UNITED STATES

NUCLEAR WASTE TECHNICAL REVIEW BOARD

TRANSPORTATION PLANNING PANEL MEETING

October 13, 2004

Salt Lake City, Utah

NWTRB BOARD MEMBERS PRESENT

Dr. Mark Abkowitz, Chair, Morning Session
Dr. William Howard Arnold
Dr. B. John Garrick, Chair, NWTRB
Dr. Ronald Latanision
Dr. Andrew Kadak

SENIOR PROFESSIONAL STAFF

Dr. Carlos A.W. Di Bella
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I N D E X

P R O C E E D I N G S

8:00 a.m.

ABKOWITZ: Good morning, everybody. I feel like I'm about to announce a racing event, or something, that the horses have entered the paddock here.

My name is Mark Abkowitz, and I will be chairing today's meeting here in Salt Lake City. Today, we'll be reviewing the planning process associated with development of the transportation system to support the proposed repository at Yucca Mountain in Nevada. And, I want to stress the word Nevada, because I've been saying Nevada (pronouncing) for two years and I finally learned how to do it right.

As many of you know, the Nuclear Waste Technical Review Board has formed four panels, each consisting of several members with specific expertise or interests. Today's meeting involves one of those panels, which is the Panel on the Waste Management System. This panel has met twice recently, in February 2003, and January 2004, to review progress in developing a transportation system, and today's meeting will continue that review.

Let me begin by introducing the Board members who are present here today, and I'd like to ask them to put their hand in the air to acknowledge who they are. First, is our Board chairman, Dr. John Garrick. Dr. Garrick received his

doctorate in engineering and applied science from the University of California in Los Angeles. His fields of study include neutron transport, applied mathematics, and applied physics. John was the founder and executive officer of PLG, Incorporated, an international engineering, applied science, and management consulting firm specializing in the application of risk science to technology-based industries. Dr. Garrick has been a driving force in developing risk assessment into a scientific and engineering discipline.

Howard Arnold is a consultant with 40 years of experience in the nuclear industry. During that period, he served in senior management positions, including vice-president of Westinghouse Hanford Company, where he was responsible for engineering, development, and project management. Before his retirement in 1996, he was president of Louisiana Energy Services, an industrial partnership formed to build the first privately owned uranium enrichment facility in the United States. From 2001 to 2002, he served as Chair of a National Academy Committee that assessed the scientific basis for disposal of special nuclear materials.

Andrew Kadak, a fellow Red Sox fan, is Professor of the Practice in the Nuclear Engineering Department of MIT. His research interests include the development of advanced reactors, space nuclear power systems, improved technology-neutral licensing standards for advanced reactors, and

operations and management issues of existing nuclear power plants. Andy was President of the American Nuclear Society for the year 1999 to 2000.

Ron Latanision, also a Red Sox fan, is Emeritus Professor of Materials Science, Professor of Nuclear Engineering, and former director of the H.H. Ulig Corrosion Laboratory at MIT. Ron is Principal Engineer and the Mechanics and Materials Practice Direct for the consulting firm of Exponent in Boston, Massachusetts. His areas of expertise include materials processing and corrosion of metals, and other materials in different aqueous environments.

And, finally, myself, I am Professor of Civil Engineering and Management Technology at Vanderbilt University in Nashville, Tennessee, and Director of the Vanderbilt Center for Environmental Management Studies. My areas of expertise include transportation, risk management, the systems analysis and information technology applications. I am the Chair of the Board's Panel on the Waste Management System.

The other members of the Waste Management System Panel are Drs. Arnold Kadak, who I previously introduced, and Dr. David Duquette, who was unable to attend today's meeting. All Board members are welcome to attend panel meetings, and we are fortunate to have Drs. Garrick and Latanision joining

us today.

Turning now to the agenda. Our agenda for this meeting includes a number of presentations by the Department of Energy, as well as presentations by representatives of other organizations. This morning, we will hear an overview of DOE's transportation planning activities, followed by a presentation on transportation risk modeling. This afternoon, we will take up the topics of transportation security, cask testing , route selection, and emergency preparedness. These are four of the topics in which the Board has considerable interest.

Tomorrow's presentations will include the planning process and lessons learned from the Private Fuel Storage project proposed for a site in Utah, and also discuss issues related to managing risk perception in the transportation planning process.

Before we begin our presentations today, there are a few housekeeping items that I would like to take care of. First, I ask that each of you turn off all your cell phones, or set them to silent mode. I'm hoping this will be the first meeting in about six months that I've been involved in where that is actually 100 per cent successful. We'll find out.

Second, because the Board values public input, we have scheduled public comment periods at the end of each day

of this meeting. If you would like to comment, please add your name to the sign-up sheet at the entrance to the room where Linda Coultry and Alvina Hayes are located. Alvina, do you want to wave to the crowd? Thank you.

Normally, we are able to accommodate all comments from the public, but if an unusually large number of individuals should wish to speak, we may need to limit the time of each comment. You are also welcome to submit written comments, which can be given to Linda or Alvina as well.

I might also point out that the Transportation Panel Meeting selected Salt Lake City as the site, because we recognize that transportation is not just a Nevada issue, it's a national issue and we want to give opportunities for groups in other parts of the country to be present and participate in this process.

Finally, we have a standard disclaimer that we offer at the beginning of every full Board or Panel meeting. And, that is that individual Board members are encouraged to speak frankly, and to voice their personal opinions, but those individual views should not be interpreted as positions of the Board. Formal Board positions are articulated in writing, usually as Board letters or reports, and are available through the Board's website, which is located at the URL of www.nwtrb.gov.

Now, let me introduce our first speaker, and that

is Tim Holeman. For the first item on today's agenda, we asked Tim to provide some introductory remarks. Tim is with the Western Interstate Energy Board, and is currently the Nuclear Waste Program Manager for the Western Interstate Energy Board. He has a degree in economics and a Masters in Public Administration. From 1987 to 1992, he served as the senior advisor to Colorado Governor Roy Romer, and from 1992 to 2004, he has owned and operated an environmental management and public affairs consulting firm in Denver.

Tim?

HOLEMAN: As he said, I'm the Nuclear Waste Project Manager for the Western Interstate Energy Board. Welcome to the Board, and thank you for taking the time and energy to come out to Colorado--to Utah, I mean. I'm still in Colorado time. And, welcome to the Great American West. With Utah at its heart, we're very concerned about issues regarding nuclear waste, and nuclear transportation.

Water is scarce. Public lands are vast. And, we're plentiful in nuclear waste. Nuclear waste, is at the foremost, a very important issue for the Western Governor's Association. We've been working on this issue for 20 years. We have Envirocare that takes low-level waste. We have transuranic waste being taken by the WIPP project. We have, of course, the Yucca Mountain project, and we have the PFS project.

I'd have to say that we are reluctant stewards of nuclear waste in the west. We don't want it to come here, but we accept our fate. That's why we're focusing on transportation. The Western Governors have been dealing with NWPA transportation for 20 years. It's been a long time. We've had numerous resolutions, and positions on how NWPA works out.

2010 is fastly approaching. We think the Department needs to make decisions in the next couple years regarding issues over mode, dedicated trains versus general freight, issues around emergency response. So, while we've been working on it for 20 years, we think that the next two to three years are some of the most crucial for the Department.

With that, I'd like to welcome you to Utah and the West. Thank you.

ABKOWITZ: Thank you very much, Tim.

We're now going to hear for the first of three times, this is kind of a tri-series thing, from Gary Lanthrum, who's going to give us an update on the Office of National Transportation Activities--I'm sorry--on National Transportation Program Activities with DOE.

Gary, as most of you know, is currently the director of DOE's office of National Transportation Program, and he was formerly Director of the Environmental Management,

otherwise known as EM National Transportation Program in Albuquerque. In this capacity, he was responsible for managing EM's field transportation programs. These included nuclear materials packaging, research, shipping and certification, operation of the TRANSCOM system for WIPP shipping, and managing the Automated Transportation Management Program for tracking all of DOE's nuclear and non-nuclear shipments, as well as running the EM National Transportation Program's stakeholder outreach.

Did you ever sleep, Gary, when you were doing that? And, today, as I mentioned he'll be talking about where the Yucca Mountain transportation planning process is at, and what we can expect downstream.

Gary?

LANTHRUM: This trip has not started off very well for me, despite the fact that I'm coming back to where I consider my more recent rouge, which is the Southwest. I really like it in the Southwest. I like having the big sky. In Washington, D.C., even on a clear day, you don't really see blue sky. There's this just heavy haze that kind of hangs there, the different colors of gray, you see, but not really any blue. The trip started off pretty bad because my hard drive crashed when I got here, and the first thing I do, being a resident geek, as I watch my laptop and I look at my e-mails and see what other crises I need to be dealing with,

I couldn't do that.

The other thing that I couldn't do is that I typically try to start these meetings off with a little bit of humor, and I don't have enough of a social life, as Mark indicated, I don't sleep much, and so I don't get my humor from my social contacts. I get it a lot, I go searching for jokes. Well, I couldn't do that either. And, considering the situation right now within the Office of National Transportation, and within OCRWM as a whole funding-wise, perhaps that's appropriate. There's not really a lot to joke about right now. And, I'd like to give a little bit of a context for the rest of my presentation, because it's going to be a framework that has to be understood as I talk about the additional points.

As you all know, the federal government right now is operating under a continuing resolution, and that means that we have the authority to spend up to what we had in our budget last year. Unfortunately, the Office of Civilian Radioactive Waste Management had expected a significant increase in its funding requirements for 2005 compared to 2004. So, we're starting off with a bit of a disconnect.

Added to that uncertainty, is the fact that there has been a lot of hope that there would be an omnibus appropriation where Congress would get together and just fund the whole government at the level it was funded at last year,

just to make the things keep rolling and not to be under this continuing resolution for a lengthy period of time.

Unfortunately, in the last week or two, there's been talk about the omnibus appropriation actually going forward, minus the energy and water appropriation, which is the piece of the appropriation process where OCRWM gets its funding from. If that's the case, it doesn't bode well, and the supposition from all the folks that are really good at hand wringing, myself among them, is that we may wind up with less than the funding we had last year.

For Transportation, that has some pretty significant impacts, because the Transportation, as I've presented before, is really a service organization to the OCRWM program. We provide the transportation service that supports both the shippers' needs and the receivers' needs, and the receiver being the repository itself. If there is a significant impact on funding for the program, it may well be that funds would have to be shifted out of Transportation to make sure the repository part of the program could proceed.

The final decisions have not been made. We don't know what our final budget is yet, and that's the context that I want you to be constantly mindful of as I do my presentation, but you may have a lot of questions that I won't be able to answer because we don't know exactly where we are in funding space. And, unfortunately, the magnitude

of the funding disconnect that we're looking at may not simply mean changes in schedules. It may also mean changes in scope, and those changes could be fairly significant and require that I don't just drag things out in the Transportation Program, but that I also make some fundamental changes in what I'm working on. So, much for the disclaimers and background.

Jumping into things, we have done some stuff since the last time I spoke to you. I think the last time was in May in Washington. We had a presentation. Hopefully, we'll have better luck with the sound system this time than we had there. What we have done, and I had talked from the beginning about, we did create the Project Management focus, and what that means is that I have a Project Logic that we've input over the Transportation Program.

Transportation has activities that are very, very traditionally projects in nature. You have a defined beginning of the effort, and defined end. A prime example is building the Nevada rail access to the repository. That is a traditional project.

We have other activities that are not traditionally project in nature, things like our institutional outreach program. But, I'm treating it as a project because the footprint that we want to have for operations is not in place yet. And, to make sure that we have all the connections and

all the pieces working that we ultimately want, that build-up is a project, and once we get all the infrastructure in place that we want, we'll be treating it more as an operational activity rather than a projectized activity.

But, we do have the project logic in place. I have assigned the project managers. We're doing continual work on refining the infrastructure overall in our schedules. We did do our budget preparation for the '04 and '05 transportation scope based on these project and the available budget.

We issued our transportation strategic plan. It was a little later than intended. It was intended to be out, I think, in the end of fiscal year '03. We got it out before the end of calendar year '03. Unfortunately, I didn't come into the job until August of '03, and with the fiscal year ending in September, it wasn't a whole lot of time to complete that activity, but we got it out in November of 2003.

We've been working with the State Regional Groups, and I think we've had a good movement towards, as I said I think before, at least in discussions with them, I really didn't like the idea of getting together twice a year, or on an ad hoc basis and throwing pallet point presentations at each other. And, we challenged each of the State Regional Groups to propose projects that would help their needs, as well as further our needs, and I think we've come up with a

very good list of projects, as well as the ongoing routine work that we have to do with the State Regional Groups. I'm encouraged that those projects are going to bear fruit for both them and us as we work through the next round of transportation infrastructure development.

But, those are the substantive issues that I've got bulletted here. And, we started actually working on building infrastructure. When I came into the job, things like packaging, where we have to buy a large number of casks to support the transportation of our current plan, which is up to 3,000 metric tons of waste a year in spent nuclear fuel, that was a large number of casks, and back in the early days of planning, it was assumed that there would be single contracts let that would be design, testing, certification, and fabrication of those casks. That's about a five year prospect. The design and testing leading into certification is a three to three and a half year process. And, then, the actual fabrication can be over a year for the number of casks that we're talking about, even in the start-up years.

What I've learned since I've come on board, rather than sitting back in an office in Washington, we actually invited the industry to come and talk to us, and that was part of our strategic plan, was to involve stakeholders, and the industry is one of our stakeholders. And, so, we had the cask vendors come in and talk to us, and explain to us the

degree to which they thought existing cask designs could serve our needs. And, we'll talk about that a bit more. But, the answer was that we've got fairly good coverage, and, so, rather than having to let contracts in 2005 that would provide coverage for the design, the testing, the certification, and then fabrication, we may, in fact, be able to skip an awful lot of the design work and testing work and use existing hardware designs and only focus on expanding the coverage of certificates that are out there, and then fabrication. So, as we learn things, our schedules are changing, and that's one of the good lessons that we've learned.

We did announce our selection of the mode for transport and mode of transportation that's going to be mostly rail. That means that there will be some truck shipments, and those truck shipments may be from the point of origin, all the way to the repository. They may be from the point of origin to a rail head. Some of the sites that we'll be shipping from don't have rail access, and, so, there could be truck transport, possibly even heavy haul transport from those sites to a rail head to get the very large rail packages to the repository.

We also made a selection on corridor. In the final EIS for the repository, there were five corridors for building a rail line in Nevada, if mostly rail were selected.

We did make the selection of the Caliente corridor. And, we issued at the same time of our selection, a notice to prepare an Environmental Impact Statement on that corridor for exactly where within that corridor space the track would actually be laid, and that process is going on right now.

We held five scoping meetings in the State of Nevada to talk about possible alignments, and to help define the scope of that EIS, to give us advice about what we need to include, what activities and concerns the landowners and land users along the corridor had, and other interested stakeholders.

We've awarded the subcontracts to do the technical analysis along that corridor. In earlier studies, there had been some superficial engineering done based primarily on train and elevation data. What we're doing now is we've got subcontracts to do geotechnical work, to actually look at what the ground is made up of along the corridor, and that that drives more economical construction decisions on possible alignments. We're looking at hydrology along the corridor. We're doing photogramatry to get more detailed information about the elevation changes, more detailed than what we have available through the USGS data that we've got currently. We're doing conceptual design work to define the number of bridges, culverting, and drainage issues that we're going to have in constructing a rail. All those subcontracts

have been let, and those are all feeds into the EIS.

We've expanded our interactions with other Office of Radioactive Waste Management Program elements, and I'll talk about that a bit more. I think a lot of times for people on the outside, they see DOE as a monolithic organization that's tightly integrated and is working very well together. It's problematic across program boundaries, and to talk to EM about what their plans are, they have their own set of drivers. EM is the Environmental Management Program. They are the ones that are responsible for an awful lot of the DOE spent nuclear fuel and high-level waste that will be coming to the repository. Their plans and drivers do not always align with the plans and drivers that OCRWM has, and the same is true for the defense program folks that have some of the high-level waste that is coming into EM. Their production of conversion of their high-level waste into a form that can be transported is also something that hasn't always been in coordination.

We're doing a lot more in resolving those cross-program issues, but we're also dealing with some stovepipes, as it were, within the OCRWM program itself. There's a huge challenge in getting the license applications together for the repository, and all the design work that's needed to do that. They've got their own set of drivers and their own schedules that they need to maintain. So, working with

Transportation on issues that they see as being much further down the line has been complicated in the past.

We've had a lot of good interactions with them over the last six months or so, talking about common issues like there will be some fuel that comes in that is not ready to go underground yet. Some of the fuel will be too hot. They have to get a mix of fuel to get the right heat loading in the disposal packages, and until they have fuel to choose from at the site to mix into a disposal package, there will be some stuff that will be staged for a period of time.

The staged contents would be in some kind of a cask, and the question was was the repository going to go off and procure its own casks, or would they be able to use casks that Transportation procured that would be both useful for transportation and storage. And, we've got an agreement now that Transportation will be the one that has the lead for the casks, both for the transport and for staging at the repository until they get the right mix for putting down hole.

This is a slide that you've all seen before. The things up here on the waste acceptance side, this is the activities that affect the shippers, and the interactions that are ongoing with the utilities and with the DOE side, so they're going to be shipping waste to the repository.

We have a lot of input on transportation that comes

from stakeholder interactions. It's the State Regional Groups, it's the industry partners that we have. It's also, to some extent, the repository over here winds up being essentially in some cases a stakeholder. We've focused on them more specifically, but all these things wind up driving transportation, and what I'm going to be really focusing on is this piece down here, just talking about the activities there.

In transportation, along with the idea of developing our projects, our activities as projects, we've come up with our work breakdown structure, it's a way of just organizing the work to make sure that your funding requests are tied to specific blocks of work and there's good traceability between what you asked for funding-wise, and then traceability on what you spent funding-wise. It's a good way to organize just the mechanical aspects or the technical aspects of the work. That's been done and approved.

The project management tools have been instituted to track cost and schedule progress. We hold what they call monthly operating reviews. It's the status of the program on a monthly basis. And, then, each quarter, we have a meeting with the director, Dr. Margaret Chu, it's a director's program review, which is an expanded operating review, where we go over our performance in terms of traditional project

indicators like cost and schedule indices, but also where we are on reaching our milestones and overall deliverables.

The organizational structure for the Office of National Transportation has been formally approved. And, nominally, it is a combination, I have two directors now that are approved under me. Those slots have not been filled yet. There's one director that is over institutional and operations. These two are combined in what's termed an operational development group. And, the fleet acquisition and Nevada rail are combined under a division called the infrastructure development division. And, again, these are the two activities that are more traditionally project in nature. These are the two that were being treated as projects as we build up the capability. But, once the capability is in place to manage the shipments on a routine basis, they become operations, and the people working in this area will wind up being re-allocated over into one of those two areas.

The initial efforts to define the work scope for the project areas has been completed, and our integration with the other elements of the OCRWM program is ongoing, and I think bearing some real fruit.

This is an I chart, and for those of you that have the paper handouts, or copies from back there, it's the work breakdown structure. As far as O&B is concerned, there are

two projects in Transportation. There is a Nevada Transportation Project, and a National Transportation Project. And, that's just an artifact of the Nuclear Waste Policy Act and the way that the program was structured in the early years. It still works.

I've had to devolve the National Transportation Project into more activities, whereas the Nevada Rail Transportation Project is pretty much confined to developing the capability for Nevada Rail.

This only takes it down to two levels of explosion in WBS. Our WBS dictionary takes things down to the fourth level in all cases, and in some cases, we go down to a fifth level. That detail hasn't been provided here, but this shows a basic roll-up, where we can easily collect costs and do our budgeting at these levels. So, we've got very good definition for our tracking systems. And, incidentally, that was not in place in 2004, and, so, to try and say how much money we were spending in some of the different areas was, in many cases, an allocation rather than something that you could truly track with good budget tools.

On the Transportation institutional piece, we did award the cooperative agreements to the four State Regional Groups, and actually, that should say renewed rather than award, because we've been maintaining our working relationships with them, and 2004, I believe, is when we

started back again. But, the agreements were re-upped, so this is a little bit odd, because the fiscal year for the State Regional Groups that we work with is not aligned with the federal fiscal year, and in this case, that's turned out to be a very good thing for them, because they got full funding in July of 2004, which runs them through June of 2005. So, they're a little bit immune, at least to start off with, for funding perturbations that the program itself has, and that's the good news, and hopefully by the time their June time frame rolls around, we'll have found the money needed to maintain that important activity.

We've agreed to the special projects to be pursued by the State Regional Groups. There's a good spectrum of projects that addresses in many cases local issues, not just the national issues. So, it gives them the ability to tailor the way that they spend their time and their money, rather than doing things that are only driven by a national perspective.

A prime example is the Southern States Energy Board is looking at the barging options to get from sites that don't have rail access to a rail head. That was an area of significant interest for the Southern States, and now the Northeastern Council of State Governments is looking at barging as well. Whereas, the Midwest has been fairly adamantly opposed to barging, and, so, that's not a topic

that they're very interested in. They're looking at putting their money in other activities, which is good.

We kicked off the new Transportation External Coordinating Working Group sessions. The Transportation External Coordination Working Group, TEC, that's just a lot easier to say, is an expansion of what we're able to do with the State Regional Groups. It brings an industry perspective, as well as other federal agencies participate in TEC, and just interested stakeholders. So, we've got a very broad spectrum of interests that come to these TEC meetings, which helps us have better information to base our decisions, as well as really good input on working groups.

And, the two working groups that have been newly formed, one on security and emergency preparedness, and we've also kind of transitioned an old rail topical group into a topical group now on routing, and the topical group on routing was refocused primarily, this most recent meeting that was held in Minneapolis, and, so, it's in its very early stages. And, that gets to a discussion, Mark, that you wanted to have later on routine, and we'll talk about that some in this presentation, and some as we get to that later discussion. That captures the refocusing the rail topic group on routing issues.

And, then, internal planning efforts have integrated the operational and institutional projects on

cross-cutting issues, and hopefully, that's going to help us drive some of the decisions that Tim referred to as being of interest of the Western States. But, I think all the states are interested in seeing some more decisions being made. The input that we get from these working groups is going to help us frame those decisions, and make sure that we've addressed all the concerns that our stakeholders have in those areas.

On operations planning, we have been working. Last April, I believe it was, the Secretary was down at Oak Ridge, and made an announcement in a presentation there about a security for the 21st Century Initiative. And, the Office of Security and Safety Performance Assurance within DOE is tasked with implementing this new security for the 21st Century set of programs. We've been working with them on an interface that they may have with transportation, and they've been chartered to look at security in multiple areas. Cyber security is an area that they've been chartered to look at, fissile security, which is one area that we're primarily interested in, but also technical issues associated or affecting security, and there may be in fact some technologies that we can take advantage of that would enhance our security. So, we're working very closely with this office in moving that program forward.

The first draft of our concept of operations is internally viewed. It looks at basically how we would

conceive of conducting operations, and some conceptual views of how security would be addressed. It's a very early stage of its development. I'm hoping in 2005, we can drive that to finality.

We are acquiring hard data. One of the challenges in getting burn-up credit, fuel that has been used for an extended period of time in a reactor has a number of fission products in the fuel. Some of those fission products are, in fact, poisons, or have other contributions that would mitigate any kind of a criticality incident or concern during an activant situation.

Unfortunately, currently, we are not able to take credit for the performance of high burn-up fuel, because we don't have hard data that validates or benchmarks the performance against real world examples. So, what we're doing is buying data that the French has, since they have done the analysis. The French do take significant credit for, burn-up credit for the shipments that they make, and for their storage situation. This can wind up having some significant benefits for us in the long-term, both in the transportation sense, and possibly in the packaging efforts for the disposal packages at the repository.

We are buying the first round of data this year, and we're partnering with the Nuclear Regulatory Commission and EPRI in this. The Nuclear Regulatory Commission has

agreed to pay for the analysis of the data, and EPRI has also contributing to the effort. We're looking at an additional installment of hard data procurement this year, but, again, that's going to be funding dependent.

We continue to do work on an optimization model for transportation. One of the first elements of this optimization model that is being prepared by Sandia is an investment planning module that looks at the kinds of infrastructure that we could procure, and what contribution various types of infrastructure would have in our ability to achieve the throughputs that we want at an economical level.

The State Regional Groups have expressed interest in this model, because it--modules, or the model that are coming along later, we're going to be able to do enhanced planning for routing activities, looking at reducing time through various corridors, based on actual road or rail conditions, and other good planning attributes that would be of benefit to the states. And, so, we're working with them on developing hopes that they may want to have into the model, so that the model is groomed to meet both our needs and their needs.

We provided some support for a couple of the transportation modeling tools. RADTRAN and TRAGIS are two important tools that are used by the Transportation community. RADTRAN is a transportation risk analysis tool

for radiological transport. TRAGIS is a routing tool per se, and can do a lot of work for shippers in quantifying how they would like to go about planning for shipments. The two tools combined together provide a very effective tool for doing analysis of transportation activities.

It's interesting within the department, watching the accendency and decendency of various programs. EM, the Environmental Management program, has been the sponsor of these two products for a very lengthy period of time. But, as they change their focus to just clean-up and site closure, their funding support for these activities may in fact be on the wane, and we were hoping that in RW, our funding in 2005, which is part of our request at least, was going to provide continued coverage. What we're going to have to work on now is to make sure that if in fact the transportation funding in 2005 is not as robust as we had hoped, that we can cost share with EM until 2006 when our transportation budget would be robust enough to maintain ongoing support for these tools, because they are important for the community at large, not just for DOE.

We're also collaborating with our international partners. RW is a participant in an international working group on cask sabotage. The working group includes, within the U.S., the NRC as a partnering agency. But, overseas, we've got the French, the British, and the Germans are also

participants in the study. The last meeting was held in Scotland. We weren't able to attend, because RW was precluded from doing international travel in 2004. The next meeting is going to be held in the U.S., and we will be partners in that meeting, as well as contributing to the funding. And, the first round of materials, I think, are being collected now for doing the tests. The tests are going to be conducted at Sandia, and will contribute significantly to our knowledge of performance of both the materials and the casks in a variety of sabotage events that will lead to our overall security planning.

On fleet acquisition, I talked in my introductory remarks a little bit about the fact that we've invited the cask vendors and the rolling stock vendors to come in and talk to us, and the good news is from the cask vendors, we believe now that there is a significantly reduced number of casks that we would have to design from the ground up. And, so, the number of casks out there, the current designs will support about, I believe it's up to 60 per cent of our transport needs with existing certificates, and up to 90 per cent of our transport needs if we modify the certificates to add additional contents. That's really good news because it lets us address the fact that schedules are slipping, based primarily on funding right now, without changing the overall end date.

We also invited the rail car manufacturing community to come in and talk to us. One of the artifacts of our shipments is that there is a fairly recent, it's getting older now, but there is the Association of American Railroads has a standard 2043 that addresses special design requirements for cars that carry nuclear waste or high-level waste, spent nuclear fuel or high-level waste.

The design requirements apply not only to the load bearing cars, but also to the buffer cars that provide some space between the casks and the engineers, or the casks and the escort cars that travel with the train, and to the escort cars themselves. And, so, we've got what was termed in the industry a consist, a whole train has to meet these requirements, or at least the cars that are associated with the waste itself, and that's the load bearing, the buffer and the escort cars.

In the current design of rail cars, passenger car design has the suspension systems and the wheels, which is in the industry referred to as trucks. The trucks or passenger cars come closer to meeting the design requirements of this 2043 standard than freight cars do. You don't worry too much about the ride comfort or stability of a ride for packages, whereas, you do a lot more for passengers. And, the stability of the cars was one of the aspects that this standard was developed to address to provide something that

would be nominally more resistant to derailings.

So, we have a fairly significant participation from the passenger car design and construction part of the industry, but a less significant involvement from the freight car industry. Part of it may be that the passenger car industry is used to dealing in smaller orders, like the ones that we're going to have. We're looking at possibly 150, maybe 200, cars that we'll be procuring. Whereas, the freight haul people like orders in the terms of 5,000 cars at a time. And, so, the size of the order that we're likely to process is not of much interest to them, and I think that part of the industry sees a fairly high level of risk compared to the benefit for their involvement. They have indicated that when we actually come out with a request for proposals for constructor, design and construct, they may be a lot more interested.

One of the things that came out of the interactions, though, with the people that did participate and come in and talk to us is that the testing requirements under this AAR standard are not just for the individual cars, but there's a requirement to test the consist, the connection of cars with each other. And, all of the vendors that came in and talks to us suggested that we hire a single prime contractor that would be responsible for developing the consist, whether it was a passenger car developer that had

the lead, or a freight car developer that had the lead, and have them provide the interface with sub-tier contractors to do the rest of the train, if that was necessary. And, that would ensure that there was a good integration of the design of the consist, not just the design of the individual cars. So, that was a good bit of feedback that we've taken to heart.

The first stage of our Transportation team's project proposals have been accepted. We had a fairly significant set of project proposals and schedules based on the requested 2005 budget. In 2005, the budget for transportation was supposed to climb from just under $64 million to $186 million. And, so, I had already started ramping up my staff's capability, and my contractor's staff's capability of dealing with $186 million budget before the end of 2004, and having to backtrack very quickly, because if I'm held at a level of $64 million, is a significant difference. And, so, these project proposals are back in the relook stage.

Then, what they're not concerned about is that even if the program, OCRWM, gets $577 million for 2005 after we get to the final appropriation, there is no guarantee that transportation will be funded at a level compared to 2004. So, my funding may be reduced even further, and that will require additional look at what we could actually continue to

support in 2005.

I'm going through a detailed analysis currently of all of the tasks that we had on our original schedule in a prioritized sort, and it would be nice if it were just a simple matter of wrapping up all of these tasks that we've done through this work breakdown structure, putting them all on a list, rating that list in terms of priority and saying that a $577 million budget that translated to a $64 million budget for transportation, these are the tasks that I would be able to pursue. And, at a lower budget, there would be a smaller set of tasks, and you'd just move the line up and down that list. Unfortunately, it doesn't work that way. There comes a point in time where if you have a significant enough change in your budget, you don't do the same tasks. You restructure your whole work plan, and we may be at the point where that's going to be necessary.

We've done a preliminary assessment of the capabilities for fleet management facility, with the large number of rail cars, large for us, and large number of casks that we may be required to support. There's a fairly significant maintenance program that you have to have in place, and we have looked at the technical requirements, and space requirements for a facility to provide that maintenance support. That's been nominally called our Fleet Management Facility or Fleet Maintenance Facility. If, in fact, we have

to back scale our activities in 2005, I wouldn't be able to pursue the conceptual design details for this facility, and we may be forced to look at buying services when we start operations rather than having our own facility. And, that's one of the major kinds of changes that big differences in our 2005 budget may drive us to.

