rid of materials from nuclear facilities that do not cause any harm to your employees or the public.

STINSON: Okay. Let's move to our discussion on copper. Kristin, maybe you can kick us off with some further description of your several tons of copper that you are now dealing with.

ERICKSON: Yes. Kristin Erickson, Michigan State University. Although copper is a really uncommon waste in typical academic --

STINSON: Can we keep the discussion focused at the table, please, gentlemen? Thanks.

ERICKSON: It's typically not a big problem at most academic and medical institutions. But, because we have a huge accelerator, in fact, the biggest cyclotron of its type in the world and now we're getting bigger, we have this waste. The history is they built one machine they call the K-50 and then there was the K-500, then the K-1200, and now we're putting them together to make a K-1900. We're talking major energies. And when they do that, some of the old machines, which are huge amounts of copper -- because these are superconducting cyclotron, they use winding copper coils and it's literally tons and tons of this big huge equipment with up to a 12- or 15-foot diameter.

The copper that we have to deal with is from the cyclotron, not from our typical research labs. And it's two types: one is the type that I mentioned, the big part of the machine; the other type is copper in electronic parts, which is a more common problem for any place such as perhaps the Army or other places where they're taking things and buildings and so forth apart or machines.

The copper, in itself, as an activated product, is not really a problem and I don't think it should be for anyone, because these are short half-life materials. With copper, you can do storage for decay fairly easy and fairly rapidly. And, in fact, our big huge hunk of copper I said would be, with confidence I can tell you now, free released, because we are required and do survey anything before it goes anywhere from where it sits on our university, if it's in the radiation use area. In this case, it was a machine and they surveyed the whole entire thing with very sensitive equipment by hand; found a year-and-a-half -- or two years ago, rather, one spot of 8,000 dpm, which translates to 800 cpm on our machine -- on our instrument.

That will be decayed by the time we check it. This was a tiny spot of about a centimeter and our plan will be simply to survey again. If we still find any detectable radiation at all, we will cut that apart and the part -- the one little spot will be shipped or decayed further and the rest will be able to be released as not radioactive.

Now, I just like to add some experience that we have, because talking about activated products, rather by reactor or accelerator or whatever, metals and so forth, we have a lot of experience, because of this cyclotron. And this has been what we call a kingdom of its own for many years, until about 10 years ago.

People wouldn't survey. They wouldn't put a number. They wouldn't label, which we're supposed to do with isotope, date, and radioactivity and dpms or micro curries. And the reason they wouldn't and couldn't is because if you take electronic parts or tool or part of a machine, anything, even another bolt, it's typically not a pure metal; some are, but most are not. So, your activation products can be, well, what is this; what radioisotope shall I call it; what efficiency would you like me to use. It's very difficult to do that.

But, I said, well, hey, I used to come out of research, so

we can handle this. And what we did is we took representations of all the different kinds of things we encounter, whether it's an electronic part or a -- actually a neon or a fluorescent light bulb or everything you can think of that you run into in a building, and we gamma spec'd them and surveyed them with beta analysis and gamma analysis and, also, alphas, to determine what materials were in there; what radioisotopes. And then we determined deficiencies for those with our NIST-certified standards. And then we made guides for all of the operators and users in that building -- they may be an electronics person, not a rad person -- and a very easy to use cheat sheet, so they can pick up an instrument, survey their part as they dismantle: this goes in the hot drum, this one is not, with very good confidence. And this is something that's been in effect for a number of years now, has tremendously changed the mentality at that facility and has tremendously changed the risk downwards, and has concurrently empowered and raised the knowledge and the ability of the common person over there, who is not a radiation health physicist person, the everyday worker, the electronics tech or whoever.

That's the kind of process that I would like to see as part of an eventual law, just the same as it is with our routine lab surveys. This is something that is not rocket science. I train firefighters to be able to do this. And I know that at any institution, whether you are a reactor industry or even if you are not a licensee, it is possible to have proper instruments easily used and well used to certify and show that things are safe, before they hit the release spot, whether it's the lead recycler, or the hazardous waste facility or the steel or copper facility.

Thank you.

STINSON: Okay. And Kristin, if you could just give a little thought -- not to respond now, but just give a little thought to how you would see that working into a regulation of some format. That

would probably be helpful.

Mike and then Jud?

MATTIA: Just to talk about markets, focusing on copper, but just to sort of give an overview of the values of materials, in terms of recycling, material like iron and steel, which we've talked about, is the most voluminously produced scrap; yet, when you look at a value per pound, it is the least expensive scrap or let's say the least profitable, because it sells at a fraction of a penny per pound. It's usually dollars per ton. Large values are produced, because there's a large volume demand, and it's one of the most expensive materials to scrap, because it takes a tremendous amount of equipment and manpower and expensive equipment to create the type of ferrous scrap that is in demand by the steel industry.

When you go to the non-ferrous materials, of which copper is a good example, where as iron and steel will sell for fractions of a cent per pound, things such as copper can sell for dollars per pound. So, it is pound per pound more valuable, because how much there is to be scrapped; how much it costs to produce the new ore, so it's more productive to create the scrap; and it's not -- you don't require as much processing in the scrap facility to produce copper scrap. Oftentimes, it's a case of just sorting and knowing what type of coppers goes in what bins and how you will sell it to what maker.

When you talk about scrap, I think the Cadillac of scrap, in terms of value per pound, would be nickel, probably one of the -- it's the gold of scrap, that and maybe below it would be things like stainless. But, these non-ferrous materials have a market value per pound in the dollars and takes a smaller amount of effort, in terms of investment, to produce. And so what you will have is the margins of profitability for, let's say, iron and steel, will be very, very small. Once you've produced and once you've shipped it, you're making a small margin; whereas the margins start to expand when you're doing the

non-ferrous metals, because you're getting more for it per pound and you're -- what you have to do to it is less expensive than how you have to process the iron and steel.

So, if you're looking at the scrap industry, you could put the 600,000 pounds of ferrous material on the table and say, you know, that's here, and you're not going to see a whole lot of salivating over it. But, if you start putting tons of copper and tons of nickel on the table, tons of stainless, which is a very, very profitable metal -- it has a marketability worldwide; it's easy to ship -- there is, in terms of the scrap market, a tremendous interest. Now, granted, when you start dealing with the contamination, it becomes a problem, because just like the ferrous industry has been monitoring, so has the aluminum and the copper and the nickel industry, realizing that there's problems there, as well.

But, in terms of markets, in terms of profitability, the non-ferrous metals, just on a market basis, are those that -- you get attention with small quantities, where it takes huge quantities of ferrous and non-problematic quantities to really get the attention. That's why we've heard at the table, you know, the 600,000 tons of iron and steel, when you've got a heap, which is 100 tons, and you do -- you can have a facility that does a couple of those a day and there's a tremendous amount of ferrous out there, it doesn't turn heads. But, if you start talking tons of non-ferrous material, it starts to get people's attention.

STINSON: Okay; thank you. Jud?

LILLY: This is Judson Lilly and I have a question for Kristin and then, also, some DOE experience with the copper. The copper from your accelerator was activated?

ERICKSON: Yes.

LILLY: And the question I have was: what was the -- in more detail, how did you go about releasing that, as activated material?

ERICKSON: We did a funny thing at our accelerator, since our accelerator fell through the regulatory cracks totally. We decided, when I took over as RSO at the university, and it was a bad kingdom at that time, we decided to do it completely under NRC. Because we have many licensed sources and because there was not another regulation in place from our State, who was doing nothing, we decided that's the consistent easy way to do it. And so, we took that as our whole program.

What we do, actually, is -- the process is we analyze with gamma spec. For example, this copper would be one category or the electronic part, to determine exactly what isotopes are there and exactly what percentages are there. Then, we, also, looked at, with our standards, what efficiencies we have for these relative isotopes. For example, our activated steel is primarily going to be some very, very short half-life isotopes that go away quickly and what remains will be cobalt 60 and sodium 22. And we know approximately what percentages, about a 10 to 1 ratio cobalt to sodium. And then, we can either gamma spec it or use a Geiger counter contact, depending on the depth and the volume and the geometry, to determine exactly how much radioactivity is in that.

In this case, with copper, it was -- it's really quite thin, an inch or two, and it is massive, big slabs. Actually, they look like slabs -- pieces of a circle. And we just survey the entire thing by hand, found the one little tiny hot spot that's less than a centimeter in dimension, and labeled the whole thing, brought it out there for storage. They thought they were going to take it back and use it for another machine someday, which isn't going to happen. So, now, it's going to be waste. And the process is simply going to be our team goes out there with our Geiger counters. We use beta pancake, low energy gamma, high energy gamma, one-by-one gamma. We have all three. Alpha detection, we use those, as well. If it is any chance of teridium,

we're doing wipes for that, or taking -- grinding samples, in some cases, and then we analyze.

Our limits that we use for release are always less than the twice background rule for the proper calibrated instrument, and that's under -- what we call under the NRC regulations. And the way we do it -- the proper calibrated instrument means I can meet the detection limit of 200 dpms per hundred square centimeters. In our case, we go lower, 200 dpms period. Whether it's a micron or whether it's larger, we calculate up for areas. In other cases, depending on what we're releasing and how we're doing it, we look at the MPC. We use that. So, if the maximum progressible concentration for unrestricted release for air and water -- and that's what I do with ash, I'm licensed to use the water limit for ash, which is another foolish thing and another reason why we'd like to see solid material numbers. Ash and water aren't the same density, but we can use that and we do, because that's the only licensed way we can get to that.

So, that is our process and it works very well. It just took some time, some preliminary effort on our rads staff's part to identify the groups of materials; analyze those very, very carefully and repeatedly, to get some good data; and then come up with some efficiencies and then write the guide, train the people, post the guides all over the cyclotron. That's what we did.

STINSON: Given the experience that Kristin is relating and the dollar figures of the value -- the potential value of copper in the marketplace, I'm wondering if there are any particular alternatives for control that make more sense for copper, than, perhaps, other materials. And I want to make sure that people get those ideas out on the table, you know, express your views on alternatives. And we need to understand if there are more potential health and environmental and cost impacts that you'd like to see the NRC consider, if they move forward with the rulemaking, get those on the table, as well.

Is that it for you, Jud?

LILLY: NO, I wanted to -- this is Judson Lilly, again, with the Department of Energy. I wanted to follow up. We've had similar experience to Kristin. We have accelerator facilities, where the copper has been activated. There's a facility in California, where we released activated copper at very low levels. We coordinated that with the State of California and, also, under the DOE Order 5400.5, which I've discussed, which does have a volumetric procedure. There are additional accelerator facilities, also, in California, that will be doing future releases. And then, finally, there's some copper at Frenold, that's on the table to be released, also, following the same procedure.

So, I think Mike was correct that this is a material, where the value is such that it warrants the extra attention, because of the price it commands. But, there is some experience on our side of the house, where we've been able to do this.

STINSON: Great; thank you. Paul?

GENOA: Paul Genoa, NEI. And, of course, with my experience with nuclear electric utilities, copper is a key component. We don't routinely see a lot of copper coming out during operations; but when equipment is changed out, there will be lots of cooper available.

But before I get into listing the types of copper and sources, I wanted to talk about another control element, to kind of follow on Kristin's thought. And this covers all materials and is required as part of the evaluation of a survey on all materials. And that's because at a power plant, we deal with a whole spectrum of isotopes from -- potential isotopes from the reactor and from the fuel. So, we don't have the luxury of saying, well, there's only carbon 14 here or there's only cobalt 60 or there's only cesium. In fact, there can be a wide spectrum, and the only way for us to be able to know is from process knowledge and experience and through sampling and analysis. Not only do we have to do the surveys, the gamma spectroscopy that you

discussed; but we, also, have to think about those hard to detect isotopes, often in very trace quantities.

And it is a challenge. The detection limits for many of these things are very, very -- the limits are high; the detection limits and the concentration that's potentially there are very, very low. So, in many times, even when we send samples off for very expensive and detailed chemical separations, concentrations, and analysis at off-site labs, the answer comes back non-detectable. But, nonetheless, we assume that there is material up to that level, if necessary, and to develop what we call scaling factors or ratios between those hard to detect isotopes and the isotopes that we can see routinely; sort of like fingerprints for a certain part of our facility. And so when you can measure cobalt or cesium, which are very easy to measure with routine instruments, we, then, apportion an assumption that there are these other isotopes along with them, because they could be, and then our detection capability has to factor those things in, as well.

And that's, also, how we would characterize material for waste shipments. This really is designed for waste shipments; but it is, also, practice. Facilities in Tennessee that receive material from us, the Greenest Clean Program, material we think is clean, but we want to send it to a facility that's dedicated at survey and release, they will actually take that fingerprint analysis, build it into their computer algorithm, to determine their detection sensitivity and counting criteria. So, that's sort of an overview, and maybe that's a discussion of another control approach or monitoring approach.

But, as to the copper, itself -- and I really have just started thinking about this, so I don't have, you know, quantitative numbers for you. But the truth is, the NRC has done a lot of work on referenced PWRs and BWRs and virtually knows every piece in those power plants.

STINSON: Say what PWRs and --

GENOA: Pressurized water reactors and boiling water reactors. So, there are several new regs that I can refer you to that go piece by piece of what's in there, so they should know that material.

But, every power plant has a turbine generator system and the generator is a giant electric motor, completely wrapped in copper. Those are always going to be clean, unless some very bizarre thing has happened. There is, obviously, electrical cabling and very large electrical cabling, all over the power plant. All of that material insulated with very high integrity installation to last in a safety related capacity, over the life of the facility. And the experiences today, internationally and nationally, is that that material, even if the cabling installation is contaminated, when it's stripped off, the metal inside is clean. There are just small motors and pumps everywhere that have small electric motors, that have windings, those have the potential to have some surface contamination, depending on where they are; many won't.

There are electronics of all types that have copper components in them, that could be salvaged and recycled. It's unlikely that they would be contaminated, but it's possible. There are large transformers, huge electrically transformers that are loaded with copper; very unlikely that they're contaminated at all. But, again, I don't know where this rule is going, so we have to assume that everything has to be removed.

So, I would guess that -- and some of the motors, like our reactor coolant pumps that actually move the cooling liquid through the reactor, there's usually two to four of those and they're about 12,000 horsepower each, so they're very big engines -- very big motors, rather, and loaded with copper. And those have -- the reactor coolant pumps, themselves, have the potential to have some surface contamination. But, we've got real creative people out there that clean these things all the time and refurbish them, so I'm quite sure that they can be cleaned to

some level, if it's established, and allowed back into the marketplace.

So, I think there is a valuable resource there. The bulk of it probably won't be available until decommissioning of these facilities, although there's probably a small stream routinely released.

STINSON: Okay, thank you. Dan Szwed, you've been waiting.

SZWED: Dan Szwed, speaking on behalf of the Metals Industry Recycling Coalition. To some of Mike's comments and Paul's comments, they're correct in their assessment that copper and stainless and nickel have cost values of dollars per pound. However, the industry is not interested in accepting any of that, unless it's clean. The risks to our products, many of those which go into consumer applications, is just too great and the business isn't going to accept it, regardless of what the price is. So the burden is going to have to be if stainless or nickel or copper is going to be released, it's going to have to be below a background number, it's going to have to be below a dose number, and it's going to have to be below numbers, where there are rigorous, accurate, and very low detection methods used to establish those levels. Just passing an instrument across and saying it looks like it's clean won't cut it in the marketplace for the ultimate customer, which is going to be the copper smelter or the nickel smelter or the steel smelter. There's just -- we pay too much money for that material to demand anything less than clean material.

STINSON: Because of consumer -- potential consumer reuse of this material, if it was to be released, are there any particular health and environmental impacts that you would recommend NRC pursuing, studying in an EIS format, as they go that route?

SZWED: Well, let's take the copper. I'm not a copper expert, but I have copper plumbing in my house and I think with the move away from lead-based solders -- I mean, there was an environmental impact, whether they were real or imagined, created elimination of lead-based solder in copper drinking water pipes. It has opened up new

markets for alternatives to copper for drinking water pipes. So, anything in the way of an environmental impact, whether it's the chemical makeup or any radioactivity contamination, has to be considered and it has to go all the way down to the consumer.

That's the exact perception issue we were talking about yesterday. You may not think you can quantify it, but you have to. You have to use some of the assumptions from the experts in this audience. And I think Peter Hernandez brought up an excellent one yesterday, where he said, let's just assume one percent of the steel market goes away because of this. There's a man that's an expert in the steel business. Why isn't his opinion valued when he says one percent? Maybe that wasn't the most rigorous research done, but it's coming from an industry expert, so it ought to be acknowledged and that ought to be factored into it. And that's how you value the perception issues.

STINSON: Yeah. And I don't think there's any indication that, you know, any statements here are not being valued. I think the effort is to try -- I mean, people are repeating certain issues, not, I think, because they're being ignored, but to reiterate them and make sure that they're in the record and to put different twists on them and that's helpful.

SZWED: I'm just reiterating, as well.

STINSON: Yes, sir? Did you have a question about copper specifically?

BARNETTE: Jack Barnette, EPA, Chicago. Every year, several thousand -- tens of thousands of people are killed in automobile accidents in this country; about 400,000 people die from tobacco-related illnesses in America; and about two people die from shark attack each year. But, if you go to a crowded beach and yell, "shark," everybody will run out of the water and about half of them will get into their cars and light up a cigarette.

People understand cigarettes and they understand cars. They

don't understand sharks and so they have a great fear of the unknown. I think the same is true of this discussion that we're having today. People have a great fear of what they can't control and what they don't know. And I think the people in the industry, who deal with the reprocessing of these metals, have stated it very clearly: people have an enormous fear of what they don't understand.

STINSON: Can you get to your point about copper?

BARNETTE: I'm going to get to my point. Some of the folks, who are the professionals in the health physics area, from a very scientific point of view, can point out that there probably aren't greater risks possibly from these things. But, I think the general public and the elected officials aren't going to understand that. If we want to reuse these metals, which is a good resource and it's a good way to save energy, it's a good environmental benefit, let's recycle them within the industry, itself, rather than have a free release. Free release jeopardizes the integrity of everybody at this table and it raises concerns with the public that can't be addressed either by NRC, EPA, or the industry, in general. So, I would say that if we want to do this and we see some environmental and economic benefits to the country, let's consider doing this within the industry, itself, as opposed to some other alternative.

STINSON: Okay; good. I wanted to -- I thought maybe you had a specific question. I wanted to allow that into our discussion. If members of the audience want to make general comments and offer their input, we're welcoming that and looking forward to that and we'll do that at the close of each metal discussion or each material that we discuss; so, just for future reference.

Let's see, I think we have Paul and then Susan -- I mean, Mike and then Susan. Paul?

MATTIA: Again, I'm going to ask Kristin to give me a little bit of an education. Your copper, for example, from your cyclotron,

when that is offered for sale, how will it be presented? I'm assuming you are offering it for sale for recycling purposes. How is it -- how will it be presented? The individuals, who are asking to purchase it or bidding on it, what will they be told and what type of documentation is being presented for that material?