On our cask capability reports, I mentioned that we had the vendors, the cask vendors coming in and talking to us. They came in and had really good stories to tell, but we, it was largely a sales pitch. The vendors came in, they had good stories to tell, and we wanted to see it in writing. And, so, what we did was we said great, it's a really good story, we like the story, can you put it in writing and make it more explicit for us so you can actually map the degree of coverage that your current cask designs have to the inventory of fuel that we'll have available to ship in 2010. And, from the very beginning, our goal has been to provide a transportation infrastructure that was robust enough to cover any of the contents that we would be possibly asked to move in 2010.

So, I had hoped to have a transportation infrastructure that would have casks that could ship anything that we were asked to move, whether it was high level waste, or spent nuclear fuel, in any consist, whether it was in rail cars or in truck, depending on what the access was to the

sites, and that the final decisions made by both the shippers through the Nuclear Waste Policy Act, options they have for changing priority at the last minute, to the capability at the receiving side at the mountain, that we'd be able to accommodate any of that. Well, that's not likely to be the case. But, we did find these cask capability reports where the vendors mapped their current cask coverage to the inventory that will be in place in 2010, they showed the degree of coverage that they would have with existing designs and existing certificates, the additional coverage they could provide by changing certificates, but using existing designs, and the gap that would be required to be filled by doing completely new designs.

The capability reports confirmed our original estimate that about 40 per cent of the commercial spent nuclear fuel could be shipped with current certificates of compliance. And, as I indicated earlier, with the existing hardware, and just changing the paperwork, that we could perhaps expand the coverage by up to 90 per cent of what's going to be out there in 2010, which is very good news.

And, as a result, we had not anticipated that we would be pursuing much, if any, cask designs from scratch in 2005, that our focus in 2005 would be to expand the capability of the existing cask fleet to cover a broader spectrum of the materials as a more efficient way of moving

forward.

On the DOE side, there's some challenges with the way that the characterizations has been done on the DOE data. You can get certificates that will cover the DOE data, but you may be constrained on the amount of material that you can put in a package. And, the challenges for a large quantity--not large--a portion of the DOE spent fuel on high-level waste, items have been characterized on an average basis rather than on a bounding basis. And, with average characterization of the contents, the NRC has got a huge challenge in how they can assure against criticality problems during accident or off normal situations in transport.

The way you deal with that is you constrain the amount of material that's put into a package. There's a couple of things that we can do to address that. One is to do more detailed analysis of the specific contents, and that winds up being an EM issue, since they'll be the ones loading the packages. If they would like to have more efficient loading, collecting more detailed data that we could present to the vendors to help prepare more robust certificate proposals to the NRC, but that's a bit of a disconnect on the DOE side as opposed to the commercial side, but they've got very, very good data about what their characterization is of the materials they're going to ship. And, that just captures the discussion we just had.

This idea that the materials owner must certify that the material meets the limits of a COC's allowable contents, when the actual loading is done, and for the DOE materials, EM is the responsible loader, they're the one that has to make sure that they meet the requirements on the certificate of compliance when the packages are loaded. And OCRWM's responsibility will be to make sure that they have the QA and QC programs in place to do that effectively. So, we'll be auditing them just as we will be auditing, to some lesser extent, the other participants in the shipment programs.

It is likely that the only fuel, DOE fuel shipped in the first five years would be in canistered form, and that is a little bit simpler. Again, there's a pretty good coverage from the cask vendors in providing overpacks to accommodate the DOE canisters. Again, there would be perhaps changes in the basket design as they go inside the transportation overpacks, but that sounded like something that could be done fairly well. Again, with that question about bounding criteria for the contents, maybe restricting how much could be put into a single package.

But, again, we have casks that can support the DOE wastes. The thermal structure and shipping requirements in those packages are bounded. The concern is over criticality and having detailed enough information to bound the

criticality concerns. The internal basket designs could be developed, or for the existing cask overpacks, and then certificate modifications would be required for those new baskets. And, the first five years, we don't anticipate developing any new casks to handle DOE content.

On the escort cars, I talked a little bit about the Association of American Railroad standard. We have met with the passenger car vendors. They believe that the designs they currently have could be supported, changed only slightly to meet the new AAR standard requirements for shipping spent fuel and high-level waste.

And, this again, this last bullet gets to the idea of not buying the escort cars from a passenger car manufacturer, and then buying the cask cars from a freight car manufacturer, and hope that the two work well together after you combine them, but have a single contractor responsible for the consist, and doing the overall development of the train, rather than having individual efforts that would have to be integrated after the fact.

The freight car manufacturers, again, we had a much lower turnout from the vendor community in the freight car side of the house. They were very cautious about their ability to meet the AAR standard, and they were a little bit cautious about even talking about the need, because there are spent fuel shipments going on currently, consolidation

shipments for some of the commercial sides that are being done by rail with cars ability to meet the AAR standard. And, so, they were a little bit questioning about why we were doing this. But, the shipments that are being done currently are over a much shorter distance, and a much fewer number of shipments, and so, I think as we move forward, the standard makes more sense for us than it does for the private sector and the limited scope that they've got for those shipments.

One of the good things is that, I mean, it could be included in the contract, the schedule that we proposed for developing our designs for the rail cars for doing the prototype development, for doing the testing at the test facility in Pueblo, Colorado, and then getting on to the actual fabrication of production units, the schedule that we had laid out for doing that seemed realistic to both the passenger and the freight car companies, which was encouraging. But, that schedule did call for beginning, at least the conceptual design work, in 2005, and until we know what our budget is, that's a question mark.

On the Nevada Rail project, the EIS, the Environmental Impact Statement for alignment of the rail line within the corridor that was selected has been started. We did have the public scoping meetings. We received over 4,000 comments. And, when we started the scoping process, we indicated that the formal scoping process would end on June

1, but that we would continue to consider comments that came in after that date to the extent practicable. And, we are still getting comments. Many of the comments that are still coming in are duplicative of comments that were submitted before the June 1 date. And, so, to that extent, they are already bounded, and others are continuing to come in. We've got a very engaged set of stakeholders, both along the corridor and folks outside the corridor, that are interested in the development of this EIS, and what it means for both the development of the shipment capability, and for the rail construction activities.

We have awarded the contracts for doing the technical data collection for field survey work and for developing the conceptual design in support of the EIS. And, the draft EIS right now is scheduled for completion in late spring of 2005, and scoping, or actual hearings would be held on that draft after that point.

On the waste acceptance side, at the shipping sites, there's a separate part of OCRWM that is responsible for the interface with the utilities. They have a process that they update on a regular basis called the Delivery Commitment Schedules. These DCS documents are a way for the utilities to say what it is they want to ship, and when, and how they want to ship it. The requests for the DCS updates went out this summer. The due dates for those was September

30, 2004. A couple of utilities requested extensions. I believe we've gotten all the responses on these Delivery Commitment Schedule update requests in now.

Those Delivery Commitment Schedules include the reactor site where the spent fuel would be picked up, the maximum cask loading weight of crane capacity at those locations, the proposed shipping mode and delivery year. We actually encouraged the shippers to indicate what they would like to ship, not just in 2010, which was the start-up of our transportation operations, but also to include input for 2011 through 2015. Very few were inclined to provide that additional information, but we got good feedback on the 2010 shipment proposals. And, the number of assemblies that they propose to ship and the type of reactor that was covered.

We also requested through FIDS, acronyms are going to be the death of me, but a FID is a facility infrastructure data sheet, and it looks at all the infrastructure that we would rely on at shipping sites to be able to do the transportation activities. We started a process of updating the FIDS in the spring. We've got about 80 per cent of the responses from the facilities, the 74 facilities, and that includes a couple of DOE sites as well as the commercial shipping sites. What we were asking for is rated design and load lift capacity of their cranes, access of the cask areas and lay-down areas. How much space do they have? Do they

have rail sidings at their site? Could we leave the rail cars there as well as the casks? A lot of questions were asked in that arena.

We asked about dimensions and their floor space, where they're actually going to be doing the loading. Can they get the whole cask in, or would we be looking at possibly using a transfer cask to get things from their fuel pools over to the cask located in another location.

And, out of all this, another busy chart, some interesting data comes up, and it's interesting because it gets back to the question that Mark and others have raised about how well are we integrating our analysis of our shipping requirements. We called the cask vendors and then said how well do your casks bound our shipping needs. And, we have now an understanding that existing hardware designs could cover 90 per cent of our shipping needs.

The challenge, though, is when you look at the actual shipping site location capabilities, this is crane capacity in tons, the rail casks that we're looking at are in the 100 to 125 ton capacity range, which is up in this range right here. And, if you look about half of the reactors can handle casks that large. The other sites have a sliding scale of capability that they would be able to handle, and then identified as a gap between the hardware designs that are out there, and what we might have to be able to use to

address capabilities at the sites.

There's a couple ways of going about it. We could procure more casks of smaller sizes and weights that would address the crane capacities, or we can develop a transfer cask that would be lighter for them to handle, that would actually take the fuel out of the spent fuel pools and be used to transfer over to where the cask would be located, where we could have portable equipment brought in to actually load the cask onto the rail car after the fact. But, that's part of an internal discussion that we've got continuing. But, we are looking at impacts from both the vendor side of the house, as well as the utility side.

We've got more analysis that's being done on this data, capabilities at the sites, and we're folding in now the DCS data about what specific fuel the sites would like to ship in 2010, integrating that with the cask capability reports we have, and these crane capacity reports, the data we've got from the FIDS, to get a little better idea of what we believe the shipments in 2010 would look like, based on the feedback we've got currently. And, that, again is going to have an impact on how we move forward with developing a transportation infrastructure in this year.

On the repository side, we have had a series of ongoing integration meetings with the service design folks out at the repository. We've been meeting with the Office of

Repository Development and local counties on communications infrastructure. As they start construction activities out at the site, and there's a number of things they'd like to do before the site actually is building facilities, they'd like to build access roads, they'd like to build improved utility capability out there, power and water. There's a lot of development that would be necessary to support the health and safety of workers when they actually start full-scale construction.

Before that preliminary construction begins, though, you'd like to have more robust communication capability out at the location. I don't know how many of you have actually done site tours out there. There's a routine set of tours that are conducted at the mountain itself, and when you're out there, your cell phones are dead, and some of you consider that a blessing, but when you actually start construction activities, you need to have better communication coverage for the kinds of routine industrial accidents that are likely to happen on any construction site. And, so, there's an ongoing effort between the counties and the Office of Repository Development on developing communication infrastructure out there, both radio and cell communication capabilities.

And, Transportation is participating in those discussions to make sure that that infrastructure would fit

in well with the ultimate transportation communications we'd like to have along the full extent of the corridor, because we have the similar challenge along the full Caliente corridor. It's not just at the mountain itself that's a communication challenge.

And, we've had continuing discussions about shipper issues with the site. One of the ones I talked about earlier was the idea that they are going to have to have casks for their staging area until they get the right mix of fuel to combine into disposal packages, and rather than have them pursue one procurements, and have transportation pursue a separate procurement, we've decided to combine and have a single procurement that would serve both needs. And, so, that's a case of really good integration between the two aspects of the program.

This is another very busy eye test. Mark had asked me to address the integration between project activities. One of the things I whined about was the fact that my project plans are schedules. I've got some very good Gant charts, which is another buzz word in the project planning world that looks at schedule dates, and shows relationships between project activities where, in some cases, one activity has to finish before another one can begin. In other cases, the initial activity has to finish before a second can finish. There's all kinds of relationships between these different

tasks. It's not just a finish one before you start the other. Some things proceed in parallel. And, we've done that level of planning. But, again, that level of planning was done assuming that we would get the full $186 million in the 2005 budget.

Now that we're looking at a significantly reduced budget, what I've done is I've stripped out a lot of the detail, but I've also stripped out the schedule, and just showed the superficial dependencies between some of the activities here. And, we can talk about that to some extent. But, with where we are in the budget process right now, there's going to be possibly a very significant look, not just at changing schedules, but also changing scope, that we're going to have to deal with. And, that may change this whole map.

Overall, with where we are now, since 2004, we essentially got the budget we requested. The program was wholly funded in 2004. Our project activities to date are on schedule, because we were provided with the sufficient funding to move out as we had planned. And, this shows the basic project lines in National Transportation and in Nevada Transportation. On the fleet acquisition, we had planned to have our initial meetings with the vendors. We are still on schedule with our planning activities here.

The next set of activities, though, were to

actually award conceptual design contracts, and the conceptual design work is being segued into more probably modifications to certificates based on the reports that we got in from the vendors. We're hoping to do that this year. Again, that's going to be funding driven.

On the fleet acquisition, we also had some activities for the rolling stock. We were hoping to pursue conceptual design for the rail car designs also this year. Again, that's going to be funding dependent.

On the operations side, there was only one major activity that we were obligated on the schedule to complete. An awful lot of the activities on operations were things that could proceed in parallel, are not driving schedule like the international sabotage work that we're doing. It's not something that drives our ability to deliver capability at the end of the development effort. But, that also completed, but it's not showing as a critical path activity on this schedule.

On the fleet management facility, we did work on initial conceptual design requirements, and we've had a lot of discussion about siding criteria. This little diamond has not been completed. We don't know exactly where the facility is going to be located. What we've done in the EIS is that we are considering locations for a number of the transportation facilities for bounding criteria within the

EIS. So, we're going to have EIS coverage, although the explicit location of these facilities may in fact change over time, and, in fact, may wind up not being on the Caliente corridor. There's a potential for things like the fleet management facility to be located elsewhere.

On the institutional activities, we had the TEC meetings. We're working with the State Regional Groups. We are pushing towards having our draft policy for implementing the emergency preparedness training funding under the Nuclear Waste Policy Act. We've got a very good working group performing under this TEC session to try and help frame what the input to us would be on developing the draft policy. We're starting with the policy that was published in draft form in '98, I believe it was, and so we're picking up from there. We made very good progress.

I think at the last TEC meeting we had, I think, much closer agreement on the funding approach and developing a formula based approach that would provide assurance of better equanimity between the funding regions, making it more technically based rather than more subjective, which the previous draft approach was a needs based approach, which was going to be very difficult to quantify and to make sure that it was evenly managed. So, I'm very comfortable that these activities are moving forward, and that will support a new draft policy in the nominally spring time frame of 2005.

On Nevada Transportation, we did get our record of decision on mode and corridor. We have started the EIS process. And, the EIS process is in play. We have the subcontracts supporting that, with technical data collection. We were late in getting some of those subcontracts issued. It would have been very nice to have been able to complete the geotechnical work, handed a final report over to the EIS contractor for inclusion in their write-ups. That didn't happen in time. So, what's going on now is we're having weekly meetings between the technical subcontractors and the EIS contractor, and raw data is being shared across those boundaries to make sure that the EIS contractor has the information they need to work with, as information is continued collectable on these corridors are the options that we're looking at for the corridors.

On intra-agency coordination, we're regularly meeting with the Environmental Management Program. As the Environmental Management Program continues to look at changes in its overall responsibilities and its focal points, there's a lot of things that it used to take ownership of that it's trying to divest itself of. I talked earlier about RADTRAN and TRAGIS being two important transportation modeling tools. Those are things that the Environmental Management Program is looking at moving away from. We're looking at picking those up within OCRWM to make sure that the tools are

available both for the Department, and for the stakeholders.

We've got some significant interface with the Nuclear Energy Program, because of the materials that they've got, and the ongoing contributions they have possibly to the long-term success of the nuclear programs in the country.

We're working with the Office of Naval Reactors fairly consistently on activities like the Department of Transportation work on their dedicated train study. There's a significant amount of interface between the Naval Reactors' program within Department of Energy and OCRWM and EM. So, we're all working together on activities like that where we have a shared and common interest.

We are also working with Naval Reactors on learning a lot from them about their safeguards and security, as well as working with the Office of Security Transportation on their safeguards and security footprint. That's the office within DOE that transports the special nuclear materials and the nuclear weapons for the DOE programs.

We did participate in the Naval Reactors exercise that was held in Topeka, Kansas last summer. It was a very good exercise. I think a number of you here in the room were there also. We're looking at that as a possible model for the kinds of exercises we may want to prepare before we start shipments. I think there was a lot of good information that came out of that, and I think it's a big confidence builder

to go through a potential exercise before you actually start shipments, so a lot of the players have a chance to actually exercise some of the activities that they've been funded to develop and make sure that they actually work well together.

We have looked at the lessons learned report from the West Valley shipment. There was a shipment of spent fuel from West Valley up to Idaho. Other shipments that the Department is currently conducting we're paying close attention to to get any additional lessons learned from that would contribute to our operational planning.

Working on routing criteria for the shipments is really a joint process. It's not something--in fact, we had some interesting discussions as we went through the question of how we were going to develop the special projects with the State Regional Groups. There were a number of teleconferences that we had where we talked about the kinds of projects that people wanted to pursue. And, one that was of interest to most everybody was routine. How are you going to do the routing process. And, our position has been that there is not going to be the announcement of DOE routes. There's going to be a collaborative development of routes, where the states have a primary lead in establishing their role, particularly for the highway shipments, most notably because of their role and their ability to designate alternative highway routes under DOT, but also their role in

the planning for the rail shipments to the extent that they may be involved in inspections and other activities in route.

And, so, that process involved an interesting discussion, and part of it was looking at providing funding to have states work on development of route proposals. And, all of the State Regional Groups as a whole were interested, but the State of Nevada was more interested within WIEB of pursuing a path where DOE would announce routes and they would comment on them, rather than having them be part of a collaborative development of routes.

And, so, the regional groups are all actively engaged now. It will be interesting to see the extent to which the State of Nevada participates in the development of route proposals from the states, or at least criteria and methodology for route selection that would be advised to us from the states as we make our selections.

Now, we're also working with the Department of Homeland Security. I think a number of you are aware that DHS required critical infrastructure protection reports. It's an effort that was concluded I think in summer of this year. DOT had a critical infrastructure protection report that they had to do on transportation of hazardous materials overall, and the Nuclear Regulatory Commission had a critical infrastructure protection report that included transport of radioactive materials. And, so, there was a little bit of an

overlap between the DOT responsibility and the NRC responsibility. DOE was involved in both of those meetings to make sure that we were comfortable with the reports that went forward from each of the agencies and there weren't going to be challenges for our execution of our transportation planning. So, we're integrated well there.

In summary, we've got a lot of challenges, not the least of which is our funding profile. But, we are making progress. 2004 has been a very good year. I think we've had an awful lot of very good success. We have moved the program forward, and we've engaged a lot of our stakeholders, both on the State Regional Group side, on the industry side, and I hope we'll be able to continue that in 2005.

We look forward to continuing our work with the states and tribes to address the transportation issues, such as routing, and emergency response, and I'm hopeful that we'll be able to maintain our schedule for developing the revised draft policy guidance on emergency response that we'd like to get out in the spring of 2005.

Based on the feedback that we're getting from the rail car manufacturers and the cask vendors, the level of participation we're getting from the states in doing planning activities, there are no technical issues that would preclude our ability to develop a robust transportation program ready to ship by 2010. There are significant funding concerns that

will affect our ability to do that, though.

And, that's the end of the presentation.

ABKOWITZ: Thank you very much, Gary. There was a lot of very useful information that you presented, and we certainly appreciate the update on everything that's going on.

We're going to open up the floor for questions from Board members and Staff, and I'd like to start with one quick question, and then we'll start to spread it around.

I'd like to go back to Slide Number 20, and first of all commend you and your colleagues for putting this together. This is the closest thing yet to what we had been looking for in terms of being able to see the critical milestones along each project path, and also the interfaces that are required in order for appropriate decisions to be made based on information that's interdependent coming from other sources.

You made the comment that the funding situation may impact schedule and scope, and I'd like to use this slide as kind of the backdrop for my question. Schedule would imply to me that the timeline that's not drawn on the bottom can't be drawn because 2010 may or may not be within your sites if the funding is not there. That's my interpretation. I'd like you to comment on that.

Also, scope implies to me that either some of these

boxes disappear because of the level of sophistication and the work can't be done, or they're done at a much more sort of higher, 30,000 foot type of thing. You know, each of which has implications on the quality of the effort, and what people can expect out of the transportation system.

Is my interpretation of your comment correct? If you could elaborate a little bit more on what all this means?

LANTHRUM: Well, the answer is going to be verbal, but it's going to be a bit of a tap dance, and it's both. It's going to be, in terms of scope and schedule, there are--these blocks are fairly large and inclusive. And, for example, the development of the cask acquisition. If we have significant impacts on our overall budget--when I started off, I mentioned that the desire was to build a transportation system that had broad enough capability, the decisions on what got shipped, and the shippers can change things up to six months prior to shipment. They have the latitude under the Nuclear Waste Policy Act to make changes in their commitment about what they're going to ship up to six months prior to the shipment.

With that uncertainty, my desire was to build a transportation infrastructure that was immune to those decisions, or changes in decisions. So, that if they made a change in the last six months, I would say fine, instead of taking something off Shelf A, I'd take something off of Shelf

B, and I'd support them.

If I'm driven down funding-wise, that constrains the breadth of coverage that I can have with the transportation system I do procure. And, so, these cask capability reports we got from the vendors are very helpful, because as I make decisions about what to buy, if I don't have the money to buy everything, I buy the things that give me the most coverage so I have the most flexibility, but I won't have infinite flexibility.

And, so, the first constraint in scope is I don't buy as broad a capability as I would otherwise. And, as things shrink down further, I may lose capability. Right now, I'm expecting that we can still maintain 2010. If I have $64 million in 2005, I would still be able to ship in 2010, based on input and things from the cask vendors, for example, that suggest that I don't have to do design work right now. All I have to do is certificate work, and that is not as time consuming as starting from ground zero.

So, we can still meet 2010, but based on what the funding is, it may not be that robust coverage in 2010. It may be a constrained coverage. And, if things shrink enough, then it becomes a very constrained coverage.

A prime example is if we don't get the funding to do more broad detailed design work on Nevada Rail in 2005, that would challenge my ability to have a rail line completed

in 2010. If I don't have rail completed in 2010, that constrains the throughput significantly. As Bob Halstead has said a number of times, that if you use an only truck infrastructure, it's a huge, huge impact if you try to maintain the levels of throughput that are suggested in our planning basis. Our planning basis starts at 400 metric tons a year and ramps up to 3,000 metric tons a year over a four or five year period. Even at 400 metric tons a year, it would be very difficult with a truck only transportation infrastructure.

The other thing that we've done in analytical space is that from a purely efficiency point of view, if I have any money at all in 2005 to develop my infrastructure, I'd really like to use that funding to provide continued support for developing rail. If you look at the cost per metric ton of shipment by truck as opposed to shipment by rail, infrastructure I buy for truck shipments that would support shipment from the shipping site all the way to the repository, as soon as rail is available, that becomes wasted inventory. I won't use it. It is grossly inefficient compared to rail shipments. And, so, there's some big impacts. Right now, I can still meet 2010 if I get $64 million, but it won't be that robust capability. If things shrink further, other decisions have to happen, and blocks could in fact disappear if things shrink enough.

It's not just a matter of stretching schedules out at some point. There are decisions made about just not doing certain things. And, we're not there yet, so we don't know what the funding levels are. In fact, we had a discussion earlier about possibly deferring this panel discussion until we had a more solid feel about what the budget was, and none of us know when that's going to happen. We're on a continuing resolution right now that's going to run through November 20th. It would be nice if we had confidence by November 20th we would have a permanent budget. I don't have that confidence right now. But, we could very well be running into the end of the calendar year on a continuing resolution of some sort, and I know you want to get feedback before then. But, it's going to be a lot of uncertainty, not just for transportation, but for the impacts in the program as a whole until we know what our dollars are.

ABKOWITZ: Thank you. Dr. Arnold?

ARNOLD: Howard Arnold on the Board.

Gary, the experience that I've had with DOE and its predecessors, ERDA and AEC, were that generally DOE is most comfortable as a manager, an overall manager, and it has operators that do its bidding to do various tasks. This kind of leads to different roles for people in the process. DOE tends to deal with organization charts, work breakdown structures, budgets, contracts, and so forth. Whereas, the

operators are tasked to take a systems view of the whole process.

In this case, your transportation tasks is sandwiched between two others, namely the repository itself, and what takes place at the reactor sites. And, I see a need for someone, maybe it's OCRWM itself, to take the overall systems view of this process. I mean, there's a myriad of things to worry about. What's at the individual sites? I see you working on those? How is it accepted? That it's ready to go to the repository. How is it handled at the site? What is it put in? How is it shipped? How is it routed? How is it accepted at the repository, which may or may not be the same thing. How is it handled at the repository? What gets done with it? And, certainly not the least, how are errors, accidently, non-standard events, et cetera, prepared for and dealt with, and the necessary QA at every step.

I'm curious, this is really building up to a question, what is DOE planning in the future as to how this operation will be managed and done? If DOE plans to do it itself, I see that as a really new type of DOE organization, at least one I'm not familiar with. You're looking at a lot of the issues, but I don't see DOE has in its history an operation, running an operation itself, doing an operation itself. Maybe I'm missing something. I certainly see you

doing pieces of it, but what is the evolution of this process? Is there going to be an operator organization, perhaps the repository is in charge, and it manages all these other things, or perhaps some new headquarters organization is in charge, and actually does these things? How do you see it evolving?

LANTHRUM: Again, my perspective is more narrowly focused because I'm responsible for developing a transportation system, and I'm trying to be as broad in the development requirements for that responsibility as possible. That's why I'm looking at things like these facility data sheets to make sure that the input we get from the cask vendors is going to interface well with the facilities.

But, getting to your point out a systems approach, there is another group under OCRWM, it's the Office of Strategy, Development, and Integration that takes this broader systems view of things, and I work fairly closely with Chris Kouts.

ARNOLD: Will that evolve into an implementing organization?

LANTHRUM: I don't think that decision has been made yet. I doubt that it will evolve into an implementing organization. The actual construct of operations, since we haven't even gotten through license application for the repository, I think is premature. There are a lot of options

about how that would be done, and I don't think a final decision has been made on that.

You're right, DOE has more typically used contractor organizations to conduct operations, and they provide just a management umbrella over it. There are a number of different ways that could be done. One of the things that's being considered right now is looking at an owner's representative, essentially bringing in one of the large architect engineering, construction management firms that could provide an overall systems approach. But, again, no commitments have been made in that regard. It's just one of the options being looked at.

Right now, we're so early in building the infrastructure, the base capability, that the operational considerations for how this system is going to conduct its requirements is a little bit premature. But, again, we do have the work being done by Chris Kouts' organization, the Office of Strategy, Development, and Integration, that is developing a total systems model that will help inform decisions about what might work best in that regard.

In the meantime, there's an awful lot of discussion and cross-integration work that we're doing, like the work I've been working on with the repository, to make sure that the transportation infrastructure interfaces very well with what they've got, and again with the shipping sites, both DOE

and the commercial sites.

Until we know what the infrastructure itself looks like, I don't think any decisions will be made on what the actual operating environment is going to be like, whether it's going to be contracted out, whether it's going to be federalized. Even within Transportation, there's an awful lot of talk about how the transportation security environment would be done. There is an NRC requirement currently that we have escorts for shipments. The question is would those escorts be federal agents? Would those be private security service providers? The decision hasn't been made on that either.

So, there's an awful lot of operating considerations that haven't been set in stone, and I think we need to get the infrastructure developed a little bit further to understand how the infrastructure would support initial operations, what kind of initial operations we're talking about before we talk about more details of the management of that process. But, Chris Kouts' organization would be a good one to talk to in a more broad sense about the systems' view of things, because that is their charter.

ABKOWITZ: I have John, followed by Ron and Andy. John?

GARRICK: Yes, Gary, thank you.

On Slide 8, you talked about optimization of the transportation system, and you also talked about burn-up

credits. I wonder if you'd elaborate a little bit with respect to the optimization parameters, and also with respect to the impact that burn-up credits will have on shipments?

LANTHRUM: Since we don't know the exact fuel that's going to be shipped yet, it's not clear, if in fact the shippers chose the youngest fuel that they have in their spent fuel pools, and if that young fuel had very high burn-ups, in the order of 50 plus gigawat days per metric ton, there are a lot of concerns about the potential embrittlement of the cladding on that fuel, and other stability issues with the fuel itself. And, there is currently no credit taken for the significantly large number of fission products that are in that fuel, and the contribution they may make to poisons, and what not, and some kind of an off-normal situation.

With hard data, it is very likely that we will have significant credit we can give to the poisons that are present in part of those fission products. We would have more detailed information about the stability of the cladding, and we may, in fact, be able to get more assemblies into a cask than we would otherwise.

If we're shipping initially older fuel that's cooled longer, has decayed more, that may not be as big a concern, and, in fact, we may not derive much benefit. But, the potential is there that if we are concentrating, if the shipping sites concentrate on younger fuel, and younger fuel

particularly that has high burn-up, that there could be some significant benefit to fully loading casks rather than leaving casks only partly full for the transportation.

GARRICK: And, what about the optimization parameters that you're going to be focusing on?

LANTHRUM: The optimization is largely a network study of throughput and looking at where I stage casks. One of the things we're asking ourselves currently is do I keep all of my inactive casks and rolling stock inventory at one place, or do I have multiple staging sites across the country where I stage reserves to feed out to the shipping sites. That's a question that's not really easily answered because of the size of the network we've got without modeling capability. And, then, once you actually determine where you stage your assets, how do you do your pickups.

We don't have enough definition yet to know whether or not the sites that will be doing the shipment would be able to load more than one cask initially. If we are taking one cask from one site and one or more casks from other sites, how do we manage that network. Do we take the one cask from one site to a DOE site for temporary staging, pick up others from other places, combine them at a DOE site, and then take the whole consist from there? Or do we try and run the train from one shipper's site to another, and pick up casks as we go? Those are questions that have some

significant operating cost impacts and schedule impacts, and the model is helping us look at issues like that as well.

So, how do I maximize the use of the resources we have based on what assumptions we have to make? Or looking at a Monte Carlo sort of assumptions that you could make, what would be the optimal solution? On the flip side, looking at what is the least optimal solution, and what does that drive me to in terms of the amount of infrastructure that I have to have? And, so, I'll be looking at both inefficient modes of operation that would affect the number of casks, the number of cars I have to have, as well as efficient modes of operation that may reduce the number of casks, and possibly use that as part of the ongoing discussion about what the initial shipments would be composed of.

GARRICK: But, the point is I guess is that the optimization is primarily with respect to throughput?

LANTHRUM: Primarily with respect to throughput; that's correct.

GARRICK: Yeah. One other question. I know we're going to hear a lot about risk and safety later on. But, at your level, what can you say about the safety assessment program, and how you're going to allocate resources, and what you consider to be the priorities?

LANTHRUM: On safety, or security?

GARRICK: Safety.

LANTHRUM: Safety. The primary defense on safety is the very robust packages that we'll be using that are certified by the NRC. So, that is the prime, or that is our first line of defense for safety.

GARRICK: I know what the lines of defense are. I'm really asking about what you're going to do, what assessments you're going to make, what studies you're going to perform that you haven't performed? I know you're going to rely heavily on the cask tests and the certification process and the analyses that are required by the regulations. But, I just wondered from the standpoint of your overall perspective, what additional analyses you anticipate performing, or what you consider to be the priorities with respect to the safety analysis, safety assessment?

LANTHRUM: The big part right now is looking at the capability after there is an off-normal situation, and that's what we're working with the State Regional Groups on. One of the topics we're looking at in emergency preparedness is what kinds of activities could be covered under the 180 C funding capability, looking at the gaps between what currently exists in states for their ability to respond to an emergency, and what they believe would be necessary, looking at the gaps between what states currently have in place and what they believe would be necessary. That gets down to this idea of a formula for calculating what kind of capability we would be

putting in place.

We have not made any decisions yet about the use of dedicated trains. And, so, to the extent that we would be using key trains, we don't have much say, or would not have much say in the question of routing for rail shipments. If we wind up making the selection to use dedicated trains, then routing selection becomes something that the Department, along with its stakeholders, could have a significant play in. And, in that regard, we would probably do some significant routing studies about contribution that routine decisions would contribute to safety for safe operations.

GARRICK: So, you're going to embrace the states in helping you make decisions.

LANTHRUM: No question about that.

GARRICK: Yes. Thank you.

ABKOWITZ: Ron?

LATANISION: Latanision, Board.

Gary, my recollection is that in some of your previous presentations, I believe we've seen something of a timeline that indicates the project schedule in terms of shipment, and in terms of the volume of waste that's transported. Is that correct?

LANTHRUM: No, I don't believe I've showed--well, it's possible.

LATANISION: Is there such a timeline?

LANTHRUM: Well, there is a gross of the throughput. It was 400 metric tons. Then, I believe it's 400, 800, 1,200, 2,000, 3,000 metric tons spread over a time span. That is available I believe, yes.

LATANISION: I mean, obviously, that drives such issues as fleet management and acquisition and so on.

LANTHRUM: Right.

LATANISION: And, so, you really have to have some sense of a projection in that context.

LANTHRUM: We do have, but that projection was predicated on the funding profile. And, now, they're looking at a funding profile that is significantly different, $300-some million different for this year alone, possibly. We won't know until we have the final determination.

Margaret Chu came out I think in her Congressional budget testimony and said that the 2010 that we've been talking about, which is the 40 metric tons a year, and this robust capability, was predicated on full funding between now and then. Without full funding, that progression of shipping throughput is very likely to change as well.

LATANISION: Let's assume the funding is there, and that's--

LANTHRUM: I like that assumption.

LATANISION: The question I have is what sort of thoughts have been given to the issue of which shippers will

be activated first. I mean, how do you envision determining which utility or which organization will be first allowed to ship, and what are the elements of that?

LANTHRUM: It would be very nice if that were our determination. Unfortunately, it's not.

LATANISION: Whose is it?

LANTHRUM: It's the utilities. Under the Nuclear Waste Policy Act, their priority for shipment is based nominally on the age of their fuel. There's a part of the Act is oldest fuel first, is essentially the consideration. But, it's not really oldest fuel first. It's he who owns the oldest fuel has the ticket for first in line. How they use that ticket is their discretion. When I talked earlier about they can make changes up to six months prior to the shipment about what actually gets shipped, that ticket can be used for any inventory that that corporate entity has. So, it is their decision, not our decision, and that drives one of the biggest uncertainties in the program.

LATANISION: Right. That will affect your management of the fleet. It will affect a lot of the issues that are obviously of great importance.

LANTHRUM: There is a caveat in that planning, though, is that when they propose shipment, if it's something that we're not capable of supporting, we're not capable. So, what's your second choice? And, if we had the full funding

that we were pushing for, I would have been immune, I, the Transportation part of the organization would have been immune to any last minute decisions. If, in fact, we're driven by funding constraints to limit the size of the infrastructure that we develop, there will be things that we have to say sorry, can't do it.

LATANISION: Are those kinds of conversations going on now between DOE--

LANTHRUM: Unfortunately, they aren't, because of the lawsuits that are out there, we are constrained from talking directly to the utilities. The correspondence between the program and the utilities is very formal, and it goes from the program through the lawyers here, and DOE, to the lawyers at the utilities, to the technical people at the utilities, and then comes back through that same circuitous route.

LATANISION: That was my understanding. And, yet, that seems like a pretty flawed process if we're serious about all this.

LANTHRUM: Well, we did send out the delivery commitment schedules, which are the first line of commitments, that say what they want to ship, what the fuel formula is, what sites they want to ship it from. And, so, we do have a picture right now for planning purposes, and that's all we have, and that's a basis for doing planning. It is a fairly complete picture. The challenge is that that picture is subject to

change. But, I think they all understand that the only planning we can do is with data that we have, not with data that we don't have. And, since the program and the Department is not in a position of dictating what will be shipped, that's one of the challenges that we have to live with. Again, the preference would be to develop a transportation system that was immune to those kinds of decisions, but if funding winds up being reduced significantly, we won't be able to provide that.

The flip side is that the news from the utilities and from the cask vendors, is that with a small number of casks, we can accommodate a very large portion of the inventory. There are utilities out there that have off-normal sized items that would not fit into the average cask, and that would constrain our ability to support those. Because, with limited dollars, I'm going to buy what gives me the most coverage for the money, rather than focusing on things that only have limited coverage. And, that would make the outlying designs problematic for initial shipments.

LATANISION: Thank you.

ABKOWITZ: Andy?

KADAK: Andy Kadak, a member of the Board.

One of the stakeholders you didn't really talk about very much, and my experience is it's probably the most difficult to deal with, are the railroads, actually shipping

the materials that are maybe heavy loads. Could you share a little bit of your discussion with the actual railroad companies who will be doing this shipment?

LANTHRUM: Lawsuits-R-Us, and the Department was engaged in lawsuits with the railroads over the cost of spent fuel shipment. The first railroad that we engaged in the lawsuit was Union Pacific. The settlement agreement was just signed about a month ago, and so, now, we are just now being able to have productive conversations with Union Pacific. We haven't selected the next, and the Service Transportation Board dictated that we would have to work through these lawsuits railroad by railroad rather than having a large class action suit that would affect all the railroads at once. So, we're negotiating the resolution of the tariffs for transporting spent fuel railroad by railroad.

Since we've got the settlement agreement with UP, we can start discussions with UP, and we'll be doing that. The initial discussions with UP are more technical and more focused on the EIS, where would we tie to the UP track that comes down by Caliente. The repository EIS had three options and we wanted to have some discussions with UP just in general terms about what the requirements would be for designing a tie-in, how we would manage the tie-in, if there's special considerations they want us to take into account, and that will be the segue for more discussions with

them.

KADAK: So, how would you say the relationship between DOE is and the railroads right now, relative to implementing all of your infrastructure and plans?

LANTHRUM: There really is no relationship because of the constraints we've had during the process. The lawsuit was going on for 20 years. It was a very, very lengthy drawn-out process.

KADAK: Would you put that on your critical path for this--

LANTHRUM: I don't believe so, because basically, the lawsuit says that these shipments are not something that the railroads can turn down. If we're compliant, they have to take them. And, we're currently doing shipments right now using rail. The foreign research reactor shipments, those are done partially by rail. Naval Reactors is doing shipments by rails. The Department is doing shipments. OCRWM is not. And, the shipments are proceedings, and there's not been any major issues with getting the material from Point A to Point B. The big issues have been over tariffs and discussions, but we may want to have on routing, that may become a little more contentious, but that doesn't come into play until we've made a positive decision on whether or not to use dedicated trains.

If we use key trains, the railroads choose the

routing, and that simplifies the process. They are basically in charge of the decisions on how to get it from Point A to Point B, and that doesn't require a lot of interface with the Department at that point.

KADAK: Just a quick clarification. Your slides implied that the DOE was going to be responsible for off-loading the spent fuel from the reactors into their shipping casks; is that correct?

LANTHRUM: No, the reactors will load it into--the utilities will load it into the shipping cask. We take title to the fuel as it leaves the site boundary, and then we will own title to the fuel all the way until it gets actually placed underground in the repository. The only actual fuel movements we would be doing in and out of casks would be at the repository. We may have to plot additional infrastructure for sites that don't have crane capacity, and if a transfer cask where a viable solution for getting things from a spent fuel pool to a transport cask, where there end-building crane capacity can't handle a rail transport cask, that's something we'll have to work on with the utilities. But, the utilities will actually do the casks.

KADAK: Okay, thank you.

LANTHRUM: Now, DOE will be responsible, on the Environmental Management, for doing the loading of DOE casks, and so there is a responsibility for the Department there.

But, again, that not an OCRWM responsibility. That's an EM responsibility for the EM contents.

ABKOWITZ: Thank you. Abkowitz, Board.

I'd like to ask you a couple questions, Gary, and then I'm going to turn it back to Howard for some more questions.

I'm interested in the Nevada Rail project, the rail alignment EIS work that's going on right now. And, in a presentation you gave to us on April 19th of this year, you made a comment relative to the administrative land withdrawal, and that comment was segregation of lands is subject to all prior existing rights and uses. One interest group I can think of that that statement would apply to would be the ranchers. Could you elaborate on the process that's going on to take into consideration those points of view, and how it affects the ability to design a railroad--

LANTHRUM: You bet.

ABKOWITZ: --infrastructure that meets the statement that was made?

LANTHRUM: Certainly. Well, we got hooked up a bit by the State of Nevada and by the ranchers when we came out with our preference statement for not having meetings with the land owners and land users along the corridor prior to making the selection. Our position was at the time that we had had significant interactions with all the affected parties in the

draw-up of the final EIS for the repository where the five corridors were selected. And, it was just using that data that fed the actual corridor decision that was made in the record of decision in December of last year.

Since we've issued our record of decision and started the EIS process, we spent a huge amount of time out along the corridor, not just meeting with ranchers and others, but all the businesses out along the corridor, and meeting with the counties. We've driven that corridor more times than we can count now. We've had meetings one on one with the ranchers. We've had meetings with groups of ranchers. The most recent set of meetings in Lincoln County, we are providing sets of maps that show an overlay over the existing grazing allotments with BLM, with our corridor options that are currently being studied, not just the corridor alignments that were in the repository EIS, but additional alignments that were proposed as part of scoping during the EIS development. And, so, all of that is outlined for the ranchers to comment on.

We've asked for feedback from them about where specifically have they developed water capabilities? Where specifically are they doing grazing operations? What kind of paths do they have for those that have grazing allotments that are large enough to have separate summer and winter grazing areas, and some of them do, is there a specific area

where the cattle move between the winter and summer grazing areas that we need to be concerned about, provide either at grade crossings that would be not problematic for the cattle or underpasses for the cattle, if that's more effective. And, so, we've had a lot of meetings with the ranchers.

We've spent, in fact, in January in the TRB meeting that was held in Las Vegas, Mr. Fellinni (phonetic) was one of the ranchers that was most vociferously opposed to what we were doing. We spent half a day with him in his pickup truck driving around his grazing allotment. He has a huge grazing allotment, and has done a lot of work in developing water capabilities to make sure that his cattle can actually get good grazing. It's pretty sparse country out there, and without some water developments, you just can't get much production out of the land.

I won't go so far as to say that everybody is thrilled about us being out there now. They do have a much better understanding about what we're doing and how we're doing it. They are much more understanding of the fact that we are willing to accommodate special concerns they've got, and part of the purpose of giving them these maps that show the mark-ups of the overlay on grazing allotments and routing alignment options that are being considered is it will give us more specific feedback.

A lot of the concern was over some gross

misunderstandings that they had come up with. I was at a meeting that the BLM held on the land withdrawal up in Piosh this summer, and a lot of ranchers came into that meeting. A couple of them pounced on me and wanted to know why it was we were fencing this whole stinging 320 mile corridor, and I said we've not made a decision to fence it. If it makes sense to fence it, we are crossing between grazing allotments, and if you've got some challenge with cattle going across allotments and that creating a problem for the ranchers, if us having a fence helps you, we're happy to have a fence. If us having a fence hurts you, we're happy not to have a fence. If us having underpasses for the cattle helps you, tell us where to put them so that we can make it work well. If you have some specific advice about how wide those underpasses have to be for cattle to be comfortable, let us know. We're willing to consider that. So, we've had an awful lot of interface with the ranchers and other business users and other land users along the corridor.

We've met with some of the mining interests out there. My initial conception was that the mining interests would be jumping up and down for joy with the thought of a railroad coming across that remote part of the state, because they would have access to, or possibly have access to better haulage rates. Well, it turns out the mining interests around Goldfield are not interested in a railroad. They're

not hauling ore someplace for processing. They're doing cyanide leach extraction of gold from existing tailings, and they're doing that at the site. And, so, what they're needing to transport is a very small quantity.

And, so, we're having a lot of interactions with people. In fact, the folks around the Goldfield mining area have suggested some routing alternatives that would avoid possibly impacting areas where they have mineral rights. They're hopeful that gold prices will continue to climb, and that they will have more productive extraction of existing fields out there, and they would like to limit the amount of land that we would impact with the railroad. So, we're having an awful lot of interface with people now that the selection of the corridor is out, looking at dealing with specific impacts, we're spending a lot of time with.

Now, another issue out there, I think you're aware of the fact that there is a monumental sculpture out in the Nevada desert. It's called CITY. It's been funded by the DIA Art Foundation. It's been underway for about 30 years. I think the grant funding from the DIA Foundation has only been in place for a couple of years, and they have made significant strides at completing it. But, it's a sculpture. It's a mile and a quarter long, and a quarter of a mile wide. It's huge, and it's selection for that central Nevada area was primarily for the same reason we selected that area

for a repository. It's very, very remote and very isolated.

Unfortunately, that isolation is part of the context that the sculpture is created to enjoy, and, so, they've been giving lots of feedback about some routing options that would avoid impacting their sculpture either with sound or visually impacting it. And, so, we're getting lots of feedback from all of the landowners and users out there, and all that's being taken into consideration as we develop our draft EIS.

ABKOWITZ: Thank you. I have one other question. If we could turn to Slide Number 17?

I recall from an earlier presentation, and I presume it's still going on and just wasn't mentioned today, but isn't there a companion to this work that looks at what modal access exists to these various facilities?

LANTHRUM: There is.

ABKOWITZ: Because, I mean, crane capacity may not be that important in places where you don't have rail access.

LANTHRUM: The FIDs included all of that activity right at the site area. So, we looked at rail access, we looked at laid out areas, all the things that would impact us at the site. And, if you've got rail access to the site, we would presume that you would have rail access to get to those connections. Most of the operating sites that had rail at one time, still have rail, as sites, we knew their operating

licenses, and extend the period of time that the plants would operate.

There's a need to bring in and take out other large pieces of equipment that are part of the site operations, and, so, most of them still have rail access if they had it at one time. And, that's been upheld by these facility infrastructure data sheets. It's more than just the crane capacity. The crane capacity I focused on because of its interaction with the discussions we had with the cask vendors. But, we've got information overall on the capability of the sites for transportation, not just the crane issues.

ABKOWITZ: Howard?

ARNOLD: Yeah, a couple more.

You mentioned that the utility is responsible until it leaves the site. That has to be tempered again, my question about the overall systems management, someone's got to be in charge of the whole process and supervise that part of it, too, so that the utility doesn't end up loading a cask that isn't going to be accepted at the repository. So, there has to be an overall responsibility for that.

LANTHRUM: Ostensibly, OCRWM is responsible for all the fuel the utilities have. So, at some point, we have to go and take all of it.

ARNOLD: Yes.

LANTHRUM: And, so, to the extent that that is true, you could postulate that anything they put in the cask is something we're going to eventually have to accept. Now, within the constraints of the certificate of compliance, as the entity performing the loading operation, it will be the utility that signs off that we have met the certificate of compliance requirements for what we've put into the cask. And, DOE will not have a role in that signature.

ARNOLD: Well, someone's got to supervise that.

LANTHRUM: There will be that ongoing discussion. I talked about the delivery commitment schedules, which is the formal document that we're trying to get input from, there is a final commitment schedule that really hammers down what is going to be shipped, and that's the document that is basically the contract for yes, come pick up this stuff on this day at this site. And, that is an agreement that is done between the Department and the utility. But, once that agreement is signed, it's the utility's responsibility to implement their part of the agreement. We will not have oversight of their activities at the site while they are loading.

ARNOLD: I guess I'm a little uncomfortable with that. I think eventually, there will be an overall management maybe sited at the repository, and it will have the right to go in and say no, you're not doing it right.

LANTHRUM: Well, that's a discussion that would go beyond my transportation. I can't respond specifically to that. I can tell you that the plan right now does not include us managing the utilities' responsible operations under the Act.

ARNOLD: Another comment on the question of the first shipment. One's a non-technical one. I think an important criterion is going to be that it's an easy one, and easy to call a success.

LANTHRUM: I'd love that.

ARNOLD: The second one, the second comment on that is you have a number of DOE shipments that you can deal with on your own, and perhaps deal with some of those at early stages.

LANTHRUM: We do have. But, as you're probably aware, there are the lawsuits that are still out there between the utilities and the Department for not picking up fuel in 1998. We just reached an agreement with Exelon on the damages for us not picking up their shipments, and I believe the agreement was for $300 million, and that's still tied to us beginning shipments in 2010.

As long as those damages are still out there, and we have that overall responsibility, our focus is going to be heavily on the commercial side because of the payments we're making. The only way to get out from under those damage

payments is to pick up as much as the utilities are producing, so we don't add to the damages, and to work off the inventory that they've got in dry storage as soon as possible. And, so, there's a significant driver to pay attention to those shipments.

ABKOWITZ: Andy, you have the last question.

KADAK: Thank you. Kadak from the Board, I guess is what I have to say.

You talked about lessons learned from previous shipping campaigns, such as West Valley and the WIPP and foreign fuel. Could you just summarize some of the more important ones?

LANTHRUM: Communicate, communicate, communicate.

KADAK: A little more detail.

LANTHRUM: There were lots of plans made about how communications would be done from the shipments, about how would be notified, how the notification process to the states along the routes would be managed. There were some last minute changes in when the shipment actually left, and the transportation plan did not accommodate effectively how you deal with last minute changes. In fact, there were some challenges on the way the pre-notifications were done. In some cases, there were faxes of communications and phone calls. There was a desire to have a more formal process.

We met the letter of the law, but the way that that

communication was handled was not appreciated. I think that has to be improved. I think that the planning process has to acknowledge the fact that as you get very close to doing the shipment, everything will not work necessarily as you had hoped, and you have to have contingencies in there that everybody has bought into ahead of time about how you deal with last minute changes.

Our planning process is going to be conducted far earlier than the six month period when the utilities can make a change. I'm going to have to address how last minute changes by utilities are going to be incorporated in doing the pre-notifications. That's a big part of it.

KADAK: Were there any technical problems with loading, off-loading, actually getting the--

LANTHRUM: There were technical problems, but they primarily raised their head before the shipment started. The West Valley shipments were in casks, on rail cars, and the rail cars were parked for an extended period of time. And, as they got close to making the shipment, they found things like flats on some of the rail wheels, just because the thing hadn't been moving, and you had a substantial amount of weight on the cars for an extended period of time. I think that's more isolated, since we're not expecting to have things stored in casks on rail cars for years at a time.

But, the lesson learned from them is that you exercise,

do more studies of the capability of the car just before you make the shipment than they did, that hopefully will not be directly applicable to us. But, there will be a fairly robust review of the capability of the equipment before the shipment is made. So, to the extent--it's not directly applicable, but the lesson about making sure that you're taking another close look at your equipment and the fact that your equipment, your certificates and your maintenance and everything is up to par on everything, so that you don't wind up with a maintenance requirement that expires somewhere in the middle of the shipment. The idea of paying close attention to your hardware before you start the transportation aspects is an important lesson that comes out of the West Valley experience.

The biggest thing was just a fact of communication. There are a lot of people affected by these shipments, and to make sure that they all understand what's happening in fairly real time, and that they are well informed and feel like they are being kept apprised of changes is important. And, that's going to be one of the biggest challenges. Looking at the experience the Department has in doing spent fuel shipments, we've often said that this is nothing new. Superficially, that's true, but if you look at making one shipment a quarter as opposed to two to three shipments a week, that's a huge difference in the amount of communication

that's going to have to take place, and make sure that we've got adequate staff and adequate understanding about how that communication is going to be rolled out is going to be very important.

ABKOWITZ: Okay, thank you, Gary, for completing Part 1 of your trilogy.

Much to the surprise of my colleagues, we're right on schedule. We will take a 15 minute break, and reconvene at 10:15.

(Whereupon, a brief recess was taken.)

ABKOWITZ: Okay, it's post time again.

It's my pleasure to introduce Ruth Weiner, who will be giving our next presentation. Ruth is a member of the technical staff of Sandia National Laboratories in Albuquerque, and is the project leader for RADTRAN, which, as many of you know, is the computer code that's used for estimating the risks of transporting radioactive materials.

Dr. Weiner's current research interests are in the area of modeling risks from routine transportation of radioactive materials and transportation accidents involving both radioactive and non-radioactive materials. She was a member of the team that prepared the final Environmental Impact Statement for the Yucca Mountain high-level radioactive waste repository, and has published extensively in the area of radioactive waste disposal, radioactive

materials transportation, and radiochemistry. She has recently been appointed to the U.S. Nuclear Regulatory Commission's Advisory Committee on Nuclear Waste.

As Ruth is approaching the podium, we're getting prepared here, I wanted to point out that as kind of a follow-up to Dr. Garrick's question before about the safety case in transportation, it's our perception that RADTRAN is a fundamental piece of the analysis capability that's used for that purpose, and that's one of the reasons why we asked Ruth to be here today, is for the Board to develop a better understanding of what's involved in that modeling process, and, therefore, what comes out of that process, and how it's utilized in the context of doing safety evaluations.

Ruth?

WEINER: Thank you very much. Can everybody hear? I'm using the lapel mike, because like Gary, I prefer to do my own button pushing here.

This slide says Department 6141. In true Sandia fashion, we're about to become Department 6143. A little bit of history about RADTRAN.

RADTRAN I was developed for NUREG-0170, which was the Environmental Impact Statement for Transportation of Radioactive Materials that the NRC published in 1977. It was developed by Sandia National Laboratories, and it is a program itself written in FORTRAN for those of you who are

interested in that kind of thing, and it was initially developed, of course, before we had programs like Excel and Access and very dynamic database programs.

Today, we would probably do it differently. However, we have developed RADTRAN to the point where it is a very useful tool, and it is used a great deal.

RADTRAN III, which was funded by DOE, was made available to users outside Sandia National Laboratories, and that was launched in 1986. RADTRAN III ran on a server via the TRANSNET gateway. It ran at Sandia National Laboratories, and could be accessed remotely.

RADTRAN 4, which was launched in 1992, included a menu system that made it much easier for users, but it still ran on the UNIX, first the VAX and then the UNIX server at Sandia.

With the advent of 911, and increased security precautions, DOE and Sandia made the decision to transition out of this mode of operation of Telnetting and accessing the Sandia server. Sandia wants to keep external access to its servers at a minimum, except the ones that are for public information.

So, we have been, with RADTRAN 5, which followed RADTRAN 4, we transitioned out of that. RADTRAN 5 was actually launched on the Sandia server. It included a new stop model and increased the user-defined input to the point

where it was about 85 per cent. That's an approximation.

I mention the new stop model because if you look at RADTRAN assay of incident-free transportation work done prior to RADTRAN 5, the incident-free risks, the risks from routine normal transportation, are completely dominated by the risks at stops, and this is an artifact of the way stops were modelled.

What we did with RADTRAN 5 with the new stop model was to allow flexibility, how many people are within what distance of the transportation cask at a stop, and for how long they're there. That was not possible in prior editions of RADTRAN.

As I said, in 2001, security considerations required access via secure shell, but it made access more and more difficult, and various other users of RADTRAN had firewalls that made it even harder. So, we have copyrighted RADTRAN, it's now Copyright Sandia National Laboratories, and it is downloadable with the graphical user interface, and the GUI generates an input file and runs RADTRAN. So, when you download this you can do the whole thing on your PC, and for those of you who are interested in playing with RADTRAN, using it, there's the website that you can download from.

We have a web based registration form to, first of all, to give us a list of who the users are, and to ensure that there is some sort of security along with the download.

We are in the process of launching RADTRAN 5.5, which has added to RADTRAN a fully functional atmospheric dispersion model, and expanded the internal radionuclide library from 60 nuclides to approximately 150. I think the actual number is 148.

We are in the process of designing RADTRAN 6, which adds a model to calculate risks from accidents in which there is only loss of gamma shielding in lead lined casks, casks that are steel/lead, steel sandwich. We're in the process, DOE wanted us to add an economic model, and we're in the process of doing that. And, the emphasis which used to be on routine transportation, risks from routine transportation, and accident risks to populations, is gradually being focused by user demand toward calculating the consequences for the reasonably maximally exposed individual, and for critical groups. We are also adding an alternate ingestion dose calculation method to the one that is used now.

At this point, I'd like to say something. The new models that are being included, the loss of shielding model, the economic model, these are being designed by graduate students under my supervision at the University of Michigan. It's only the University of Michigan, because I happen to have an appointment there. Otherwise, it would be some other university. But, the reason for using graduate students is financial. We can make our budget stretch much further by

having graduate students work on developing these models, and I must say they have done a very good job.

Our loss of shielding model, which I have a slide of a little bit later, was developed by a young man who now just got his master's degree at Michigan, and he won the Student Paper award at the annual meeting of INMM, Institute for Nuclear Materials Management. He's now working, Dr. Kadak for industry, he's working for Framatome. Turned us down.

The economic model is being designed by a young woman who is about to enter the graduate program at the University of Michigan.

The earlier direction of RADTRAN was to develop a transportation risk analysis protocol. In other words, how do you analyze transportation risks. We are changing direction a little bit in concert with our sponsor, Department of Energy, and the current and future direction is to develop and maintain a transportation risk assessment tool that is available to anybody, and that anyone outside can use. We also do training workshops, and we have a help desk. You can always call. Currently, I am the help desk, but we expect that might broaden.

The initial EIS that was done in 1977, NUREG-0170, over estimated risks from both incident-free transportation and accidents. There is, of course, very little data to go

on. There have not been any accidents where there has been a release, significant release of radioactive material. Not that much radioactive material is transported when you compare it, for example, to the shipments of hazardous materials. So, very largely, the estimates of inputs of, you know, what would happen in an accident, how much would be released in what kind of an accident, these estimates were engineering judgment, and the judgments were, for very good reasons, because we wanted to look at a bounding case. They were over-estimates.

There has been some questioning of the use of collective dose for very low-dose chronic exposures, which is what you get from routine transportation. And, as a consequence, the focus of risk assessments is shifting toward separate reporting of consequences. We used to just report accident. They were reported in dose units, but you called it dose risk, because it incorporated a probability. We are moving more and more at the behest of both our sponsor and the users of RADTRAN to report consequences of accidents separately, reporting doses and risks to the RMEI and to critical groups, and to first responders. And, there is, the last has a problem that I'll get to when I talk about the dispersion model that we used.

RADTRAN is a very input heavy program. I want to make a point here. RADTRAN just reads numbers. It reads

numbers and it multiplies them, in a few cases, integrates them, manipulates them, and it outputs numbers. It is a very flexible code, and very forgiving. In other words, what you put into the input will be reflected in the output. We have made, over the years, fewer and fewer judgments about what an analyst should or should not, especially should not, put in. And, as far as I'm concerned, people can put in any numbers they want. It's going to be reflected in the output. But, I think this is an important thing. This is not a black box. It's actually a rather simple program. Most of what it does is multiply numbers.

And, the numbers that you input, it basically has two separate modules, for incident-free transportation, and accidents. I haven't listed all of the inputs here, because it would make too busy a slide. But, this gives you some idea. You input the package dimension, the external dose rate, any dimensions associated with the vehicle. You input route characteristics. You input population densities, stop characteristics, how many buildings there are in urban areas, what the building density per square meter is, and so on.

For accidents--by the way, the dose and risk from routine transportation depends only on the external radiation from the cask. It doesn't matter what's in the cask. The input is the external dose rate. It has nothing to do with, you assume that whatever is going on between the cask and the

shielding is going on, and you use only the external dose rate. And, by the way, when we could get actual numbers for external dose rate, we used those. Barring getting an actual external dose number, what we do is model the regulatory maximum, which is for 10 millirem per hour at 2 meters from the side of the cask.

The radionuclide inventory becomes important in accidents, because we model possible releases from containers of radioactive material. The accident rate is a route characteristic. Spent fuel, vehicles carrying spent fuel have the same accident rate as any other vehicle of a similar size and weight and construction that is carrying something that isn't radioactive. So, we simply use, as input for accident rate, we use accident rate statistics.

Argonne National Laboratory has published, from time to time Chris Sarex at Argonne publishes compendia of accident risks for semis, for rail per rail car, for barges, and so on. The last compendium is 1996, so it's a little bit out of date. These data are also available from Department of Transportation websites. So, we get these data where we can.

In the early years of using RADTRAN, there was not the emphasis on documentation that exists now, and we're talking 30 years ago. And, now, we are very careful to document the source of our input data, so that we can make no

claim about whether it's good or bad or whatever, we just use a documented source where that is available.

Clearly, the user decides the release fractions, what is likely to be released, how much of that is likely to be aerosolized and how much of the aerosol fraction is likely to be respirable, and we use a 10 micron aerodynamic diameter as a sort of cutoff of respirable fractions.

Particle settling velocity is an input. Clearly the meteorological parameters are population densities, and so on.

One of the inputs that I didn't mention for incident-free transportation, moving back to that for a moment, is the vehicle density, the number of vehicles sharing the route segment with the vehicle that is carrying radioactive materials. Actually, the occupants of those vehicles are, of course, much closer to the vehicle carrying radioactive stuff, and dose is a function of exposure time and exposure distance. So, the closer you are, the more you're likely to get.

We have used numbers that have historically been used in RADTRAN, and I have another student now looking at what vehicle densities and various states on freeways and on rail routes actually are. And, we're in the process of collecting those data.

The outputs, there's a lot of output. RADTRAN

calculates collective external dose to residents along the route, to the public at stops, to people in other vehicles, to urban non-residents, people we have--there's a factor that you can enter that looks at people who are in the city, but don't live there, only for urban areas, occupational doses, doses to truck driver, external doses to the maximally exposed individual.

For transportation accidents, we look at collective dose risks, and look at the inhalation and resuspension dose, and resuspension is actually an inhalation dose, groundshine dose, and ingestion doses. We look at maximally exposed individual doses. You can get an output per radionuclide. You can get an output to a critical group if you identify the critical group, and we have now designed a dose risk from loss of lead shielding.