ERICKSON: That's a good question and, boy, we run into that often. We release things at MSU to salvage yard all the time. Our refrigerator goes there, an instrument. So, those things coming out of labs are an almost everyday thing. And we finally developed a process, working together with salvage yard, our campus, and ourselves, and that is when somebody wants to release anything, whether it's a refrigerator or this stuff from us, we have to do a complete and thorough survey for very single thing that could have ever been on it, according to the use it was.

And then, we have -- we've developed a form, called the "Equipment Release Form," and it was a simple piece of paper that we worked together with our physical plant people, who do the ventilation and all sorts of repairs, they were worried. And it simply says, this is what this material is; here's where it came from; and this is what was used; and here's what we looked for; we did not find anything at all and here's who you can talk to. We sign our name and date, so it traces right back to us even.

In the refrigerator case, it may be the lab releasing it. But, they don't trust them as much, so they actually have us check it, too, and we put our name on it. So, our office, which is Office of Radiation, Chemical, and Biological Safety, long name, ORCBS assigns that and says we certify it, too. That's how it's done. So, we release it as not radioactive, together with that form.

MATTIA: Just as a follow up, when you release it, are you releasing it according to Reg Guide 1.86?

ERICKSON: No, we don't use that at all.

MATTIA: Is it safe to say that there is some level of contamination possible in this material?

ERICKSON: No, there would be none. And this is part of our ALARA program. Ours, in MSU, is so aggressive. I've talked about the cement floor. That little chunk of carbon 14, I think anybody in this room might know how to find it. When we had an incident and we were surveying carbon 14, difficult to detect out for that incident at our cyclotron, we were finding things that the State did not find and the NRC did not fine. We're so picky and we go down to nothing. Things that the reg say we can release, we do not. Contamination on the bench in the lab that is permitted under the law, we don't permit. We cite it as a violation and make them clean it up, because that's our program. And when we release something, I, honestly -- we do it to such a degree, that I could defy anyone, anywhere, to come and try to find some radiation with any method they want. So --

STINSON: So, it sounds like your facility is diligent.

ERICKSON: We build in the most conservative --

STINSON: Right.

ERICKSON: -- lowest -- we find the way to do the lower load number technology. We make ways and we document that with certified standards.

STINSON: Susan and then we're going to ask if there are any comments out in the audience or questions that folks would like to raise. And Giorgio has a question, as well, I think. Susan, go ahead.

LANDAHL: Susan Landahl, Comm Ed. I just want to build on what Paul had mentioned, and one my concern, listening to the conversation, is that if the -- I'm always going to the practical implementation of any potential rulemaking. And as far as releasing material from the power plant, it would be very difficult for us to implement different standards for different materials, just because what we're releasing is things like motors that maybe has some copper, some

aluminum, some plastic.

And while I understand the difference when you get to the end point, because if we're talking about reintroducing it into, you know, the population, it takes different forms when we do that. We need to have some way to actually survey, you know, these complex items when they come out. As Paul said, it would be very unusual for us to have a large volume of a particular metal, you know, like copper, maybe. When we replace a generator, then there could be something specific. But, I wouldn't want to ask health physics technician to be making a judgment on what the instrument should read, based on him having to know what material is in the item. Cable was another great example. You know, we can't -- we can't strip the cable before we release it and count the insulation to one level and the copper, you know, within it to another. So, just from a practical standpoint, I'd ask you to take that into account.

STINSON: That's an important point registered under the potential for alternative control measures. Giorgio?

GNUGNOLI: This is Giorgio Gnugnoli from NRC. I just had a clarification question for Kristin. Earlier, you said something about using twice background for copper and then you said you're so clean, that's below, you know, the normal affectability for other entities. I just wanted to clarify those two things. Maybe, I got the wrong thing written down, that's all.

ERICKSON: Okay. We use a variety of instruments. I want to first comment that we don't use one millirem or anything. We have microrem ion chambers, so we know our background is 10 or 20 microrem or 100 or 200, depending on where we are. And we are at that level. We use an ion chamber. We use a beta pancake detector, which sees between 50 and 100 counts per minute background of radiation, which translates to 10^{-5} micro curies per gram for carbon 14. So, we see that level. For low energy gamma, we get a background of one to two hundred counts per

minute. For a one-by-one gamma, we get eight hundred to fifteen hundred. To use a high energy gamma background detector, which I believe that's what a lot of the waste scrap metal places are using, you can see three and five-thousand counts a minute background.

That's why this twice background thing is critical and I don't think it should be used. You know, a generic twice background number, our State has that. Twice background could be a wide range.

GNUGNOLI: So, you don't use it, though, is what you're saying?

ERICKSON: We use it on certain parts of it, if we're screening. Okay, if I'm screening lab benches twice background; but, then, when I release something, I use every instrument possible to get down to the MPC numbers. Thank you.

STINSON: Okay. Thank you for that clarification. Frank, you have a question, also? No. Rob, then, we're going to move on in our discussion.

LEIB: Rob Leib, First Energy. Mike's question about can you really say that there's no contamination, the way I view it is that there's really no way that you can guarantee that there's not a few atoms of this and a few atoms of that. All you can say is within the statistical ability of your instrumentation, that we cannot detect any difference from the background, with the parameters that you set. I just want -- I don't want you to be disillusioned and hear that, you know, yeah, there could be a few atoms.

STINSON: Is that current, Mike? Very quick.

MATTIA: Just two issues. One, I agree that the concept of zero is a very difficult issue. And that goes back to the comments we've made in the past on numerous occasion, that if -- as we talked about perception, people understand zero and people understand anything above zero of radioactivity could be a problem. That's why there is a need for -- in the industries and the scientists to come to some kind of

an understanding that zero isn't the ultimate; maybe that something above zero is livable with, even if we're talking -- because no one can say that it's at zero.

The other issue in dealing with copper, for example, and this doesn't go just to the scrap recyclers, but it goes to the people who own the material, the steel mills or the industry, if you've got some copper and in order to sell the copper for two dollars a pound, it's going to cost five dollars a pound to clean it; now, you're going to be in a quandary, because the industry may not want to make money selling this material to scrap, but they certainly don't want to take a bah on it.

And so, the concept of at what level will it be acceptable to industry and at what levels are considered clean is a tremendously important issue, as is decontamination, because, you know, maybe you don't want to strip the insulation from the copper cable. Maybe there are industries that will do that and buy it for x amount or you strip it and then you sell it for a higher amount.

But, again, these are issues that need to be addressed and some conclusions reached, before you start to create rulemaking, because then you've got the industries agreeing on how this material will flow within parameters, and then you can create the rulemaking. Just dumping it out there, I think, it's going to -- on large levels, it's just going to cause a great deal of chaos.

STINSON: Okay. Paul, did you need to follow up on that?

GENOA: Paul Genoa, NEI. As a point of clarification, and following along Mike's thought train, the truth is nuclear power plants are in the business of making electricity. That's what we do and that's what we're focused on. The materials management issue is a collateral activity that's required. It's the cost of doing business.

We learned a long time ago that in many cases, it's more profitable, it's more effective, to allow market-based solutions to

handle some of our problems. And so in the Oak Ridge area, for instance, there is -- developed a whole series of industries that are vendor oriented industries, to serve some of our unique needs. And those unique needs are things like the processing of material, as you mentioned.

We would not take an electric generator or a reactor coolant pump and strip it about at our facility. We would transfer that piece of equipment, probably under license conditions to a license vendor, who is in the business of doing that. And that person, who does nothing other than take apart those kinds of pieces of equipment and subject them to radiation survey and release, or constant decontamination, concentrating the activity in one place and disposing of it and isolating it safely, while releasing the clean material for reuse. So, we fully envision that if a standard is -- if a reasonable practice safe standard is developed, that the existing industries out there will continue to do what they're doing and new industries will evolve to address those solutions for us.

But, just so you understand, we don't go to a great deal of trouble. We don't take a computer terminal apart and strip out the copper parts and do something with them. We release a computer terminal or we throw it away. It's just physically impractical.

STINSON: Or you send it to a licensed -- another licensed vendor.

LEIB: Right, or -- yes. Someone says, hah, I can set up a business by taking computers from all over and subjecting them to this type of recycling. And that's what I'm saying, it would be very difficult for you to anticipate who could do what under what conditions. But, if you set a standard, then the market will respond, if there's a market.

STINSON: Okay. Two cards have gone up. I want to shift our conversation to concrete, or else we're never going to get there.

So, if you guys can live with that or fold in your comments elsewhere, Peter, that would be great. Are people okay if we proceed into concrete and get that discussion going, before we take a break? Anybody dying?

[No response.]

STINSON: Okay. We're going to look to you quite a bit, Charles, on this particular issue. Again, you know the questions before us and if you can just speak a little bit to the experience that you may have or know of, regarding the nature of the recycling of concrete, how it's used, etc., and how introduction of additional or particular types of radioactive material would impact your industry, that would be helpful.

WILK: Thank you. I'd like to start out first of all to say I'm Charles Wilk with the Portland Cement Association. The Portland Cement Association is an industry association of the cement manufacturers in the U.S. About 94 percent of the cement that's manufactured in the U.S. comes from our member companies.

There is a distinction between cement and concrete, and it's important that people keep that in mind. We often use, including at this table sometimes, the term cement --

STINSON: Just now in my comments.

WILK: -- and concrete. Cement is a manufactured material. It makes up 12 percent -- generally, 12 percent of concrete. Concrete is 12 percent Portland Cement, usually. There's aggregate sand and water that's part of that, to make up the very familiar material that we see. Concrete is used in -- obviously, in paving, in buildings and structures. You'll see a lot of it in high rises. It's finding an increasing use in residential housing. Most people from -- in many part of the country have concrete foundations and basements. We're, also, seeing an increasing use of concrete in above-grade residential walls in construction. And I think that's important to the discussion here, as far as risk, because you may wish to base whatever your calculations, as

far as safety, on people sleeping their entire -- sleeping, living in a surrounded by concrete. And, of course, while they're at the workplace, they're surrounded by concrete. So, their exposure -- their everyday exposure to concrete is probably greater than most of the materials we've talked about so far.

You, also, have to realize that concrete is used for drinking water reservoirs. In tanks, it's used for conveying drinking water. It's, also, used perhaps -- and we'll get back to it here when we talk about uses of pre-owned concrete, that concrete -- there are reservoirs that are lined with riprap, which could be recycled concrete.

As to the different uses for concrete that's been recovered from other facilities, first of all, it's important to note that concrete is not used in the manufacture of cement. Cement is manufactured from quarried and mined materials. It's not -- the use -- you don't grind up concrete and put it back into a cement kiln to produce new cement. However, concrete -- used concrete might find its way back into new concrete as an aggregate. There, also, a great use of used concrete as a paving base. People from Chicago here might know that the Eden Expressway was previously used -- was previously constructed of concrete. The old concrete layer was ground up and used as a base in-place for the new concrete that was placed over it. Used concrete can be used as fill. Some of that fill goes into residential housing and some of it into industrial uses. I mentioned before that used concrete might go as riprap that would line reservoirs.

Another point I wanted to make is concerning costs, and earlier statements were made, as to the relative values of different metals or alloys in the marketplace. I, personally, do not have a dollar value for what used concrete might be valued at. I can tell you that Virgin Aggregate, which is probably the closest material to perhaps recycled concrete, although I think Virgin materials are probably worth more, Virgin Aggregate is worth around eight dollars a ton. So, it is

very -- the value of used concrete would be significantly less than that and -- which brings us to something concerning economics.

I don't really see -- well, let's go back. In our industry, when people make -- in the concrete industry, which would, I guess, in a way include the cement manufacturing industry, you have the cement manufacturer, you have the people who create concrete, which would be the Readymix ~~or~~ Companies & the Readymix folks, they would be, then, in turn, stockpiling aggregate, and cement and water. And then, of course, you have the cement ~~basins~~ masons that would use this material everyday.

The -- we discussed the detection, as I understand, and I think that the scrap industry is probably further along in this than the Ready Mix industry, in that in the scrap industry, people use detectors for each load of material that comes in. I'm not aware of any Readymix guys -- or Readymix companies, that screen demolition concrete with radiation detectors. There might be some out there. It's quite a diverse -- it's quite a diverse bunch of people, as far education and business practices. So, there may be some out there that do screen this material, but I would suspect there are a significant number that do not.

I think that's important, in terms of economics, to understand, because if the concrete industry and the Readymix industry learns that there's a possibility of them receiving material with some level of radiation, they would probably be very, very interested in now buying equipment and training people. I understand that it's not rocket science. I think it's probably nuclear ~~physicists, seience~~ physics, as to the detection of that. And there would be quite a significant outlay in capital for the equipment detection and in training of the people who would be conducting the surveys of that material.

We had a comment earlier today concerning the cost to power generation, as to increased cost of disposal. It would seem that if the NRC allows the unrestricted use of material, even at some level of

radioactive contamination, that what the NRC is doing is actually moving the cost of disposal from the power generating industry to other industries. And I don't know whether the emotional part of this issue would then cause the industries that were receiving these materials higher costs, higher dollar values than would have originally be incurred by the power generations or the people with this material in their disposal costs. Perhaps if the rates were raised commensurate to include the disposal costs, people may use less electricity, and there's obvious environmental and economic savings in the use of less electricity.

That's pretty much the end of my formal presentation. Thank you.

STINSON: That's helpful. And it would be helpful to hear from the industry a bit, and maybe that's why Paul's card is up. What kind of material, what amount of material would be coming from -- potentially from different facilities, you know, and where might you see it sort of going from there and where does it go, you know, if it is, in fact, through decommissioning instead of release, at this point?

Peter, did you want to address this issue or -- okay, go ahead.

HERNANDEZ: Thanks. Peter Hernandez. I wanted to ask: what is the current recycling rate for concrete and do you see that as increasing, staying the same, or decreasing over a period of time? That's the first question. And then the second: does it include highways and bridges?

WILK: Okay. The current recycling rate of concrete in the manufacture of Portland Cement is zero. As I stated before, I'm with the Portland Cement Association and that's what we do. We, obviously, have associations with other industries, including the people that produce concrete, and a very close association, because we -- obviously, our industries are closely tied.

The -- I have not researched that question to give you an answer. One of the factors of recycling concrete, because of its value is so low, you don't transport that material very great distances. And as an example of the Eden Expressway, the material is ground and used in place. I would imagine, again, the value is very low and so the risks posed to a Readymix company, as far as public opinion fallout from possibly radioactive foundations and so forth, is quite high, compared to the benefits to that industry.

HERNANDEZ: Thanks. The reason I asked is I was in Denver recently and I saw them recycling a highway and some bridges. What happens to the steel that's in that material, if you're grinding up and reusing the concrete --

WILK: You're talking about the --

HERNANDEZ: -- the cement.

STINSON: -- the reenforcing steel that would be embedded in the concrete?

WILK: There are plans that can separate the rebar out of the concrete. And I'm not certain of this, I would assume that that steel just goes back as scrap steel. I don't really know the metallurgy of rebar to know whether that's just common steel. Perhaps people here from the scrap industry know. So, I don't really know the value and how much effort is placed into separating and segregating that material.

STINSON: It seems like a real relevant piece of information, at some point, to find out what the answer to your first question, what really is the rate of recycle of concrete and how does it get used? How big is the industry, etc.? And we appreciate you trying to speak as much as you can at these issues, recognizing it's not really directly your business.

Steve? And we'll just let you know that the comments for concrete we're going to take at the end, so I don't want -- you can stand if you want to, but I don't want you to have to stand the whole

time. Steve?

COLLINS: Steve Collins from Illinois. Questions again for the Portland Cement representative to educate me. The cement comes from quarrying what? And then after you answer that, at what part in the process of making concrete or other use of Portland Cement does fly ash get added a lot of times?

WILK: Okay. Cement is made by quarrying shales, clays, limestones. They are fired into ~~large~~ the largest industrial furnaces that exist on the earth, to 1400 degrees to 1800 degrees centigrade. The use of fly ash has increased in concrete. Fly ash is used in two ways. There are such things called -- ~~it's called~~ blended cements, which are blends of cement and fly ash, which those bends are made at the cement manufacturing facilities. ~~There are, also,~~ -- There is, also, fly ash that is introduced into concrete at the Readymix plant. The federal government mandates some level of fly ash, to be used in all federally-funded projects.

COLLINS: Okay, that's very helpful. So, everything that goes into your process, unless steel or some of the others, is a naturally occurring material from the earth, so it has naturally occuring radioactive materials in it, including the fly ash that you add to it. So, it would appear that maybe your industry might be more receptive to accepting some slight increase of some radio nuclides and still using that? Or is that not an accurate statement?

WILK: So, you're asking if our industry would be willing to accept additional radiation in their product?

COLLINS: In other words, is recycled --

STINSON: Given the level of background, it might already exist.

COLLINS: Is recycle more of a potential on yours than some of the other metals industries want to --

WILK: Well, I really don't know the answer to that and I

think the way to discover that answer is for the NRC to conduct a radio perception study, as to people's willingness to accept greater activity in their basement foundation and their above-grade residential walls and in their office buildings.

STINSON: Okay. Let's keep this discussion moving. See if there are thoughts that you all have on methods for control. If anybody knows about the use of detection equipment regarding -- for concrete or for cement, that would be helpful, trying to bring some of those issues out.

I was going to go to Jas and then Mike.

DEVGUN: Jas Devgun. I think my first question of the day for Charles. I think you spoke very well, with respect to the overview of the concrete industry as such. But, do you see any resource value, not only in terms of the concrete, whether we recycle or how cheap it is, but in terms of what else we do with it? Like, if we dispose of it in landfills -- industrial landfills, we are taking up a lot of space there, too. And that's a resource in itself -- the landfill space is a resource. So, there must be some kind of balance in the value to the society, the net benefit.

And then maybe, areas, for example, where you, obviously, don't want to put it in people's basements and they probably would not -- from perception alone point of view, would not like to have a basement, which shows any licensed activity there at all. But, in terms of the highways, for example, which use very large quantities, may not be as high. Do you see any value with respect to those two issues: the resource and conserving the disposal space and, also, in terms of using it on highways?

WILK: I understand that it costs money to run a landfill. I'm not well enough versed in this to know whether or not the radioactive contaminated concrete is -- goes to a sanitary landfill or a hazardous waste landfill or does it go into a demolition degree

landfill. There's probably differences in the costs between all those different disposal scenarios.

From a scientific sense, I can see that conservation resources is important. But, the economic reality will be that people will not want to purchase concrete that has a higher radioactivity or a potential for a higher radioactivity, than was done before people started recycling this into commerce. And those costs would -- I would suspect, outweigh the additional disposal costs, based by the people who generated and profited from the use of that material.

STINSON: Okay. Mike and then Kristin? Steve Collins, is that current? That's current.

MATTIA: I guess the question for anyone: where -- and let's say, facilities that would have radiation, that would be recycling material, where do you see concrete being used and the potential for that concrete to be demolished or potentially recycled and what's the potential for the contamination and for decontamination?