So, you get a large variety of outputs, and it is more or less at the user's discretion which of those outputs are important to him. By the way, the output is the--the input and output are both text files, regular text files that can be edited with a text editor, or you can open the output in a spread sheet program like Excel or Quatro, and then you can manipulate the--that's nice, because then you can manipulate the output.

The text input file, the input data, can either be written with any text editor, Word Path, anything like that,

or using the input file generator RADCAT, which has a graphical user interface. And, for you new users, it's better. It's a little bit easier. Input file is read. RADTRAN copies the input file into a file called R5IN.DAT, and then reads in text files of various default values. Those top two, the STD and DAT, contain, among other things, the results of atmospheric dispersion models.

In RADTRAN 5, the atmospheric dispersion of released material, only the output is read by RADTRAN. These are calculations that have been done off line, captured in these two text files, and RADTRAN then picks the appropriate output to calculate. We are changing this in RADTRAN 5.5. We've actually worked together with Argonne National Laboratories to incorporate the atmospheric dispersion model in a code that they developed called RISKIND, and we've called it RISKIND in the RADTRAN code, for want of any better name.

So, now, we'll have three options. Currently, in RADTRAN, there are two options for looking at atmospheric dispersion. One simply gives you the isopleths, the dissolution factors, and the centerline distances using national average meteorology. The other one allows you to select a fractional input from the six pascal stability categories, but does not allow you, the wind speed is hard wired to those, and then we'll make whatever fractional

combination the user decides out of the isopleth, the dissolution factors, and the centerline distances.

MR. GARRICK: Mr. Chairman, can we ask questions as we go along?

ABKOWITZ: Well, let me ask the speaker, are you comfortable with answering questions?

WEINER: Sure, especially from Dr. Garrick.

ABKOWITZ: Okay. As long as the time management doesn't become a problem. We'll keep it that way, and I may change the rules as we go.

GARRICK: Well, this is a very specific question to what she's talking about now. Garrick of the Board.

I wanted to quiz you a little bit, Ruth, on the atmospheric dispersion model that you're picking up from RISKIND. Has this got features in it like stability variability, like wind directional dependence, like wind speed variation? I think you just said that when you pick up the stability factor, you pick up a wind speed.

WEINER: Yes.

GARRICK: Okay. So, that's fixed to the stability factor.

WEINER: Not in the new model. But, let me--

GARRICK: The one thing I'm really interested in is whether it has directional dependence capability in it, or whether it's a straight line plume.

WEINER: It's a straight line plume.

GARRICK: Okay.

WEINER: It's a straight line plume in both cases. Let me be a little bit more outgoing about the differences. Currently, in RADTRAN 5, with these scheme, we can only model ground level release. And, the wind speeds are hard wired, the wind speeds are fixed to the stability class. They're hard wired to the stability class. We can only model dry deposition. The new model allows variable wind speed, elevated releases, which is becoming very important, as well as dry deposition.

But, the directional question is a very interesting one. If a transportation accident happens, and this was really the reason for using national average weather in the first place, you don't know where it's going to happen, and you don't know what the wind is going to be doing. So, we model only the down wind direction. We assume that we're modeling down wind.

GARRICK: Thank you.

WEINER: These text files, I'll talk about INGEST.BIN in a moment, these text files contain default values, and there was considerable criticism of RADTRAN at one point about, you know, forcing people to use default, so we got away from the terminology of default and called them standard values. But, they're basically default values.

Virtually every default value can be overwritten. As a matter of fact, in this scheme, if you want to do your own dispersion model outside of RADTRAN, you can manually enter the isopleth areas, the down wind distances, the dissolution factors, and so on, that can all be overwritten, and RADTRAN will pick up an overwrite and substitute it for the default value. The default values are there for convenience. Most people do not have, for example, at their fingertips, what the average adult breathing rate is. So, we made a default value out of it, that kind of thing.

The fourth of those text files is actually not read as a text file, it's a BIN file, is the output of the ingestion code COMIDA, which was developed at INEL by Abbott and Rude, and was used initially in MAX-2, which is the program for looking at dispersion from reactor accidents. And, we picked up and recoded--well, ran COMIDA for transportation accidents.

COMIDA has been run. This is a static program. COMIDA outputs the ingestion dose per curie for the radioisotopes that are in the RADTRAN internal library, and then just gives you that ingestion dose as an output. The program picks up that output from COMIDA, multiplies by the number of curies, and so on. So, that again, is a static program.

There is an alternate way of calculating ingestion

dose, which by the way, we used in calculating it directly from ground deposition, which was what was used in the Yucca Mountain EIS. RADTRAN is an extreme forgiving code, and I've tested this myself, it will take numbers between 10^{30} and 10^{-30}. If you go outside that range, RADTRAN doesn't like it a bit, and crashes. But, you can put in big numbers, small numbers, your choice. And, the input is echoed in the output. This has prevented people from saying, well, I ran your code in RADTRAN and look how different my answers are. You put in the same input, you get the same output every time.

This is a flow diagram. It's in your handout. I won't go through it. It just shows a little bit how the data flow through RADTRAN.

The incident-free model over estimates the incident-free dose. It models the cask, or the container, as a sphere, moving down the transportation route, and the critical dimension is the long dimension, the longest dimension of the container. It's not necessarily the horizontal dimension, but it's the longest dimension. Clearly, RADTRAN uses the external dose rate and takes the external dose rate at 1 meter, this is clearly not to scale, and models it as a virtual source at the center of the cask.

So, clearly, if you're quite close to the cask, you have to add the cask radius to the distance that you'd

modeling. The distance is the distance to the receptor.

We were asked more than ten years ago by the ACNW actually whether RADTRAN had ever been physically validated. And, some years ago, we did do a program. It's a publication by Steinman, Keirfalt (phonetic) and myself in I believe 1998 issue of Health Physics, where we actually did make measurements. What we did was to run the detector past the source, because it's easier than running the source past the detector, using some very hot, empty tanks at Hanford on a rail track, and running a detector by them at distances of 1 meter, 3 meters, 5 meters, and so on, from the cask.

What we found was, not surprisingly, that RADTRAN over estimates the dose, because in the vehicle moving down the road, RADTRAN integrates basically from minus infinity to plus infinity along the route. And, what you actually see is that until the detector and the source are in line, there is no dose, no detectable dose. So, we are over estimating. And, of course, we had to be fairly close, because once you get quite far away, everything is lost in background.

The equation that governs the off-link dose is this. And, I'd just like to make a few points. I'll get to a slide that had those integrals in it in a moment. But, basically, the dose is the product of that Q is simply, to make all the conversion factors come out right, you multiply the basic integral by the distance, the length of the route,

the dose rate from the package, the population density that is exposed if you're looking at a population density, and you divide by the speed. So, that the faster the vehicle is going, clearly, the lower the dose is, the larger the dose rate from the package, a higher dose, and so on.

RADTRAN carries out this calculation, and then multiplies by the number of packages per shipment, total number of shipments, to calculate a total population dose per link.

I have to say at this point there is a big question as to what that total population dose means, and if you read the Yucca Mountain EIS, you will see that we calculated, for example, for the mostly truck scenario, the total incident-free population dose for 53,000 shipments. And, of course, that's millions of people.

Calculation of this collective dose is useful in comparing routes, but it really has limited utility as an absolute number. To borrow from a distinguished health physicist friend of mine, one person getting 1,000 rem is quite different from 1,000 people getting an average of 1 rem each. But, as far as collective dose is concerned, it's the same number. So, I think we need to keep that in mind in all of these calculations.

The difference between calculating, RADTRAN allows you to fractionate the external dose rate between gammas and

neutrons, and of course unless you're carrying something like Californium 252, you have mostly gamma. But, you can juggle that a bit. And, of course, the coefficients for neutron dose calculations are different for gamma, it's just one. The attenuation and build-up are quite different. Neutrons are attenuated in air, which is why you really don't get much of a neutron dose.

I put this slide up to show the integral, basically the integral that is used for incident-free dose calculations. And, if you can see, it incorporates the attenuation, the exponential attenuation factor, a build-up factor, and the denominator in that integral. X is the perpendicular distance out from the vehicle to wherever you want to go out to. We usually go out to half a mile on either side of the road. R is the distance to the receptor. So, you are integrating over a band of population basically of width X on either side of the route. And, clearly, you have the dose rate, shipment speed, and so on.

This is just a final equation for the dose to the population along the route that sort of adds up and multiplies by everything. I wanted to get to this, because this is--by the way, I want to apologize, I made these figures, and I'm not an artist by any means. This was one that was made for Yucca Mountain. It's a pictorial representation of the incident-free doses that are calculated

when you have legal weight truck or overweight truck going from the shipment origin to the destination. And various things happen to that truck along the way. We generally calculate the dose to residents along the route from 30 meters, which is the interstate lane width, out to 800 meters, which is half a mile.

I've done these calculations out to a mile, and since the dependence is 1 over R squared, essentially, there is not much difference at all. The routing code, TRAGIS, by the way, automatically gives you the populations within a half a mile, a mile, and I think even more. I think there's one other number that you can use.

There is also a rest and refuel stop, and in a long route, such as the ones trucks will be taking to any kind of central location, the truck has to stop every now and again to refuel for a rest stop, for food, and so on. We calculated that for the EIS, for example, that a truck going, these trucks carry 80 gallon fuel tanks, and they don't like to go to empty the fuel tanks more than half way. So, between rest stops, on an average, a truck will go 845 kilometers. Some states and some regulations require a walk around inspection every 100 miles. What happens in a truck is one crew member gets out and walks around the truck. And, we figured ten minutes for a walk around inspection. That was an engineering judgment on our part. We haven't actually

measured that. I will get to the stop model in a moment. There is quite a complex stop model.

The same thing in rail routes, the stops are calculated much the same way. This illustrates one of the few remaining hard wired numbers in RADTRAN. A number of years ago, studies were done when a train was put together, of how many, you know, what cars were moved how much, who moved them, how far away the people were, and so on, and an occupational dose was calculated for this activity. And, that number, that dose, average dose to the rail yard workers at the beginning and end of a trip, at the original and terminal classification stop for the train, that number is hard wired in RADTRAN, and what the user can do is to indicate how many of these stops there are, one or two, however you want to characterize the route.

In addition, there are stops at sidings, and the dose to the yard workers at a siding is a fraction, depending on how many stops there are, is a fraction of this classification dose. That's documented for those of you who are interested in the RADTRAN 5 technical manual, it is Appendix B. We have not got as good a stop model yet for rail as we have for trucks.

You can also model waterway transport, and we modelled barge transport. Clearly, with a barge, you're generally further from the residents along the shore. There

are no in between stops. There are no other vehicles sharing the route, or quite a distance away.

This is to show a Sandia capability, and it's such a nice slide, I couldn't resist. We used TRAGIS, the Oak Ridge routing code, with RADTRAN, and we recommend its use for a very simple reason, and that is different models will give you different answers every single time. You use a different model, you're going to get a different answer. One of the important things in this whole transportation exercise is consistency, and in order to be consistent, you may not get an answer that is absolute or that you can depend on in an absolute sense. But, in order to compare risks along routes, you've got to use consistent models. So, we recommend the single routing model, which is TRAGIS, be used with RADTRAN to get the parameters that are associated with route, distances, population densities, and so on.

This particular slide comes from our GIS system at Sandia, and it basically allows you a refinement of the TRAGIS routing system, and this one happened to be for a barge route from West Palm Beach to Fort Pierce, Florida. The red dots, the snake that runs along there is the mile width, half mile on either side of the highway, the red dots are urban population densities, the blue ones are suburban population densities, and the gray ones are the rural population densities. By the way, to make those

distinctions, urban, suburban and rural, we use the TRAGIS scheme, which bins population densities into eleven bins, and arbitrarily calls the lowest density the first four rural, the middle four suburban, and the largest four, the highest density for urban, and we use the same scheme, again, in order to be consistent.

For vehicles moving in the opposite direction on the freeway, the thing that is interesting about this particular equation is that it is inversely, the dose is inversely proportional to the square of the speed, clearly, because you have the vehicle moving, and vehicles moving in the opposite direction. For vehicles moving in the same direction, you are looking at the vehicles that pass the vehicle carrying the radioactive materials.

I put these equations up because basically, the coding in RADTRAN is simply a FORTRAN code of these equations. You can actually take a single instance of a transportation route, and do this calculation by hand. And, we have done this in order to ensure that RADTRAN does the math right, basically. But, this is quite possible to do, and the verification of RADTRAN consists of taking these equations and multiplying them along.

I'd like to go back a moment and show you something else with this particular equation. It is possible, if you have a large number of routes, different routes, lengths,

different population densities, and so on, to break this equation at any point. For instance, you can just use the two integrals, and then use a spread sheet or a database like ACCESS to multiply through. And, that is exactly what was done for large projects. I've done several myself, and for something like the Yucca Mountain EIS, we actually used an ACCESS database, calculated what we called unit risk factors for population density of one, route length of one kilometer, and so on, and just multiplied through by whatever you can get.

Okay, the stop model was actually, the parameters for the stop model were actually determined by several of my colleagues sitting at truck stops, this is for trucks only, sitting at truck stops, observing how many people came and went, measuring the distance from the gas pumps to the nearest building, figuring they're shielded in the building, and using a stop watch, how many people you have in what kind of area over what kind of, or during what kind of time. And, they went to some urban truck stops and some rural truck stops. They only did this in New Mexico, by the way. So, it can be argued that this model is only good in New Mexico. And, have published a little paper that shows that on an average, you have seven people inside--the numbers in here are the average numbers--you have seven people inside that annulus, and the average length of time that it takes for a

large semi to refuel and be on its way is 20 minutes. The maximum time is a little less than 50 minutes.

The user can enter all of these data. This is entirely a user defined model. You can enter the radius, the distance between the gas pump and the building, the radius of that inner circle. You can enter the number of people, the amount of time, it's all at the user's discretion. And, what I show here is that basically, you model this complex as two separate stops. One is the people in the rest area, near the fuel pumps. The other are residents who live near the stop. And, those residents you model out to half a mile, or wherever you would like to model them to.

By the way, those distances, although there are default distances, we have the default distance lane width is 30 meters, the default distance out laterally from the source is 800 meters. Those can be overridden. You can write in any distances you want.

Okay, this is something you can look at at your leisure. Basically, you can either specify the number of people at a fixed distance, or the population density in an annulus, and RADTRAN will read that appropriately.

This is a list of some of the default values for incident-free transportation, and simply gives you an idea of what the default values are. You can get an output in terms of latent cancer fatalities, and all that that does is

multiply the dose by 5 times 10^{-4} per rem for public, 4 times 10^{-4} per rem for occupational. And you can also get an output of genetic affects. I am, this is a personal view, I am currently trying to say that we should only have our output in terms of dose, and if people want to do that multiplication, they can always do it offline. I recommend the output in terms of dose.

Okay, let me talk about accidents. This is our generic cask that simply shows all of the features of the cask, and I don't want to take away from Earl Easton's presentation, he's going to show you a lot about casks I guess. We use, as a basis for the data, for probabilities, release fractions, and general behavior of materials inside, in the cask in the event of an accident, we use the data in NUREG/CR-6672, which was basically a re-examination of the model study data. It's called Re-examination of Behavior of Spent Fuel Casks in Extreme Accidents. And, the 6672 categorizes these. We simply made a matrix out of the data by impact speed for the accident which is along the left row, those are impact speeds and miles per hour, and temperatures up to the regulatory temperature.

And, let me show the next slide, because this is a little bit of an eye chart one. I just took a portion of the slide, and blew it up to make the point. The way that RADTRAN models accidents is to say that the universe of

accidents can be subdivided into accidents of varying degrees of varying probabilities and varying consequences. And, generally, you've all seen, I'm sure, event trees of vehicle accidents where you have an accident or no accident. If you have an accident, there's either a fire or no fire, various kinds of impacts, and so on.

The probability on this chart is the conditional probability that if there is an accident, it will be an accident of this particular type, and this particular severity. And, in RADTRAN parlance, we call these probabilities severity fractions. That is a term that is lost in the mists of RADTRAN history. Actually, on our new GUI, we call them conditional probabilities, which is what they are.

The other numbers are the release fractions of the various constituents. Now, the releases or potential releases in the event of an accident are a function of the cask, and the particular physical and chemical behavior of what's in the cask. And, we call those physical and chemical behaviors, the category, we call them physical/chemical groups. So, you can categorize each radionuclide as being part of a physical/chemical group.

We generally, what is shown there is pretty typical, crud is in a release fraction by itself. This was obviously written for spent fuel. Krypton is the synonym for

gas, gaseous releases, also applies to tritium. Cesium stands for the volatiles, except for ruthenium is ruthenium, and everything else that is emitted is usually lumped together as particulate matter.

In RADTRAN, you can have up to 15 different physical/chemical groups, and if you have one radionuclide that, for example, is either an activation product, or a fine particle, or crud, for example, cobalt 60 is a good example, you can characterize it as both, just simply by giving the radionuclide a different name.

What RADTRAN does in calculating the risk from an accident is to multiply the release fraction times the conditional probability of the accident times the appropriate dose conversion factors times the numbers of curies, and you'll see this in an equation, and then add the whole business up.

Now, since these probabilities are extremely small, the number that you get for accident dose risk in the event of release is a very small number. What we have added to it, and what we did, by the way, in the Yucca Mountain, what was done in the RADTRAN analyses for the Yucca Mountain EIS, was to include in this accident dose risk what happens if the vehicle is just stopped, if it doesn't, you know, if it's in a fender bender, but there it sits. Well, you're going to be irradiating the emergency responders and possibly people by

the side of the road, that generates a dose also. And, we also calculate that just simply using a stop model.

We added a model if there is an accident where there is no release, but a loss of rad shielding. Then, the external dose from the cask increases, and you can make a matrix similar to this.

These data exist, for better or worse, for spent fuel. There is no similar good collection of data for other packages, other radioactive materials being transported, and that is one of the lacuni in RADTRAN. We really have better data for spent fuel which gives people the idea that spent fuel is where most of the transportation is. It's not. Most transportation of radioactive materials is small packages carried by Fed Ex. And, we have very little of this type of data for anything except spent fuel.

You can break down the universe of accidents into as many categories as you want, and it does not make any difference in the net dose risk that you calculate. My former colleague and mentor, Seguendi Neuheiser (phonetic), used to have a wonderful cartoon showing a peanut butter sandwich cut in half and cut in quarters, and one child is saying you got more than I did because yours is in four pieces, and mine is only in two. Well, it's the same sandwich. So, we have the same sandwich here.

What we did for the Yucca Mountain EIS in the

RADTRAN calculations was to take the 19 and 21 accident categories in NUREG/CR-6672, and by doing a probability weighting like this, reduced them to six, because it was easier to handle. And, what you get then is something like this, and this is a good way to display the input data for RADTRAN. The severity category, that column on the left, is just an index. It says that in this case, we divided our universe of accidents into six, one of which is always the no release case. And, as you can see very nicely from this slide, the column labelled severity fraction is the conditional probability. You can see that the most likely accident is one in which there is no release.

So, that if you multiply the release fractions and subsequent parameters by the probability that you're going to have that kind of accident, you get a very, very small number for the release fraction.

That has led to people quite rightly requesting that you output the consequence as well as the risk, and that's, in fact, what you can do. The RADTRAN output has consequence as well as risk.

For the dispersion of released material, we have, as I've pointed out, the standard Gaussian. We use the standard Gaussian dispersion model, which is not good close in. And, we also simply have run a standard Gaussian dispersion model using these equations. If you have

deposition, and I'll show you in a moment the way that RADTRAN handles deposition, if you have particles, they will deposit, as they move down wind. And, if they are small enough, then the deposition velocity, the terminal velocity of the particle is a function of the particle diameter density, the viscosity of the air, and so on. This is just a footprint of the dispersion.

What RADTRAN does is to calculate the deposition in--the next slide gives the equations, but it's easier to talk from this slide. RADTRAN calculates the dispersion and the deposition in that first area, A-1, and depletes the plume that moves out to the second isopleth, and then repeats that calculation, calculates how much deposits in that second isopleth, depletes that plume, subtracts it from the material left in the plume, and moves the plume out to the third isopleth, and so on.

The maximum number of isopleths that RADTRAN can reasonably handle is 18. That gets you out to more than 80 kilometers. We're of the opinion that going out to 50 miles, 80 kilometers, is way over reaching, where the same model will hold, but that's the EPA number. So, we use it, too. You can change that. You can do it for fewer isopleths, and so on.

So, in a written accident where there is a release, and I just used inhalation here as an example, what RADTRAN

does is to take the release fraction, the fraction that's the RF, the fraction of package contents released in an accident of a particular severity, the fraction of released material that is aerosolized and the fraction of aerosolized material that's respirable, multiply that by the dose conversion factor for each isotope to each organ, we do it by organ, but also by the committed dose, multiply that by how much it is diluted in the nth isopleth area, multiply that, since the dilution factor is basically curies per cubic meter of air, multiply that by the breathing rate. And, then, multiplying this by the appropriate dose conversion factor, sums this over all organs, all radionuclides in a given physical/chemical group, which is what is called materials in this slide, all radionuclides in a given material, and all materials, and that gives you the total inhalation dose.

A similar scheme is used for resuspension dose and for groundshine and cloudshine. Since resuspension is basically an inhalation dose, the inhalation dose tends to dominate very much. This is just the integrated population dose, and this is the one for groundshine. The numbers are basically to make units come out right.

I apologize for this slide. I just didn't have another good one for COMIDA. This is a flow chart of the ingestion dose code, the output of which we use in RADTRAN. It's called COMIDA. It was published by Abbot and Rude in,

I've forgotten what the publication date is. The code was originated at INEL, and it incorporates things like soil weathering of the food chain, decay and in growth of those radionuclides that will give you an ingestion dose, what kind of crop comes out, and so on. And, using, by the way, national average food transfer factors, transfer of radionuclides from one step of the food chain to another. And, we simply take the output of COMIDA.

This is just the end of any inhalation dose, or any other dose, you multiply by the probability, by the conditional probability, the severity fraction, some of all of the severity fractions, and that gives you a risk.

The default values for transportation accidents, again, all can be overridden. I want to point out two things here. We put into RADTRAN an interdiction threshold, and I apologize for the typographical error. If you interdict an isopleth, RADTRAN will not calculate a dose for it. That says that people are moved out, they don't go back. So, there's no exposure in that area. That's something to be quite careful of. There is a default value for the interdiction threshold, and if you want to calculate doses for everything, you just override that value with a big number.

The loss of shielding model that has been designed for RADTRAN, and has incidentally been validated against

MCNP, and we get very good validation, what we do with the loss of shielding model is to calculate--this is just a diagram of a cask that is a steel-lead-steel sandwich. As has been done in RADTRAN for a long time in accidents, we take no credit for the neutron shield which is actually another stainless steel shell. But, this is a picture of the model, and what we do with the model, what the model does is to calculate a factor along that line of receptive points, by which you multiply the external dose rate of the undamaged cask.

So, if your external dose rate is 14 millirem per hour at 1 meter, and you calculate from the photon impact on that line of receptor points, you calculate a factor of two, then for that particular loss of shielding void, then you would have a dose rate of 28 millirem per hour.

RADTRAN can be--this is just a slide showing the integration with other systems. The input is a text file. The output can be either read as a text file or an Excel spread sheet file. It can be read electronically into a database, and uses the routing code TRAGIS.

This is just a slide that compares RADTRAN with similar codes that do similar things.

And, finally, I would like to give credit to the RADTRAN team at Sandia, including our very involved sponsor, Steve Hemp from the U.S. Department of Energy, and our

programmers, and the Sandians, and Ken Sorenson, our manager at Sandia. That's it.

ABKOWITZ: Thank you, Ruth. You've kept a schedule which I'm very pleased about. Your knowledge and corporate memory is very impressive, and I think important to the focus of the Board. I'm going to ask a couple questions, and then give my colleagues an opportunity to get involved, and then I'll probably come back and ask a couple more.

But, I wanted to start with a couple of sort of big picture questions. RADTRAN is focusing on incident-free and accident radiological risk. There's no intentional man made risk in this process so far, so the whole security side of this has not really been investigated. Will there be an attempt to bring that into this process, or does one have to scratch around to some, the risks that you've calculated with the risks coming in from that other stovepipe?

WEINER: No, we are looking in fact at using the accident module at deliberate attacks, what happens if you blow a hole in the cask. There is one problem which RADTRAN does not in its present configuration does not handle, and I think this is a problem with all dispersion codes. When you get very close to the source, the Gaussian dispersion is not a good code to use. It simply blows up close to the source.

In my opinion, what we have to do, and we are working on this at present, also working on getting funding

for it, if anybody would like to contribute, is to look at what emerges from a hole in a cask using a fluid dynamic, some sort of computational fluid dynamics code, so that you can do a better job of calculating doses, or consequences of such an attack to people in the immediate vicinity. Because it seems to me that's where you're going to get--the problem is going to occur with the emergency responders, the first responders, and so on.

We did a small project simply looking at mechanical trajectory, and that just does not do the job. The material coming out of a hole behaves like a fluid. You have fine particles and they behave like a fluid. And, we're working on that at present.

There is another problem that I haven't touched on here, and that is in a Gaussian dispersion model, in an urban canyon setting, or any other reasonably confined setting, is not a good model. Anyone who has walked any distance through a large city can tell you that, that you get down canyon winds, and they converge at intersections, and then the wind goes in another direction. For that, we would have to use a different dispersion model. We could use the same kind of inputs, but there are urban dispersion models available. We haven't taken any great look at them. But, I would not say that there's any--I think the work has been done. It's just a matter of collecting it.

ABKOWITZ: Okay. And, then, the other comment/question I wanted to make is that this Board has seen a fair amount of work done on Total System Performance Assessment at the Yucca Mountain Repository, and one of the big issues has to do with the confidence in the estimates and, therefore, bounding the estimates and uncertainty analysis are very important.

From what I can see, and correct me if I'm wrong, RADTRAN is essentially a deterministic model in its current form. And, do you believe there needs to be, and is there any plan, to allow it to be more probabilistic in nature?

WEINER: We actually have a model on the UNIX at Sandia, which is Latin Hypercube Sampling model, and you can distribute most of the--most of the input variables can be distributed, and you can choose the shape of the distribution that you want. Then, the former programmer for RADTRAN wrote a little sampling, LHS, Latin Hypercube Sampling program, and then you can choose how often you want, put in a random number, generator, and choose how often you want to run RADTRAN.

So, you can get out, and NUREG/CR-6672 does give both incident free and accident results, display them as CCDFs, with the mean and the 95th percentile, and so on. And, we are in the process of trying to put that kind of a program into a downloadable, run it on your own PC, form. I don't think we'll use Latin Hypercube Sampling. We may just

use another Monte Carlo sample.

But, I do want to caution you many of these inputs, there is no uncertainty. I mean, you can measure the length of a route, a route is a route, you know how many miles it is, you know what the population densities are. You get that from the Census Bureau. For many of these things, it makes a lot more sense rather than introducing uncertainty, it makes a lot more sense to calculate a unit risk factor for RADTRAN, and then use a database program like ACCESS to calculate the doses along different routes, and then calculate an average, if you want, or whatever.

The most uncertain parameters, it seems to me, are the inventory, the radionuclide inventory. That's going to be a function of burn-up, cooling time, what the fuel was, and so on. There are uncertainties in that. The accident probabilities, there is a great deal of uncertainty. I mean, we're just drawing event trees from what we know from accident data, and applying them to accidents that have not occurred. So, I think with all that, we are developing a point, but I think the user has to be very careful not to introduce uncertainty where you already have quantities that you know.

ABKOWITZ: Okay, let me respond. I understand what you're saying, but I'd be careful about some of the areas where you're saying that there is no uncertainty, because

population distribution is certainly an area where I believe there's considerable uncertainty. The census data is, in some case, is, you know, many years old. You have different populations. There's a different census database for residential unemployment population. You have a lot of special interest groups, in the case of Las Vegas, for example, where you've got a lot of transient population. So, I mean, there are some issues there. But, that's for another time.

Let me just wrap up and let my colleagues get started. Is it fair to say then that the capability exists to do non-deterministic modeling or probabilistic modeling, but certainly in the Final Environmental Impact Statement, that was not done?

WEINER: The capability certainly exists. It was not done in the Final EIS. It was done in NUREG/CR-6672.

ABKOWITZ: Okay.

WEINER: But, let me respond to your population. We have, over the years, Sandia has done a number of studies like what are the movements of populations into and out of the intercity. Is the residential population really representative of what's in the urban area? And, for non-urban, Las Vegas is a wonderful example, we can simply take the Chamber of Commerce estimate of non-resident population, you can already do that in RADTRAN, and you can distribute it

if you want to. That's true.

ABKOWITZ: Okay, thank you. John?

GARRICK: Carrying forward a little bit with the uncertainty discussion, Ruth. In the case where you did uncertainty analysis based on Latin Hypercube Sampling, did you do that on the same case where you did the regular deterministic models, and did your deterministic results, on which side of the central tendency parameters did your deterministic results fall, on the conservative side, or the non-conservative side? What I'm getting at is what has been the experience of RADTRANs with respect to the point estimate calculations, and how they stack up against a calculation that's more comprehensive in terms of propagating uncertainty through the model.

WEINER: That's a good question, because that particular calculation I don't believe has been done. The calculations done, 6672 did six deterministic calculations and a number of probabilistic calculations where things like route links and populations were distributed and sampled on. And, I frankly don't remember, I would have to look it up to see, on which side of the distribution the deterministic calculations fell. But, I think that that's an excellent suggestion for our work, and I think it's a very easy thing to do internally at Sandia because we have that capability, and I think we should very definitely do that to see with which variables and what

kind of distributions, that makes a difference or where it falls. I thank you for that suggestion.

GARRICK: Let me another question about pathways. Now, you do mainly inhalation, those calculations with the groundshine calculation as well. On some radioactive materials are more easily mobilized than others, and there are those instances where other pathways might enter into particularly the close-in dose. I'm thinking of if you have something like a calcine waste, or you have something even like a vitrified, the defense waste, and you have an accident, the likelihood of localized dispersion might be considerably greater than for the case of spent nuclear fuel.

And, therefore, if you happen to have had the accident in a time, a downpour or a rain or something, other pathways, such as liquid pathways or ground pathways, at least for close-in doses, and that's where we're probably most interested, might be a factor.

Do you have other software that you can link to cover these kind of special cases?

WEINER: You can sort--we have a work-around, that's the easiest way to put it. Material is either going to be suspended in the air or deposited. If it's deposited, as you say, and we can now do rain-out, if it's deposited in a waterway, you can look at the deposition and the ingestion of drinking water, and so on, and make that calculation. In

other words, you can calculate that particular ingestion dose by using the deposition over whatever particular waterway you're looking at, because RADTRAN does calculate, does put out an interim calculation of ground deposition micro curies per square meter, curies per square meter, whatever, for each radionuclide.

So, you can look, and that's also a function of the physical/chemical group of the radionuclide. In other words, cesium is probably going to behave, cesium/iodide, cesium is probably going to behave like volatile organics, you know, high vapor pressure. Organics, other things, are going to behave like particles.

One of the programs that we now have going is to look at particle size distributions, and I think that's also critical, because it tells you how far away from the source stuff is going to fall out.

We have, over the years, simply used 1 centimeter per second as a settling velocity, because it guaranteed that you got deposition over the whole 50 mile down wind, and there was no better reason for that than to say we thought it gave conservative answers. But, there is a way to do this. You don't have to invoke another code.

GARRICK: No, you've already articulated one of the issues here, but it's kind of important in these transportation accident calculations, and that's the close-in

dose calculation, where the dimensions of the cask become comparable to the dimensions of the receptor, if you wish, and assumptions like point source assumptions don't work very well under those circumstances. And, also, the whole issue of close-in dose and building effects and structural effects, and so forth, there has been, and I'm sure you're aware of this, there's been a lot of work done for reactor calculations for close-in where you get into situations that clearly compromise any equation or any atmospheric, classical atmospheric dispersion model, and where they build in more detailed particle models and more detailed geometry and source conditions to accommodate these close-in doses. I assume that the later versions of RADTRAN are going to consider some of those.

WEINER: As a matter of fact, let me answer that in two parts. The question of close-in incident-free dose, the person standing next to the cask, RADTRAN, if R is small enough, RADTRAN automatically models it as a line source, not a point source.

GARRICK: Yes.

WEINER: So, that for handlers, for crew, for anybody, emergency, you can specify emergency responders, escorts, people walking around the cask, that's simply be specifying the distance between the receptor and the source. And, if that is smaller than--if that is within the same order of

magnitude as the cask dimension, then RADTRAN automatically looks at that, models it as a line source, and tells you in the output this is a line source, not a point source.

GARRICK: And, my final comment, and it may be related to the same thing, I didn't see the equation long enough to figure out just how it worked. But, the shaping factor that you had, what does that do? The source shape, the point source package shaping factor?

WEINER: If you model--let me think how I can structure my response here. If you measure the dose rate, and we usually use 1 meter from the outside external surface of the cask or the vehicle, whichever you want to use, and represent that as a source at the center of the cask, then the factor is you add basically the diameter--

GARRICK: I see.

WEINER: --of the cask to that. Let me respond, though, to the part of your question that dealt with building weight. In RADTRAN 5.5, the dispersion model that we have adopted is essentially the reactor dispersion model. That's the one RISKIND has. So, that the user can specify the size of the source, and thereby take into account at least the building weight factor from the source itself, from the cask itself. We put in a default value, but that again can be overridden.

For other close-in building weight factors, like as Dr. Abkowitz has pointed out, we really have to go to urban

dispersion models.

ABKOWITZ: Ron?

LATANISION: Latanision, Board.

Two short questions. One on validation. You mentioned that in some effort to validate your model, the indication was that the model over-estimated the dose. Is that a systematic issue in terms of whatever kind of incident, whether it's a barge or a truck stop, or whatever, it always over-estimates the dose.

WEINER: Yes. Well, I shouldn't be quite so glib about it. Unfortunately, unless you have a very large source, which we really have not been able to get yet, you have to measure close-in. Even the sources we used at Hanford, we did this out in the open, and we were not able to get enough of a dose rate that even 5 meters away from the source, we got--we could measure anything above background.

If you try to do this, and we're trying right now, we have an experiment going at the University of Michigan to validate the loss of shielding model, and you do get a problem of scaling, and to get a 5 meter long lead wall with a gap of, say, 10 centimeters, we'd like to be able to scale that down and make it a little more tractable. But, there are scaling problems inherent in that.

There has not ever been, unfortunately, a great deal of interest in validating these models. I feel as if

I'm pushing very hard to have this done. There was a lot of resistance to it on theory that if you have a conservative model, and it shows low doses, what do you have to validate for. We know we're over estimating. Nothing happens with the over estimate, so, you know, go away.

LATANISION: That seems like a strange attitude.

WEINER: It's not an attitude that I share.

LATANISION: I mean, as a modeler of sorts, I think the validation step in the evolution of any model is crucial.

WEINER: I agree.

LATANISION: And, the corollary would be as you improve or enhance or modify your model, is validation a part of your process?

WEINER: It is as long I am pushing for it. I can't speak for my successor, whoever that may be in this program. Yes, it is a part of our process now.

By the way, the atmospheric dispersion models, plume models, have been validated by other--in other circumstances. But, I am very interested in having better data and, thereby, I'm interested in validating our incident-free model and our loss of shielding model, getting much better numbers for that. That would have to be done with very large sources. We just can't do it with small ones.

LATANISION: One other question having to do with the kind of incident, just a point of clarification. I take it

from your next to the last slide, I don't see a number on it, but, for example, if you were concerned about an explosion, you would turn to a code such as HOTSPOT, which conceivably is seemlessly integrated?

WEINER: No, these are just other codes. You can model an explosion with RADTRAN now. HOTSPOT, it's a cruder dispersion model. I put this--and, it was designed specifically for very high releases of--there's not much in the way of input. There's a lot that's hardwired into hot spot. You can get a general idea if you explode, oh, I don't know, a shipment of uranium, and you put in the mass of the uranium and the strength of the explosion, you can see how far it goes. But, these are not connected to RADTRAN. They were simply a good comparison.

LATANISION: But, you haven't actually looked at an explosion, for example, as part of your modeling?

WEINER: Oh, yeah, we have.

LATANISION: Oh, I see.

LATANISION: And, I have not done--we did do releases and compared RADTRAN results to the RISKIND results before. Now, of course, it would be the same, because we've incorporated the RISKIND model. I have not done a comparison with HOTSPOT, and that would be an interesting comparison to do. Now that we can do elevated releases, an explosion is basically an elevated release, and now that we can do

elevated releases with RADTRAN, and we could always do them with RISKIND, that would be a very good comparison to do.

MACCS 2 is a very complex code. I've just got the windows version of MACCS 2, and it uses much more complex meteorology than you would have available for a transportation accident. And, you don't know where it's going to happen, you don't know what the wind is going to be doing, and so on. MACCS makes use of meteorological data around a reactor, and we really don't need that.

Otherwise, RADTRAN was actually, initially a stripped down version of MACCS, the accident module, a stripped down version of MACCS adapted for transportation.

LATANISION: Thank you.

ABKOWITZ: Okay, Andy?

KADAK: Kadak, Board.

I'm curious as to whether or not you've applied this code, since you did say it was not a predictor of dose or consequence, you're just saying it's a good comparative tool.

WEINER: Yes.

KADAK: Has anybody at DOE or at Sandia done an analysis of the proposed, say, rail routes and options to see which of the routes is preferable from RADTRAN's perspective?

WEINER: Oh, yes, that's in the EIS.

KADAK: What does it show? Does it show material

differences?

WEINER: Well, the dominant thing, of course, if you add everything up, which was the instruction for the EIS, then clearly, the fewer shipments you have, the lower the dose to the residents by the side of the road.

KADAK: But, can you distinguish routes, is what I'm asking.

WEINER: Oh, yes. Yes, you can distinguish routes. We did something like 240 routes for the Yucca Mountain EIS, and I, frankly, don't remember. As a general feature, the longer the route, the higher the collective dose, because you have more people, you're going more miles. The more urban areas you go through, the higher the collective dose. It's useful in that, the more traffic there is, and so on. But, that is all the Yucca Mountain EIS. It's not in Chapter 6. Probably the best place would be either Appendix J or the calculation package does give--I see Judith nodding, she's read this more recently than I have. I can't cite off the top of my head which routes are specific route from reactor to Yucca Mountain, which are greater, which are less. But, that's all there, and that's easy to do. You can look at any particular set of routes and see which ones have the higher risk.

It's also based, we did for the Yucca Mountain EIS, we used state by state accident risks, accident probabilities, frequencies. And, again, if you go on a route

where there are fewer accident frequencies, your accident risk is lower, clearly.

KADAK: Just a second clarification question. You talked about a loss of shielding accident.

WEINER: Yes.

KADAK: Could you just give me the scenario for how that happens? Is it a fire, or something?

WEINER: 6672 looked at actually ten different scenarios, one of which involved--two of which involved fire. One involved fire, and one involved fire and a puncture. What we have noticed, in the packaging part of the Sandia complex, and my colleague, Doug Ammerman, actually has some pictures of that, if you drop a lead shielded cask, you will actually get a bulge at the end of the cask, because lead is ductile, and there's enough, and the momentum is enough to give you a bowing. So, you get a thinning of lead at the other end of the cask. That's very difficult to model. So, what we model instead is a gap, and make the gap basically correspond. We say that the lead shielding is gone from that end of the cask, and has accumulated at the other end. And, of course, there would be more shielding at the other end, but that's a little bit beyond anybody's modeling capability.

In a fire with a puncture, you can actually lose lead from the cask. In a fire that is combined with an impact, and I would have to yield here to people who know

more about cask testing than I do, maybe Earl can speak to that, in a fire with impact, you would get voids if the fire were hot enough, you'd get voids in the lead. Lead has very a low melting point, and you do get shifting.

KADAK: Thank you.

ABKOWITZ: Howard?

ARNOLD: Arnold, Board.

Andy's last question was mostly mine. But, if that's a serious contributor, then it would lead to suggestions for design changes in cask.

WEINER: Yes.

ARNOLD: Yes.

WEINER: It can be a serious contributor, and it's particularly, it seems to me, a serious contributor, because unless you take a very close look, if there's a cask in a hard impact, unless you take a real close look at the cask, you don't know that that's what's happened, and it seems to me that, again, it is the first responder who is at risk in this instance.

ABKOWITZ: Abkowitz, Board. I have a couple of other questions I'd like to ask you, Ruth.

I want to go back to the work that was done in the Final Environmental Impact Statement, since that's kind of the definitive transportation risk assessment. I presume that a set of modes, some mode and route assumptions had to

have been made in order to do the RADTRAN runs. So, in the Final Environmental Impact Assessment, the risks that are being reported are on a pre-selected set of mode and route assumptions; is that correct?

WEINER: I'm not sure what you mean by pre-selected.

ABKOWITZ: Well, you had to have made assumptions as to what mode was being used to transport how much material over a certain route from an origin to a destination. So, there was a fixed set of mode and route decisions that were made, that were inputs to the RADTRAN analysis.

WEINER: Yes, yes.

ABKOWITZ: Okay. How do you know that they were the least risk options?

WEINER: We don't.

ABKOWITZ: Okay. So, at the beginning of this whole chain of events, there was a predetermined set of modes and routes upon which the entire system was assumed to operate; is that correct?

WEINER: Yes. Well, let me expand on your adjective of predetermined. Highway routes, if you take the route for highway route controlled quantities of material which these are, you take the DOT regs, or the NRC regs, or both, and you get them from, we used, as a matter of fact, initially, the highway and interline, which are the precursors of TRAGIS, but if you use TRAGIS, which is the same code, it will give

you those routes. And, basically, we looked at every possible route from origin to destination for highway, which is fairly easy to do if you simply abide by DOT regulations.

For rail, there were routes, and I'm speaking from memory now, this was not work that I myself did, I took it from somebody else, for rail, there were very long routes that we did not look at. That is, you can design a rail route that goes around every city in the United States, and only hits the little cities, because trains go from center city to center city, and there were some of those that we did not look at. But, we looked at every reasonable route, rail route, that wasn't excessively long.

For barge routes, we stayed along coast lines and took the short, basically the shortest route from the origin, the plants, origin site to the nearest rail head.

ABKOWITZ: Okay. Now, my recollection of highway and interline was I know there was data inputs that could have been used to be more site specific with accident rates and population densities, and so forth. But, my recollection in studying that work back then was that, in essence, it was an optimization model based on minimizing distance. And, I'm pretty confident about that, but if I'm wrong, that would be fine.

So, essentially, what the Environmental Impact Statement has done is it's assessed the risks of the most

efficient routes that could be taken, and that's what the risks are that have been reported in a deterministic fashion.

I guess I have a couple other follow-up questions. One is if these routes and modal decisions have been made, shouldn't those just be published and the states can start going about the business of figuring out how to make it happen? Why are we actually involving the states in routing criteria, and if they come up with a different set of criteria, don't you have to go back and redo the entire risk assessment?

WEINER: Let me answer that a number of ways. First of all, I can't speak to--I simply can't speak to why things are, just pick the risk out of the EIS and use that, that's up to others than me. There are decisions, criteria, there are criteria on which decisions can be based other than just the shortest route, the lowest population density. By the way, you can, in highway and interline, and more easily in TRAGIS, you don't have to go with shortest routes.

ABKOWITZ: But that was what was, I understand that today, but I'm talking about back when the--

WEINER: EIS was done? No, there were some done, as I said, I didn't do the work myself, but there were some done where we put in, you know, skipped nodes, and things like that. For example, on truck routes, you've got to use bypasses. You cannot go, the DOT says if there's a bypass,

you use it. So, you're not minimizing distance in that sense. You can de-select nodes, and you could do this in highway and interline also, you can de-select nodes, you can de-select various things. You can figure your route, and a certain amount of that was done. So, it's not always the shortest route. But, as I said, there are other criteria.

For example, if you want to avoid population centers, you're going to get a longer route. If a state, and I'm simply guessing here, if it is desired to avoid some large population center, St. Louis, Chicago, whatever, that's an additional criteria that was not, in fact, wasn't considered in the EIS. If you, for some reason or another, have to, if a state says you cannot go through this particular urban area during either morning or evening rush hour, you may have to find a stop site before you get there in some other place. Again, that's not a criterion that was considered in the EIS. So, there are still decisions, decision criteria that, for better or worse, in doing a rather generic Environmental Impact Assessment, you just don't consider. And, they may be of importance to one or another entity along the route.

ABKOWITZ: Okay. Before we break, there's one question that's been handed to me that has come from someone in the audience, and that has to do with how RADTRAN measures the impacts on individuals or areas where there's already been a

history of direct nuclear fall-out.

Is that a special condition that is dealt with in any particular way?

WEINER: That's nothing that--RADTRAN simply calculates a dose from transporting a shipment of radioactive material. Whatever, that's an external consideration that the analyst, whoever he or she may be, can add to that.

And, let me give you a very good example. Background radiation differs very much from place to place in the United States. You do not include in calculating incident-free doses through the state of Colorado, you don't take into account that background is higher in Colorado than in, say, Missouri. That's just not part of that calculation. If somebody wants to do another, an external calculation, that's at their discretion. We simply don't have a module that takes that into account.

ABKOWITZ: Andy's got one more question.

KADAK: Just a quick one. You mentioned earlier in the presentation--Kadak, Board. You mentioned earlier in the presentation that NRC had a concern about collective dose. Can you kind of discuss that in the context of what we just talked about, namely minimization of risk versus distance?

WEINER: Well, I misspoke, probably misspoke a little bit. We have discussed this, and the Advisory Committee on Nuclear Waste in public meetings, that the notion of

collective dose probably has limited utility, because of the sort of inherent dichotomy. It's inherently a concept that shouldn't be applied in the absolute. But, that's a personal opinion, by the way.

I forgot the rest of your question.

KADAK: If we start doing analyses about minimization of risk, you'll need to have some kind of a metric, and the metric that people are now using is collective dose. Does that help or hurt in the analysis of really minimal risk?

WEINER: I think it is a good metric for minimizing risk, recognizing that the risks that you are calculating, estimating, are very small for incident-free transportation. But, if you really would like to compare the risks between two different routes, then, yes, collective dose is a perfectly good metric, because it incorporates both population and distance, which are usually the two biggest, the dominant parameters. Mostly, it's how far you go and how many people you go by.

But, in the absolute, the risks that you are calculating don't have much significance. Let me do this with numbers. The average individual risk to a person by the side of a truck route is order of magnitude 10^{-7th} rem, 10^{-4th} millirem.

Now, you can get two routes where one is 4 times 10^{-4th} and the other is 8 times 10^{-4th}, so you can say that route

two is twice as risky as route one. And, that's a perfectly valid conclusion. I mean, that's what this code is really good for. But, to say that either one of those is a significant radiation risk I think is stretching things a little bit.

So, in the absolute, these are not good. But, one reason we are going to RMEI considerations is exactly this. You can calculate using RADTRAN maximal exposures. And, in the event of something that you mentioned, Dr. Abkowitz, a deliberate attack, you could get enough of a release that you could really see that a population dose, a collective dose, would have some kind of significance, would be significant.

And, again, the same thing is true for accidents. The predominant criteria in accident risk is really the accident rate itself, and how likely an accident is to happen. And, that's a very good way to compare routes, and you really don't even need RADTRAN to do that. You can just look at mile times accidents, or kilometers times accidents per kilometer, and you do that, too. Is that significant?

ABKOWITZ: Okay. Thank you, Andy. Thank you, Ruth.

I've been told by Linda Coultry that the restaurant here in the hotel, I think it's called Oreo's, or something like that--Oleo's, thank you, has set up a special buffet, and I think I have the price correct, $9.00 including tax and gratuity, and that's to help expedite people who want to have

as leisurely a lunch as possible, and still get back here.

We will adjourn for the moment, and reconvene at 1:15. Thank you.

(Whereupon, the luncheon recess was taken.)

AFTERNOON SESSION

ABKOWITZ: If I could ask everyone to settle in?

We're ready to begin our afternoon session, and I think I mentioned earlier in my opening remarks that there were particular topics of interest to the Board, not all of which we'll be able to cover at this Panel Meeting, but there are a handful that we're trying to focus on more explicitly, and the first of those is the transportation security risk assessment.

We had invited Nancy Slater Thompson to be the speaker on our agenda for this purpose, because this is an area that she has direct responsibility within DOE for. Unfortunately, she is unable to be with us today for medical reasons, but in her place, and his second time around here, will be Gary Lanthrum, who will discuss the DOE's transportation security risk assessment activities.

I might also ask you that if you activated your cell phones during lunch, if you'd kindly de-activate them again. Thank you.

LANTHRUM: Nancy is actually having surgery this week, and I don't know, maybe she's got the better end of the stick here, rather than me. We'll see. Fortunately, it's not major. She's got carpal tunnel, and she's been trying to get that scheduled for a long time to get whatever fancy work

they do to the nerves to get rid of the pain in moving your hand fixed, so she can grab me around the neck and squeeze better than she can now.

Again, since Nancy is the one that has the lead, I'm not going to be as conversant in the details of this, but I'll try and field your questions as best I can.

The important point to start off with is the fact that the Department as a whole has a very good background in transportation security, and as I mentioned earlier, the work that the Department has done in shipping weapons and special nuclear materials is a prime example. But, we've also provided security for spent fuel shipments for both the Naval Reactor shipments that go from the Naval ship yards, to storage in Idaho, and to the Foreign Research Reactor Fuel Program and Domestic Reactor Fuel Program.

Right now, we are working with the States, Tribes and local governments on looking at the output from the NAS study on security. We've also got, there was a GAO study that was done of transportation security and safety for rail that was done some time ago. There's a couple actions that come out of that that would affect our planning approach that asks questions about can you prioritize shipments differently to affect overall security, and that gets into this question of the role that the Department has in saying what shipments would go first as opposed to the role that the utilities

have. But, also, looking at the possible contribution to security that using dedicated trains would make. And, that report is due, I believe, around May, June of 2005, is when we're supposed to have that analysis completed.

But, again, the Department has significant experience in managing transportation security for a variety of contents, not just spent fuel and high-level waste.

We are committed to doing this collaboratively. This development of the transportation security approach is not going to be any different substantively from our overall transportation planning. We're going to be doing a lot of partnering both with other programs within DOE, and with other federal agencies. We're going to try and look at innovative ways that we can address security. And, that gets back to that security for the 21st century initiative that the Secretary has and that's being managed by the Office of Security and Safety Performance Assurance.

We're going to be committed to doing constant improvement in what we may view as an appropriate security envelope today may in fact change between now and the time that we start our shipments. Perhaps we'll win the war on terrorism by then, and that won't be a concern. But, I'm not holding my breath. But, the reality is that the kinds of concerns, and sometimes even the specifics of those concerns change over time, and we're going to have a footprint that's

going to be flexible to meet whatever the current environment looks like.

And, the slides that Nancy put together are primarily on the risk management approach.

This is a flow chart that captures the basic steps that we're taking care of. We are committed to doing some benchmarking to make sure that we are taking into account the best practices of both programs within the Department, and other shippers from outside the Department. It will be interesting to hear the presentation tomorrow from the private fuel storage people about their approach to transportation security, particular with the possibility that they may be doing shipments before we start our shipments, and if they have a special approach that we could learn from, we'd be more than happy to pay attention to that.

The three activities here on the left, Numbers 1, 2 and 3, are shown in line. They do proceed in parallel, but there's also arrows between them to show that the things that you learn as you assess your assets affect how those assets may be able to accommodate various threats that you would look at, and also look at the vulnerability. So, there's an iterative process between those three activities that combine to your risk analysis work, which is the Number 4 star.

Once you've done your analysis and the weighing of both the capabilities of your assets and the vulnerabilities

of your assets, as well as the potential threats that are out there, you evaluate your overall infrastructure capabilities and make the appropriate adjustments, and your risk management decisions. That goes into actually your actual operations, and then your continuing improvement look that feeds back into the process, and you keep iterating it.

On the critical assets, the first step was to identify the critical assets that require protection, looking at the possible undesirable events and the impact of an expected asset loss.

And, when Nancy started working on this, she and I had a little dance we would go around and around on. There's a discussion, and when you look at the degree of security planning that you do, there are some things that you do for reasons other than security planning that, incidentally, contribute to your overall security footprint. For example, we are obligated to use casks certified by the Nuclear Regulatory Commission. Those casks are very robust and they give you a certain degree of protection for a variety of events. In fact, you wind up having to postulate some fairly significant weapons in order to overcome the capabilities of a cask. Sitting around with a rifle on a mountain range and taking pot shots at a cask isn't going to do anything to it.

So, there are some things that we do that contribute to our security posture and our capability that

are not done for security. The discussion in here is the things that we would be doing explicitly for security that would be an add-on to those activities.

But, as you go through, looking at your assets, identifying the events that could impact those assets, and then ranking the assets from a purely security perspective for that planning activity, on the consequence of losing the asset, and, we've had a very broad approach to what we would characterize as assets. We aren't looking at just the casks. We are looking at the facilities that we would have to have. If we have a maintenance facility that's required to maintain both the casks and the rolling stock, are there vulnerabilities there that would affect our ability to continue to operate. Are there vulnerabilities of the rolling stock itself as opposed to just the casks. Are there vulnerabilities to the personnel that would be different, that could possibly be vulnerable to a threat that would impact our ability. So, it's a broad based look at all of our assets involved in transportation, not just the casks.

On the threats, we've been working very closely with this SA, I think is the shortened abbreviation for that Office of Safeguards and Security Performance Assessment. It's quite a mouthful. The Department currently has a design basis threat that it uses for planning all of its activities, whether they're threats to facilities or threats to

transportation.

As we look at the design basis threat that currently is the precursor to our security posture planning, we may in fact want to revisit whether or not that threat is appropriate for the particular aspects of transportation that we're going to be involved in, and the Office of Security and Safety Performance Assurance is the one that's got the lead on developing the design basis threats for the Department.

Looking at the capability of adversaries that are designed is also really within their realm. We don't have the expertise specifically in OCRWM for doing that. We rely on the experts in the Department that have that capability.

Then estimating the impact of each threat relative to the assets, the ranking process gets proceeded again, based on threat capability, not on value of the assets. And, then, we look at our vulnerabilities, and looking at the combination of the capabilities of the assets and the potential of adversaries, and then looking at where weaknesses could be exploited by those capabilities, and what things you might want to protect against.

Also, identifying existing infrastructure, and existing countermeasures and operations and how those contribute to our overall effectiveness in providing a secure operating environment. So, there's a fairly substantial round of activities on just the analytical side of things.

And, that feeds into the actual risk assessments here that are done to determine where you get the most risk in doing your prioritization for the activities that you would wind up having to take on to counter those risks, either through design or through operational changes or other considerations.

On the countermeasures side, after you've ranked your risks and you start looking at the countermeasures that you current have in place to address them, and the additional countermeasures that you may have to develop, looking at the infrastructure and the operational practices, and looking at whether or not other elements of DOE or other service providers may be the ones that would be most efficiently able to provide the countermeasures.

And, then, identify those in terms of risk reduction. It's kind of the corollary to the cost benefit analysis that's done on the business side for other actions that we would take. On the risk side, we look at the security benefit as opposed to a cost benefit in terms of the countermeasures that we could implement. And, after that, we still have a cost element, and there would be a cost benefit analysis for the countermeasures that could be implemented, and you would rank those, along with your assets and vulnerabilities, to determine where you spend your resources.

The risk management decisions, we want to make sure

that they are based on objective criteria, to the extent practicable. It's challenging when you look at potential threats, trying to say what probabilities are, and so the typical risk assessment world where you look at the risk being a product of your probability of an incident times the consequences of an incident, and the sabotage and terrorism aspects of the world, it's very difficult to come up with an actual number for probability. And, so, in many cases, you assume the probability is one, and then look at the impacts, and use that as the starting point for your discussions, which does complicate the process a little bit.

We want to make sure that our approach is structured and yet flexible so that we can apply it to a variety of scenarios that may be put forth. And, ultimately, we would have a process that would give us a good basis for both the posture and the infrastructure changes that we would make for making sure that the shipments can be conducted safely.

Implementing a security program, there is going to be a security plan that comes out of this effort. We have said a number of times, and we had an interesting discussion during lunch over the degree of regulation we have from the Nuclear Regulatory Commission. For commercial shippers that are licensees to the NRC, they do have a security plan that's approved by the NRC. The NRC does not regulate DOE in that

regard, but we have committed to meeting or exceeding requirements. And, in that regard, we will have a security plan that addresses both the analysis that has been done, and the changes that we are making to the security posture based on that analysis.

The way that most people will see the impact is when we develop our security protocols and procedures, our transportation protocols and procedures. There may be some changes there that would address practical aspects of managing the security.

There will also be training, particularly for the folks that are handling the waste, either at the loading end or at the receiving end, and in transit. We are expecting to have for our rail shipments, an escort car that travels with the train. There will be special training provided to the escort force. The primary function is to make sure that they can provide appropriate notification if there is a challenge or a security threat along the way, so that you can bring in outside responders that can help either deal with the threat or deal with the consequences of an attack. But, there is going to be specialized training for the security escorts that we have, whether they're escorting a truck shipment or a rail shipment.

There will be some countermeasures that will be applied. The specific countermeasures, many of those will be

classified, as we get closer to the shipment, that are developed. And, those with the need to know and the security clearance will be able to discuss them with us. That will be a fairly limited subset of our stakeholder groups.

We do expect to test and validate our capabilities in transportation. Part of that test would include the ability of the safeguards that are provided for security to be effective. For the cases where you don't have, you can have drills that show what the consequences are, and make sure that you bring in the appropriate emergency responders for a consequence drill. But, we are expecting to have drills and exercises prior to starting the actual shipments.

We do have a broad outreach that includes not just the people within DOE that we have significant immediate involvement with, but also other federal, state and tribal and local agencies. Again, most of that is going to be later on as we get more of our operational practices in place, and have a more direct interaction about how the shipments would actually be conducted.

We're going to be continually re-evaluating, and that means adjusting our plans as appropriate to address the current threats. We will be dialed in more closely with the Department of Homeland Security, and to the extent that they can give more specific advice and counsel about the kinds of threats that may be out there, we will be notified of those,

and we will be able to change our security posture accordingly.

We expect to enhance the security in the areas where the vulnerabilities and the impacts to critical assets could be greatest. There may be areas where security would not be enhanced over other shipments where the impacts would not be as great.

The risk management process is dynamic. It's not something that will have an answer that's going to come out in the next month or two months or six months, or even in the next years that would then be static for the duration of the 24 years of shipping. We're expecting fully that the review of our security posture and the security posture of the context of the threats that are out there would be a continuous process.

And, that's it. And, Nancy would be happy to take any of your questions now.

ABKOWITZ: Thank you, Nancy. Let me kick off real quickly here, and then we'll involve my colleagues.

It would help me, at a minimum, if you could articulate clearly the roles and responsibilities and jurisdictions of the different players that influence the transportation security risk management of DOE. In other words, how much control do you have over your own ability to evaluate and set policy? How much of that is being

controlled by NRC or Homeland Security, or whatever? And, if you could just sort of define the playing field?

LANTHRUM: That's a little bit tough, and it's a little bit tough because of the statements the Department has made that says that we will meet or exceed NRC regulations. And, that statement has been made in parallel with the comment from NRC Commissioners that they only regulate us in terms of package certification and prenotification. So, that's the only regulatory oversight they have.

The rest of, and I think the NRC folks are going to talk about this a little bit later today in more a general sense rather than specifically in a security sense, for the rest of, for example, the NRC does review security plans for commercial shippers that are licensees. It's not likely that they will be reviewing our security plans, although there are cases where DOE has had the NRC review plans as if they were a regulator, even though they have no regulatory authority. And, a prime example is on the Foreign Research Reactor shipments.

There are cases where you've got economically disadvantaged countries making shipments that the DOE actually pays for the shipment. DOE owns the shipment. DOE plans the shipment. And, for those, they are DOE shipments, and yet we have submitted those to the NRC for review, asking for their feedback that if they were regulating the shipment,

would they in fact approve it. And, that was managed through a memorandum of agreement between the two departments, the Department and the Commission.

Something like that may wind up evolving for the RW shipments. That hasn't been determined yet, but we have made the commitment to meet or exceed the requirements of DOT and NRC. How that will be implemented is still an open question.

ABKOWITZ: Thank you. John?

GARRICK: Yes, Gary, I think this is a good example of a very systematic approach. All the elements seem to be there if they are actually implemented. And, I wanted to ask on the design basis threat, is that a product of this kind of an exercise, or is that something that was handed down from on high?

LANTHRUM: That's handed down from on high, and it is reviewed on a regular basis. The Department has a number of shipments that it does that need to maintain high security. We've got a number of facilities that are required to have fairly high security, and the design basis threat for the Department is managed for all those shipments and facility concerns. So, it is from on high aspect.

GARRICK: The follow-on comment is that the advantage of doing a systematic risk management process, or implementing a systematic risk management process is that you don't have to depend on an arbitrary design basis approach. You can

represent on the basis of a more systematic process what the threats and vulnerabilities really are.

And, so, I would hope that as you exercise this, that you would have an opportunity to provide the kind of assurance that comes from knowing that the issues that you're designing against or developing procedures to provide mitigation against are based on a realistic and systematic process such as you're advocating here, rather than a design basis threat. The design basis threat is kind of archaic in terms of risk management, in that we can do much better than that now.

And, I guess my comment is that to the extent that you can influence a realistic representation of what's likely to happen, by this process, you will make a major contribution.