STINSON: Kristin and then Paul.

ERICKSON: I'll answer that one first, because I was going to comment that anyway. In the academic and medical institutions, it's not a common problem; but as years wear on, we encounter it more and more. The comment about the building, we totally -- we gutted it right down to the bricks and then rebuild, cement floors, walls, ventillation. So, we encountered some there. As years go on, though, and we do begin to tear down more buildings -- our science buildings, we may, again, encounter it.

Now, the potential for contamination is essentially none, very, very little. In fact, that whole huge building, Anthony Hall, four floors, big, big, building, we found one spot, less than one square centimeter, of 200 counts per minutes, which is barely above background, and that's all we found in the whole building. So, I don't think it's a big problem for us. I think the surveying of it is easy, because it's

likely to be surface contamination, if anything at all.

And release of it, well that's pretty easy, too. You find a spot. You either decontaminate it and treat that as radioactive waste, whatever the materials are, or you just chunk it out and treat that as rad waste, which is what we did with that spot.

I have two other comments related to and to respond on the fly ash and the cement, in general. Thinking of the mining of shale and what it does, I've seen them smash mountains in Colorado and I'm not a really big activist in Greener, but I do care about the earth a lot. That's how I got into this business. I think we all did get into for that reason; otherwise, why would we be such masochists?

At any rate, that's one thing to think about. If you mine all that shale and knock down those hills and those mountains or create those gullies and take chunks of the earth out to build roads or bridges or homes, this can be minimized by reusing concrete. Overall, I think concrete is an easier and more likely candidate for reuse, because of the ease. It's porous. It crumbles apart. If I had a chunk, I could actually just analyze it by dissolving it and doing some very sophisticated wet lab things, easy to do. So, I think that's one thing to think about.

The other thing to think about and keep in mind for Charles, your fly ash has higher radiation than most of anything we could ever release. I cannot use fly ash or wood ash or coal ash or anything else in my analysis of our ash. It cannot be used for control ash, because there is so much radiation in it, that it's much higher than anything I measure.

STINSON: That was part of Steve's point, I think, in raising it.

ERICKSON: Yeah. The radiation in there is enough, that you would have trouble measuring low, low levels already. Just a comment.

MATTIA: I think it's alpha and beta.

STINSON: Thank you.

ERICKSON: Alpha and betas, yes; that's right.

STINSON: Sure, go ahead.

WILK: As I mentioned, the content of --

STINSON: Mention your name, I'm sorry.

WILK: My name is Charles Wilk with the Portland Cement Association. The use of fly ash, as I mentioned before, is mandated by the federal government, and I think -- I don't really know the regulatory history as to that, I would suspect that the reason why they were interested in incorporating fly ash into concrete is to find a way to manage the waste stream from ~~cold~~ coal fired fire air -- cold fired electric facilities. So, fly ash -- I think we would probably be more interested, as a cement manufacturing industry, to produce more cement, than to substitute it with fly ash. It's not, as part of, our choice that we're introducing possibly radioactive material.

And the prospect of adding additional radioactivity to a product associated with cement industry, as I mentioned before, I don't really know the answer to that, but I would suspect that some study could be done to ask the public would they be interested in living and surrounded with more highly radioactive concrete.

STINSON: I have to apologize. I mentioned that I would be taking the public comment on copper and I thought I would ask for that at that moment and I think I didn't really ask for it.

There may be comments that you want to make on copper. We will certainly do that for concrete also, so if you do have those comments you are not passed by and we will take both of those at the same time when we complete the concrete and cement discussion, which we may accomplish before the break but probably not given the number of cards that are up, so be ready to make comments on both at the conclusion of this discussion, and we will go Paul and then Steve and possibly take a break.

GENOA: Paul Genoa with NEI. I wanted to focus on a couple of comments made, to reinforce them, and that is that concrete is very heavy and its recycle value is very small, so it is unlikely that facilities are going to transport the concrete a very long distance because the transportation costs will outweigh the benefit.

The second point is that nuclear facilities generally, because of th stout nature of their construction, the benefits of the shielding and the containment offered by concrete, particularly in power reactors, we have huge volumes of concrete.

Our concrete mats at the bottom are 10 feet thick. The side walls are three to five feet thick of our containments. Tens of millions of pounds of concrete in a facility. Most of the material stays in the facility until the facility is decommissioned. You could envision sidewalks, parking lots, incidental materials, perhaps shielding block and so forth that might be released during the operation of the facility.

Concrete itself is a porous material, so there is the potential that if contamination -- if it is directly contaminated that it could soak into the material some distance. Power plants learned this lesson early-on and the inside surfaces first are generally covered in steel but in other cases are covered with epoxy coatings and so forth.

Our recent experience in power plants is that potential contamination within the containment structures, the most highly contaminated parts of the plant, are limited to one or two millimeters thick surface contamination.

During the decommissioning of these facilities that material is scrabbled off with aggressive grinding type tools, also hydrolasing and so forth, so if you can vision a four foot thick concrete structure with two millimeters removed from the outside, the rest of it is clean.

There is some potential that in close to the reactor itself

there is activation in the bioshield. Those areas are put there to protect the workers should they have to enter. Those areas probably are not ever suitable for recycling or reuse and most likely will be disposed of at a facility.

The rest of the concrete really makes most sense to either leave it standing, demolish it and bury it onsite, a concept known recently as "rubblization" -- but it is nothing different than is done in many other industrial facilities essentially using it as beneficial fill within the site and taking allowance for any potential activity there in the model that is required under the license termination plan or releasing the concrete to a local industrial landfill or releasing the demolished concrete to a vendor who wants to use it as aggregate in nonstructural applications or perhaps in rip-wrap and things that Charles mentioned.

The 1640 document indicates the typical endproducts for recycled concrete include base for roads, stabilizer for asphalt, and aggregate for nonstructural materials. The references here indicate that recycled concrete is not used as aggregate in structural concrete such as used in houses or buildings.

The rebar issue -- generally if the material is demolished or recycled or even just demolished for disposal, rebar would be separated out and experience is that scrap dealers would tend to take that rebar unless again it came from in close to the reactor or it was activated and then it couldn't be released. It would have to be disposed of.

I have recent experience coming back from Germany last month at a clearance symposium, international. We went to a decommissioned German reactor. We watched them go through a very meticulous implementation of their 10 microsievert or 1 millirem per year clearance standard. They not only -- they cut out with diamond saws the chunks of concrete including the rebar. They surface frisked all surfaces. They

put it into a calibrated box counter. If it passes those tests it moves through into another calibrated box counter that is operated by the state inspectors and if it passes that then application is asked for for it to be released.

Once it is granted it is released. At that point the radiological considerations are done. A dealer comes in, grinds it all up into aggregate. The rebar is released for scrap. The aggregate is released for road bed construction in the vicinity of the facility and that is how it is managed.

A final comment on the fly ash. It is important to understand that I think you are absolutely right in what the motivation was to take care of this issue. It is a resource conservation issue, but it is hard for us not to acknowledge the fact that the levels there that were found acceptable and do not appear to have impacted the sale of that material are ten times higher than the levels being talked about internationally, so the fly ash is roughly 10 millirem per year, 10 times the clearance levels that the international community is talking about -- for perspective.

STINSON: Okay, Tony, we will let you go ahead, since we queued you up, and take a break.

LaMASTRA: Just an anecdotal comment on recycling of concrete. Several years ago when New Jersey was cleaning up the Montclair and Glen Ridge communities that had the residue from the old radium days, they tried to ship out the material -- essentially dig out underneath the houses, which was dirt, not concrete, but ship it out to a disposal site out West, and most of the states in between objected to it. The Governor of New Jersey suggested that they take the dirt and use it as fill for Interstate 78 in an area in Union County which required building up about 100 feet in elevation of road bed. The idea was to lay the contaminated material in the middle of this 100 foot elevation fill.

Several groups in that area essentially picketed, so here you have people essentially reacting to putting something in the middle of a 100 feet of dirt in a road. Again, whatever you do, I think you have to take into consideration the perception issue.

STINSON: Okay, thank you. I have ten to 11:00. We will come back at 11:05 and continue with this discussion and move on to our next material, which is soil.

[Recess.]

STINSON: Okay. We have a couple of things to cover here. The first is we have a member of the public, an environmental community representative, I think, who is prepared to read a written statement. Is there someone who would like to do that -- we'll go ahead and accommodate schedules here and ask you to go ahead and read your statement at this time, if that is what you are prepared to do, and then we will continue a discussion of concrete with Steve and then Jud and then take -- if you still have a comment, Jud -- Is that Jud's card? -- and Rob and those cards that are up, and then find out if there are any additional comments on copper or concrete.

Go ahead. Mention your name and affiliation.

BALCH: Okay. Is it me you wanted to speak now?

STINSON: Yes.

BALCH: I am Jeff Balch. The term "BRC" -- the term "below regulatory concern" is not used these days, but I believe it is still what is at issue here.

My disagreement with the Commission is fundamental. The Commission is looking for safe ways to direct radwaste, and I just feel that more effort -- all effort should be placed on eliminating radwaste and not trying to find waste to introduce it into the public waste stream.

My statement is a parody. This is the way that I prefer to express my feelings about this policy. I entitle it "Below Regulatory

Concern." It will just take me a minute and a half to read it to you, and I have extra copies for anybody who wants them.

I was walking to the soda shop to get me a malt when I got mugged and robbed, got my head stepped on. There was a cop on the corner. He witnessed the assault. He walked on over when the thieves were gone. He had a big old gun. His shades were black. He was tall and taciturn. He said, "I would have jumped in, but it looked like this attack was below regulatory concern."

I asked him what he meant. He said "You hurt real bad? " I said, "Some bruises and my head feels strange." He said, "And how much stuff did you lose?" I answered, "My credit cards, five bucks and some change." He said, "We have got a new mugging policy now. It may seem a little bit stern but if the injuries are minor and the theft is small, it is below regulatory concern."

So I walked along and passed a kid who whacked me in the knee with a baseball bat. His dad was standing just a couple feet away. I said, "You are just going to let him get away with that?" The dad said, "Hey, the kid's still young. Give him some time. He'll learn. But for now, since he has not killed anybody, he is below regulatory concern."

So I limped back home and from the end of the lane I saw flames shooting out of my house. There was a fireman there. He asked, "Who is inside?" I cried, "My two kids and my spouse." The fireman said, "I'm sorry, pal. We're going to have to let the thing burn because with less than one spouse, four kids and two pets it is below regulatory concern."

Now we are gathered today to discuss deregulation of some kinds of nuclear trash. The NRC says the deaths will be few and that NRC will save some cash. Well, I think we ought to answer very clearly before we all adjourn that nothing that causes people to die is below regulatory concern. Those are my feelings in this matter.

STINSON: Thank you. Thank you for taking the time to come. Let's see. Steve, did you still have a comment you wanted to make?

COLLINS: I took care of it at the break.

STINSON: Okay, good job. Jud?

LILLY: I wanted to -- this is Jud Lilly from the Department of Energy. I wanted to just for informational purposes second the remarks that Paul had about the commercial nuclear industry's dealing with concrete and the quantity issues. There are significant quantities of concrete.

The thing that hasn't been brought up explicitly -- I believe the NRC is aware of this though -- is the benefits, the market value of concrete for recycle is not very high but the disposal cost for the concrete are enormous, so it is the quantities and the disposal costs of this as low level waste would be the driving part of this equation. I just wanted to add that to the formal record here.

STINSON: Thank you, Jud. Rob.

LEIB: Rob Leib, First Energy. This is kind of a question for Charles. I think you may have part of an answer for us -- the fly ash issue and its reuse in concrete.

It is also reused in other consumer products. We know for a fact that it has increased levels of natural radiation that have been concentrated by the processes that go into creating fly ash. Has there been an economic impact to any industry where this increased use of fly ash has occurred? Has there been a public outcry? Has there been a loss of jobs or money or whatever?

WILK: I don't have the statistics to --

STINSON: Would you just mention your name?

WILK: Oh, I'm sorry, I'm Charles Wilk, with the Portland Cement Association.

I understand your point on the fly ash issue. The use of fly ash again was required for Federal funded projects. I don't really

EPA did not consider radiation exposure of fly ash in concrete 58 FR 42471

know if at the time when that was mandated whether the public was told or whether it was considered that the fly ash had some radioactivity to it.

In truth it was not see 58 FR 42471 8/9/93

SPEAKER: It was.

WILK: And I wonder if in today's -- now if people were to come up with the same argument whether the result would be the same, whether the public would be interested in purchasing concrete that has some level of radioactivity that is attributed to the fly ash or would they just go with a natural material.

I wanted to say to everyone here that I am not really debating your science. I understand that. What I am trying to convey is that there is science and there is also a lot of other factors that go into the economy.

There is a third point, and I don't know if this is the appropriate time, but we had talked about -- Paul, you had mentioned that demolition of concrete is used sometimes for aggregate in nonstructural concrete. I think yesterday we discussed about perhaps using used material as part of the packaging for higher level radioactive waste that was destined for disposal, going to the mountain of course at Yucca Mountain or maybe at WIPP.

The concrete that -- those kinds of facilities that they are destined for -- for Yucca Mountain they last for thousands of years -- the concrete that I would imagine that would go into the packaging or structures at Yucca Mountain would be probably the best concrete that Man has ever made -- you would think, right? -- because actually the Pantheon has been around for centuries but Yucca Mountain is going to be there longer.

I am wondering whether or not, because right now the concrete, used concrete is used for nonstructural things, that Yucca Mountain would probably be the most highly -- the durability of that would be longer than anything Man has made so far I would think of the

structural concrete.

DOE and NRC might want to consider that.

STINSON: Okay, good. I just want to ask sort of a final question on the concrete cement area material, concrete especially, and that is are there suggestions for particular alternatives as a result of this conversation or because of your own thinking prior to this meeting, alternatives that folks would come forward with? Prohibition, unrestricted release, restricted release only to road beds, restricted release to landfills -- how would you suggest managing this particular material?

That is not assuming that all materials would be treated differently, but just to illuminate for this material -- any particular thoughts?

WILK: Yesterday didn't we talk about --

STINSON: Charles, go ahead.

WILK: Oh, I'm sorry.

STINSON: No, Charles, go ahead. Just mention your name.

WILK: Okay. It is Charles Wilk from the Portland Cement Association.

Yesterday didn't we mention that restricted use eventually becomes an unrestricted use at some time?

STINSON: Yes, we definitely talked about that in some depth.

WILK: Okay, so --

STINSON: I just wanted to see if there's anything further that you might want to say on alternatives, which is the third column up there, and we did talk about it yesterday. We just haven't talked about it much today.

We talked about it in general terms, not specific to concrete. Paul?

GENOA: Paul Genoa, NEI. I am just throwing this out to

answer your question, because I think concrete is unique among the materials we have talked about today.

The economic value associated with its recycle is limited. The costs of transporting the bulk and weight and mass are high. It has other environmental impacts. So perhaps a different strategy for the material or perhaps the realistic uses of the material are limited and so could be reflected in some kind of control scheme, but as I point out, it is envisioned that the bulk of the material should be decontaminated to the extent possible and should be used in its location. You don't want to transport it across the country.

Now for certain specific material, as I talked about bioshields, other areas where the activity is high, you are going to have to take care of it that way, and that is how it has been taken care of in the past, but for the bulk of the material you are going to be able to reduce any activity associated with it down to extremely low levels and the material could safety stay at the site, could be used perhaps for roadbed, rip wrap, other direct reuse applications in the local vicinity of the facility or disposed of in industrial landfill somewhere in the location of the facility. I mean those are sort of the logical outcomes.

STINSON: Okay, great. Let's move to the audience and see if anyone has any comments that they would like to make. Two folks -- we will take the gentleman on the right. You have been waiting quite awhile, I believe, and then in the back.

NECHVATAL: I am Mike Nechvatal from the Illinois EPA. We have dealt with concrete demolition from many, many sources for many years, in Illinois at least, northern Illinois. It has no value. It is a negative value even when taken to recyclers. They pay the recycler to take it.

In fact, those recyclers in most cases would not be there were it not for state grants that buy them the equipment to crush rocks

and such. Even with that in its place, the amount of illegally disposed construction and demolition concrete waste is very high in northern Illinois and Chicago itself had some examples of extreme disposal, like 40 feet high of square city block. I am not kidding.

There were several of those. How do they get cleaned up? Most of them had public funds used to take them to quarries where they were disposed of as clean construction. It was just concrete. It was not concrete and other kinds of construction material. It wasn't contaminated in any way.

My point is that there is no market for this material. Certainly if you have to take it any distance at all there is actually no market in terms of geography below Chicago. In central Illinois and more rural areas of Illinois there is not even a market for recycling whatsoever so it is taken to either landfills -- actually landfills kind of like the stuff. They build roads out of it a lot, so to some degree they like construction demolition waste, or it is taken to landfills solely for its construction concrete disposal or a lot of it is simply just discarded on the side of the road, and that is really bad.

So the idea that there is an actual market for this -- this is actually recycling -- is kind of tenuous at best. It is just another disposal method.

One option -- many industries dispose of inert waste on their own property. The stuff could be left, I suppose, if it is inert and clean, it could be left on site.

STINSON: That's certainly part of what Paul is suggesting I think might be most practical. In the back? Come forward and just state your name and affiliation if you have one.

QUASEY: My name is Kathy Quasey. I belong to several different groups, interfaith groups and peace and social justice groups and some environmental groups, but today I want to thank you for the opportunity to at least offer the option to talk to you. I come to talk

to you today as an individual, as a human being.

I am a writer and a marketing person. I have a Master's in Business. I understand the whole marketing opportunity of this industry nationwide and what it represents in a number of industries. As a writer I have researched this for over three years now, so I come with some knowledge of what we are talking about.

But all of that aside, I just wanted to provide some testimony today regarding some of the personal experiences I had this year.

This spring I met a woman who is from Russia. She is a very professional person. She was at a resort outside of Belarus when the Chernobyl accident happened. She and her husband had very professional jobs.

A few months later she miscarried terribly malformed twins. A few months after that when she was pregnant again she aborted terribly malformed triplets. Her daughter has a very bad kidney ailment, and as a result they fled the area. They came to the States. She is now working a two-bit job and her husband is working driving a cab in the city.

This summer I met some more children of Chernobyl. Many of these children were 10, 13 years old now -- how long ago was it? '86, right? -- and I tell you just as an individual if you can just open your hearts and think about your own children or the children that you can see, and you see this one little girl who is about 10 years old and she had a very severe vision defect and she had as a result very timid steps. She was hunkered down. She was beautiful and she was paralyzed at the same time in her relationship with the world around here.

What we know of radioactivity we can't claim any innocence of youth anymore. My father worked in this industry as did a lot of the parents of my friends growing up. They were all wonderful men, good family people. They had great intentions. They thought they were

solving one of the world's great problems. But here we are many decades later and we know that we have invented something that we don't have solutions for and at this time no matter how we treat it or recycle it the truth is at this time we cannot contain it. We have invented something that will last well beyond us, beyond the Romans and the Greeks and Henry VIII and President Reagan and President Clinton and well into the future, so what we are encountering is actually if you can consider that the exposure and the way it is being presented at this time the multiple exposures with no control within a household, within the frames of households.

We have some testimony from indigenous people who live in radioactive, contaminated houses. They have high rates of cancer, and we are talking about exposing our unborn children as well as our living relatives, and I ask all of you to think about yourselves before you got your titles, think of yourselves as human beings before you had positions of authority, and to contemplate what it means when you look at these children who essentially are causing the extinction of their own family trees and in Russia we are looking at a very high death rate now.

So I feel for you. I have a lot of empathy because I understand there is an urgency to do something, and we are Americans. It is a big part of our culture to do something, but maybe at this time we may need to think about -- with humility what we have done and to recognize that we don't have all the answers right now, and until we can guarantee it that perhaps the best thing we can do is do nothing. Thank you very much.

STINSON: Thank you for your time. Are there other comments from the audience on particular issues we have been talking around, concrete or copper? Have we missed anybody in that comment period?

[No response.]

STINSON: Okay. Thank you. We are going to move on to soil

and try to cover soil and trash before we take a break for lunch. I am not sure how that is going to go. Obviously that means it is a later lunch, if people are willing.

Are there any -- I believe trash comes from a suggestion from the power industry that there is an array of materials that are in common trash that must be dealt with. I think that it would be helpful to have -- I'm doing soil. I am looking up there and so the soil issue actually came up early in the processing and NRC has initiated a study to examine soil in a similar format to the materials examined under NUREG-1640, and we heard a presentation on that yesterday.

Are there any folks here that have particular experience with potential uses and disposal of soil from facilities that would be able to talk a little bit about -- in a similar vein that we have done so far? Okay. Kristin and then Paul.

ERICKSON: Academic and medical institutions, as I said, you can find a little of everything there and a lot of some things. Here we have some soil as waste that we get from researchers who are doing research with soil, either the main area we have are the people who are doing environmental remediation studies -- in other words, does a biological organism eat up the methanol or the dioxin or whatever chemical contaminant or not, and the way that they do that is to analyze sometimes with radioactive tracers labelled to the methanol or the dioxin or whatever it is.

What we typically have done with this is fairly straight-forward as far as our program is concerned. It is a little out of the routine. We do a little more analysis. We get this soil. We have them label it with what they know, they put in there, and then we always verify -- in fact, every bit of waste -- we get in liquid waste -- we analyze it in my own lab, again to see what is in there as far as isotopes and concentrations and chemicals.

The soil is something we just do a variety of wet methods

with. You can do a dry meter reading on grams, or minigrams, and general screening of big volumes which is done and then also some wet methods to detect other isotopes that can't be detected with a portable Geiger counter instrument and is how we release it.

I don't think that soil is a huge problem for us, but once again when you look at the decommissioning of areas and buildings in future years -- let's say at the point where we decommission our cyclotron -- the soil underneath that machine will likely be activated to some degree. We have very thick concrete underneath to shield that and calculated for that, and we have in fact drilled corings down through, prior to onset of new machines and in our building phase.

We have analyzed that soil and found nothing. With this big, huge more powerful machine that we will commission next year we expect to see something so it will be an ongoing monitoring.

At that point you are talking about very low levels, looking at environmental level measurements that we would have to do. That's it.

LESNICK: Kristin, may I ask you, is it your sense that for similar, for other research institutions that the largest volume then we'll be associated with with our large facilities eventually decommissioned, is that where you see the largest soil implication?

ERICKSON: I don't think so. I don't think in routine -- that's the abnormal, the cyclotron.

LESNICK: Right.

ERICKSON: Or power reactor, if they have a research reactor it might be a problem there. We did decommission a research reactor, by the way, and found nothing in the soil. We had so much concrete around it -- it was a very small reactor, however, so the larger ones may see some, just like our larger cyclotron might, but routine research and develop, biological research, we don't even see it on the surfaces of the benches because we are so -- I neglect to call it -- so "Nazis" --

"radiation radbusters" -- we make them keep it so clean, the chance of it being in soil is essentially nil.

CARDILE: So, Kristin, may I ask you if NRC was to try to do something from a dose, what would you look to NRC to do if it were to try to do something from a dose-based standard in the future, thinking about these alternatives we were talking about yesterday.

That was Frank Cardile, just for the record.

ERICKSON: Okay. Kristin Erickson, Michigan State University again. I am talking "big picture," overarching, what I would like to see as far as regulations, rulemaking. I would like to see the development of a standard and education and guidance for, first of all, the radioactive things that people and institutions and facilities will encounter -- what do they encounter, what isotopes will they encounter there, what instruments should be used properly and what can those instruments do and then having those instruments calibrated according to the isotope.

Now that is already in the rulemaking in Part 20. Many people don't adhere to it, but it is there. You must have your instrument calibrated for the isotope to be measured and know these deficiencies with certified standards or traceable standards.

Finally, what I would like to see is not a dose standard such as one millirem for the entire piece of equipment, although that could be a secondary guidance, I would prefer to see something like we have for air and water where it is a flat concentration, so many microcuries per cc of material, which is in fact ultimately a dose-based standard. It relates to the dose and considers the pathways, the radiotoxicity of the isotopes, the forms of the isotopes, et cetera. That would be the easiest way -- in fact, it goes totally hand-in-hand with what is already existing. It is known. It is usable. It is easy to measure, easy to train, easy to document, and it is very, very conservative, so I would like to see that happen for all of these

materials including soil or whatever.

LESNICK: Thank you. Could we go next door to Susan and then we will come down to you, Paul.

LANDAHL: Susan Landahl, Commonwealth Edison.

My experience with soil has to do with my previous position, which was at a licensee in Unit 1, excuse me, Region I, so I am not 100 percent sure that this is uniformly applied across all the NRC regions but I will throw it out at least as something in Region I.

We had the issue of free release, which I think we have talked about or release for unrestricted use, but particularly with soil at least a boiling water reactors there is measurable contamination over time at very, very low levels all over the site.

In this particular case the bind that we are in is even simple demolition, or say we are replacing asphalt or we are laying new pipe for something. There is some quantity of soil that is very, very slightly contaminated and technically we can't even distribute that at a low-lying part, another part of our site, if you follow me, so we can't release it from the site except as radioactive waste. We can't even use it to fill in the low spots somewhere else because -- without applying for a particular 2002 Part 20 exemption because we don't have a license to bury waste, which technically is what we are going if we move that dirt from one point to another.

So from a practical standpoint it is just -- that one really doesn't make any sense to me I guess is what I am saying and I just want to throw that out as another issue in addition to just the unrestricted release of the material. Thank you.

LESNICK: Let's come down to Paul and then Charles -- again, comments about soil, please, how it is being dealt with now, suggestions you have got, particular aspects around this material that NRC ought to be thinking about. Paul?

GENOA: I am Paul Genoa, NEI. Yes, the soil, to expand the

types of soil materials that might be of concern at least at utilities, you know, I think you just heard that fundamentally there are currently not only EPA but NRC criteria for the releases of materials in air and water. There are effluents from power plants.

These effluents result in small amounts of material distributed around the power plant site. If you were to go and be required to dredge a discharge canal because it had silted in or filled in, you would need to get an alternate disposal request processed to allow you to do that and to do anything with the material because in fact if you monitored it you would see activity.

Frankly, if you monitor it, you see activity anywhere, and of course in our environmental monitoring -- and that is the level that we need to go to for detection -- we can find activity anywhere, anywhere, on our site, off our site, in your homes, whatever, so it makes it very difficult when we have to move material for whatever purpose, to show that that material is not our licensed material or if it is our licensed material to do something with it.

I gave you the example of dredging a canal. There's also cooling towers that you see that people mistake for reactors, but those cooling towers are there to cool the cooling water. If they pull the cooling water from the discharge canal or the vicinity of the discharge canal, they could pick up some of the liquid effluents that are released over time and they concentrate it just like you would concentrate in a tea kettle when you are boiling it down. You get that residue.

Well, they actually in many cases concentrate naturally-occurring activity or activity from other sources or activity upriver from another facility. It makes it very difficult to determine what the appropriate -- what you are allowed to do with that material.

Other examples are you could envision that even if you used the best monitors available to check personnel, people, equipment, moving out the facility, there are trace amounts, extremely small, that

will move in and out of the facility. There are concentration mechanisms -- your feet, your shoes, walking across the clean part of the turbine hall. Every night someone comes in and cleans the turbine hall with a mop and a bucket. They pour the mop and the bucket-water down the drain. Over time, there can be detectable activity, extremely low, but detectable activity that would concentrate in the sludge and sediment in the septic tank. For that matter, if any of your workers had a medical treatment, you would also find that activity in the sewage system treatment and that sediment and sludge needs to be pumped out routinely and dispersed, and we have guidance on how to do that, but it is relatively inconsistent.

There are just yard drains for stormwater runoff. If you have effluents around the plant and you have people walking in and out of the plant over time, 20 years, 30 years, 40 years of operation, there is a potential for that material to exist out in the environment. When it rains it goes down the storm drains and it concentrates in sediment and soils around the drains.

Fortunately all these materials are anticipated, found, dealt with during decommissioning, but sometimes they have to be dealt with during operation so in operational conditions we need to have some standards to determine what we can and can't do with the material.

Again, soil is very similar to concrete. There is not a significant economic value associated with the soil and the material needs to be dealt with, but there is a high disposal cost and transportation cost for soil if it has to go across the country to deal with risks that are in the same range as the soil in anyone's back yard -- so it seems a little bit difficult to deal with.

There are also opportunities to clean soil in certain cases. There are technologies available to do soil washing and remediation that would allow that soil then to be released to be used for clean fill or left onsite, but again you need standards to assess whether the

cleaning operation was done properly or not.

We do have a useful tool -- 2002 Alternate Disposal Requests have been used by the industry. We hope that they will continue to be allowed to be used by the industry and they can allow us to deal with some of the situations, I have personally dealt with them, that allow for state-approved disposal in a local landfill or onsite or whatever, but they are cumbersome, they are expensive, they are difficult, and all of the analysis associated with them would not have to be reinvented if a standard was determined.

It would make it more pro forma, easier to manage, and the disposal type options, as I mentioned, could be disposal onsite, disposal offsite. They could be land-farmed. They could be used for beneficial fill in low-lying areas, et cetera.

LESNICK: I know we have got a question from Tony and I will remind people -- there are some folks coming and going -- after we discuss each material, there will be opportunity for public comment and so we are in the middle of a discussion about soil but after that we will have public comment. Tony.

HUFFERT: This is a follow-up. Tony Huffert, NRC.

Paul, you mentioned not only soil, but I think sludge, from cooling towers or septic tanks, for example.

We are making a differentiation between soil and sludge in our analysis. We are not currently going to be doing sludge. Do you think this is a material that should be added to our list that we should be taking on right now?

GENOA: I do, for two reasons. One, that material is probably more problematic in day to day operations, and two, the analysis for the materials should be very similar.

I can see differences for sewage sludge, but you are already doing some analysis for that because other generators are allowed to use sewage disposal intentionally, but the end-products are similar enough

to soil that I think it might simplify your consideration.

I would also include sediments from settling ponds and so forth. There are power plants and other facilities that do have settling ponds. Actually, many of them are settling ponds for fossil facilities, but there are because of effluents and because of other situations, there are opportunities for concentration there, from storm water runoff or whatever, to levels that are detectable using sophisticated instruments.

Given that, there ought to be a way to evaluate what the appropriate disposition pathways should be for those materials.

LESNICK: Charles, you have waited patiently.

WILK: Yes.

LESNICK: Do you have some comments about soil?

WILK: Yes, I do. Susan Landahl -- is that the correct pronunciation? -- you talked about having to -- the problems of moving soil, contaminated soil, and using it as fill at the facility, and Paul mentioned 2002. I am not familiar with that, but I am familiar with under the EPA Superfund Program they have sort of a problem, too, for cleanups. There was something -- how CIRCLA related to the Resource Conservation and Recovery Act, and they came up with an idea called a CAMU. I was wondering if the NRC might want to look at how that is done, which in theory exempts a Superfund action when they pick up waste.

It used to be that when they picked up that waste it would become under RCRA jurisdiction if it was managed within the facility and a Corrective Action Management Unit would exempt that, so you wouldn't have to deal with getting a RCRA permit to put that material back down at the facility.

I am not familiar with 2002 and I don't know how that relates but NRC might want to look at how the EPA handles that situation.

LESNICK: May I ask Kelly or David, anything you would care to comment about from the Department of Defense perspective about soil, your experience, your advice for the agency on this?

CROOKS: Sure. Kelly Crooks, U.S. Army.

Yes, we do deal with a lot of soil cleanups, but typically they are for decommissioning activities, either decommissioning of a license or of a part of a license, and maybe that would be one question I would have to the Commission is how would what we are talking about here tie in with the decommissioning requirements and the 25 millirem per year standard there.

One of the issues that we have, you know, that I have mentioned that of course we have installations in every state and you are dealing with every waste compact, is at the start of any remediation project one of the big issues is developing the release criteria for that particular site. We typically deal with the NRC and also EPA and the state the installation is located in, and to get buy-in from all of those regulators to agree amongst themselves in negotiations with us as a generator typically takes months if not in excess of a year, which can wreak havoc with trying to manage a budget and trying to schedule activities.

Of course, a lot of times we will end up doing a cleanup in, say, Vermont in February, which doesn't work real well, trying to get the trucks out and across the country to Utah, so one of my questions -- I know Mr. Collins had mentioned yesterday that the states will reserve the right to determine their own standards, no matter what the NRC decides to do here, and another question I would have for the Commission is what kind of buy-in are you getting from the states in terms of whether they will agree to go along with any standards you would set if they would accept that at face value for approval for release criteria within their state.

LESNICK: What was the first question you had? Was it for

Steve?

CROOKS: I had a question. I had mentioned that when we typically do soil remediations it is in conjunction with decommissioning --

LESNICK: Yes.

CROOKS: Decommissioning is the term for license termination, and you can either terminate an entire license or you can terminate a portion of your license if that particular site is mentioned in the license, so to me we have decommissioning rules --

LESNICK: You want to know the relationship between this and that?

CROOKS: Yes.

LESNICK: Thank you. Good. Appreciate the clarification. Anyone from NRC first care to comment?

MS. HOLAHAN: All right. Patricia Holahan, NRC. A license termination addresses decommissioning a facility and what is left onsite. What we are discussing here is what can be -- we are considering a standard for what could be released during normal operations offsite, either in the form of possibly a restricted release or unrestricted release and, as I said, at this point we haven't set a standard or looked at a specific option, and that is where we are still exploring how to deal with material that is onsite that licensees may be looking to release and move offsite.

Tony, do you want to address specifically the soil?

HUFFERT: Tony Huffert, NRC. When it comes to soil, I guess an example might help.

If you had some soil that was near a down-spout, as Paul Genoa mentioned, or if you had a spill that was near the foundation of the building that was readily cleaned up, that would be something that would be done during operations, but if you had to go underneath the foundation of a building during decommissioning that is probably where

you would be generating more volumes.

Now it is unclear right now whether or not the licensee would be able to release that material under this initiative or if it would be done at the time of decommissioning as part of the decommissioning plan.

We have not worked that out yet, but what we are envisioning right now is relatively small amounts of soil that would be released under this initiative.

LESNICK: Okay, and then -- go ahead, Kelly. Do you want to quickly respond?

CROOKS: Yes. Just one other comment. That is kind of what I figured. I was just also going to mention that with soils this is an area where the restricted use or restricted release I think has I think some applicability, at least for us in the military where you have an enclosed facility that has I think ample security associated with it to keep out intruders and ongoing operations that may not be rad operations but may be done in the same area that the rad operations were that contaminated the soils.

Specifically for us I know we are dealing with some of our outdoor firing ranges where we had shot depleted uranium ammunition. Some of those we pretty much restrict test firing now to indoor ranges, but those outdoor ranges still fire other ammunition that doesn't contain depleted uranium and so we are facing the prospect of having to clean up the DU from the firing range, knowing that the day it is cleaned up we are going to start shooting other ammo that contain heavy metals onto the same areas we just cleaned up.

In essence, you know, we would be looking at cleaning up the same area twice, which doesn't make much sense, so in that case I think that is a perfect scenario for a restricted release scenario and would hope that the NRC would seriously consider options like that.

LESNICK: Thanks, Kelly. Let me take the comments of the

cards that are up on soil, public comment, and then try and start of trash and ask NRC Staff is there anything in particular regarding soil you would like to pose to the group also. Susan.

LANDAHL: Susan Landahl, CommEd. I just want to go back to Tony's point on sludge and another angle that if the NRC is going to include that into the rulemaking there's really kind of three components.

There's the semisolid sludge -- I am talking about sewage treatment facilities and some licensees have some form of sewage treatment onsite. There's semisolid, sludge, there's a liquid, and then what some folks are doing is they take the solids and they form into a truly dried solid brick which is then released and that introduces just another variable into the required sampling, you know.

Do you take the pre-dried material and put it on a gamma spec and count it to some environmental lower limit of detection or do you take the solid brick that remains and count it with your surface or your box monitor or whatever? If we are going to go that way, you probably need to address both aspects of the potential release path.

LESNICK: Thanks, Susan. Why don't we just swing next door to Steve before we come down.

COLLINS: I was just curious whether or not the Army representative had ever asked the appropriate NRC region or headquarters for an exception to that timeliness in decommissioning requirement when the reuse there is for heavy metals but basically required to be cleaned up again later anyway, because certainly most of the states would use common sense and say we will waive the timeliness requirement and you commit that you will clean it up when you are through using it, because you are going to have to clean it up again anyway.

We would certainly consider that a valid reason not to clean it up and then start reusing it again the next day for recontamination by some other heavy metal that would have to be cleaned up.

LESNICK: Sounds like something you might want to have particular conversations with later.

CROOKS: The short answer is yes, we have.

LESNICK: Can we move to Paul and Charles and then Jaz.

GENOA: Paul Genoa, NEI. Just a reflection on the issue that you raised about decommissioning at a 25 millirem plus ALARA for unrestricted release of a facility, and carry that discussion just a little bit further.

The fact is that, as was pointed out, that is for residual activity that may be associated with structures and soils at a facility but the conundrum you get into is the day after, and that material can be as high as 25 millirem if it meets ALARA criteria or less if that is appropriate.

The conundrum is that the next day a nonlicensed facility, it is unrestricted. That soil can go anywhere for any purpose, and it probably won't and it has already been evaluated that if it did it would be safe, but there's a regulatory dichotomy there between what you can do day one and what you can do day two, so I think there is a need to address that.

The second thing, and this relates, Kelly, also to your point of the use of soil, and let me tie it also back to concrete, because I forgot. Last week there was a IAEA international symposium in Virginia with people from all over as well as EPA, NRC, DOE and folks from around the world.