LANTHRUM: I am hopeful that we will influence what the design basis threat is in the context of our shipments. The design basis threat has changed for the Department over time. It made a significant change after 911, as you would expect. And, that had huge impacts on the way the weapons and special nuclear material movements were managed and taken care of. Those changes can also be motivated from the inside by analyses like the ones that we are doing. And, we are hoping to take our analytical work and provide that to the SA Office in hopes of driving perhaps changes to the design

basis threat, and we may wind up with a design basis threat for our activities that are driven by the analysis that's been done, rather than something that's just been--but, it's going to have to be negotiated with the Department as a whole.

GARRICK: Thank you.

LANTHRUM: And, the reason I say that, one more comment, is that even though OCRWM will become the biggest shipper of spent nuclear fuel and high-level waste, there are other program elements within the Department that will still have their own responsibilities for those kinds of shipments, and we have to make sure that the process that's developed for OCRWM winds up working with the Department as a whole, not something that is just viable for OCRWM.

ABKOWITZ: Ron?

LATANISION: Latanision, Board.

Gary, you probably have already answered this, but I just want to make sure I have a correct understanding. Is the concept that nuclear waste would be shipped independently, or are they shipped mixed with other types of freight, or what is the concept in terms of shipping?

LANTHRUM: For the spent fuel shipments, or--

LATANISION: Pardon?

LANTHRUM: Are you talking about our spent fuel shipments?

LATANISION: Yes.

LANTHRUM: Right now, we haven't made a decision, and it's a policy decision on whether or not to use dedicated trains. If we use dedicated trains, it would only be spent nuclear fuel and high-level waste in the train. And, if we go with the key train, it could be commingled with other commodities, and that decision hasn't been made yet. It's going to be a policy decision that I said for a while, just as the FRA has said for a while that the dedicated train study on the safety benefits of dedicated trains would be out soon. I'm hoping our decision on dedicated trains from a policy perspective would come out soon. We believe that there is primarily operational considerations that come into play in making the decision, and hopefully, this calendar year sometime, we would have a decision out.

LATANISION: The latter approach in which other types of chloride or ammonia tankers or nitric acid tank cars are intermixed, that would post a different sort of risk.

LANTHRUM: Or, as Representative Porter said in the House Subcommittee Hearing on rail that I attended last March, candy for our children, challenged on that possibility of having nuclear waste next to those kinds of shipments.

ABKOWITZ: Howard?

ARNOLD: Arnold, Board.

I assume you're constrained from discussing actual

threats or threat models. But, Slide 11 implies that you have to have some fairly broad audiences for your discussions, the middle bullet there.

LANTHRUM: Right.

ARNOLD: You're going to have to balance the need for security of who you talk about it with with the number of people you've got to talk to.

LANTHRUM: Looking at the actual security profile, it's going to be primarily internal. But, as we travel across the country with the shipments, the security escort group that travels with the shipment is going to have to be well integrated with the security apparatus and the states and the times we pass through along the way. And, the same is true of the secure transportation shipments that are done for the weapons and special nuclear material. They have their own federal agents that travel with those shipments. There's a cloud of protection that surrounds them. They do a lot of outreach to the local security apparatus, whether it's in states or tribes, and so they are very well integrated, and everybody understands their relative roles. That's primarily the discussion about the exercises there, is who is going to have what role if there is an incident somewhere along the way, making sure there's good communication and a good understanding of the relative roles and responsibilities for the security group that we provide with the shipment, as

opposed to the local security responders.

ARNOLD: While you're doing that, you've got to have some specific discussions of threats and threat models.

LANTHRUM: Possibly.

ABKOWITZ: Andy?

KADAK: Kadak, Board.

Just as a follow up. I'm just wondering since security is a very publicly important issue, how are you going to communicate the--what you're doing to assure the public that in fact these shipments are going to be secure from terrorists threats, or whatever?

LANTHRUM: Well, I think part of that is the constant outreach that we've got to state regional groups, the interaction we have through a broader stakeholder group, through the TEC Working Group. I think communicating. We can't talk about the specifics. We can't talk about the specific threats that we're dealing with, or the specific responses, in many cases. But, what I'm hopeful is that as we go through the process, the agencies and programs within DOE that we've been working with and developing the security posture, that to the extent that the outfall of those discussions is visible through our protocols, that there will be some confidence that we have adequately addressed the concern. But, you're right, we can't go into the details with everybody about what we've done to avoid any probability

or any change of a security problem.

KADAK: I can understand, you know, the training, the communication systems that are set up as part of normal emergency response. But, to give the public confidence that you've got it under control, I think will require at least some discussion of the types of threats that you've evaluated, at least looked at, and how that rolls back into the design of the cask, for example, and the transportation systems that you use. Because without that, it's almost like a trust me, I'm doing it okay.

LANTHRUM: And, that's going to be a fine line to walk between the trust me and the full disclosure. It's not going to be entirely trust me. It's not going to be entirely full disclosure. And, how well we do that I guess is yet to be seen.

KADAK: Where do you stand on the development of this, I don't know what I should call it, a security plan to respond to some realistic threat?

LANTHRUM: We have just started.

KADAK: Just started. And, just for the Chairman, what is our role in this going to be?

GARRICK: The Chairman is over there.

ABKOWITZ: What is our role in security? Abkowitz, Board. The Board has a mission to focus on the technical aspects of Yucca Mountain Transportation Planning, and

certainly to the extent that this is a technical issue that influences the safety of the transportation operation, it's something that we, you know, consider to be fairly appropriate to put energy into. And, I do know that there will be some work that's being done in this area that will be classified, and there is an opportunity for Board members to get clearances to be able to look at that information.

Abkowitz, Board. I have a couple of sort of wrap-up questions for you, Nancy. The first one is I don't disagree with this approach. I think, you know, the systems approach makes a lot of sense. But, I am concerned, and this is not unique to the DOE, I'm concerned about the way that the country is dealing with safety versus security, and how that gets aggregated up to an all hazards approach. Because, ultimately, that's what this is all about. It's, you know, security is a form of safety, in that we're protecting human health, and the other things that go along with it.

What is going on within your own agency to make every effort to integrate these activities, you know, towards some overall scheme, so that no stone is left unturned, and we also have an efficient and effective management plan?

LANTHRUM: First thing, the mouthful of that organization that we're working with, the Office of Security and Safety Performance Assessment, those were two separate offices. They've been combined into a single office, under a

single manager, within DOE. And, so, that reflects a view on DOE's part that the two are inextricably linked, and have to be dealt with in a holistic fashion. I think that's a very key step in the right direction. So, it's one manager we're dealing with that has overall responsibility for the Department, for both aspects, which gets us closer to an all hazards approach.

ABKOWITZ: Okay, thank you. Abkowitz, Board.

The other question, kind of comment, I had, I agree with you this probability of occurrence, the likelihood issue is the real typical one to get at from an intentional act standpoint, one, because you don't have any kind of valid historical data on which to make those judgments.

LANTHRUM: Thank goodness.

ABKOWITZ: And, two, because when you're intentionally trying to do something and you harden one target, that just means that, you know, the opportunists shift their attention to somewhere else. They don't just disappear.

LANTHRUM: Right.

ABKOWITZ: So, has there been some discussion about how to bound the probability of occurrence? I know that some of the security work that I do, we use this concept of what we call reasonable worst cast scenario a lot of times. Can you comment on that?

LANTHRUM: A little bit. The Department has focused

more on what they call the attractiveness of a target, and that's one way of doing their ranking system. That gets away from the probability, but it looks more at what the benefit of the target would be to an organization, and what the risk would be to a terrorist organization to try and approach that target. And, that's a measure the Department has used more in the past.

The traditional scale for measuring attractiveness of a target would not necessarily apply to our shipments, the way it has applied to other shipments. Its primary focus has been on, again, special nuclear materials and weapons components or weapons themselves that are moved, where the concern is diversion of material rather than damage to material. And, I think the threat that we need to be dealing with is more likely to be an upset threat rather than an actual theft threat. There's not really any benefit in stealing a cask full of spent nuclear fuel.

So, we've got a different threat environment that I think we're working with, and what measures we wind up using to rate the risks is something we'll be working very closely with SA on. But, it's likely to be suddenly changed from what's been used in the past, because it's a different environment.

ABKOWITZ: Okay. One more from Andy.

KADAK: I was going to ask about tow missiles, but I

don't know anything about tow missiles. Is that part of your envelope in your security assessments?

LANTHRUM: We are looking at readily available and not readily available weapon systems.

KADAK: Okay. My comment is I think in your earlier presentation, you talked about 24 years of shipping.

LANTHRUM: Nominally. That's what the EIS looks at, yes.

KADAK: And, that's for Yucca Mountain?

LANTHRUM: That's correct.

KADAK: And, the reason I'm making the comment is because I'm expecting that if the nuclear industry continues, there will be more than 24 years of shipment, and some of your decisions relative to investments, such as a dedicated train, might be different, you would view them differently if it was, say, a 40 year or a 100 year kind of timeline for shipments to a repository wherever it may be, the second one or the third one. So, I wonder if you could just kind of keep that in mind as you think about your planning for infrastructure?

LANTHRUM: Certainly. I would expect that most of the infrastructure that we procure, because technology is going to change over that 24 year period, a lot of it may become technically obsolete over that period of time, and may get replaced regardless of whether it's still useful or not. So,

I'm not expecting that the infrastructure investments that we make now are going to constrain our ability to operate differently in the future. But, it is worth taking into consideration, and making sure we think about it as we develop the process.

ABKOWITZ: Thank you, Gary.

We're in the area right now where, as Gary mentioned, there's more than one organization that's focusing on transportation security risk assessment as it relates to Yucca Mountain planning. The U.S. Nuclear Regulatory Commission being another one. And, our next presenter will be Philip Brochman, who will tell us about what NRC is doing in this area, focusing both on the transportation of spent fuel by private entities, and also how these considerations may differ for Yucca Mountain.

I also wanted to point out a program change. That's one of the reasons why we've let this current session linger a little bit. The Department of Homeland Security was invited to participate. They were unable to make a commitment to participate, and, so, consequently, they will not be presenting today. And, as a result, when we're complete with Philip's presentation, we'll move on to the spent fuel cask testing area.

BROCHMAN: I just sat here and listened to Gary and realized that, gee, a lot of what I was going to say, you

have all just discussed. But, I will quickly try and go through some of these issues, provide you a context, or perhaps an explanation of what we're doing.

By way of background, I'm a Senior Program Manager in the Office of Nuclear Security and Incident Response in the NRC, and I deal primarily with transportation security issues, spent nuclear fuel, and nuclear material is what I focus on.

And, also, I would mention that Mr. Earl Easton from the NRC spent fuel project office is here also to answer any questions related to safety issues that may arise as part of this discussion.

Briefly, what I have for you here is if an entity is an NRC licensee, and I'll put aside the question of Yucca Mountain for the moment, but let's say some other power reactor company, what are they subject to in terms of our regulation and oversight. And, what we have is certification of the shipping packages, inspection of the package itself, the package design, fabrication efforts. Enforcement of NRC and DOT rules. The DOT rules are safety, NRC rules are safety. There's also the fourth bullet, we also have physical security measures. And, finally, emergency response. We serve as a lead federal agency for these types of shipments.

Next slide, please. When we get to Yucca Mountain,

as was mentioned earlier, one of the issues we are constrained by is the way the statutes are constructed. What I've given you here is the two statutes and sections that really cause this difference in approach. And, the Energy Reorganization Act is the first one that starts the ball rolling, and it basically limits what the NRC can do with respect to DOE, except for some very specific items, or other laws.

An example of the other law is the Nuclear Waste Policy Act, and Section 180 is the principal regulation that the NRC would apply in looking at shipments to Yucca Mountain. As was mentioned earlier, there are two sections, Section A, certifying package designs, and Section B, requiring advance notification of shipments to state and local officials.

Next slide, please. This would be our understanding at the moment of what DOE would be doing compared to my first slide. Inspection of package designers, fabricators. We're approving the design, but we're not doing inspections of the fabrication or of the related activities. Enforcement of DOE's and DOT's safety rules as the shipments move down the road or across the rail. It's not our responsibility. Enforcement of DOE's physical protection measures. By enforcement, I mean to say a regulatory oversight enforcement model where you have an inspector going

out, observing activities. If they're finding adverse activities going on, they're documenting them, and there's some sort of enforcement process if the events are significant enough. The NRC would not have a role in this case. Emergency response. DOE would be the lead federal agency on these shipments.

And, one of the things I note is that this presumption is based upon the standard contract, as I understand it, that the Department would take title to the fuel at the reactor site. If a reactor licensee, for whatever reason, decided it was going to ship fuel to private fuel storage facility, if one should be licensed, or to Yucca Mountain, if it should be licensed, the power reactor had made the shipment, that would be subject to NRC regulation completely. But, if the Department of Energy makes that shipment, the regulatory oversight the NRC has is limited by statute.

Next slide, please. As was mentioned earlier, DOE, the phrase here used was DOE is trying to meet or exceed NRC requirements. The phrase I use is voluntary adherence, as opposed to regulatory compliance. As was mentioned, we have a program with the Environmental Management Office in DOE, and the Foreign Research Reactor Fuels is a good example of that. The Department or its contractors have submitted requests for approval of routes used to ship spent fuel. As

you may be aware, one of the requirements in 10 CFR, Part 73 for the shipment of spent fuel is that the shipment be on an approved route, and by that we mean security, from a security standpoint, not from a safety standpoint. The safety routing is covered by the Department of Transportation under its regulations. But, these are security measures, and typically what we're looking at is issues of safe havens, communications, et cetera. They also make advanced notifications of such shipments to the NRC.

And, finally, in general terms, what the NRC looks at from a physical, in today's model, what we're looking at in terms of physical security for spent fuel shipments is armed escorts, position monitoring, immobilization devices, training procedures, what do the people do, and also those are in the regulations, and then the last item there is enhanced security measures. Since 911, the Commission has issued via orders enhanced security measures to a whole range of activities, licensees, reactors, gaseous diffusion, CAT-1 facilities. Spent fuel shipment is one of those measures, one of those activities. There are some measure, and they are currently in place, and will remain in place for the foreseeable future.

Next slide, please. I want to jump ahead to the last one. I want to touch on this one, then I will go back to the tables, because they're a bit complicated.

One of the statements that DOE has made is that they intend to make, or they would desire to make advanced notifications of shipments to Native American Tribes, along with the notifications they're making, they would make to the NRC and to state and local officials. Currently, the NRC regulations do not provide for this.

As I note here, the Commission issued an advanced notice of proposed rulemaking in December 1999 on this specific subject. Based on the comments we received back from many tribes and other stakeholders, the Commission directed the staff to move forward in a proposed rule. And, I was actually the person working on that along with others. Unfortunately, 911 came along, and the Commission made a decision in October of 2001 to basically suspend development of this activity. Notice my choice of words, suspend versus cancel. So, at the moment, this rulemaking remains on suspension, and we believe it will be resumed at some point in the future. I think there are, as I say here, there are some other security efforts on transportation that we will likely get to first. But, given the time frame we're talking about for potential shipments to Yucca Mountain, I would hope that we can have a regulation in place before those would begin to occur.

Backing up, if I can, just to, what I have here is sort of a--it's a nice table, it's busy, but it sort of gives

you a comparison of who's doing what. So, this is sort of a summary in a table form of what you see, who the roles and responsibilities are, and we here have package approval, preparation, carrier safety, and you can see who does the various roles, NRC, DOT, DOE, et cetera.

I'll leave any questions you may have on the specific items, but I know you're trying to move along in your schedule.

KADAK: Just a clarification. Do both NRC and DOT approve the package; is that right?

BROCHMAN: That's a good question. If I remember right, and Earl can correct me on this, the Department can approve package designs, but I believe it has deferred approval of Type B packages to the NRC.

EASTON: What was the question on the NRC? No, DOT approves certain types of packages, for example, you have six packages for unenriched, and they have spec packages, like the 6-M for plutonium, uranium shipments, that's separate from what the NRC does. So, either one of them can approve packages. We do certain types. DOT does certain types.

BROCHMAN: And, if you're talking about specific, let's say, packages for shipment of spent fuel for high level waste, the package design would be approved by the NRC.

So, let's go to the next one. As I just ran through for you, physical protection here, we have this NRC

regulating NRC licensees, DOE regulating itself. As Gary mentioned, if the contractor who's bringing the fuel back into the country is being paid by the Department of Energy, we consider them to be a subcontractor of the Department, and we're not regulating that shipment.

If, on the other hand, the foreign country, let's say the university, whoever, the research reactors is paying for the shipment, that shipment is subject to NRC regulation. One of the provisions of the import license is also that for shipments that go to a government facility, for example, Savannah River site, where a lot of the returning spent fuel shipments go, that does not require a specific NRC import license. It's allowable under a general license. If it was going somewhere else, there would be a license activity associated with that.

Emergency response, I think is relatively clear. And, selection of routes is, as was mentioned, you know, the licensee and the NRC get together, or the licensee submits to the NRC what its proposed route is, that route is in compliance with DOT routing criteria, et cetera. I'll give you a good example of one of the questions that was raised about departing from the Interstate Highway System. We have, and this is public information, we have a route that goes through the State of Nebraska for shipment of spent fuel. The State Highway Patrol in Nebraska, for a portion of that

route, said we're going to have major road construction for the next three years. So, we would prefer that the route not take Interstate 80 over a certain portion, but go a different way. We accommodate that request. So, we view the routing process as I'll say an evolving or periodically revisited process, and, therefore, you have the ability to deal flexibly with issues such as major road construction, bridges out, et cetera.

As I mentioned earlier, you have the DOT criteria, and that's in 49 CFR 397, Part 397. And, security, what we look at primarily is local law enforcement contacts, safe haven locations, and I would mention again that safe havens are applied to road shipments, not to rail shipments.

I think I've talked enough, and I'll be happy to take any questions you may have. And, my name is not Nancy.

ABKOWITZ: Okay, thank you, Phil.

Just to sort of kick things off, are the Department of Energy and your agency in total harmony over these roles, and also, are there any aspects of the transportation function that you can think of that somehow falls between the cracks of the two?

BROCHMAN: Since my understanding is that our respective General Counsels have had discussions and have told us what our roles are, in other words, I'm a technical staff, I'm not a lawyer, and I get the lawyers telling me you can do this,

and you cannot do that. So, my understanding is there is clean lines. I think the part of the problem is the general public, as well as other technical organizations, such as yourself, have not appreciated what these lines are.

And, what was the second part of your question is there disagreement?

ABKOWITZ: No, is there anything that falls through the cracks?

BROCHMAN: I don't believe so. I think it will either be us or it will be them. There is nothing that will fall in the middle. As we get into the Department of Homeland Security evolves more, and we understand what its role is going to be, one could argue that we may have even overlap when you start considering what the Transportation Security Administration is going to do in terms of monitoring shipments and being aware of things going on.

ABKOWITZ: So, at this point in time, they have not been a player in this?

BROCHMAN: No, TSA, I think really because it's such a new, in terms of its role in Department of Homeland Security, is so new, I don't believe it has focused on this. It has focused on a lot of other activities, both Congressionally mandated and perhaps higher priority.

ABKOWITZ: Thank you. John?

GARRICK: Garrick, Board.

This gives me an opportunity to ask a question I've heard from the public many times, and it's the who is in charge question. If you have an accident or a terrorist attack, who's the point person, or agency, or institution? Who really can make the decisions and call the shots?

BROCHMAN: Well, there's a document called the Federal Response Plan, which lays out across the entire federal spectrum who is the lead federal agency for certain activities. In this case, for, let's take the example of a shipment of spent fuel to Yucca Mountain, my understanding would be that the Department of Energy would be the lead federal agency if there was an accident, an incident, a terrorist attack.

Now, they provide an overall response, or an overarching response, but you still have the local responders, you know, the first people on the scene, the firemen, the police, et cetera.

GARRICK: But, the scenario I'm thinking of is there's lots of confusion, there's people all around, Department of Transportation, the NRC, the DOE, the licensee, the state, the local responders, very quickly somebody has to take charge. Who takes charge?

BROCHMAN: I'm trying to think of the acronym. There is a--I've had briefings on the issue of unified command structure, and when you get to a scene, who takes charge. An

example of that would be the--I'll just give you an example. The Pentagon, even though it was attacked as a terrorist attack, the Arlington County, Virginia fire chief, who was there, was the incident commander for about ten days, until the building was stabilized and other things, and then the command control was shifted to the FBI for a criminal matter. So, this whole issue of unified command, who is responsible, the players who work in that field have thought all this out and have worked out protocols as to how it will be done.

We also do exercises with officials from state and local agencies, and I said the National Response Plan, this is a very big effort, and I believe those questions are answered in that context.

GARRICK: Thank you. This is a major issue and probably a question I've heard as much as any single question about the transportation issue.

BROCHMAN: It may be something that would benefit from further clarification in a public communication setting.

ABKOWITZ: Thank you. Ron?

LATANISION: Okay. Latanision, Board.

ABKOWITZ: I'm going in reverse alphabetical order.

LATANISION: Okay. Walk me through this chart here. I mean, let's just take route selection. There are a number of different parties that have interest, according to that description. Is it sort of an implicit given that they're

going to come to an agreement, or is there an arbitrator involved? How do you envision the route selection issue sifting out?

BROCHMAN: Which routes are you talking about? Are you talking about Yucca Mountain specifically, or are you talking about any spent fuel shipment anywhere in the country today?

LATANISION: Choose one.

BROCHMAN: I'll take the second one, because I have a role. What I've seen and the staff who work on route selection are in my group, and provide some oversight on that activity. Licensee would come to the NRC and say--let's back up. They request approval of a particular route to ship usually between two points, and that is good for a period of time, typically today we're using two years as a working model. And, so that route lays out very specifically what the route is, where the safe havens are, what the local law enforcement contacts are.

Now, in looking at that, we do our own independent assessment and say what's the mileage of this route versus some other comparable route. We look at that, consistent with the concept of meeting, as mentioned, the DOT--the control quantity routing criteria, and we made dialogue with that licensee and say we're not sure why you're using this route versus that route.

To give you a good example, I remember a year or so

ago, we had a shipment coming down from I-95, or it was coming down for those of you who are familiar with the East Coast, it was going to come down Interstate 95 around Washington, D.C., instead, we routed it on Interstate 70 and down Interstate 81. It was going to Savannah River. So, there are times where you can choose, or the NRC has found it reasonable and appropriate to route around a high population center, and potentially have a longer route.

So, some of this also gets to what's your traffic patterns, et cetera. A lot of states are getting more and more engaged in this, and they have standards on you can only ship during certain times of the day. It becomes very challenging to schedule shipments when you have states saying I only want shipments to move during certain time periods.

LATANISION: But, it sounds, from that description, as if there is some sort of consensus building process that's involved in reaching a decision. I'm just wondering, is that the case, or--

BROCHMAN: No, the NRC has regulatory authority. We take input, we make judgments, and we ultimately make decisions. Our goal is to gather input, but your question implies that there's sort of some co-equal relationship, and that the licensee can say well, now, I want this, and the NRC is forced to accede.

LATANISION: Yes.

BROCHMAN: That's not the case.

LATANISION: So, the NRC is the final--

BROCHMAN: We have the regulatory authority.

LATANISION: All right. Thank you.

ABKOWITZ: Howard?

ARNOLD: Arnold, Board.

I, too, was struggling with that chart, and I guess you've answered that in the sense of the route selection. NRC licensee is for anything that's not going to Yucca; right?

BROCHMAN: Basically, yes.

ARNOLD: Yeah, the Yucca column is all shipments to Yucca?

BROCHMAN: Correct. Under the current statute.

ARNOLD: Whereas, West Valley is all from West Valley?

BROCHMAN: And, as I said, this table is based on the assumption that Department of Energy is taking title to the fuel and taking possession at the reactor site.

ARNOLD: Okay. But, the left-hand column refers to cases where the licensee wants to ship from one of its sites to another.

BROCHMAN: That's right, and those shipments are going on today.

ARNOLD: Yes, right.

BROCHMAN: So, just to give you a sense of what we have

in terms of spent fuel shipments at year right now, I think rough numbers, between 10 to 20 shipments. Most of them that are going on today are occurring between a utility that is repositioning spent fuel within some of its facilities. We also have shipments of single fuel assemblies, or rodlets from a single assembly, where there's been questions on the performance of that fuel assembly, and they're sending it to facilities for metallurgical examination. That, and the returning research reactor fuels covers pretty much the gamut of what the NRC is seeing today in terms of shipments. As I said, we're not talking a big number. We're talking 15--10, 15, 20 shipments a year.

ABKOWITZ: Andy?

KADAK: Kadak, Board.

Relative to the last thing there, security route approval, what kinds of considerations do you weigh in that approval box?

BROCHMAN: The criteria we're looking at are really are they identifying safe havens, and the definition of a safe haven is provided in the NRC's regulations and the enhanced security measures, and have they properly identified the local law enforcement contacts. We look at, as the shipment is moving down the road, as we mentioned earlier, if something, from a security perspective, if somebody attacks that shipment, the local law enforcement is going to play a

critical role. So, the question is do you know who immediately to reach out and touch knowing where the shipment is. The shipments are tracked with GPS position monitoring or other technologies, so, having the correct information. And, what we've found is over time, area codes change, phone numbers change, and so it is important to go back and verify and validate that information. Also, this information is provided to the driver, so the driver, of a carrier calling this material knows where the safe havens are, knows where all the phone numbers are. So, it's information that's not just put away in a safe someplace, but it's information that's used in the operations of the transportation activity.

KADAK: Are you looking at this as well in the route selection, like some routes may be more secure than others, or is that not a factor at this point?

BROCHMAN: At this point, the NRC has not drawn any what I'll say comparisons that one route is more secure than another route. What we've done is we've had licensees or other parties make requests to us to approve a route. We've evaluated that route against the criteria we have, and said is all the information there, does the route meet the DOT requirements. If so, yes. But, we have not done a what you might call a security risk comparison.

KADAK: And, relative to the Foreign Reactor Fuel shipments, did you do anything different than you just

described for those shipments than what you just described relative to that? The same principles?

BROCHMAN: The Department of Energy came to us and said we would like to voluntarily adhere to your routing criteria, and they provided us the same exact information, in large part because some of the contractors they're using are also hauling other shipments, so they knew exactly what to provide. So, we have several routes that are active today that go from Charleston, South Carolina to Savannah River, from Savannah River to Idaho National Engineering Laboratory that the Department could use to ship Foreign Research Fuel.

ABKOWITZ: Thank you, Phil.

We're going to shift gears now, and get an update on what's going on in the physical testing of spent fuel casks, and our presenter is going to be Earl Easton from the U.S. Nuclear Regulatory Commission. Many of you have known early for quite some time. He's had considerable experience at NRC related to the transportation of radioactive materials. And, today, he'll discuss the physical testing of shipping casks, and I also understand that he will describe a full-scale test that he recently witnessed in Germany.

EASTON: Thank you for that short introduction.

As stated, I'm Earl Easton. I've been with the Nuclear Regulatory Commission about 20 years. I started as a technical reviewer of spent fuel package designs, and have

been involved in almost all of the transportation activities at the NRC.

Before I get started, though, I want to take this opportunity to address a couple things that came up. One was a discussion of loss of shielding accidents, and I didn't want the impression to be left that accident causing loss of shielding is by any means frequent. In NUREG 6672, we estimated that that happens about 1 times 10^{-9th} times a year, and FRA, I guess, in their study to be published soon, estimated that it would happen about 4.2 times 10^{-15th} per mile. It's a very infrequent event that you lose appreciable amounts of shielding.

Vulnerability assessments, and how we communicate vulnerabilities to the public. That came up, very good question. I want to mention that a little bit. I'm from Safety, Phil is from Security. So, if I stray too much and you hear a shot, he's been instructed to shoot me if I cross the line. But, after 911, the NRC undertook a series of vulnerability assessments for all their license activities, reactors, spent fuel storage, spent fuel transportation, transportation of all radioactive materials.

We have completed the vulnerability assessments for storage casks and storage pools. We have completed the vulnerability assessments for transportation casks. We are now completing the vulnerability assessment for

transportation of other things than spent fuel. Unfortunately, I cannot tell you much about the details today that I would like to, but let me give you some creative ways we're thinking about communicating to the public.

As you know, we have two studies ongoing by the National Academy of Science. One was a Congressionally mandated study, which is the first phase is complete, that studied the risk of spent fuel storage, both wet and dry, vis-a-vis terrorist type events. Now, they did a Class 5 report and submitted it to Congress. They're working on an unclassified version of that report.

We also have another group from the National Academy of Science who are doing a self-initiated study of transportation, and they have asked to look into vulnerability assessments for transportation. It's an idea the Commission is seriously considering, an independent third party looking at our vulnerability assessments for transportation, and working with them to come up with a non-classified version of the information that can be released to the public. So, you may get a peer review, and you also may get something that can be released to the public. That is ongoing.

And, the type of things that we looked at in the vulnerability assessments were spent fuel casks and storage casks are attacked obviously by large aircraft, attacked by

charge, and attacked by explosions.

The other thing I would just venture to say is I was at a meeting in Chicago with the National Academy of Science, at which time we were fortunate to have a representative from the Department of Homeland Security present, and I wanted to make the comment who's in charge when you have a terrorist attack, or you have an accident. When you have an accident, there's no question the person in charge are the local responders. They're the ones on the scene. They take charge.

The person who leads the federal response is called the lead federal agency. Where we license the material activity, the NRC is the lead federal agency. What does that mean? We put ourselves at the disposal of the states and local responders to provide information, perhaps about a cask design, perhaps about those calculations, et cetera, et cetera. And, if necessary, we will help escalate the response up through the federal chain, because DOE has resources that might have to be brought to bear.

In the case of sabotage, I think it's a little different. I think what I heard at that meeting is the Department of Homeland Security has several response plans, the difference there being you may have different federal agencies involved that don't all report to the same agency. If it's an attack by a terrorist, it might require a military

response. It might be a crime scene, like the FBI. It might be NRC. It might be DOE. So, you have to have somebody up and over that can bring all these parties to bear. And, my understanding is that is the Department of Homeland Security, and they do have response plans. This is what I heard from them at the meeting in Chicago, and I was hoping that they'd be here today, because that's my understanding of how they explained it to the National Academy of Science Committee studying transportation. Okay, enough said.

I just wanted to make a few comments about the NRC, who we are. NRC is an independent regulatory agency. We're not for transportation, we're not against transportation. What we're for is that any time you transport something, we want it to be safe. That's our goal. That's our stake in this. We do that by three ways, three methods. First, cask design where I think you get about 90 per cent of the safety. Second, Phil is working on security. And, third, we help DOT enforce their regulations about the carriage of radioactive, when it's actually on the road, we help them enforce that. And, they have that duty for all hazardous material under the Hazardous Materials Act.