There were some very excellent examples of approaches that you could view as restricted release for some of these materials and I think it was actually at DOE so -- don't hold me to it, but the concept was that there was already a cleanup going on in a facility, in a community and the level of activity associated with the material was low but it needed to be controlled.

The decision ultimately was that that community wanted to

upgrade their airport and were very interested in having the land associated with the facility for an enhanced airport facility and that the soils associated would not need to be cleaned beyond a certain level if, in fact, they were covered with runways and buildings and everything else, so in effect it ended up like a restricted release scenario where the public gained benefit and the Government reduced costs and everybody seemed to be happy.

So, you know, there are innovative ways to deal with this, but you do have to set some basic -- you know, what's safe -- kind of standards before you can do that.

LESNICK: Last comment on soils.

DEVGUN: I think Paul already made the point. I will elaborate on that a little bit, because I think I would be really concerned about the dichotomy of applying whatever criteria we come up with here for soil which would be based on pretty well close to 1 millirem, whether we accept that right now as a target or not and the license termination rule.

It took many, many years of effort for the Commission to come out with the LTR and have it out on the street in 1998 as 25 millirem, and the way it is applied is to survey at the site under MARSIM, the final status survey, which means deriving the DCGLs, deriving the concentration guideline levels in soil, mostly in soil. The NRC can include the structures, so I mean that itself tells you that we have already something for soil as a standard to clear and nothing stops -- like Paul said after you have terminated the license you can do what you wish to do with that site including the soil, so that dichotomy is a real one and it should be looked into.

The other thing I would mention is like the Department of Energy I had some experience working through Argonne National Laboratory for many years on DOE, RESRAD and other programs. We typically derived these soil concentration guidelines, and they were based on a certain

dose level and then you derive where we had the levels which are already codified through DOE orders or what-not as, say, 5 picocuries per gram for Radium-226 and 15 below a certain level in soil, but where we did not have, for example, for uranium isotopes, we derived them based on a pathways analysis method, so whatever we do here should not come in conflict with what is existing already, otherwise we will be revisiting a lot of these soil issues again and again.

LESNICK: Thank you, Jas. Let's take some time for a public comment. As you know, after each discussion of material we have opened it up for comment, particularly about the material we just discussed. In some cases people make broader comments, so let's see if anyone would like to take advantage of this time for public comment. We do? Okay -- if you wouldn't mind identifying yourself.

FOUSHEE: My name is Lea Fouchee. I am Cherokee and Opinny Chief. I have talked with Barbara Stinson before about being here. I would like to thank you for allowing us to have this opportunity. We probably would have come and taken it anyway, but thank you.

As an indigenous woman it is my responsibility to think and then act for seven generations into the future using the wisdom and the knowledge of my ancestors for seven generations from the past. This process does not do that. It does not protect our Mother Earth. It puts us in a situation where we are threatened for geological time.

We now have cancer as the number two cause of death in Native American lands in North America, both women and men -- it is the leading cause of death over the age of 45, and it is not just Native people. How many of you in this room have had a loved one die of cancer? Raise your hand. How many of you?

[Show of hands.]

FOUSHEE: Everybody, raise your hand. We know what causes it. The Federal Government and the nuclear industry have long been in bed together and now you want us all to be in bed with the nuclear

industry. That is not right. We will not allow you to do that to the future generations.

I would like to commend the steel industry. They are the backbone of this Western civilization. Without the steel industry this civilization would fall. You are threatening the steel industry with things they do not want. They have told you that. They have told us that. This cannot be done.

Just because your idea of regulation is burning or burying or dilution does not mean that it solves the problem. If you destroy the foundation upon which we stand as a civilization, our Mother Earth, our sacred land, our children, you ignore your ancestors and you ignore the very foundation of your corporate Reich, your civilization will fall and anarchy will prevail, and you are seeing that on the rise, and we do not want that. We want to work for a future for our children. I thank you for your time.

LESNICK: Thank you, Lea. Anyone else?

If you don't mind, please identify yourself.

BENCHELOW: My name is Carrie Benchelow.

LESNICK: You could pull that up closer to you, Carrie.

BENCHELOW: Sure.

LESNICK: Just make sure you are close to the mike so that people can hear you and it goes on the transcript.

BENCHELOW: Is that better?

LESNICK: Yes, that's much better.

BENCHELOW: Okay. As I said, my name is Carrie Benchelow. I am a member of the Board of Directors for the Nuclear Energy Information Service --

LESNICK: Even a little closer. I'm sorry to interrupt.

BENCHELOW: -- based in Evanston, Illinois.

[Pause.]

BENCHELOW: Thank you. I would like to read a statement on

behalf of the following organizations, and those organizations are: Friends of the Earth, US and UK; Physicians for Social Responsibility; Alliance for Nuclear Accountability; Low Level Radiation Campaign, UK: US Public Interest Research Group; Project on Government Oversight; North American Water Office; Illinois Public Interest Research Group; Citizens for a Healthy Planet; BOND; Coalition for a Safe Environment; Help the Environment; AWARE; Don't Waste Ohio; Ohio Citizen Action; Environmental Coalition on Nuclear Power; Central Pennsylvania Citizens for Survival; Shunda High Network; Nuke Watch; Citizens Action Coalition of Indiana; Don't Waste Michigan; Coalition for a Nuclear Free Great Lakes; Citizens Resistance at Fermi 2; Women's International League for Peace and Freedom; Citizens Awareness Network; Committee on New Priorities; MCS Health and Environment; Chicago Student Environmental Alliance; Home of Peace and Justice; West Michigan Environmental Action Council; and the Nuclear Information and Research Service.

The statement is as follows:

Our call to the Nuclear Regulatory Commission is to fully regulate and isolate radioactive wastes and materials and anything they contaminate, no matter what level. The radioactive legacy of atomic weapons and energy production should be isolated from the public and the environment. We don't want nuclear power and weapons waste released, cleared, deregulated, exempted, generally licensed, designated de minimis, unimportant or BRC -- Below Regulatory Concern, or by any other creative, direct or deceptive means allowed out of nuclear facilities and into the marketplace or the environment on any level.

The current methods of releasing radioactive waste from commercial licensees and weapons facilities must immediately cease. No future radioactive releases should be permitted and a full accounting and recapture of that which has already been released should commence.

Using radioactive wastes in consumer products poses unnecessary avoidable, involuntary, uninformed risk. The consumers, the producers,

the raw materials industries don't want these radioactive wastes or risks.

It is not credible to believe computer models can calculate and accurately predict any or all of the doses to the public and the environment from all of the potential radioactivity that could be released over time. Projections of acceptable or reasonable risks from some amount of contamination being released are meaningless and provide no assurance.

Monitoring for the specific types and forms of radioactivity that could get out could be very expensive and tricky to perform. Hot spots can sneak through. We can't trust the nuclear generators to monitor their own releases. No matter what level the NRC sets for allowable radiation risk, dose, or concentration, it will be difficult to impossible to measure, verify and enforce. Who is liable if the legal standards NRC intends to set are viable -- or violated?

For decades the public has clearly opposed releasing radioactive materials into commerce. We continue to do so. Naturally occurring background radiation cannot be avoided except in some instances -- for example, reducing radon in homes -- but its presence in no ways justifies additional unnecessary, involuntary radiation exposures, even if those exposures might be equal to or less than background, nor does it justify shifting the economic liability from the generators of radioactive waste and materials to the economic and health liability of the recycling industries, the public and the environment.

We fully support the complete opposition and zero tolerance policies of the metal and recycling industries, the management and the unions. We appreciate their efforts not only in opposition to legalization of radioactive releases but in their investment and detection equipment and literally holding the line against the radioactive threat to the public. They should not have to be our de facto protectors. The NRC, DOE and EPA must act to prevent the

dissemination of radioactive wastes into recycled materials and general commerce.

The problems that have been experienced by the steel recycling industry with generally licensed sealed sources getting into their facilities and costing tens of millions of dollars to clean up should serve as a warning not to let any other radioactive wastes and materials out of regulatory control.

The fact that radioactive waste is already getting out should not be use to justify legal levels allowing more out. The NRC, EPA and DOE should prevent future and correct past releases. The fact that other countries are releasing radioactive materials into the marketplace is no excuse for us to legalize it. The United States should take the lead in preventing contamination of the international marketplace. We protect ourselves best by not facilitating international radioactive commerce.

The fact that it is difficult and expensive to monitor and detect radiation does not justify its release. It is all the more reason to prevent any waste getting out so we don't have to check routinely for contamination.

LESNICK: One more minute. One more minute.

BENCHELOW: The nuclear industry and regulators should be aware of what materials at reactor and weapons sites are waste and which have been contaminated. Those materials must be isolated, not released at any level.

The mindset of the NRC appears convinced that it should legalize radioactive waste being recycled into the marketplace. Our demand for prohibiting releases has been considered unreasonable. That is why many of us are refusing to spend two days at this meeting.

Until the logical public positions that radiation exposure should be prevented and that radioactive waste should be isolated, not recycled into daily use are considered reasonable, our time is better

spent educating the public on what you are planning than here debating levels we will never expect and methodologies we will never trust. Thank you.

LESNICK: Thank you. If you have an extra copy, if you could leave it, we would appreciate that.

Would anyone else like to comment at this time? Yes, please. If you don't mind, please identify yourself.

WOLDENBERG: Yes. Can you hear me?

LESNICK: If you can get closer, can you tilt the microphone down a little bit towards you?

WOLDENBERG: Okay.

LESNICK: That's better.

WOLDENBERG: Can you hear me now?

LESNICK: Thank you.

WOLDENBERG: All right. Just two days ago --

LESNICK: Could you identify yourself, if you don't mind?

WOLDENBERG: Oh, sorry, yes. My name is Sue Woldenberg. I live in the area, but what is happening here affects everybody everywhere.

Now I have only heard about this two days ago and when I heard about this I said, gee, what they are trying to do -- this doesn't sound right. Can people in their right minds and hearts allow something like this? And it scared me.

I have never done this and I am shaking right now, because I said to myself, well, you know, I got to find out a little more about this. This doesn't seem -- this doesn't seem good -- and this is going to be occurring here in the United States when we are all trying to think how can we make this world a better place, whether it is individual like me -- because I am representing myself. I am here because I am just curious and, my goodness, if you have the ability to have some kind of check on controlling what others are trying to do that

are wrong, please, use your conscience, use your intellect, use your own self, like me. I came here by myself.

I think what you are doing, what you have power to do is to check what is going on that is wrong and please vote with your intellect and your conscience and do what is right. Thank you.

LESNICK: Thank you very much. Anyone else care to comment? Yes, please.

BAIMAN: I'd just like to tell a little story.

LESNICK: Would you re-introduce yourself? I know you spoke yesterday but if you don't mind.

BAIMAN: I spoke yesterday. I am Sydney Baiman. You heard me shout yesterday, so today I am going to tell a story.

My niece used to live in Syracuse, and we drove up from New York City and she had a dog, and when we arrived on a Sunday night we took a pail of water. She gave the dog some water from the tap, and the dog refused to drink the water and we didn't understand why, so then we had to get some spring water for the dog.

Then we found out that there was a steel mill -- I think it is AllSteel, is that right? -- I was talking to one of the gentlemen -- nearby, that had just recycled radioactive steel with cesium in it, and apparently it was called "orphan waste" -- somehow these wastes by accident -- I don't think it was an accident, I think it was a Mafia job -- get to these steel mills.

Okay, so this dog refused to drink the water and of course it was June, so all the cesium, radioactive dust just from this little bit of recycling blew over on the strawberries, of course, and all the beautiful gardening that was going on. Also, this radioactive dust went to the reservoir so that is why the dog wouldn't drink the water, and there was a little article this big in the tenth page of the newspaper saying that this steel company had recycled the cesium.

Now this is just one incident of what happens when you

recycle this stuff. It is not just going into the products. It is going into the land, the sea, the air, and guess what? -- pregnant woman comes along and eats those strawberries -- what is going to happen to her baby? Will she be a Down Syndrome or retard because she didn't know that this was going on?

All right? I think we are playing with -- what is happening with this industry is really unconscionable and you know you are killing people with doing this. That is all I have to say.

LESNICK: Thank you very much. Anyone else care to comment? Yes, sir, please.

WILLIAMS: My name is Chris Williams. I'm the executive director of the Citizens Action Coalition of Indiana. We represent a quarter million households in the State of Indiana. We worked on some very significant nuclear issues over the years, mostly construction issues regarding commercial power plants.

I want you to just consider that right now, as you talk about these substances, which you want to label as below regulatory concern, I just want to assure you that once the public at large begins to be informed about what that means and what you're trying to act on here, it will not be beneath public concern. And as the debate and the public education on this issue grows, you will see what I mean. Thank you.

LESNICK: Thank you, very much. Any other comments? Sir?

TREPANIER: Good afternoon. My name is Lionel Trepanier. I'm with the Blue Island Greens, a local affiliate of the Green Party U.S.A. I say with certainty that the Greens have been, are, and continue to be opposed to nuclear power and nuclear contamination of our environment. And I could -- based on that, I could assure you, also, that the Greens would oppose unrestricted and restricted release of nuclear contaminated materials.

I had a question, if that's appropriate, as to when or if

the comment period was extended from the June 30, '99 notice?

HULAHAN: The comment -- Trish Hulahan, NRC. The comment period for the issues paper closes on December 22nd.

TREPANIER: Do you know the date that -- that notice that was in the Federal Register, June 30, '99, with a cutoff date that has already passed. Is that the date that was extended?

HULAHAN: Yes. That original date, I'm sorry, was November 15th, and it was extended and we published a Federal Register extending it to December 22nd.

TREPANIER: Do you know the date of that Federal Register or announcement of the extension?

LESNICK: No. But, you know what, when you sit down, we can -- someone can get you the -- if you want the Web site, you can track all the information and what announcements were made. It might be most convenient for you to see everything in one place. Would that be helpful?

TREPANIER: Thank you.

LESNICK: Great; thank you. Any other comments?

[No response.]

LESNICK: Okay. Before we break for lunch, Mike Mattia, you had a quick --

MATTIA: Mike Mattia, Institute of Scrap Recycling Industries. I, personally, want to thank the individuals who came here to make comments, because I think they're important to hear. There was two phrases, and I apologize for not remember names, but you indicated that it doesn't sound good; it doesn't sound right. And you're right. When we -- when the public, and even individuals like us that are close to this thing, when you look at the concept of recycling radioactive material, it doesn't sound right. It doesn't. And the comment of below public concern is probably one of the best statements I've heard, because you're right, this has got to be everybody's concern.

And I go back to the one comment, the one position that I have trumpeted, and I promise this will be the last time you'll hear it this session, and that is that there is a tremendous fear about radioactivity and it's a well placed fear. There's a tremendous concern about the material that is out there and what's going to happen to it. And if we do not address the concerns, if we do not address the options, if all of the stakeholders, be the steel industry, the recycling industry, the research, the medical industry, the public at large, until everybody can understand exactly what is there, exactly what is present, and exactly what the options are, and everybody weighs in on what is acceptable and what isn't, then we really cannot have a rulemaking, Because the purpose of a rulemaking is to put in place mechanisms to casee and affect that everybody needs and wants. It's like when OSHA creates a rulemaking to protect the safety of workers, it's a foregone conclusion that workers are getting hurt for a particular reason and that those workers need to be protected and so the rulemaking, in essence, creates the mechanisms to protect them.

In the issue of radioactive material and what's going to happen to it when its usefulness has expired, we haven't addressed that issue appropriately, properly, and completely, so that all of the parties understand it, have gotten their arms around it, have seen it, understand the options, and have weighed in on what options are acceptable and what are not.

And I, again, urge, number one, the Commission, to consider allowing the stakeholders, themselves, with your assistance and your backing, to study the issue, to allow the stakeholders to see all of the issues, to quantify, to obtain acceptance for alternatives. And then once that has happened, once we don't have public fear about what may happen, once we have industry assurance that once they will get is acceptable to them and what will be done is acceptable, then you do a rulemaking to make that happen.

And on behalf of my industry, I pledge to be the -- to start whatever is necessary, and I ask anyone that's here and anyone that has been at these meetings, if you agree that we need to cut through the fear and through the rhetoric and get to the facts and get acceptance of the facts and the alternatives before the rulemaking, to please let that be known, because that support is going to be necessary for the Commissioners, the folks that these folks report to, to hear loud and clear the public and industry don't want a rule until we've agreed to what we'll accept as part of that rule.

LESNICK: Thank you, Mike. I see two cards. I will take those before we break for lunch. I just want to note for the gentleman, I'm sorry, I don't recall your name, in the back, that was curious about the extension date in the Federal Register notice, Bill Lipton was able to find a photocopy, so we're able to get that to you. So, I hope you have it. I think it was in the October 19th Federal Register. So, thank you, very much.

Charles and then Peter and then we will break -- Paul, and then we'll break for lunch.

WILK: Yes. I think Mr. Mattia -- I'd like to join with him in thanking the public for coming by and giving their perspective on this issue. I think it's very relevant.

We were talking about soil and I think Mr. - is it Crooks, from DoD, was talking about remediation, different scenarios. And I don't really know how the cleanups are conducted at DOD and the NRC. Under the EPA, they have different cleanup scenarios, as far as establishing the acceptable risk posed between industrial scenario and then the residential scenario. And perhaps that leads into how the NRC would handle restricted use of contaminated soils on a particular property.

The regrettable part of that is that that restricted use, under institutional controls, would be -- would rely on institutional

controls. So, we're talking about deed restrictions and fencing and so forth.

LESNICK: Thanks, Charles. Peter and Paul.

HERNANDEZ: Peter Hernandez. The steel industry has been working with the environmental community for over 10 years to promote recycling, as a societal good. We appreciate the comments and the support that we've received from the environmental community, as we have heard it at these hearings. And we urge the Nuclear Regulatory Commission to get very serious consideration to the comments you're hearing from the public and the environmental groups. Thank you.

LESNICK: Thank you, Peter. Paul?

GENOA: Paul Genoa, NEI. I wanted to take just a moment to follow up on Mike Mattia's comments and offer, as I believe there is merit there. I believe that there is -- that we have talked past one another on numerous occasions; that there -- that the packaging of this issue has not been the best; that it is understandable that people have concerns. It's understandable tnat some people would not accept this under any conditions, particularly the way it's been portrayed.

But, I think there are realities that could be explored and I would offer to participate in further debate, further opportunities. And as I have in the past, I would offer, within reason, to try to arrange for tours of facilities, so that people can get first-hand experience with the kind of materials we're talking about it, the kind of controls that we're already opposing, if that would help the debate in any way.

LESNICK: Thank you, Paul. Okay, friends, I'd like to thank those around the table, a good thorough discussion this morning; very frank. People drawing upon their experience, their point of view. I'd like to thank observers, members of the public, people that have come and taken time out of their day to share their thoughts and their views about this, as well.

Let us take one hour for lunch. Report back at 1:30 and we will continue our discussion. Thank you, very much.

[Whereupon, at 12:26 p.m., the workshop was recessed to reconvene later, this same day.]

AFTERNOON SESSION

[1:32 p.m.]

STINSON: Our prior discussions entered into the steel area, and then we'll talk a little bit about next steps and where NRC is going from here, all that before 3:00. Wish us luck.

Charles, and we'll give it to Mike Mattia. Go ahead, Charles.

WILK: I was asked earlier during the concrete part of our discussion about were there every any cases where people have lost market as a result of recycling material. And over lunch, I gave that some thought.

I can relate the following to you: I think Ms. Rogers is probably familiar with this, that cement kilns do recycle hazardous materials. These usually are hazardous wastes that have fuel value to them.

And so they are used as energy to drive the cement kiln or to fire the cement kiln. It has been rather controversial in different markets across the United States.

In response to, "has anyone every lost market as a result of that kind of recycling activity?" there was a case where a large home building supply store or -- what do you call it -- chain, that passed a policy within their own company that they would not purchase cement that was produced from the burning of hazardous waste.

So there you have an actual account of loss of market as a result of doing some sort of recycling.

That gives you an idea of why people would be very, very sensitive to that issue. That response by that retail chain was not a response to the science of whether or not this cement contained a hazardous or toxic material; it was in response to what their purchasers or their customers wanted.

And so here you have where the public perception of an

endangerment posed by including these hazardous constituents in cement, whether they be scientifically real or not, did cause an economic hardship on certain distributors of cement.

We had talked about reuse of material. There is a Super Fund site in Salt Lake City that's called the Midvale Slag Site. The EPA is busy trying to figure out a remedy for this site, and part of that remedy or part of the alternatives used to look at that remedy is to interest people in using the contaminated slag as a road base for the interstate highway that's currently being built there, I-15.

And because it's a Super Fund site, there are liabilities that are associated with that material that continue basically forever. The Federal EPA was unable to, so far, interest the state DOT in accepting this material that came from a Super Fund site into their highway.

You might be then able to guess what the public or Department of Transportation's reaction might be to someone saying, gee, we have this radioactive concrete, can we put it underneath your highway? It might be a very similar situation.

The final thing I wanted to say, in thinking a little bit more about it, I think the NRC is interested in developing a list of stakeholders.

When I talked about concrete, I was remiss, and I should have talked also about the other paving material, which is known as asphalt/concrete in the terminology. Obviously, there is Portland cement type of pavement, and there is asphalt concrete paving.

And the asphalt people also use aggregate, and perhaps the NRC might be interested in getting the asphalt people to recycle the radioactive waste in their materials.

STINSON: Thank you, Charles. Tom, did you have a general comment?

CIVIC: Yes, a general comment. I'm sorry that Kristin

Erickson isn't here this afternoon. But I had talked with her at the break, mainly because of the information --

STINSON: This is Tom Civic.

CIVIC: Sorry, Tom Civic from AISI. The information that she was presenting here at the workshop was very enlightening in terms of the rigorous sampling and measurement protocols that they had developed at Michigan State University.

She does not have all of them -- and I'm just paraphrasing what she had to say, so don't quote me as this is exactly what she said -- she has most of them written up, but she does not have all of them in writing.

If she was asked to, she would prepare them and submit them to the NRC for consideration. And I would recommend that that would be done.

From what I heard so far at the sessions I have attended, they sound pretty close to being best practices. So I would encourage the NRC staff to contact Kristin and ask her if she would be willing to submit those for the record.

STINSON: You bet, thanks. Okay, let's shift into trash and materials for reuse, items for reuse. Again, these came up at prior -- these ideas came up in prior meetings. What do you do with equipment, and what do you do with just general rubbish? Maybe we're talking largely about fairly large licensed facilities where this would be an issue, but Paul, we're just going to cut to the chase here and turn to you and ask you to make some introductory remarks about what this issue is all about.

GENOA: This is items for reuse.

STINSON: We'll, we're going to try to combine -- you may not have been here when we started this session, but I said that we're going to try to -- we've got to accelerate this process a little bit to get through by 3:00. We're going to combine trash and items for reuse.

And that's going to make Georgio's life really difficult, but we're not going to get through it otherwise.

GENOA: I'll go through a range of items for reuse first. At a large facility, and to a lesser degree, at all the smaller facilities, they may have the same kind of issues.

And this has to do with virtually any type of material that needs to move in and out of the facility.

Now, at a power plant, that includes clothing, workers' tools, and tools are small hand tools, as well as things like welders and forklifts and cranes and trucks; pallets that materials are packaged on; consumable materials such as paints, oils, lubricants, you know, anything that you could find in your garage or in a shop or in an industrial facility. That's the kind of thing we're talking about.

We're talking about compressed gas cylinders that are used, you know, industrial compressed gas cylinders that are used for many applications.

We're talking about wire, we're talking about scaffolding, we're talking about containers such as Sealand containers that have materials in them; boxes, drums.

We're talking about computers, computer terminals, video screens; we're talking about video monitors that are used to observe remote work activities. We're talking about hand-held radios; we're talking about beepers.

We're talking about clipboards and notebooks; we're talking about anything you can imagine in an industrial facility, that's what we're talking about.

And what we're saying is that if those materials are clearly radioactive, and if they can be decontaminated to become non-radioactive at some standard of proof, then that's what should happen.

If they are contaminated and can't be decontaminated, then they'd be disposed of as we've always talked about, as waste.

But the materials aren't waste if they're not contaminated. They're not waste if they're still reused and reusable.

And most of the material can be reused and is being reused. So I hate to try to make it a quantitative list, because, you know -- and then if you wanted to go to a university laboratory, it's a little bit different.

It's the same thing as it would be in any nonradioactive laboratory, university laboratory, only it has the radioactive constituent. So petri dishes and bunsen burners and pipettes and ventilation systems and bench top counters, and that sort of thing.

So, I mean, that's a small sampling of the kind of materials that are or use. Obviously, many of those are very, very valuable in their current form to be reused. A truck is still a truck when it leaves. A compressed cylinder, many of these things are actually --

I mean, we take a compressed air cylinder in, we plug it into our system. It pressurizes our fire suppression system or some other safety system.

When it gets down to a certain level, it's changed out, swapped out with a new one and taken out and taken back to the vendor to be refilled and brought back.

Now, if it has to go into an area of the plant where there is know contamination, we put a canvass bag over top of the cylinder, or we wrap things in plastic. I mean, we take the appropriate steps to reduce pollution, to avoid contamination, but some level, particularly if we really are rigorous, some level is inevitable and has to be dealt with.

Most of it can be managed through the same types of control mechanisms that we've talked about. So the first level of control is, don't let it get contaminated.

The second level of control is evaluate whether it can be cleaned or not, and if not, isolate it from the environment.

If it can be cleaned, send it to a place that can clean it, or do it yourself, and, finally, use whatever is appropriate to ensure that there isn't residual activity that is above whatever the appropriate standard is.

Our current standards are a legal definition that is not verifiable, period. And so that yields the problem.

LESNICK: Frank?

CARDILE: I just had a question of clarification. Frank Cardile, NRC.

Can you, in your daily practices, clearly distinguish between materials that are clean that have never been -- all the ones you've ticked off or read down the list of, that are clearly from clean areas and are clean, have not been exposed to any radiation, and those that, like you say, go into radioactive areas that you --

I mean, that would be your practice, you know what's coming from where?

GENOA: The answer is yes, and all of the things that I just mentioned are things that have the potential. There are also the exact same kind of materials that we believe don't have the potential and we don't evaluate.

Those include your furniture in your office complex, the food in the cafeteria, the soft drink dispenser in the cafeteria. People come and go from there all the time.

The security guards, their guns, all of that sort of thing. So I really do believe there needs to be this principle of process knowledge.

A nuclear facility is a very large facility, and only small parts of that facility are actually engaged in operations that involve those radioactive material in any fashion.

So that's a clear distinction, but all of the things I mentioned anyway still could be going into that area, and it's proving,

in fact, that they are clean when they come out that we have difficulty with.

Again, when I talk about framing the issue, our sense is that in most cases, this material, we believe is clean, or we are surveying it to find out where it is not clean so it can be cleaned, segregated, chopped up, you know, sectioned or whatever.

CARDILE: But before we move on maybe to talk about your kinds of facilities, I have a question for you: The category that says analysis needed, given the wide range of kinds of materials that you're talking about, is there anything you would encourage the NRC then to think about as they consider this kind of grouping of material, anything different, in particular, to what's been suggested thus far?

GENOA: Yes. And although I believe that there should be a dose-based standard as the basis for moving forward, I recognize, as was pointed out, that to implement a rule, you need to have concentration-based values.

Of course, they're going to be derived from that dose-based value. But you can do detailed analysis using all assumptions, and you can end up with a whole hodgepodge of numbers for every different material possible.

And while I hate to choose the most restrictive in every case, which is sometimes ludicrous but often done, I do believe that looking at a distribution of values and picking a rational value that everyone would implement uniformly, would aid in our evaluation of these diverse materials from one facility as well as comparing the release and verifying it to the public's satisfaction from many facilities.

CARDILE: Can I ask one other quick question? You read through a long list of items. Where might they go? I mean, you mentioned tools, scaffolding, computers. They don't go into the general public domain? Where would they go?

GENOA: Sure they can. The scaffolding, depending on where

it is, may be reused by a nuclear power plant or a nuclear facility, or it may be used, if it's free-release, by any other industrial facility.

When the computers come out, if they are clean, they are treated as any other computer, and they go to someone's desk, and when they get obsolete, they go to recycling somewhere or whatever.

Hand tools, if they are free-released, you know, are free-released. They may be used on the nonradioactive side of the plant.

Now, traditionally, many of these tools -- it's prudent to go ahead and just set up with a paint scheme, a set of dedicated tools that never comes out. Those are for work in contaminated areas.

But as I say, there are materials that we talk about that we know are radioactive.

Unless they're easily cleaned, we're not going to worry about those, or they're going to go to a dedicated facility to be cleaned. It's all the stuff that we're not sure of.

How do we prove that it is clean? But, yes, I mean, that's why the terminology in our industry is free-release because there are no constraints on the material, once it's released.

And although we do dedicated surveys, we don't sit down and develop a documentation package associated with every wrench that comes out of a facility. That's just not the way it's done.

CARDILE: Thanks, Paul.

LESNICK: Can we move on to Kristin to talk about you type of facility in a university research kind of facility and what your experiences are, both with items for reuse as well as trash, rubbish?

ERICKSON: This is the biggest bulk of our problem, or our volume, I should say, in medical and academic institutions.

We have both reuse all the time. In fact, that's the very nature of our work, and this is something that may not be so straightforward to some people, but I have a laboratory, I've got a lot

of people working with loose radiation there.

And every day they have to control it at the source. Okay, let's say they have some contamination on their absorbent lab paper, they have to survey after every use. If it's contaminated, they have to clean it up.

And so every single day in every way, we are sort of free-releasing. And the way we do it is under our license and with the regulatory guidance.

We have a limit of 200 dpm for high-risk betas and gammas; 2,000 dpm for low-risk betas and gammas. They all have to have their own geiger counters. We require before they're approved to use it in their lab.

We calibrate those geiger counters with NIST-traceable sources, so we know they work. If they don't work, we decommission them and they have to get another instrument, or they can't use this until they do have an instrument.

So this is common every day. Survey, release, reuse. And whether it's a big piece of equipment or their little pipetter or the bench top; it's all the same ball game.

Now, as far as waste is concerned, we have primarily paper/plastic gloves, but it's also glass and all kinds of things, you know, the lab glassware, the pipetters, and the little stock bottles and all of those sorts of things that you can commonly see.

But that's not the only categories. So here, I would like to add and share with you some of our way of managing it, because we have a good waste program that works, it's cheap, and it's extremely safe, and extremely compliant.

We have categorized our rad waste into two primary categories, of course: Solids and liquids. And then within that, we have regular radioactive liquid and a regular radioactive solid, so that's the primary liquid waste that I generate from my research or the

solid waste paper/plastic gloves.

And then we have a category called other solids, that's stock bottles, a sealed source such as a Nickel-63 electron capture device sealed source.

Or there are some of the other unusual solids you might run into like a piece of contaminated lead that they can't use, obviously.

The other liquid category is the same kind of thing. We have an Other category for liquids, very specialized, very concentrated stock bottles, those sorts of things.

We don't want them dumping it in with our big carboys because that's higher concentration, higher activity. Also, we have to, all the way through this -- our worst and most challenging problem that we spend time on is the mixed waste issue.

If I have a tiny bit of methanol on my liquid waste, I am now RCRA. And with my stock bottle, I mentioned the C-14 cyanide in an ampule. That's being kept right now until we decide how we can get rid of that.

These things cost a tremendous amount of money.

Then we have another category of scintillation vials, which is flammable, counting cocktails, toluene-based, so it is a RCRA hazardous chemical because it's flammable, and it has very, very low amounts of tritium and Carbo-14.

There is a deregulating category and that's another way of releasing that we have. Less than .05 microcuries per gram or milliliter is able to be released for vials and for animals or tissue or bedding.

So then that leads to the animals or tissue. Now, that category, we don't have so terribly many actual animals in our waste, because that's not the state-of-the-art anymore. It's typically cell culture, molecules, DNA that we're looking at, more than whole animals anymore.

So there isn't so much of the whole animal, although there are a few mice and rats. And then there is a lot of the cell culture types of things. We have to worry about blood-borne pathogens applications and their uses, because they're using sometimes serum, body fluids. It depends on the research.

So we have a broad spectrum of regulations and risks in this waste and in these uses. It's an everyday thing.

This waste stream -- we categorized five waste streams for the users because that's easy for them. Then we take it and we break it down further, and then we have like many, many, probably 50 or 60 or 70 different ways you could manage our waste.

The free-release part or the unrestricted release limit that I suggest is something similar to what you have for air and water. That would be very useful in many respects in our institution. And I guess this is a good place to read to you the impacts on a institution like ours.

Certainly there is solid waste. Secondly, there is decommissioning of use areas. Decommissioning is going to be a big issue for us in the next couple of years, because we have four buildings whose ventilation systems are totally trashed, ancient, need to be replaced.

Those ventilation systems from the fume hood all the way up through the roof and the ducts, the blades, the fans, all of that will have to be surveyed for release. And most of them are not going to be anything, because they were small amounts, short half-life, and we know it's not there.

We measure. But if it's tritium or Carbon-14, long half-life, then we have a number that we have to worry about. How am I going to do that? That's going to be a big problem for us.

Mixed waste issue: If I had to have a limit beneath which I don't consider it radioactive and can treat it as hazardous chemical

waste, I eliminate a lot of expense and a lot of problems for something that is essentially no risk -- less than our fly ash risk by a long shot.

Our incineration and our ash monitoring: We use the MPCs and we control with MPC out the stack, and, in fact, take ten percent of the MPCs to control that. It's the same with the ash. Any detectable radiation in the ash, we are going down to 10 to the minus eight, tenth microcuries per gram numbers to monitor this, which is very, very low.

Routine surveillance: Like I talk about in the laboratories, our laboratories, if we're inspecting a lab for contamination and we say we found it and we tell them they have to clean it up, is it cleaned up? What's the number?

Security: Lab security is a huge problem, and you in NRC know how much we struggle with that. We are required to secure all radioactive materials. We're a public institution and it is not restricted. We don't have cards, we don't have only rad workers, we have everybody coming in and out -- students, staff, faculty, visitors, in these research labs.

Yet we're required to secure these radioactive materials, and we should for anything that has any significant amount or any significant risk. But here's the question that came up with one inspector.

We laughed about it because I said this is my ridiculous scenario, and what do you think? If I have a tiny benchtop centrifuge and there's 10 dpm of P-32 inside the motor of that centrifuge and nobody is in the room, is that a security violation? They said, yes, even if that's the only radiation in the room. You see the problems we face.

Medical and veterinary uses: We have nuclear medicine for animals, and now for humans, there is a nice program with nice limits, and it's all well done and everybody pretty well knows what they're

doing, but not for animals.

They don't have regs for animals, and so we had to bring it in under our broad license. When can we release the horse after they've had a nuc med scan, or the cat?

In one case, we even did a bunch of ducks, because the research was what toxicity in the ducks are from the buckshot. It was interesting, and they all got away, too. It was funny.

Sound science problems here: I have a real problem talking to our researchers who are very educated, knowledgeable people about some of these issues. When I come and give them these silly mixed messages, it sounds like I've got a forked tongue.

Well, this is safe, we know it's all safe, yes, you can have this, we know you've got a good record. But now you're in trouble because you've got this contamination, all because of this or that.

The risks are not equated with the management. Small licensees have trouble with this, so that's another issue. I get a lot of working with people with small licenses who don't know what to do with their stuff.

Public perception of the mixed messages comes into play and we get a lot of that. Sensible ALARA is another impact.

Permits and licenses: How we write our licenses, what our permits are, all of these things are impacted when we write a license that says we will survey, too, we will not release unless, our waste is managed thus and so, a cleanup of a spill is thus and so, that's a big picture thing, too.

Finally, there are the environmental programs and operations.

I can probably make this list bigger, but you can see the broad impact it would have for all of us.

As I interacted with the academic and medical radiation safety officer group by an e-mail list, we were all struggling really

hard with this. Should it be a dose-based limit? Should it be a concentration and what should we do with it?

LESNICK: Kristin, thank you. I say this to you but also to everyone: I hope people will consider, having had the benefit of the workshops, to do some reflecting about what got discussed here, and things you might want to write down, either to clarify points, to put down in writing, things you shared verbally, or further reflections you have, based on the conversations. Please take advantage of that.

Do we have any other comments around the table regarding items for reuse, or trash, or any questions from NRC staff that you'd like to pose for the table about this particular set of topics?

Paul?

GENOA: Paul Genoa, NEI. I just wanted to add the trash component because I sort of stopped at the reuse component. I mean, for good waste management practices, we try to reduce the amount of materials that are sent to a low-level waste disposal site.

I mean, there are clear economic advantages and there are also societal advantages because those resources are very limited.

And there is waste material that is generated within the power plants, some of we know is radioactive and we know where it's going. It's going to get processed and disposed of.

But there is a vast majority of material which we call green is clean. There is a program that most of utilities use where they essentially put within the radiation control area, not within contaminated areas, they put special containers that are specially marked.

They train the workers, and the workers have the responsibility to make the determination, do I think this piece of paper, this piece of wood, this piece of plastic is clean?

If they believe so, then they put it in the green drum. If they don't think so, they put in another drum that's designated for

waste.

Most of the utilities will go ahead and collect that material and then send it to a facility that is dedicated to review and survey and release. And they apply their limits and their license to do so. And we've all talked about what those conditions are.

And that material, the vast majority of that material does go out as just industrial trash to an industrial landfill. Some small amount of it, if it does trigger an alarm, gets disposed of as radioactive waste.