Okay, why do we think casks are safe and provide most of the protection? Well, basically, unlike a lot of other hazardous materials, spent fuel casks are designed to be accident resistant, and we do that by making them meet

certain requirements, 30 foot drop, 40 inch puncture, 30 minute fully engulfing fire, and emergent test. Many of you have seen these before.

The point I'd like to make is these tests are not intended to mimic any accident, or mimic any worst case accident. They're intended to envelope the impacts that result from severe accident. So, in other words, 30 minute fire at 1475 degrees, it's intended to envelope the total amount of heat input into a package. It's not the highest temperature, it's not the longest time. But, taking all the parameters together, it's intended to bound the amount of heat input.

Similarly, the one I'm going to focus on today, a 30 foot drop test onto an unyielding surface, a 30 foot drop, many people who know physics know that when it hits, that's 30 miles an hour, when it hits onto an unyielding surface. What we want that test to do is envelope the total amount of force that that package sees. We're not interested in necessarily speed by itself, but we're interested in the total amount of force that goes into that package.

Why do we think that the standards are pretty good at protecting public health and safety? Well, we've done a number of studies over the past 30 years, risk studies, that compare our standards to real world accidents. Starting, the first one in 1977, this is the one that Ruth mentioned that

we developed RADTRAN I for, it was our Environmental Impact Statement. What the Commission asked us to do in this study, NUREG 0170, is to look at all our transportation regulations, and determine if they're adequate to protect public health and safety.

The background at that time, DOE and NRC were being split. We got the regulatory role, and DOE got the shipment role.

1977, the second study about that same vintage, called the Urban Study, and a lot of people don't realize, but this is really one of our first looks at terrorism and sabotage, way back in 1980 that led to the physical protection requirements in Part 73. We looked at things like shape charges and explosive devices against spent fuel casks. It's not totally a post-911 event. We've been looking at this continually since that time. We have taken a deep harder look since 911.

The next study done by Lawrence Livermore, commonly called the Modal Study, was a look at how casks respond to severe accidents. When we did the initial study back here, we made very, very broad assumptions about how casks respond in accidents, very, very broad. Here, we had Lawrence Livermore actually do physical calculations on how casks might respond to historic severe accidents. They go out and look at the really severe accidents, and model those. So,

this was our attempt to take a more detailed look at severe accidents.

And, finally, in 2000, we did another full-scale look at spent fuel risk study that deals with normal conditions, and uses RADTRAN 5, I believe I'm correct, and accidents, and it does some pretty detailed calculations of what you might expect in an accident. And, again, that's done by Sandia.

All these, I will caution, are a computer exercise. These are all done on computer analysis. But, I didn't want to leave the impression that there haven't been some physical testing. People have actually been out there banging up hardware, and some of those have been the Germans, BAM, don't ask me the German name for that, in Britain, the Central Electric Generating Board and Sandia.

So, if you go to the next. (Shows video). Now, this is interesting. Someone asked whether you can ship hazmats together. Okay, I'll tell you real quick how it runs on my computer. This one runs, and then this one and this one, then this one and this one. Okay. But, let me just explain what these are. This is a train crash into a British spent fuel flask. This is a rail cask at Sandia. This is a cask put into a fire. There is a rail/truck collision, where a rail runs into a truck cask. And, I have all these videos if anybody is interested in seeing them with me. And, this

is another truck collision where they run it into a wall. And, this is what you just saw, which is a rail propane tank car setting next to a German transport cask, and they lit fire underneath the whole thing, and the propane tank explodes. Rail propane car explodes right next to the cask. And, what happens is that cask flipped over and buried itself in the mud, and if you look at the German version of the video, they then go and open this cask, leak test it, and the inside is fine. And, the rail tank explosion is probably one of the more energetic explosions you can get. So, these are just some tests. They're not tests done by the NRC, and every one of them, upon examination, has some warts.

For example, this one hit a concrete wall, and the real measure of the damage done to this cask was how strong the tie downs were holding the cask on the truck body. The stronger the tie downs were, the longer it stayed on the truck body, and let the cab absorb most of the impact. If the tie downs were less strong, the cask would have shot forward at a higher speed and hit the wall. So, is it the worst case? No. But, can you learn some things from it? Certainly.

I guess the British test was probably the most extensive. They did a regulatory 30 foot drop, they did a scale model, regulatory drop, and then they staged this accident, and they compared all three of those together.

Anyhow, if anybody has any questions afterwards about any of these tests, I'll answer them, but I just wanted to give you the impression there has been work done in the last 30 years on all these.

Now, one of the, I guess, downfalls of all these tests, none of them are done on currently certified NRC packages that might be used for Yucca Mountain. So, about, I don't know, four or five years now, the Nuclear Regulatory Commission embarked upon a project to again demonstrate the robustness of full-scale spent fuel casks, called the Package Performance Study. Many, many public outreach meetings, we solicited lots of comments, we got the comments, analyzed the comments. The staff sent a plan up to the Commission, what they'd like to do, and here is what our Commission currently has approved. That is, we've been authorized to do a demonstration test of a rail cask. That means going out and purchasing a real live rail cask that might be used for actual Yucca Mountain shipments, realistically conservative test, something that might actually happen out there in the real world. We've been asked to instrument it, so a one-time shot, these things are expensive, get all the data you can get, you know, in a one-time test. And, after the impact, put it in a fully engulfing fire.

And, one of the plans the staff put forward is similar to the British test where you have a rail cask laying

across rails as if it derailed and a locomotive running into it. Now, I know the ACNW has issued a letter saying that based on the current, tell me if I'm wrong, I'm paraphrasing, based on the current state of knowledge, they don't think that this is needed from a technical point of view. But, nevertheless, the Commission is now really deliberating how to go forward on this study. And, this would add to the other tests and the body of knowledge.

What I really wanted to tell you most today, that was all sort of background, that was all done before, I just wanted to show you some pictures of some full-scale impact testing of real live spent fuel casks. The first one is a German cask that will actually come in for certification at the NRC. The second one is a Japanese cask. These things were dropped in Germany during the last week in September onto an unyielding surface.

So, what I want to show you today, so you have some appreciation, is the level of effort that went into building an unyielding surface, and then I'm going to show you a video of the drop test.

This is initial excavation of a site for building the drop pad. And, what they're doing is they're putting liners around here, and they're lowering the water table. Okay? They've dug this out. This is actually the pit that they dug, and they will then fill this with concrete, 16 feet

thick. It's 46 by 46 by 16 feet thick. Okay, they get an unyielding surface. The rule of thumb in the IAEA regulations for an unyielding surface is that this surface should weigh at least ten times the weight of the cask. So, if you're testing a 180 ton cask, 180 times 10, that many tons is the unyielding surface.

Go onto the next one. This is them putting in rebar in that pit. And, you can see from this gentleman here sitting how deep exactly this thing is. But, they're putting in rebar, and they're going to pour in concrete, and they're putting all sorts of instrumentation in here, strain and force gauges that measure how the pad reacted.

This is them actually pouring the surface. This is the concrete, and this will be a steel layer on top of the concrete, which is about three-quarters of an inch thick.

Now, outside the pad area, they built a test building, and this is a building that can be closed off to protect the test pad from elements. And, so, heaven forbid, you're not affected by the wind and weather, as if a wind could blow a 180 ton cask. But, this is them constructing the legs to build a test building around the pad. This was all built during this last summer. Okay?

This is the test building. They will then lift the drop tower on top of this. And, this is the winch that they'll pull the cask up. They designed a release mechanism

so that they can drop things at very precise angles. Sometimes you want to do an angle drop, and you don't want the thing wobbling around or moving. This thing hold it very still and releases it very precisely to get the precise angle of the drop.

KADAK: Is that single failure proof?

EASTON: You got me on that one. Okay, this is the completed facility, and all these people here are at the PATRAM conference in Berlin that was held the last week in September, waiting to witness an actual drop test. Okay? And, this facility is in East Germany. It's been a testing facility for over 100 years, started under one of the Kaisers, to test military vehicles. When the East Germans got it, they were testing tanks, you know, the kind that shoot, those kind of tanks, and when the Unification happened, the Republic of German got hold of this test site. The big explosion you saw with the propane was actually done at this site, too.

Okay, these are the specifications of the drop facility. I hope I've translated them correctly. They're all in metrics in the original, but 5.4 million tons of concrete--pounds, sorry, of concrete, 225,000 pounds of steel reinforcement. That's the rebars. This is the steel plate. The maximum weight that can be lifted is 200 tons, and a height of 30 feet. Actually, you could lift up to 32 feet.

Now, if we get the next one to work. Okay, this is the actual drop test. Okay, this is the picture taken after the drop test. You see most of the impact taken by the impact limiters. Still some distance here. It still absorbs some more impact. This is the end view. This is the close-up. Also, this is on Tuesday, they also hurried up and got the site ready, and did another drop test on Friday, a Mitsubishi cask. I don't have the video, but I'll show you some pictures of it. This is that cask getting ready to be hoisted up. There it is hanging there, and you can see the difference here. The other one was horizontal. This is a shallow angle drop. It will hit, and then slap down. And, that was to increase the damage on this end.

So, if you go to the next, you will see that this impact limiter is much more damaged than this because it hit and slapped down. And, you can see this impact limiter is almost bottomed out.

Now, why are these tests important? I think there are two things. The first test is a German cask, will actually be used, we believe, as part of the certification request before the NRC. And, also, those tests, they are going to be extensive computer analysis that will then be compared to the actual results. There are also scale model tests with computer analyses that then will be compared to the results, and once again, you have a tie to computer

analysis scale modeling and full scale.

I would love to take that German cask and put it in front of a train and complete the connection with a real accident, but that's not been decided or determined yet.

One final note I'd like to say about the German cask, is it's a very, very unique design. Most casks have lead shielding for depleted uranium, in some cases, this is a cask that has concrete shielding. That cask had concrete between two steel shells. So, it's a unique design.

Okay, one more, and I'll stop talking. Just some concluding remarks. Here's my advertisement. We believe at the NRC that Type B accident conditions provide a very high degree of safety against very severe accidents. Nevertheless, we don't set still, as you saw, we continue to do studies. We continue to monitor real tests.

And, I'll add a third one. We believe that the state of the art and knowledge in computer codes does not make it necessary to do full-scale testing of each cask design to support certification. We think computer analysis, coupled with scale model testing, coupled with full-scale component testing, such as the impact limiter, give you sufficient knowledge to make a case that these casks meet the regulations.

And, with that, I'll end up.

ABKOWITZ: Okay, thank you, Earl. Ron?

LATANISION: Latanision, Board.

On your last point about computer modeling, your confidence on that subject is attached to the analysis of tests that have been done, in which your modeling is coincident with the failure, damage that's been experienced?

EASTON: It comes from many sources. One, we use a fairly common code line ANSIS that have been benchmarked against a number of applications. We do have, while they haven't had many full-scale tests, they've done scale model testing, and we also have analysis to match up with the scale model testing.

LATANISION: Well, I'm thinking, for example, of the German test you just showed. I mean, I'd feel pretty convinced of what you said if you could show me that your models would represent accurately what those two tests have shown.

EASTON: And, that's an excellent point, and when we did the package performance study, and got public comments, people said we'd really like more assurance that computer modeling is what it is. And, we're taking advantage of this opportunity to do a thorough scrub, a thorough look, at the computer modeling versus the observed measurements. And, that cask was instrumented, you know, decellerometers, and that sort of thing. So, yes, we're going to take advantage of that, and we're also going to take advantage of the scale

model testing to see how predictive scale models are full-scale. I mean, we have a high degree of confidence now, and we expect that to be further confirmation. So, yes, we're going to take advantage of everything we can learn from this.

LATANISION: Thank you.

ABKOWITZ: Andy?

KADAK: Kadak, Board.

Have they done that four foot drop on that pin equivalent yet, or do they plan to do that?

EASTON: I haven't seen them do the puncture test. But, these casks generally tend to be so robust they hardly ever are really challenged by that test.

KADAK: Because the tests that you did show, showed that the real critical design feature is the impact limiter.

EASTON: Yes.

KADAK: And, do you want to say anything about how they designed theirs versus how we design ours?

EASTON: Well, you raise a very, very good point about the impact limiter, and the puncture. And, let me venture out on a limb like I'm prone to do here.

When you do a drop test, you've figured out with a flat surface, there's no way to hit that cask other than on an impact limiter. And, so, staff has proposed as their PPS test to put that cask across the rail line, and hit it between the limiter. Okay? That was one of the

considerations when they developed the proposed test. Now, that's not been blessed by the Commission. But, yeah, based on all the design parameters of the puncture test, we have never seen really a puncture threatened of a spent fuel cask. Of course, that's different from a drop test.

KADAK: The last question was on internals. Did you put anything in there that simulated fuel in its brittle or unbrittle condition to see what kind of damage would occur?

EASTON: I think that the German cask was filled with metal rods, not anything like spent fuel. But, I think Gary mentioned this before about the test on sabotage, and some of those tests are if you penetrate with a spent fuel, and you try to break apart the brittle fuel, how does that react. We're hoping to learn something from that. But, keep in mind that these casks, after all these tests, are still designed to be virtually leak tight. So, even if stuff gets in there, I mean, breaks all apart, we don't expect anything really to get out. It's really the cask that is your line of defense. Okay?

ABKOWITZ: John?

GARRICK: Garrick, Board.

Can you elaborate a little bit on what you mean by a conservative realistic test?

EASTON: Okay, I'll try. This is a term of art that our Commission has--

GARRICK: We may have had something to do with that.

EASTON: Right. And, I think it means, first, it's got to be realistic, it's got to have some probability of really happening. And, then, it's conservative, it's got to be tending towards the worst of things that can happen.

GARRICK: Realistic, but erring on the side of conservatism?

EASTON: Right. Realistic, but erring on the side of conservatism.

GARRICK: So, that may be something that--

EASTON: Can I give an example for that?

GARRICK: Yes.

EASTON: Some of the comments we got is why not do a drop test from 70 feet onto an unyielding surface. Okay? Now, we don't think that's realistic, because the amount of energy that goes into that cask, we don't see accidents that put that amount of energy in a cask. So, we would rule that out as non-realistic. That's what we mean by realism.

GARRICK: Is there any collaboration with the German's plan? There's not many unyielding surfaces like that around. Is there an equivalent of that at Sandia, for example?

EASTON: This is just very informal, but when we were at PATRAM in German and witnessed the test, we noted the uniqueness of this facility. Sandia does have some facilities that can be tested. But, this is brand new, built

at a cost of $4 1/2 million, I believe. Now, one of the strints of the British smash hit with the train crashing is they were able to compare scale modeling testing, full-scale testing, and a severe accident. The Germans have already done the scale modeling and full-scale testing, although it's a very unique design, concrete rather than--but it may be certified for Yucca Mountain.

For example, if we were able to do that as the rail test, that would complete that circle. But, we have talked to the Germans preliminarily, and also with Sandia included, about possibly using this facility in some manner in the future, coming up with some sort of cooperative agreement, very, very early stages, nothing concrete, just talk between the techs. Does that answer it?

GARRICK: Yes, thank you.

ABKOWITZ: Howard?

ARNOLD: Yeah, I'll just make an observation that presumably after such an accident, you'd still, if you'd had no accident and no release, but you do have something that's going to be a little hard to deal with when it gets to the repository.

EASTON: Gary?

ARNOLD: But, it's only one such task. It's an obvious point. In a more general sense, are you aware of any attempts to harmonize the shipping casks and the design of

what they're evolving at the repository for the ultimate disposal casks?

EASTON: Am I allowed to be honest?

ARNOLD: Who are you asking?

EASTON: I'll give you my own--I'll just give you my own personal observations. Could be right, could be wrong. But, my observation has been that utilities have been optimizing storage and transportation casks for a long time. Okay? That's the nature of the beast. And, they have casks that are designed, for example, to hold 21, 23 kw, kilowatts of heat. And, I think in the Yucca Mountain EIS, those standard disposal canisters are limited to 11 kw. To me, there's some sort of disconnect. You either have to leave the cask on the surface to age and cool off, or you've got to repackage. But, that's just my personal observation. I don't know how the whole system plays out.

But, what I see is utilities optimizing storage. And, what I mean by optimizing, you know, a lot of people believe that, well, let's put all the cold fuel in a cask, and then put all the hot fuel in a cask. That's not what utilities are doing, because you get rid of all the cold fuel, and then you've got all this hot fuel, and you can't put as much in the cask. So, what they're doing is putting hot in the middle, and cold surrounding it. They're optimizing the loading and storage of storage casks. And,

I'm not sure that's always been factored at the end, and maybe Gary is the one to answer that, I'll put him on the spot here, but I just see them optimizing one way at one end, and you know, the repository being driven by heat loads that maybe don't match at the other end. And, I'm a poor regulator in between and, you know, if they come with a design that meets regulations, I've got to approve it. But, on the other hand, you know, dual purpose casks are designed not to open in the canister. But, what do they do at the other end. Does that answer?

ARNOLD: Well, partly, but it isn't just the heat load. I mean, they're looking at long-term survival and moist conditions and use of hastelloy, and so on and so forth. I mean, it seems to me that they're heading down different trails.

EASTON: What I don't understand yet is we have a whole range of dual purpose casks, and by dual purpose, I mean you put the fuel inside a canister, weld it shut, put it in one overpack for storage, take the canister out, put it in a transportation overpack for transportation. You never open it. Okay? Now, when that gets to Yucca Mountain, I'm not sure whether they have to open it or they can store it or it meets the heat load, and, so, I'm not sure it's all, you know, this dual purpose cask, whether you never open a canister again, carries all the way through.

ARNOLD: I guess this gets back to my point this morning about a systems view of the whole process.

EASTON: And, I think the NRC is not the one to--

ARNOLD: No, I understand. How are you coming on that test of yours since the May date that you mentioned on your slide?

EASTON: The staff was charged with coming up with a test plan, a more detailed test plan. And, we did send one up and we did send out like we considered this, this, this alternative, here's what we came up with, and we're waiting to hear back from the Commission. Okay?

Also, you know, Gary has a funding problem. He's not getting money. We're having the same problem. We're having to stretch it out, put things on hold, because that funding is tied to the same sort of funding problem Gary has. We get money from the Nuclear Waste Fund also to do those activities, and we're not getting the amount of money we need to go out and sample, buy the cask, buy the locomotive, you know, and that sort of thing. So, it's having to be stretched way out.

So, given that it's stretched way out, I think the Commission is taking all due deliberation in coming up with a detailed test plan. Right now, it's just a demonstration test. It's not a regulatory test tied to it. And, so, I guess the idea might be do a rail demonstration test, and

then based on the computer analysis that's submitted for certification, compare the peak forces versus what would have been seen in an accident. You're comparing the calculation with a measured force.

I might add that when the British did operation smash hit with a locomotive hitting a cash, when they tried to predict the forces on the cask from the train, they were only able to predict within a range of 100 per cent. The range from--and, you'll love these units--25 mega-newtons to 50 mega-newtons, which I think is something like 5 or 6 million pounds to 10 million pounds of force, peak force. But, that's all they could really calculate, because they didn't know how the locomotive would deform. They didn't have that problem with the unyielding surface, because the unyielding surface is not supposed to deform, and all the deformity goes into the package. So, they calculated that right on the head.

If I had more time, I would love to make a few more remarks on the British test, and I did bring the full nine minute video if anybody would want to see that at a later time. But, it basically goes into scale modeling testing, quarter scale, half scale, how they compared it to the accident.

And, you know, in the full-scale test, there was a tiny release after the full-scale test. But, that was

totally within what is allowed in the regulations. In fact, based on work that the British did, it was about one-twentieth of 5 per cent, the release that would have been allowed by the regulations. And, if you know the regulations, you're allowed to release an A-2 per week, it's sort of an arcane term, but just to put it in probably a bad analogy, the A-2 for cobalt is 10, and one-twentieth of that would be a half. So, if this were cobalt, spent fuel were really cobalt, after that test, you'd release maybe a half a curie of cobalt.

And, think about what that test means. When that train hit that operation smash hit cask, it was estimated that that was subjected to a peak force of about 6 million pounds. When they did the regulatory test onto an unyielding surface, it was estimated that force was close to 17 million pounds. So, the regulatory test had about three times the peak force as the accident test, and at the end of the regulatory test, which is three times the accident test, you get a tiny release, which if you would equate it to something like cobalt, might have been a half a curie. Now, that's probably not a fair comparison, because spent fuel is not cobalt. But, if you figured out the A-2, it's a messy calculation of all the radionuclides.

But, you know, if anybody has any follow-up questions, you know, please feel free. I hope I haven't lost

too many, and I appreciate the opportunity.

ABKOWITZ: Okay, thank you, Earl.

We're going to press on now, and move into the remaining two topics that we want to focus on in more detail today. The first of those two topics is route selection. That will be followed by Section 180(c).

If you recall from a presentation made earlier today, these are two areas where the Department of Energy is planning to work very closely with the State Regional Groups in formulating policy on route selection, and on emergency preparedness. And, as a result, we structure our program where the Department of Energy will speak, and then a representative from one of the State Regional Groups will speak.

The first presentation will be Gary Lanthrum representing Gary Lanthrum, and he will tell us about the process that DOE has adopted to work with the State Regional Groups in developing criteria and methods for route selection.

LANTHRUM: You're relieved from looking at the screen for a while, but that means you have to look at me, and that may be a worst deal.

Don't ever have a presentation, because this is not a process, the route selection process is not something that DOE is managing on its own with any intention of designing or

developing routes and then announcing them for reaction. What we're doing is we're working very closely with the State Regional Groups and the tribes, primarily through the Transportation External Coordinating Working Group, to help come up with the criteria and methodology for route selection that would then be adopted by the Department in doing its route calculations.

This effort has been started, well, actually this last TEC meeting that was held in Minneapolis just a month or so ago was where it was actually kicked off, and it's a transition from a previous working group or topical group on rail studies, and that rail study topical group is the one that's being moved with some change in membership into doing more routing studies.

The basic concept is that we would provide all of the tools that DOE has used in its own routing assessments, provide the regulatory backdrop for route selection criteria that would be required for a licensee under the NRC, and provide additional background on criteria that the Department has used in the past, put that all into a big pot that the State Regional Groups and the tribal participants on this routing topical group can then stir up to look at what their own criteria would be.

Some of the tools that I think Ruth presented today, the tool RADTRAN, we're providing funding this year

for both training and support for RADTRAN and TRAGIS which are two of the major routing tools. At the previous TEC Working Group, Ruth also presented a topic, a presentation on a multi-attribute decision analysis tool, and how that could be applied to the route selection process, because depending on who's making the decision, the criteria that you use may change, and this multi-attribute decision tool lets you bring in whatever criteria are appropriate for the decision maker, and it shows how the changes in criteria can affect the route selection and could feed the process for us.

All of these tools are being made available to this topical group with high hopes that they will use the tools to come up with a set of criteria and a methodology for actually doing the route selections that would be useful for all of us. But, since it is primarily an activity of our stakeholders to give us advice on the actual route selection process, a more useful session might be to revisit this question after six months or nine months when they've had a chance to use the tools and come up with recommendations to us, and actually made some progress. It's so early in the process I don't think that you're going to get any effective feedback about where we stand at this point from the State Regional Groups.

The important thing is that we've empowered them to participate. We've provided the funding for training and the

help desk for the tools that we're making available. We're providing additional background on the selection criteria that the Department has used for shipments that it's been responsible for, where it's our own shipment, and I think that's a good starting point. But, there really is no presentation beyond that. So, maybe the best thing is to focus on your questions.

ABKOWITZ: Okay, thank you, Gary.

Let me start by--this is Abkowitz, Board. Let me start by just getting the big picture squared away here. The way you're presenting this, basically you're providing the resources and giving the full discretion for the State Regional Groups to come up with an answer. They provide the answer back to you, and you just basically adopt it. I would guess that it's not quite that simple?

LANTHRUM: No.

ABKOWITZ: And, I was wondering if you could explain a little bit more how their input percolates?

LANTHRUM: Ultimately, it's going to be a Department decision. The Department is going to own the decision. What we would like to have is input, effective input, that's couched in good technical terms from our stakeholders about what's important to them. We will use that to guide our decisions. But, the decisions will ultimately be our decisions.

Fortunately, or unfortunately, as the case may be, when you look at the DOT criteria for route selection for highway shipments, you're fairly constrained. Similarly, if you look at the routine criteria that the railroads use for determining their shipments, they look at the same kinds of criteria that DOT does. They look at how you reduce the period of time for the shipment, using the best class of track, which was analogous to using the interstate highway system that the DOT has as one of their requirements, and they look at minimizing the number of interchanges, so the number of change-over of operations between different railroads is minimized for the rail shipments that are done.

When you look at the base criteria, since we have made the commitment to meet or exceed the DOT and the NRC requirements, and I'm inferring from that that we would support the minimum criteria that the railroads use for their rail shipments, you don't really have a lot of choices. Where the real variance comes in is in the local decision making criteria that the states would like to apply, which may be things that are not on our radar screen. And, so, what we're really looking for is the additional attributes that would help support making a decision that would be more amenable to the fact that folks are going to be impacted by it.

ABKOWITZ: Okay. Abkowitz, Board.

But, I'm hearing two things there. One is that they don't really have choices to make, but you're asking them to help you make the choices.

LANTHRUM: They don't have infinite choices. There is a fairly constrained set of choices that wind up being truly available if you meet the expectation of meeting the minimum criteria of the DOT and the NRC. It's not an infinite array of choices. You can't use any highway in the country, and you can't use any rail line in the country. You are constrained. There are still choices within that set of constraints, and how we address those choices, which is a subset of the universe of routes that are possible out there, from a purely physical perspective, there is a fair amount of latitude. And how you weigh in the different regions the criteria that are appropriate for that region, are important in that region, is going to be a little bit of a difference.

ABKOWITZ: Abkowitz, Board.

Let me follow up with one other question. Is part of your plan to have formal opportunities for the State Regional Groups to sit around the same table so you can make sure that routes coming out of one region are connected to routes coming into another region?

LANTHRUM: Well, certainly. In fact, that's one of the reasons we are doing the planning at TEC, because all of the regions are there, and in fact, in the Tec working group,

topical group on route selection, all of the State Regional Groups have representation at the table. Ultimately, we come out of this with what we believe are going to be our routes. There's going to have to be another round of interactions, because the next step in the process is once you have your routes selected, or the suite of routes selected, that's where we have to develop our infrastructure capability for emergency response. And, so, there is automatically going to be a feedback loop about how we implement the funding for training of emergency responders with the states in response to the selection of routes. So, there's going to have to be a separate iteration.

ABKOWITZ: Okay, thank you. Andy?

KADAK: Kadak, Board.

I'm sort of confused about the outcome of this TEC thing. You earlier said that you were going to develop criteria for route selection. That will be the first phase of this exercise. But, will the outcome be recommended routes for DOE to consider with an improved and enhanced understanding using perhaps the format of multi-attribute decision making?

LANTHRUM: The desired outcome is that we would have the criteria and the methodology agreed to. Once that criteria and methodology is agreed to, DOE would take that and use it to develop the routes. We would then come out with the

routes that were developed using the state's criteria and methodology. And, that would be the basis for the interacting on how we would deploy emergency response, and whether or not the result of that criteria really met the expectations that the State Regional Groups set up.

KADAK: I guess my question would be why don't you have the TEC work out using their criteria what the routes may be, or at least some suggested routes, because then they would become, if you will, part owners of the selection process?

LANTHRUM: What we've made it clear in TEC and other forums that we sponsor and that we provide support for participation in, is that there are a number of decisions that are inherently DOE decisions. But, that we want to enhance the collaboration on how we get to those decisions, so we don't make the decisions in a complete vacuum. But, the decisions have to be DOE's decisions.

What we're pushing for right now is to get feedback on the criteria so we can make an informed decision, but it ultimately is going to be a DOE decision.

KADAK: What is your schedule for getting this done?

LANTHRUM: We're looking at having the draft criteria in 2005, but again, everything is going to be somewhat contingent on our ability to support budgets. If we don't have budget authority to make sure that we can support the ongoing activities of the State Regional Groups and the TEC

forum, that may in fact cause some delays.

KADAK: And, when will you finalize the route selection?

LANTHRUM: We've always said that we'd have the route selection in place in time to implement the emergency preparedness training activities, and that is targeted for three years prior to the start of shipments.

KADAK: So, 2007?

LANTHRUM: That's correct.

KADAK: Thank you.

LANTHRUM: Well, 2007 if, in fact, we start shipping in 2010, and with this question mark on the program right now because of funding, everything can move, but the relationship with the start date for shipping is going to stay constant.

ABKOWITZ: John?

GARRICK: Garrick, Board.

I like the idea very much of a formal disciplined decision analysis. If it's done correctly, it can make decision process very transparent, and that's always one of the issues, is how to make these kind of decisions transparent.

Kind of continuing along the line of what Andy was alluding to, is a very key part of a multi-attribute decision analysis model is, of course, resolving issues such as the preference functions, or the value judgements, or the utility functions. And, as to the buy-in that Andy mentioned, it

would seem that that's where the opportunity would be greatest for stakeholders to participate, is if they buy-in on the actual value judgments that are--the process that's going to be used, or the utility functions that are going to be adopted. It seems to me that would be a major breakthrough in terms of getting collaboration from stakeholders. Is that what you mean when you said earlier that you were going to involve stakeholders?

LANTHRUM: Yes. But, another point that was brought up, though, was the fact that since we are transing (phonetic) multiple regions, the value functions and the utility functions may be different from region to region, and there may be conflicts that are going to have to be resolved. And, ultimately, DOE will be the decision maker there on how you resolve those conflicts.

GARRICK: Yeah, somebody eventually has to do that, or it will never get done.

LANTHRUM: Exactly.

GARRICK: That's correct. But, I think that's an important idea, to do such analysis. But, it's more important to get the participation that we're talking about here.

LANTHRUM: And, as I indicated earlier, when we challenge the State Regional Groups to come up with project proposals that would meet their needs as well as furthering

our agenda, there were a bunch of local differences in the activities that they wanted to participate in. But, the one common area of focus was on route, developing the route selection criteria and methodology. That was one that they were all engaged interested in.

GARRICK: Thank you.

ABKOWITZ: Thank you, Gary.

We're now going to hear the perspective on route selection from one of the State Regional Groups, the Western Interstate Energy Board, and speaking on behalf of WIEB will be Tim Holeman.

If you'll recall, Tim was introduced earlier today, so I'm just going to ask him to return to the podium.

HOLEMAN: Well, greetings. Thank you to the Board for coming out to Salt Lake City and giving us the opportunity to meet with you.

I'm the Nuclear Waste Program Director for the Western Interstate Energy Board. I'm also representing the Western Governors Association.

Just a little bit on who we are. The WGA is an 18 state organization that has a number of years, 20 years, since the 1982 Act, working on NWPA issues. The Western Interstate Energy Board is a 12 state region. We're sort of the arm of the WGA, and WIEB High-Level Waste Committee is composed of 11 states, and is co-chaired by Nevada and

Oregon.