I will try to get you numbers on the annual generation, but it's fairly significant. You can imagine that any large industrial facility has a fair amount of that kind of trash material that would be generated.

And it's material like the computer printouts from the computer in the chemistry lab that's doing the effluent release work and so forth. You know how much computer paper we all use. We all know that. You know how big it can be.

CARDILE: Can I ask a question of clarification? So some of that material like the computer printout paper, is not likely to be radioactive or have been in a position where it could have been contaminated.

This is Frank Cardile, NRC.

Where it could have become radioactive -- and so that type of material, I guess, is fairly readily sent to industrial trash sites, or industrial landfill site. But I guess my question is, is there trash type material that has a potential for being radioactive, and what levels do you clean that to before you would -- or monitor that to before you could send it to an industrial landfill, before they would take it?

GENOA: Paul Genoa, NEI. The material that I just described in the Green is Clean Program is material that has a remote potential of

being contaminated because it's within the radiation controlled area, or in areas where we know radiation has -- well, within the radiation controlled area.

So there is a potential, but our experience leads us to believe that the people have handled the material properly, and that it is clean, but we're going to survey it, and we're going to prove that it's clean.

Again, it's the same technology we've talked about before. If you're doing it yourself, you know, you're applying a surface activity using, you know, frisking technology set to at least the Reg Guide 1.86 values and upon seeing no activity, the material can be released.

If it's bulk material, your guidance goes on to say you must then pass an aggregate survey with a micro-R meter or something like that, so it's a two-step process on an aggregate.

But the bulk of the industry doesn't waste time doing that. We send it all to a dedicated facility, and that facility has a license condition. There are several of them and they vary a little bit.

Some have actual numerical values, some have non-detect under certain monitoring criteria, and in some cases, they do apply the fingerprinting I mentioned before to ratio, hard-to-detect isotopes, to the others, and adjust their release limits based on that.

For trash coming from an office building that is outside the RCA, we don't monitor it at all.

LESNICK: Paul, I assume, if staff have further questions, you might be accessible to them?

GENOA: They know where I live.

LESNICK: I figured that. Susan, we're going to get your comment and observations on this, and then move on to lead, nickel, and steel.

LANDAHL: Susan Landahl, ComEd. Just to put it in

perspective, I do have some numbers on volumes.

LESNICK: Great.

LANDAHL: They're not exactly what you're asking for, Paul, but on average, anywhere from 100,000 to 200,000 pounds per year per reactor are the kind of numbers that we're talking about just going into the dry active waste stream.

And some percentage of that is definitely clean, but either because it's been mixed with something else or the economics of trying to prove that it's clean is such that we don't take the time to do it.

I don't have -- our educated guess is something like less than 20 percent of that falls into that category. But we're talking a tremendous amount of pounds of stuff, and that's my only reason for bringing it up. Thanks.

LESNICK: Thank you.

GENOA: I guess I'm wondering if on lead, nickel, and steel, should we do them separately to see what things might be different? What do you think?

LESNICK: Together. Any advice around the table for those of you who are familiar? Should we take lead, nickel, and steel separately from each other, or as a group and ask you to clarify as we go along? Any advice on this?

Let's start with lead, okay? Let's start with any comments about lead. Is that all right?

Paul, do you have any comments about lead? Judd?

GENOA: Paul Genoa, NEI. Kristin alluded to lead. I think lead, unlike aluminum, where we think it's out there in lots of places, it's in small amounts.

Lead is used routinely, because of its shielding properties, in the nuclear industry.

Lead is used not only in fixed facilities within the design of a facility as permanent shielding, it's used in sheets or bricks or

shot, or in a wool form like a steel wool, a lead wool.

The lead wool -- and so the permanent facilities tend to be sheets or bricks, or melted solids into a certain configuration, a shielded drum, for instance.

Generally, those are -- the sheets and bricks are just stacked as they are in some configuration. They're manufactured for that purpose in different interlocking configurations.

If it's a fabricated shield for a certain utility, it actually is probably poured into a stainless steel container of some kind. So in that case, its' likely protected from contamination.

There is also temporary shielding used. There are racks, commercial racks that are used that you can wheel into an area and you can hang blankets that are made up of this lead wool inside of a PVC plastic cover that's sewn around it with eyelets so that you can strap them onto a piece of equipment or hang them from a rack to shield workers from those sources.

Those clearly can be decontaminated by simply removing the external package and taking the wool out and using them. In most cases, that is done.

But when it comes time -- there is also lead used in shielding for packages. There is lead shot used in certain applications.

And I don't have good numbers, but there is a lot of lead in facilities. The bulk of that lead is going to come out when you decommission the facility or you change your configuration within a room.

The lead adds problems, of course, because lead is a hazardous material under RCRA.

So lead can be cleaned very easily. There are approaches to clean lead. Electropolishing is a good way. It's sort of the reverse of electroplating, and it just sort of strips everything out and it's

clean.

But you then end up with a mixed waste stream from that process. So there are some difficulties in dealing with the material.

But lead has value, commercial value. It is a useful product, obviously, and there is a lot of it that is probably clean. I guess that's --

LESNICK: Before we turn to Bill, since I'm assuming you're going to have some similar comments, potentially, here, why don't you keep the mike for a second about anything you'd say then about your suggested alternatives for how to address lead?

GENOA: Personally, I don't see a differentiation between handling a lead brick, a piece of copper, a piece of steel, a piece of aluminum, or anything else.

LESNICK: Bill?

LIPTON: Bill Lipton, Detroit Edison. We generally avoid using lead in the form where it can become contaminated. As Paul mentioned, we only use lead that's securely wrapped. Then it's just a matter of when we no longer need the lead -- generally, it's stored for reuse, we don't or very rarely generate lead waste, but it's just a matter of removing the wrapping.

I think that's the best approach to take. It's probably different in medical facilities where they have to use more sheet lead, but I think the way lead is generally used, it can be used in a way that it doesn't become contaminated. And I think that's probably the best approach, preventing the contaminated waste generation in the first place.

LESNICK: Thank you. Let me sneak Mike Mattia in here.

MATTIA: For the recycling industry, the lead brings up an interesting issue of storage. Generally in recycling, most of the materials, you don't stockpile them. You bring ferrous in, you want to get it out within a few days of processing. And that applies oftentimes

to a great deal of the metals.

Some of the nonferrous metals such as copper that we talked about this morning, you'll bring in and hold for a short period of time until you've accumulated it to an amount that you want to ship out.

Lead is one of those interesting things where there aren't as many lead smelters in the U.S. as there are steel mills or as there are copper smelters. So, you will hold onto the lead for longer periods of time.

You'll bring it in and hold on to it until you have accumulated it to the point where it's justifiable to ship maybe a truckload or a good amount to someone.

And you will accumulate it slowly, because it's not something that finds its way on a daily basis to the scrap yard.

That brings up a problem in that if you have contamination, even a low, low level, we're talking about this material being in a warehouse where people are working constantly, for long periods of time while it's waiting to be accumulated and shipped out.

So, lead that would have low level contamination would be a concern, because it's going to be there for awhile. Whereas, for example, if copper were to come in, it would probably move out within days; ferrous, within hours, but lead might be around while you're slowly letting it pile up.

CARDILE: As a point of clarification, I can't speak for NUREG 1640, but I know NUREG 1640 did not address lead. If we were to extend the analysis of 1640 to lead, I would presume that his contractors would work with the industries who handle this material, and follow what you just said about how the material stays at the site there.

Presumably, potentially, this group of workers would become perhaps a critical group, and so any dose limit that we use would protect -- if they were the limiting case or the critical group, it

would protect them.

So it's not like this would be something we would not have to consider.

MATTIA: If I may just extend that concept, again, when you look in the recycling industry, the ferrous materials are generally outside because they're big and they're bulky, and the machinery that needs to operate them are big and bulky.

The nonferrous materials are generally inside, and would generally be inside the warehouse. And in many cases, not just with lead, but the nonferrous materials, the copper, the brass, the lead, and in some cases, some smaller types of aluminum, definitely the nickels, that would come into a scrap facility, would be inside a warehouse where people are working constantly, and they would be held there for anywhere from days to months, waiting for the right market or the right accumulation.

So whereas ferrous, I would say a ton of ferrous that comes in on Monday, at some point is going to be gone that week.

The nonferrous could come in and be there for weeks, and even months, waiting for the right buyer, the right market.

LESNICK: I mean, that's the point you just made.

MATTIA: yes, but it doesn't apply -- I want to make sure that it doesn't just apply to lead, although that is something that would stick around the longest. The others will be there for periods of time as well.

LESNICK: I'm sorry, Mike. Thanks for clarifying that.

All right, let's keep moving quickly through lead. I want to make sure we have time to talk about nickel, and finish whatever else we have to do on steel, as well, and then we've got some wrapup. We've got to be finished by 3:00, so Kristin, some comments?

ERICKSON: Yes. For us, lead is an everyday business, lots of it. I wouldn't say it's a huge, huge volume, but it certainly adds

up, because every single shipment that comes in, most of those are in a little lead container of some sort, and we get about 3,000 shipments a year.

The University of Michigan, our sister institution in Michigan, is even bigger. I think they're more on the order of 6-8,000 shipments a year.

So you think of how many little lead pigs that is. And then you look at the number of lead bricks, and then you look at a bigger facility like the cyclotron with the shielding in it, or the old scintillation counter. When you take that apart, there's lead in there.

Not to speak of our -- we can -- orphaned, inherited lead things that we have. It would be nice to be able to prevent contamination by wrapping everything, but they don't ship them to us that way, unfortunately.

Most of the lead is not contaminated, but there is a lot of effort and time put into surveying, and most of the time there are short half-life, so not a problem, typically.

But we do have some that is long half-life, high gamma, and we are stuck with that, basically.

The other big point about lead that I haven't heard mentioned yet that we need to keep in mind is even more of a problem. It's not the radiation. Lead itself is a hazardous chemical.

Now, you've got lead sitting around your facility, it's oxidizing and you've got lead oxide in the air and people are breathing it, and that is not a good thing. What have they done with the lead-based paints? Well, you need to look at that if you're storing big piles of lead anywhere.

Is it going into the air? We have had the cyclotron as the worst pack rat of the whole facility. We've got so many tons of lead bricks over there, you just couldn't even believe it.

And they're ancient, powdery. And so those are more of a

risk to worry about than the radiation.

I think you don't need to worry about the rads here, but that chemical risk is a whole different thing.

LESNICK: Thanks, Kristin. Tony, and then we'll come over to Robb.

LAMASTRA: Tony Lamastra. To follow up on what Mike was saying, with things like lead and copper, not only are they inside, but they tend to come in in relatively small quantities. So you might have a pickup truck load, and it's going to be off-loaded by hand as opposed to iron and steel which will be handled in much larger quantities.

And that tends to be typical for most of the nonferrous, other than aluminum, maybe.

LESNICK: Thank you. Robb, then we'll come back to this side of the room and maybe finish up on the lead, I think.

LEIB: Robb Leib, First Energy. I have just a thought on lead. My experience in aggregate areas, rooms filled with items that have been controlled to levels below current release levels if there's no increase in background.

Secondly, lead would offer the additional benefit of providing self-shielding. A pile of lead will certainly not be a dose concern from small amounts of material that might be on the inside.

And third, I just want to reiterate, yes, the overriding concern at our location is the handling and ingestion of the lead material itself, rather than the radiation.

LESNICK: Thanks, Robb. Paul, you wanted to make a point?

GENOA: Yes, actually very briefly, and it was to kind of follow up on this last theme. The real difficulty with lead is lead disposal. As I said, lead is a valuable product that has to be used carefully.

But lead that is wasted and is no longer useful is a detriment to the environment, and it's significant.

And so avoiding disposal of the lead is a good thing. And I also wanted to point out that although there are ways to encapsulate it, and do all that, it's still a challenge.

But lead is unique, also, as I mentioned, because of its radiological properties. The nuclear power plants across the country have generated about 70,000 metric tons of spent fuel and will generate almost a like amount over the life of their facilities.

All of that fuel will need to go into specially-designed packages, ultimately for disposal. We're currently looking at Yucca Mountain as a possible source.

Some of the designs for those disposal containers and also the transport containers include some lead or depleted uranium. Now, the Department of Energy is responsible for that activity, and actually has a lot of depleted uranium, so it might be able to make it available.

However, we haven't progressed very far in that. My only point is that there may be some direct within the industry recycling potential of that material for a useful purpose, which is the ultimate disposal of the fuel in appropriate packaging.

But there is a lot of work that needs to be done on approving the design of the packages. Right now, it's not going to be a government design; it's the private sector, but if that material was available as a resource and made available essentially for free, I think the free market would figure out how to impose its use in those packages to the betterment of society.

LESNICK: Thanks, Paul. Can we move on to nickel? Is that all right?

Comments or information you'd like to share about nickel? Mike Mattia?

MATTIA: Very briefly -- and I had mentioned this earlier, that nickel is probably one of the precious metals of recycling. There are very few in the world, nickel refineries, and the scrapping of

nickel is a very, very valuable commodity.

We have talked about a couple of dollars per pound for things like copper, which was really great, and the scrap value of nickel can be in the tens and hundreds of dollars per pound. It depends on the market and it depends on the purity of the nickel.

It's a very, very valuable substance because it's in high demand for a lot of specialty metals, and because, as I understand it, there isn't a great many mines and refineries that refine new nickel. There are a few of them. It's not as well mined and as plentiful a natural resource as many of our other metals.

So it's a very, very valuable commodity, one that is in high demand in the recycling industry, has a lot of specialty applications for very expensive equipment.

So it's a very highly sought after, highly marketed piece of scrap commodity. And like with the others, it's stockpiled inside, it's handled by hand. And it will be gathered until there is a sufficient quantity or sufficient market force to say now is the time to deliver it. So it will also accumulate.

LESNICK: Question, Trish?

HOLAHAN: Trish Holahan, NRC. You mentioned earlier with copper that it was the processing of that that was simpler than with steel. Is that also the same with nickel?

MATTIA: Yes. In a scrap recycling facility, ferrous and those types of metals, there's a lot that has to be done. You know, ferrous material will come in the shape of a car or an automobile, something that you have other materials there. You can't ship a car to a steel mill. You have to tear the steel apart, you have to put it into certain types of packages or bundles or shred it.

Most of the time, like if copper were to come in and you were to get copper windings or copper motors, they'll go in a box because that's how they'll go to the refinery because there's a refinery

that can melt them that way.

If you get nickel in, it will be graded as to what kind of nickel, and it goes in the box until I find a buyer for that kind of nickel or that kind of lead.

So the amount of processing that you actually do is nothing more than sorting, grading, weighing it, and putting it off waiting for it to be shipped.

LESNICK: Thank you, thanks for clarifying that. Let's take the cards over here on the left first. Jud?

LILLY: This is Judson Lilly with the Department of Energy. I don't think I could have avoided speaking about nickel.

One of the most notable aspects of a large decommissioning project we have in Tennessee is the removal of 6,000 tons of nickel from the gaseous diffusion plants. And the nickel in those plants is in the form of thin tubes about the size of your finger.

There are several thousand large vessels and each vessel contains several thousand of these nickel tubes. Our decommissioning project is to take the equipment out of those buildings.

We pull the nickel tubes out of the vessels. We pretreat them, and then they're shredded, and then they are sent to an MSC -- I guess it's licensed by the state of Tennessee, an agreement state.

At that point, at the MSC facility, they are melted. After they have been -- they are classified, classified nonproliferation technology, both in terms of the shape of the tubes, the dimensions of the tubes, and some of the chemical components that are with the tubes --

When they arrive at the NRC licensed facility, they are melted. At the point they are melted, the classification issue is resolved, so at that point forward, it can be treated as nickel.

The primary contaminants of the nickel tubes, the most difficult one is Technetium-99. The gaseous diffusion plants took fuel

that had been used at Savannah River and Hanford, Washington, and that fuel introduced Technetium into the gaseous diffusion plant system.

And that is the most difficult radionuclide to remove from the nickel. The process that we have for that, we will be melting the nickel, then we will be dissolving it into an electrolytic solution.

There is a filter within the electrolytic bath, and then the nickel will be plated out. So what we will wind up with is a nickel cathode from the electroplating process.

The technetium will be held up within the electrolytic solution, and will be pulled out in the filter media on a regular basis.

The license that the state of Tennessee granted on this specific proposal is three Becqurels per gram of Technetium-99 with no ingot, no single ingot having any concentration above 6 Becqurels per gram.

For uranium, it's .3 Becqurels per gram with no single ingot having greater than .3 and no greater than .6 of concentration of uranium in the nickel ingot.

That's the process that we have for this. I'm trying to think if there are any other issues I need to refer to that?

The doses that have been calculated for that proposal are .0017 millirem as the maximum dose that would be resulting from that. The State of Tennessee was the -- the requirements that the Department put upon the project were that the contractor needed to find -- needed to receive a license to proceed with this and have an authorized limit.

They did work with the State of Tennessee, and the State of Tennessee licensed the process, and at that point, the Department was willing to go ahead with the project.

We are overseeing the radiological control program, but it is really the responsible -- we are not stepping in and taking over the turf of the State of Tennessee; they are the regulator of record, and we are there as a technical resource as well.

LILLY: 6,000 tons from this particular project. The problem, the thing that has received a lot of notoriety is this is a volumetric release. The nickel in the plants is centered, so it is effectively a sponge. And you're pumping gas through the sponge, and that gives you effectively volumetric contamination. When you melt it, you certainly have volumetric contamination.

We spent a lot of time and a lot of care to make sure we have an effective decontamination technology. By way of an overview, that's how that project is being handled and how it's being treated.

LESNICK: Thank you very much, Jud.

CARDILE: Can I ask a quick question?

LESNICK: Yes sir. Frank.

CARDILE: Frank Cardile, NRC. I just wanted to ask a quick clarifying question. The calculation, the calculated dose from the pathways, I guess, that you did was .0017 millirem per years.

LILLY: This is Judson Lilly, U.S. DOE. Yes. That's the maximum, the maximum dose. The controlling scenario for that was hip implant that would be in, in place for twenty years. The second most limiting case was a, a set of braces, and those would be in place, the assumption was, for three years.

Now the, the true use of most nickel is not an, in personal care products. Our intention would be that the majority of the material would be used in an industrial application, but that, the program doesn't have anything in place to guarantee that. So for being conservative, we assumed the most direct use for the product. So that is our limiting scenario, our limiting case.

LESNICK: Thank you.

LILLY: One aspect that was noted in the analysis was that the, the x-ray doses that would be taken for either the hip implant or the, or the orthodontic procedure would be several thousand times the dose from the x-rays than you would have from the actual use of the

nickel in the devices. LESNICK: Thanks, Jud.

CARDILE: Can I ask one other quick question?

LESNICK: Yeah, quickly because I want to make sure --

CARDILE: Frank Cardile, NRC. If I could just -- I assume that you also looked at, as NUREG 1640 did, the scrap worker, the, in the pathway analysis. I mean, the people who process the material are also in this analysis? I mean --

LILLY: Yes.

CARDILE: -- 1640's analysis showed that the scrap worker was bigger than the end user.

LILLY: No, my understanding was that the, that the worker analysis was not, was not specifically spelled out in the license application. Now, our Office of Environmental Safety and Health noted that, I believe. I believe you all have looked at that as well. That case may be, may be a more limiting, may be a higher case, but it is certainly well below any -- you know, when the levels are so low that, that even if you were off by several orders of magnitude, you'd still be well below any standards that have been contemplated.

I believe the IAEA and the European Union have standards for technetium that are 1,000 beckerels per gram and 300 beckerals per gram.

CARDILE: Thank you. I appreciate it.

LESNICK: Let me take the last two comments about nickel because I want to have, make sure we've covered steel appropriately and we still have wrap-up to do, and we will finish by three. So, with vigor.

SZWED: Okay. Dan Szwed for MIRC. Just to reiterate some of Mike's comments about the value of nickel -- I guess I'm questioning how it gets to a hundred dollars per pound. I'm not that familiar with the, the costs. I'm more familiar with single dollars per pound. But nickel, nonetheless, is a valuable material, particularly to the stainless steel industry. It's a key alloying element. It's what makes

our product applicable in many of the uses, many consumer uses. And therefore, the quality of nickel -- to use the term -- perfect. I mean, we can't accept anything less.

LESNICK: Thank you. Mike, last comment on nickel?

MATTIA: Just a quick question of Judson is, given all security issues, considered how much of this refining, decontamination process would be observable.

LESNICK: If you could be brief in the answer, Judson, I'd appreciated.

LILLY: Yeah. This is Judson Lilly again, with the Department of Energy. Once the nickel is melted, there are no security restrictions. It would be -- the only restrictions you would have would be on the radiation, operation aspects. That's why yesterday -- the classification issues of nickel will be resolved before you get into a clearance situation. So the clearance issues are not going to cloud or make the, the release of this a problem.

LESNICK: Thank you. Let's move on to steel. Now, I guess --

CARDILE: Can I ask one quick question? This is Frank Cardile of the NRC. I, I assume -- and I wanted to ask two quick questions. One is, Paul, is there any -- I guess I'm showing my ignorance -- in the nuclear and NRC license industry is there any nickel material? And the second question is, I would assume that the same concerns about dose levels, you know, the doses and receiving any of the nickel with radioactive contamination, would hold amongst the scrap people and the steel people that the same concerns would be there, as are there for the steel?

LESNICK: And if you could be succinct.

GENOA: Paul Genoa, NEI. Briefly, I don't know if substantial quantities of virgin nickel. It's used in, for plating out sources. It's used in radiolytic chemistry -- usually not by our people

but by labs. Clearly it's a component of stainless, and we have huge amounts of stainless. But our stainless, generally because of the systems, is used for highly radioactive fluids, and generally is not applicable for clearance.

That doesn't mean that smart people in the future won't learn how to decontaminate stainless; it is being done today and it can be done in the future. But I'm not sure if that really is related to pure nickel. That's more a stainless steel recycle question.

LESNICK: Okay.

CARDILE: I guess my question to Mike was, for the same concerns or reasons that the scrap and steel industry would be concerned about having steel coming in, it would also be concerned about having nickel coming in, despite the higher value.

MATTIA: Oh, absolutely.

CARDILE: Okay.

MATTIA: There's no question, especially because -- and it's not even just especially. As was mentioned, you take a substance like nickel as the other non-ferrous, there's more handling being done by the worker in the scrap yard than is being done with the ferrous. So there's even, I would say, more concern. And it sticks around near the worker a lot longer than the ferrous does.

LESNICK: All right, let's move on. Let me make a suggestion --

LILLY: I'd like to include one remark. With -- this is Judson Lilly again, with the Department of Energy. I understand what the, what the position, the policy position of the Associations both for scrap metal and ESRI are. The metals that we're having coming out of our project are generally, generally being dealt with through brokers. And in point of fact, we have -- the pedigree of our, of our materials coming out is very well known. The quality of our materials is very well known. And we've not had a problem or reluctance on the part of

individual firms to purchase that. It's very clear what it is, where it came from, what it looks like when they get it. So that, that has not been an issue with specific companies who would be in the market for this material.

LESNICK: Let's move on to steel. And I think -- let me make a suggestion here, that, you know, we've had good conversation about steel, and I think an evolving understanding also, over the four workshops. But I don't want to assume that we've heard everything that we need to hear or that some of the subtleties -- you know, we've gotten everything.

So I guess I would like to ask people around the table to have a fairly high threshold here -- things that you think are particularly unique or special that should be emphasized about steel and/or things you think that really haven't been said yet that need to be clarified, given the kind of schema we are working with. That way, we don't have to probably replow old ground, so to speak. And let's keep, keep the bar pretty high.

Pete Hernandez.

HERNANDEZ: I was going to -- Peter Hernandez. I was going to suggest that we go through the process for steel with Paul, explaining its applications. And I need to address a number of questions that were posed earlier to us by a number of representatives here. This may be part of the discussion, but I believe Paul should proceed.

LESNICK: That's agreeable I think, right? Maybe quickly, Paul and others, just ways things are being used and current practices being cleared, and then your suggestion of, of alternatives.

MATTIA: I just [OFF MIKE]

[LAUGHTER]

LESNICK: Anything you want -- as with other materials, let me -- since it is, it's late and it's the fourth --

[APPLAUSE]

LESNICK: Did you forget that you use steel?

MATTIA: No, that's right. I do.

[LAUGHTER]

LESNICK: Paul Genoa, NEI. Mars landing.

The question Paul is -- looking at this schema, when we've kicked off each area, it's been helpful to hear from the main users. How do you use this? What are current practices? How are you clearing now? And your preferred alternative, if you will. And I think that would be very helpful. Is that all right?

GENOA: Yes, I know exactly what I was gonna say. Paul Genoa, NEI.

[LAUGHTER]

GENOA: I want to say that obviously, steel is a very important product. It is used substantially in the millions of pounds. In our plant's specialty's stainless as well as a structure steel, carbon steel. The bulk of our material's carbon steel, and we do release materials from our plants routinely in the form of scrap metal when components are changed out, equipment breaks, etc. And when we decommission a facility, there'll be much structural material in the form if beams and I-beams and steps and staircases and all sort of stuff.

And I have learned about the orphan source issue, and I am very sympathetic with the concerns of the industry. And I am also very aware about nuclear stigma, radiation phobia, what it does to an industry, because I live in it everyday. So I am sympathetic.

But the way that we, the way that we regulate and control our activities -- I can understand that it's hard for you to understand it because it is so grossly over-conservative that no rational being would believe that that's how we actually do things. But I think you've heard from Kristin that it's actually not just the electric utilities

but also industry, medicine, and everyone else.

So there is a very high compliance and a very high care and huge resources expended to ensure that materials are clean, safe, monitored, etc. And you probably don't need to hear more about that. But I think it's important on the issue -- I don't think we can set a standard that will affect the industry by setting off their alarms. If you set a standard like that, then you're gonna have to mitigate the situation or avoid it somehow.

I understand that the analysis that you've done, Tony and others, that, you know, you just take some numbers that come out of these regs and you assume a certain volume and it all gets there and it's gonna set off your monitoring -- and it would under those conditions. But that's another example of the difference between a theoretical study and reality.

In reality, we release material. It may have -- on a 400-pound piece of steel, we may find one spot that has contamination. We clean that and then release it. We're nowhere near a fraction of the limit. We're nowhere near a fraction of the standard. And so it's unlikely, in my opinion, that if a carefully constructed standard were developed and it was implemented by our industry the way we implement business, that it would result at false alarms at your facility. But again -- so that's it. Thank you.

LESNICK: To make it easier -- from you and your perspective about steel and how it's used and the implications of this material.

ERICKSON: Kristin Erickson, Michigan State University. Current steel problems are not much, but they will grow as we continue to decommission parts of our accelerator and build new accelerators. The other things that we have as impact, as I mentioned before, was the decommissioning of building ventilation systems, which are many stories tall -- ventilation ducts, fan blades, some of them steel, some stainless. And those components are, although not

tremendously problematic as far as how often you find radiation, if it's there, it's problematic because it's a big piece of equipment. And that's our primary use of the current controls, or just as we do with everything else, survey down to nothing -- a monstrous endeavor to assure that there is no contamination of any kind. Tritium on up. Thank you.

LESNICK: Pete, maybe this is the time to turn to you then, and maybe for some others, for any reflections on this. We'll take five minutes or so of comment before we start wrapping up.

HERNANDEZ: Peter Hernandez. Thank you. I'd like to addresses the questions and comments made by Frank Cardile, Bob Mack, Rob Lieb Paul Genoa, at least to some extent.

The challenge that NRC faces is a complex and multifaceted problem. The frailty of the licensing and regulatory system has put the public at risk with respect to loss of control of orphaned sources. And since 1983, there have been 24 meltings in steel, aluminum, copper, lead and aluminum production facilities. So steel companies have learned the hard way that they cannot let their guard down, and they've pushed manufacturers of the radiation detection equipment to improve the detection limits. And they've demanded that their suppliers pre-screen scrap if they want to sell it to them.

Steel companies have also learned the hard way, in the '70s and '80s, that we must be customer-focused if we're going to become and remain globally competitive. And that's where the industry is today.

If the Nuclear Regulatory Commission adopts a free-release limit for steel products, it'll be creating a new scrap product, some of which has detectable levels of radioactive material. This new product, we believe, will trip our alarms, our members' alarms, and it will be rejected.

The risk of ignoring the alarm, for the steel companies, creates both potential employee and community health risk and a

significant economic risk, if also buried in that material is a shielded source that would have, typically, by our calculations, significantly lower emission levels than would the free-release scrap at the free-release level. Consequently, we believe it would be imprudent for the NRC to establish a free-release limit without considering the role of the orphaned source problem in this whole equation.

Market-based solutions will work when you have a willing seller and a buyer. We only have half the equation here because the scrap metal customers who serve the general market in the United States don't want this new product. Thank you.

LESNICK: Thank you very much. Do we have any other last comments about steel before I turn, Don, probably to you to talk about next steps and clarify what else will be happening in this process? Tony, is that your card?

LA MASTRA: Yeah. Tony La Mastra. I guess I visited Alaron, which is a facility that decontaminates commercially, decontaminated materials, at the wrong date, because when I went there, there were several I-beams that had much more than a single spot. There were large -- I don't know if they were turbines, or whatever they were, but they were big hunks of material. And if you looked at, at the metal, it basically had areas that were much higher than 5,000 DPM per hundred square centimeters. But if you averaged over the whole piece, it was significantly lower.

I'm, I know when people ask me about the safety of radiation in a steel plant, I have a tendency to present a relatively rosy picture. And I guess I'm not sure that reality is exactly, you know, the one tiny little spot all the time.

Secondly, something that really hasn't been looked at is the cost of disposal. If -- and again I have no numbers for what a reactor would pay for, say, cubic foot of rad waste --

GENOA: $375.

LA MASTRA: How much?

GENOA: $375.

LA MASTRA: Okay --

LESNICK: Keep going, Tony, but be succinct. I'm aware we need to get public comments.

LA MASTRA: Okay. Typically, if a steel mill or a scrap yard finds a piece that they are forced to dispose of, they are looking at $2 to $3,000 for that small little piece, which I think is not what the NRC ought to be encouraging for the little guy essentially to be pushed into that kind of a bracket.

Third, I just did a quick calculation, and if my reading of NUREG 1640 is correct, the proposed number, or the number that they used for cesium, is one picocurrie per gram, roughly. I think it's 1.08 picocurries per gram. If you take -- again, I'm not arguing that a piece of steel would be uniformly -- yeah. I can't speak any faster, or I'm really gonna be coughing and that poor guy over there is gonna end up blowing his ear drums out. But if you take tons, throw it into 100-ton heap of steel and it's contaminated at 1 picocurrie per gram, the dust that's produced is now at 6 picocurries per gram. That exceeds the limit that the NRC proposed to the Steel Manufacturer's Association, back, I think '93 or '94, of 2.

So in a sense it looks like what you are setting as a potential limit could possibly cause the steel industry to exceed what you're limiting them to. It would definitely exceed the 1 picocurrie per gram of dust if they then had to dispose of it.

LESNICK: Thank you, Tony. I appreciate it. Charles.

WILK: My comment is not directly about steel. Will I have an opportunity to say it?

LESNICK: This is it. This is the end of the line, so make it quick please.

WILK: Okay -- I've got the mic. I just wanted to relate

something. We've heard a lot of things from the recipient industry concerning perhaps what you might consider paranoia on our part, of public opinion. But you, the Commission of the NRC may wish to consider that there's a superfund site in Denver called the Denver Radium site, part of the ~~Shaddock~~ Shattuck Chemical Superfund clean-up out there. And I believe in 1993, the EPA came out with a remedy decision for the site that involved solidifying contaminated material, radioactive material, on-site and placed within the city limits of Denver.

And the regional administrator for Region 8 of the EPA signed that remedy decision, and the region then implemented, did a remedial action, did this remediation at the site, placed this material on-site, within the city limits of Denver. All the time that this was going on, the decision process, the public and local government politicians were incensed about this remedy, even though the EPA -- which is part of the government -- said that this remedy was protective of human health and the environment. And very recently, this fall, the U.S. EPA out of Headquarters decided that that material needed to removed. So here's a remedy that was -- the government said it was protective of human health and the environment, and as a result of public opinion, ripped out the material and had to dispose of it elsewhere.

LESNICK: Thanks. Charles. Paul, and then Mike. And then we will take public comment and hear from Don. And then we need to close this up.

GENOA: Paul Genoa, NEI, just very brief. The entire discussion on steel has revolved around recycling. I tried to point out early, because the bulk of our steel is just carbon steel scrap, and it's low value, that the economic advantage of recycling it is not significant. It's cost avoidance of shipping it across the country to a low-level waste site, and we have not spent any time talking about disposal in non-Part 61 facilities, which would be, has been done, it

was done recently in Florida, a turbine rotor. And it could be done. And that's something that should be discussed at some point.

LESNICK: Thank you. Mike, briefly please.

MATTIA: In just about every city or region of every country on the planet, there is a recycling facility. We're not talking about the curbside recycling. That's been a phenomenon over the last ten or twenty years. We're talking about metal recycling facilities that, in the U.S., date back to the Revolutionary War period. Metal is recycled daily, tens of thousands of tons. Metal is presented to a scrap recycler, and the scrap recycler has the technology and the equipment and the know-how to create that metal and to create it in a form that's acceptable by an entity who will take it and melt it and create something new in order to preserve yours and preserve the planet in other ways.

The recycling industry has always been at the forefront of what is good and essential, and we want to be there for this issue as well, and we'd like to be able to move from here to dialog, which will keep the process of what is good for industry, what is good for the public, what is good for the planet, to continue so that everyone will be in agreement as to what works and what's acceptable. And then that can be turned over to our regulators to create a rule to implement that.

LESNICK: Thank you very much, Mike. Let me see if there's anyone who would like to make public comment at this time. Can I see a show of hands, please.

[NO RESPONSE]

LESNICK: Okay, I see none.

Before I turn this to Don Cool for discussion about next steps and any other comments Don would like to make, let me just say on behalf of myself and colleagues at Meridian Institute, Barbara Stinson, Sarah Whalen, Rebecca Hensey, thank you very much for participating, those around the table and observers. Those who participated in four

workshops -- we encourage you to stay involved, and stay in touch with this ongoing process. The to the NRC Staff, thank you for making this a very transparent process, and good luck.

COOL: Thank you, Mike. Let me do a couple of things very, very quickly for you. First let me add my thanks to each of you for your participation. I think this has been an extremely useful couple of days. We've really gotten to some details and some information, and I think we've really been able to put a finer point on a number of issues that will really be useful to me and my staff as we start to take the next steps.

The Commission has asked us to bring them a summary of all of these public interactions, and some recommendations for how to proceed in March of 2000, just a little over three months from now. If you wipe out the holidays, we really have less than three months to try and assemble that particular package. We will do that with all of the informations that are available -- the transcripts, written comments -- and those are still open until the 22nd. And I would encourage you, as is often the case, on the flight home, if you suddenly think of something, write it down and send it in so that we have the advantage of all of that information.

The transcript of the meeting should be available next week. We will post that on the website. If you've got a really fast modem and want to work on downloading that, I suppose you can do that. Or you, too, can get your very own six-inch copy of paper. We could probably manage that if you want to whack a couple of trees.

Meridian, as an additional part of their contract, will be preparing a formal summary. That will be in three weeks or so, a 15- or 20 page digestion of the details. Sarah Whalen has been sitting over here at the side or in the back, on the laptop, busy adding some of those particular levels. So there will be those two particular summaries.

We have a website. There have been several references to it over the course of time, which has a number of the information. I encourage you to keep checking that. We have put together a list server -- I'm not sure whether you could consider it active, because I'm not quite sure anyone's subscribed yet. But we have tried to establish that mechanism. I'd encourage you to try and do that, so that's yet another mechanism for you to find out when some of the next steps in the process will be.

As my staff puts together the commission paper, the summary of comments, that information, we expect that some of the working group meetings that the working group has will be open to the public. We will announce those, try to get those up on the NRC's formal site for noting public meetings, get that on the list server, so that you have an opportunity to interact with us. Those will probably be half-day sessions to look at a particular thing, like the summary of comments or some of other pieces so that we can do that in a way that you can get into it and look at it.

The draft materials that they will be looking at will be available for comment. We'll put those on the site so that you can read them and tell us whether we have or haven't captured those particular items or there are things that really don't reflect quite the way you saw them, so that we try to have as best a representation to the Commission as possible.

The actual Commission briefing will be an open public meeting. It will be in late March. I don't think we've actually got official dates scheduled yet. The Commission has in times past invited stakeholders to the table. That is a decision that the commissioners will need to make, so I do not know whether that invitation will be made in this particular case or not, but we will again certainly let you know as we go through that process.

The Commission, following that meeting and with the paper,

will then be making some decisions and giving the Staff some direction of whether that's to proceed in some particular rulemaking avenue to continue a set of interactions to stop entirely for a little while or some other combination of things. Obviously I can't predict yet. One of the great joys of the system we've got is that we can engage in a very serious and lively and far-reaching discussion within the Commission, just as we have here around the table and in other public meetings.

So that gives you an idea of some of the next steps in the process. There will be opportunities for you to see information and continue to interact with us. Obviously if the Commission does direct rulemaking at some point, if that were the decision to be made, we would then enter into a process which would also be an open public process, and there will be lots of additional opportunities for interaction before we ever got to anything which would constitute a proposed rulemaking.

And with that, unless there are specific questions, I wish you all safe travels. Be careful on the roads out there, because that's a much more risk-informed situation. And have a good afternoon. Bye-bye.

[Whereupon, at 3:00 p.m., the workshop was concluded.]