Next slide. WGA has been very active, and I'll talk about it in a minute, on NWPA issues. As I said WIEB is the NWPA arm of WGA. We have a High-Level Waste Committee, and we've been working on these issues since 1985. We have a new cooperative agreement with OCRWM. They pay my salary, so I'm appreciative of that, and it's a testament to DOE being committed to stakeholder involvement.

We have a High-Level Waste Committee and we've provided testimony, actually, to this group as early as 1990.

Next slide. The WGA, you know, we have nuclear waste sites in the west. We are reluctant stewards of those sites, but we have been united in our commitment to safe transportation programs. We passed a resolution in 2004 regarding terrorism and sabotage. We've been active on the Waste Isolation Pilot Plant issue.

We passed a resolution in 2003 regarding the Private storage of commercial nuclear waste. And, in that resolution, we said that no state should be able to accept nuclear waste without the consent of the governor. And, that's an important issue for the PFS issue in Utah, because the current governor is opposed to that site. And, we've passed resolutions on clean-up of nuclear waste facilities and a general resolution on high-level waste.

Next slide. Just a quick overview of what we

believe. The governors' objective is safe and uneventful transportation of nuclear waste. Wouldn't everybody be in favor of that.

Let's not forget you've heard some technical discussions about the safety of casks and probabilistic risk assessment. There are going to be accidents. We believe that ponderance will be non-radiological accidents. Nevertheless, those accidents create severe consequences for emergency responders and the general public.

We believe in a comprehensive transportation plan to guide all transportation decisions. We believe in full-scale testing of shipping casks. We respectfully disagree with the NRC on this matter. We believe a thorough review of terrorism and sabotage should be conducted, and as I said earlier, a private commercial storage facility should only be approved with the governors' consent.

Next slide. Why are we concerned about routing? Well, if you look at the maps, we're the end of the funnel, and think of it as a funnel. All roads will lead to Nevada, but they also go through states like Utah, Wyoming, Colorado, Arizona. We believe that DOE still needs to address our concerns for advanced planning, things like 180(c), prenotification, the question of dedicated trains versus general freight.

The PFS is a big concern to us. So, we think there

are a lot of whopper decisions to be made by the DOE, and we think a number of them need to be made in the next two years.

Next slide. Just some basic facts. It's important to recognize the scale and size of this campaign. Truck and train routes could hit as many as 45 states. If you count up the counties that the routes will be going through, it's as many as 120 million people by truck, 100 million people by train, and people living within a half a mile, 11 million.

Next slide. If you go by mostly rail, we're looking at over 10,000 shipments, it depends on the number of casks that are moved per train. If you look at mostly truck, we're looking at 53,000 shipments. That's six trucks per day. All that comes through the west.

Next slide. This comes from the DOE EIS. This shows the representative rail routes to Yucca Mountain. As you can see, there are limited rail routes. A lot of them go through Chicago. A number of them come through Wyoming and Colorado, and they all, of course, go to Yucca Mountain.

Next slide. The same goes for truck routes. Places like Nebraska, Wyoming and Utah are heavily impacted. It shows a route there that goes to Denver, Colorado and stops. Since I live in Denver, that's not where the waste should go. It stops at the mountains, and should go up north on I-25.

Next slide. Just some percentage numbers that you

might find interesting. This is a mostly rail scenario. Of course, 100 per cent goes to Nevada. 82 per cent go through Nebraska. 79 per cent go through Wyoming. The point of this slide is that this is a Western issue. It's not just a Nevada issue.

KADAK: What assumption did you make about the routings? I didn't think there was a route decision made.

HOLEMAN: Well, it's a representative route, based on the EIS, and Bob Halstead, maybe you could--

Bob Halstead, State of Nevada, and in this capacity, one of the staff people serving the Western Interstate Energy Board.

Over the last 20 years, DOE and DOE contractors and Nevada and Nevada contractors have conducted many routing studies. Whatever we disagree with DOE in the Final EIS on, we think the representative routes that they used represent the most likely routes, with one possible exception in the way that I-70 would go through Colorado. Generally, the rail routes are exactly what have been predicted for the last 20 years, as are the highway routes.

And, I think that somehow, there seems to be some mystery about routing. If the shipments started tomorrow, based on the way we've been making shipments for the last 40 years, those would be the most likely routes. And, therefore, they're very good ones for analysis.

KADAK: Thank you.

HOLEMAN: Next slide. What are some of our routing goals? The big issue is which way are these shipments going to come. We don't know at this point. We believe we need a sound methodology for routes. We want early identification of routes to help us focus our ER resources and our infrastructure improvements. We want responsible criteria for selecting shipping routes, timely and defensible routing analysis. We want a limited number of routes. The more routes you have, the more you have to plan for, the more your resources are spread out. And, we want route acceptance through a risk-based and publicly acceptable criteria.

Next slide. What's the decision process going to be? If we had our druthers, we would see four years prior to the start of shipments, that's 2006, that's probably pushing DOE, but we would love to have four years advanced notice on the routes. And, if DOE engages in the process they're articulating today, we think that they can come up with routes in two years.

Who decides? This is an awkward issue, but the Western States want DOE to take responsibility for designating routes, and then consulting with us locally. There are other regions of the country who have a different feeling, that they want to do it more bottom-up approach. We want a top-down approach. We want DOE to come up with the

methodology and the criteria and finalize it in a rule. We want them to advance the TRAGIS model. We think it's an excellent modeling program, and we want to refine those criteria.

We want them to apply the selection process, pick a suite of routes, and then begin negotiations with the states and the tribes, not unlike what happened under the WIPP program.

Through that process, we'll resolve discontinuities in routes, we hope, and then we want them to identify the routes in their carrier contracts.

Next slide. What are some of the indicators of risk? Boy, there's a whole boat load of indicators, and, you know, good luck to DOE in figuring out how they're going to weave all these criteria together. The obvious ones, time and transit, shortest distance and population. We think those are valid criteria. We have ideas about accident rates, minimizing ER time, minimizing cask recovery time. There are places where you can't get to a cask, and that worries us in the west. Avoid difficult to evacuate populations, minimize transit through bad weather, avoid high hazards, avoid elevated roadways, overpasses and steep drop offs.

Next slide. Bridges that are vulnerable to failure, tunnels, steep grades, bodies of water,

environmental and cultural areas, parallel tracks at high speeds, number of railroad carriers and interchange points, and track classification. We list those not as a be all and end all. There are other items that I'm sure DOE will consider, and other stakeholders will consider.

Next slide. Rail routing. You know, this one confounds us. Highway routing has HM 164, and that seems to be a pretty good process for picking routes. But, there's no rail routing rule. We think that carriers are driven by profit and cost effectiveness, as well they should. As a result, we're not willing to have routing decisions turned over to the carrier. We think that that's a DOE decision and should be negotiated with the carrier.

Next slide. We think the WIPP model provides some lessons for highway routing. It worked out pretty well, actually, the way they picked WIPP routes. We think we need time to do route-specific needs assessment, and to do mitigation measures for improvements along a route.

Next slide. Here are some of the uncertainties. Right now, DOE has no comprehensive transportation plan. We think they need to write one and bring together all the disparate elements that they've been working on. They have yet to make a decision on dedicated trains. We have a bias toward this mode. We don't think that they should be in general commerce. Currently, they allow carriers to select

routes on rail routing.

The Yucca Mountain site may not have access to rail by 2010, so that's a big uncertainty. There are 24 reactors that will have difficulty shipping by rail. And, lastly, we know that there are going to be both truck and rail shipments, so we have to do planning for both truck and rail.

Thank you very much.

ABKOWITZ: Thank you, Tim. That provided some very insightful information. And, you can take the word insightful in either definition.

Let me kick things off, and then we can open it up to some others. It seems to me from your presentation that there's been a lot of though put into this subject for a long time, certainly by the Western Interstate Energy Board and I suspect from each of the State Regional Groups. There's a lot of collective wisdom there, and yet you've pointed to some uncertainties that really impede the ability for your organizations to get it done, so to speak.

What's your assessment of the environment that you're being asked to participate in now? This idea of collaboration and empowerment, and all that other stuff, is that plausible or is this something else?

HOLEMAN: No, no, I'm pretty encouraged by it. I think the Department has shown their commitment. They're running short of time, though. Decisions need to be made in the next

couple years. So, we need to have calls made on dedicated trains, routes, route criteria. And, 2010 is sneaking up on us. But, I think the Department is committed to that, and we as a regional organization have made it clear to them that we think they need to, you know, make these decisions sooner than later.

ABKOWITZ: Thank you. Andy?

KADAK: Kadak, Board.

I'm surprised to hear, you know, that you prefer to have DOE pick routes and then consult with you. Typically, it's the other way around. You'd like to be consulted with and participate in the decision for routes. But, why do you go with the DOE side?

HOLEMAN: That's a good question. They're the shipper. They're responsible for this waste. We think that they need to come up with a national program that uses criteria that are built by them in consultation with us. We don't think that they should develop these criteria in isolation. We think the criteria should be developed in consultation with us. From the West perspective, we just think that DOE needs to be held accountable on picking routes, and as long as they collaborate with us on discontinuities and other routes, we're comfortable with them doing this.

ABKOWITZ: Ron?

LATANISION: On that same subject, who decides, I

thought that Phil Brochman was pretty emphatic earlier today in saying that the NRC decides. It seems to me there's some disconnect here, unless I understood that incorrectly.

HOLEMAN: That's on the private stuff.

LATANISION: I'm sorry?

HOLEMAN: I think the NRC is on the private, not the Yucca Mountain, the licensees.

KADAK: NRC decides for the licensees and DOE decides for the spent fuel.

LATANISION: Okay.

HOLEMAN: And, I will say that we have a difference with other regions in the country, where they're going to be picking routes from the bottom up. There is a difference of opinion there.

ABKOWITZ: Andy?

KADAK: Given that, and the DOE's desire to have a consultive process, how will you work with other regions to sort of ferret out how this is going to get done?

HOLEMAN: Well, you know, that remains to be seen. You know, I think when we sort of butt up against each other and have different routes, we'll have to do a collaborative process. I can't give you any better answer than it will have to be negotiated in regions.

ABKOWITZ: John?

GARRICK: Garrick, Board. I'm getting better at that,

aren't I.

As an ex-modeler of transportation systems for the defense business, I see lots of opportunities here to help the process, and I just wondered if any of them have been considered. For example, I can imagine setting up a transportation model consisting of a series of links and nodes, where the links might represent the mode of transportation, and the nodes represent a transfer point in that movement, or some discontinuity. And, your list of risk indicators here is very interesting, and yet we know that some of them are important and some of them are not important. And, to have some insight as to their relative importance might provide a great assist on just how--what routes and candidate routes exist.

Has there been any consideration? And, maybe this is a question that should be partly asked of Ruth, has there been any consideration of looking at different routes, not necessarily specific routes, but routes made up of the elements of the candidate routes, and modeling them and seeing what impact these different, I would call them precursors to risk, the real risk is going to be the radiation dose to the public. These are all precursor events. And, in the precursor analysis, it would seem to me it would be rather straightforward to set up a link node model that you could vary, the number of bridges, the number

of overpasses, the population, and what have you, and develop some very interesting parametric insights into what's really important to risk, and that that could all go into the multi-attribute decision analysis, and help a great deal. Is there any of this kind of activity going on?

HOLEMAN: Yes, there is, and you're talking beyond by pay grade. But, Bob with Nevada has done some work in this area.

HALSTEAD: Bob Halstead, State of Nevada again in this capacity speaking as a member of the committee.

You're precisely right about what many of us would see in abstract terms as an ideal approach to modeling. And, in fact, the process that we considered between 1991 and 1995, as DOE will remember, those were the banner years where a lot of money was available for transportation planning, and a lot of work was done, both developing models, the first expansions of interline and highway at Oak Ridge. And, then, the way that we evolved this tiered process in the West, was the notion that what we wanted DOE to start the process at with was what we called a strawman set of routes, starting out DOE throws on the table we've done this modeling, looking at this regionally. These are the routes that we throw on the table to start the discussion.

Then, the assumption was that each state which has particular knowledge of the unique local conditions along

their routes would then bring to the table concerns, for example, about the number of tunnels, bridges on a particular route, and would be in a position to suggest alternatives. But, in fact, our approach always was that this type of an iterative process would be the way that we would, frankly, address not only safety issues, but, I hate to bring this up, institutional conflicts. There is a conflict between, for example, the State of Colorado and the States of Wyoming and Missouri and other states downstream as to the impact of a recent HM-164 route designation process in Colorado, which in effect, takes I-70 out of play as an east/west route west of Denver.

And, so, the notion was that the regional organizations were the appropriate place where the states would work out these conflicts, as well as provide their information about unique local conditions to DOE.

GARRICK: Well, I just wanted to point out that the National Nuclear Security Administration and the Defense Department have done lots of studies of stockpile to target sequence type that are very much along the lines of what I just described of the set of links and nodes where you can insert any kind of parameter and any kind of road condition, and they are extremely valuable in ferreting out what's important and what isn't.

HALSTEAD: This is exactly the same kind of approach,

and Dr. Weiner can speak for herself, but that she has been developing and she has demonstrated this at a couple of the TBC meetings. If you want to comment? We seem to be making progress on bringing the technical tools to the table where they can be shared with policy makers.

GARRICK: Yes. The point I'm trying to also make is that there's a lot that can be done technically to support the planning process, that it's not evident that it is being done.

ABKOWITZ: Thank you. Howard?

ARNOLD: Arnold, Board.

It seems to me the elephant in the middle of the room is the last few miles to Yucca Mountain itself. I'd be interested in comments from you, Tim, and from Mr. Nevada.

HOLEMAN: Well, you know, the $64,000 question is the rail access, is a 300 mile construction project. It's one of the biggest rail construction projects envisioned in the last hundred years. We don't know whether DOE can do that by 2010.

HALSTEAD: Bob Halstead, Nevada.

The decisions that DOE makes in Nevada on rail access have some impact on the major east/west flows of rail traffic, although perhaps not as much as the highway decisions do. Basically, the most likely east/west corridors are the Union Pacific from the proviso yard in Chicago, into

Ogden/Salt Lake. And, if one of the southern routes, southern corridors, Caliente, Valley or Gene were chosen, as opposed to one of the northern routes, the last one DOE considered in the EIS was Carlin, the bottom line is only about 15 per cent of the cross-country shipments, of the rail shipments, are sensitive to the routing decision that's made in Nevada.

However, from Nevada's standpoint, it's very important and we have advised DOE since they began scoping in December 1995, don't use those southern routes, because they raise the potential, even with Caliente, which, you know, intuitively obvious, you would think, well, it's east of Las Vegas, but, in fact, the way the railroads route traffic, there's the possibility, certainly the range is a minimum of 6 per cent and a maximum of 89 per cent of the shipments to Caliente nationally going through Las Vegas. So, we have always advised DOE to stay away from the southern routes and consider the northern corridors.

Those do have some implications for the other states, but not as much as highway. The real controversy in Nevada is whether highway shipments would be allowed through metropolitan Clark County. And, Irene Navis is here from Clark County, and I suspect she is going to address this in her comments at the end. Nevada has done some studies pursuant to HM-164 identifying alternative highway routes

that would keep shipments out of the Las Vegas valley. And, these involve routes coming in from I-80 in Utah in the north, and from California. And, the decisions that Nevada makes regarding highway impact will have a profound impact on the distribution of shipments through our sister states.

And, so, that's exactly the kind of a decision that I think probably by common sense, should be made in concern through a regional organization, because, frankly, as we've seen in the east where there have been conflicts, it leaves open the possibility of litigation and various administrative law disputes before the U.S. Department of Transportation.

So, yes, what Nevada does on highway has a big impact. What DOE does on rail in Nevada, which we don't control at this point, has less of an impact.

ABKOWITZ: Thank you, Bob, and thank you, Tim. We've now reached the much anticipated break time, and we're very close to schedule, so I would like to keep to schedule. We'll, therefore, break for the next 12 minutes, or so, and reconvene at 4 o'clock. Thank you.

(Whereupon, a brief recess was taken.)

ABKOWITZ: Okay, if we can assemble here for the stretch run? We're going to talk about the 180(c) aka, Emergency Preparedness Programs in our last segment here, and that will be followed by the comment period. And, I understand there are quite a number of people who have signed up to offer

public comment. So, I want to make sure that we stay according to schedule here.

The first presentation is going to be made by the Department of Energy, and it is not Gary Lanthrum. We'll be hearing from Judith Holm, who will be discussing the DOE's approach for developing the 180(c) program. It was mentioned earlier, but just as a reminder, the Section 180(c) program refers to a section of the Nuclear Waste Policy Act that requires DOE to provide technical assistance and funds to the states for training to deal with emergency response situations. And, Judy will discuss where they're at in that process.

HOLM: Thanks, Mark.

I'm going to stand up here and have someone else drive the slides. I'm not a compulsive manager of the slide machine, like my boss.

I'm Judith Holm. I've worked in the Transportation area for 15 or more years now, starting my career with the Civilian Waste Program, and I've recently returned as Manager of Institutional Programs for the Program in Washington.

As Mark mentioned, and several others have discussed, Section 180(c), I think Phil mentioned A and B, Section 180(c) of the Nuclear Waste Policy Act, provides for technical assistance of funds to states for training for public safety officials of appropriate units of local

government and Indian tribes through whose jurisdiction we plan to transport spent fuel or high-level waste.

And, it includes procedures required for safe, routine transportation, as well as for emergency response. And, often times, we don't talk about safe routine, and I will include that in the discussion today.

Some background introduction information. As Gary has mentioned on a couple of occasions to this group, I believe, the mid-Nineties saw the decline of transportation as the program focused on site characterization and license application efforts. And, then, in 2003, transportation was revived, and we have an increased approach toward working on activities and issues, such as 180(c), and just this last year, we really re-engaged with the states and the TEC working group to address 180(c) issues.

It is not a new issue, however. In 1998, the Department published a draft notice in the Federal Register of policy and procedures for Section 180(c). We had been working on this prior to this 2004 renewal for the last prior ten years. So, a lot of effort has gone into this activity.

This is a map that as someone pointed out, it's a big country. There are a lot of involvement of states and tribes. I wanted to show this because you can see the regional group involvement also, just barely I'm afraid, the Western states are shown in the light blue, Midwest is red

hash marks, South is purple, and the New England states, the Northeast region, are the green hash marks.

This is meant to represent the breadth of involvement that we do have through the State Regional Groups and with a number of tribes that we're just beginning to initiate contact with tribes.

In our current policy discussion with our stakeholders, we have looked at our prior policy to understand what's current and available to us, what needs to be revisited in the policy. Again, this is '98, well before the 911 event, and the changes within the Federal Government associated with the terrorist attacks.

Our approach is to coordinate with interested parties, and by that, we mean primarily states and tribes, and other organizations and entities through the TEC working group. We will publish a Federal Register notice to propose a policy, and announce the revisions to the policy, and then finalize the policy.

This says develop and implement a grant application process. Perhaps we should say financial assistance instrument process. We have not determined at this point necessarily that it would be grants, but we believe that that's probably the preference, since most federal agencies use grants for these kinds of assistance programs. And, then, we will aware and monitor implementation of the program

activities.

Again, we renewed our work on the policy and procedures. In the State Regional Groups, we did include work on Section 180(c) as part of their scope of work, and, so, that is included, and most of them have assigned smaller working groups composed of states within their regions to address the 180(c) issue, and they'll be talking to you about that.

And, again, that 180(c) topic group was formed under the TEC Working Group, and we have a wide range of other than just the state groups, but also industry, professional and technical organizations, fire fighter groups, and others, who can give us good input into the policy development.

Just so you'll know, the other active topic groups, because there is a relation obviously between rail and routing and security, and we have a tribal topic group that's been working for a number of years, every so often, we ask the group if they want to sunset, and they say no, they need the time to be able to talk among themselves and to work together on issues that are specifically important to tribes. So, we maintain that group.

We have looked at the changes in emergency preparedness and funding since '98. The Department of Homeland Security, of course, was formed. They have pulled

in many other organizations and agencies, as you're all aware, that have impacted emergency preparedness. There are currently two directives, Presidential orders, that the Department of Homeland Security is looking at for implementation. One is Directive 5, and the other is Directive 8. Directive 8 may have application to the 180(c) process. In that directive, Homeland Security is required to coordinate all assistance programs for emergency preparedness across the various agencies, and they're supposed to have something in place by next year. We are starting our discussions with DHS regarding what that means, and will be participants in their process.

FEMA, over the last several years, has consolidated many of their grant programs, and have one source that states and others, local governments, fire fighters, can go to to obtain funding for various kinds of emergency preparedness. All hazards type events, not just radioactive materials.

Again, we've also looked at relevant DOE experience and funding. We've had a significant change in our approach through the transportation emergency preparedness program. We have developed, this is through the Environmental Management Program, where we have developed a curriculum of training materials that is provided through the trainer program that EM sponsors. Many of the states have taken advantage of that program.

So, looking at some of those features that are currently resident in DOE, and how that translates into the opportunities under 180 is part of the research that's going on.

The Topic Group, as it's formed, develops a work plan, and goal statements for the work that they're going to do. It's usually schedule a timed activity, so that at the end of the period when they've done the work and provided the input to DOE, the group disbands and moves on to another activity.

In this Topic Group, which was just formed in May in '04, the goals are to identify and discuss issues associated with 180(c), look at implementation issues, various options and considerations. And, I'll talk about some of those issues, as various papers have been developed by the group. And, look at our outline after we take in all of the input through these issue papers, or through the various discussions that are being conducted. Take all that input and develop an outline for a policy, and then, finally issue the policy.

Again, that 30 member organizations of TEC are representative, I'm not going to read them all to you, you can see them, and it's in the briefing package. It's a fairly broad group, though.

Some of the issues that are being discussed in

detail include funding distribution method, what kind of instrument should be used, grant versus a cooperative agreement. Contracts really aren't appropriate when you're funding a governmental entity, so a grant or a cooperative agreement is the discussion underway.

The allocation method, should there be a needs based program as the '98 policy indicated, or a formula allocation method. And, then, if you have a formula allocation, what are the factors that you need to consider, and how do you weight those various factors.

Other programs, which I'll discuss in a minute, have done that, and those are some of the models that we've been looking at.

The training eligible for the funding has been discussed. The 180(c) policy was fairly prescriptive in '98, and this is a discussion that's kind of broad ranging about eligibility. Again, it's a DOE decision, but we want to take the input and provide as much flexibility as possible for the various recipients.

Who should receive the training? This is another discussion that's underway, including fire fighters, vehicle inspectors for truck shipments. It could also include training for state rail inspectors through the FRA Rail Participation Program. That was in the '98 version of the policy. Emergency Room personnel is under discussion, and

public information officers are also under discussion. These are things that the topic group has brought up to us so far.

Some of the allowable activities that are being considered include equipment purchase and/or maintenance. One of the big issues with states is that while there are a number of programs that provide equipment directly to them or to local officials, or provide funding to purchase equipment, many times calibration and maintenance of that equipment is not included in those grant programs, and equipment isn't worth a whole lot if you don't maintain it. And, that's a big void right now that appears in many of the programs.

Again, should the staff time be covered that allows them to prepare for training, or is it just time the states would spend in doing training. Exercise activities is something that was included in the earlier policy, and that's being discussed also in this one. And, again, inspection programs that cover the safe, routine transportation, with the notion that if you can find areas that need improvement in a vehicle and catch a defect early in a shipment, you have a better chance, at least in truck, of avoiding an incident or accident.

We started in early May. We held weekly teleconferences with the topic group, and later switched to bi-weekly calls, because as they started to get going, there was a lot of issue paper discussion and development, and

people needed time to start reviewing the material that was being produced. And, we have completed seven teleconferences, along with the TEC Working Group meeting that was held in September.

Again, four papers are under development at this time, the same ones I talked about before. Again, the issue papers have a format that allows a thorough exploration of an issue. It includes a description and a discussion of the issue, gives the background of the issue, why it's an important issue, discusses what was in the '98 policy, how that issue may have been addressed in other DOE programs, what has changed within the framework of the issue around that particular topical area, what kind of options are being considered by the group, and recommendations to the program from the topic group about that piece of the issue.

The funding distribution method, as I mentioned looks at funding states and tribes in different ways. We discussed in the '98 policy and procedures direct grants to states and to tribes, even though the Act didn't say funding to tribes, because of the government to government relationship, trust responsibilities and other executive orders, the Department has interpreted the funding language to mean direct to tribes.

We looked at the WIPP program and how they managed their funding program. They lean on the Land Withdrawal Act

as their legislative base for funding states. They do fund through cooperative agreements to State Regional Groups, and directly to Indian tribes through a cooperative agreement process.

Foreign Research Reactor program funds on specific individual shipments, set amounts of funding, either through regional groups or occasionally directly to states.

So, the group is looking at, and has looked at, grants to states and tribes, cooperative agreements with states and tribes, or cooperative agreements to the State Regional Groups and grants to tribes. These are all elements under discussion and being developed in these issue papers.

The current reading of Section 180(c) language, though, may only allow direct grants to states and tribes. And, that's something that we're clarifying. It is something that was in the 180(c) policy initially.

How you allocate money, that's just the mechanism you use. So, how you allocate money amongst the recipients is another issue, and this may be the toughest issue that many agencies wind up debating and discussing and involving a number of stakeholders. I know that DOT has had a lengthy process to allocate BIA road funds through a formula with tribes. It has taken them years, and I still think they're haggling over this.

We've looked at allocation of funds through an

impact based formula, a needs based grant, or some combination of the two. For us, I think the issue is equity, fairness, balancing needs at state or local or tribal level with program effectiveness and how you obtain the end goals of the program, which is to increase preparedness for the shipments, and safety of the shipments.

Again, we had a needs based method in the '98 policy. WIPP currently works on a negotiated basis with the states, and the tribes for funding for each recipient.

FRR, again, had an equal amount. They just said here's the amount of money that we'll provide to you. There was no formula, because they had so few shipments.

And, then, we at one point in the Department discussed a consolidated grant, which looked a lot like the FEMA, pulling together of many different program elements that were providing funding for similar activities. That did not go anywhere in the Department. It was just not I think the right time. It wasn't going to work. But, the formula that was discussed was impact based using number of shipments, miles through a jurisdiction, and population along the route. It looked a little bit like the HMEP grant program.

Again, the topic group was looking at the DOE/HMEP grant formula. I don't want to spend a lot of time on that because I think that Dave Crose is going to talk about it.

It's a very simple program that the states seem to like a lot. It's easy to apply for. It uses a formula. It has a base, a planning grant, and a training grant segment to it.

Western Interstate Energy Board has proposed a formula that has a 25 per cent equal share and 75 per cent based on shipment miles. And, the '98 proposed policy and procedures again was a need based grant that relied on an assessment by each state and each tribe of their needs, and then development of a program approach that would be reviewed and approved by DOE.

Again, we're looking at agreement. I believe the Midwest Group will talk about I think a break-through that occurred at the topic group, where the regional groups did come closer to that approach, which was looking more like a funding formula. And, I'll let them talk about what they came to agreement on. But, we have progress on several of these fronts, so it's very encouraging.

The allowable activities talks about what kinds of things can you do under the grant, or the funding arrangement. And, again, it's balancing needs against program goals. I think this is where you can get at that needs based issue if you look at having a broad range of flexibility in the kinds of activities that could be funded in terms of training and safe routine transportation.

Again, the '98 policy and procedures was fairly

prescriptive in its approach. It says you can take a certain percentage to purchase equipment, but it could only be used for certain things. Again, WIPP and the Foreign Fuel Program negotiated allowable activities. But, in order to ensure consistency across the country, because this is a big national program with many more states involved in it, potentially, we'd like to try to reach a more consistent approach, and have a suite of allowable activities, I believe, that would allow the recipients to choose from that suite of activities that would meet their needs best, and yet would still fulfill the terms of a performance based grant, if that's what we wind up with.

Again, those are some of the things that are being considered. And, while the legislation talks about training, some of the discussion in the topic group has been about what about transportation planning, and using funding to prepare for that, what about emergency response and public information. And, those are some of the things we need to grapple with within the terms of the language of the Act.

Level of training. Again, initially, we were discussing awareness training, and the funding program, the assistance program under 180(c) was to fill the gap between all the other HAZMAT and general training that is provided through the states and through a number of other organizations to local officials to prepare for these kinds

of shipments. And, so, we wanted to be able to address that increment of risk, if you will, or the increment that was caused by our shipments, the impact on those jurisdictions.

Again, the world has changed. There's been a lot of money for hazardous materials, along with radioactive materials training. Do they really apply to transportation? Those are the kinds of things we're talking about.

The other challenge is having a program that meets the needs of very different structures within the states for how they carry out their programs. Some states have HAZMAT teams located regionally around the states. Some don't do that. Some don't do training. They do escorts. There's a whole range of options out there. And, so, we want to be flexible on how we address this in terms of level of training.

The other discussion point that's come up has been awareness level training. In the range of functions that a first responder provides, depending on where they are, they may move from simply the first actions of cordoning off an area, to moving into defensive or more technical activities in response. So, while a first responder might be classified as just that, a first responder, who normally would cordon off the area, call for help, identify who's there, do lifesaving, sometimes the transition in the phase of an event would mean they would do other things, and they need to be

trained to those other levels, potentially. Can we cover that is part of the discussion that's going on.

We have a schedule that we've outlined. One of the things that's happened is because we've been really working hard, Cornack Alluso (phonetic), one of our staff, is reading this activity. They have been really cranking out the work, but they're recognizing that our earlier date, I think we were looking at a January time frame to develop the first draft of the 180(c) policy, is really much too ambitious, and so we're slipping that back to the March/April time frame for the first draft. We believe that will give people more time to review. It will still allow us to have a TEC meeting in February or March to discuss where we are in the process, and then issue the policy and procedures.

Once we do the draft notice, we really then are in a comment period, and we can't really talk about this a whole lot more. So, we have to let the formal process take over.

We are looking at a final policy and procedures in September of this year, with application package notice out by January. There are two pieces. One is the policy and procedures, and the other is the instructions on how to apply, and all the material that you need to fill in to apply for the program.

Planning grants are a feature that we're talking about. We're anticipating in July of '06 having the first

round of planning grants awarded. This meets the state's fiscal year. Again, we want to meet their schedules as opposed to just the federal fiscal year. And, base grants the year after that. Variable grants in 2008.

This is predicated on that 2010 mile stand for opening. We think this will allow us to have the training in place, exercises underway, and readiness reviews with the program and the states and the tribes before we would start shipments.

And, again, some of the feedback that's more general about this whole process that I thought was important to provide, one is learn from what you've done before. Don't start over. We have a wide body of knowledge. A lot of people have put energy into this program over a number of years, and, so, we ought to rely on that and learn basically from programs that seem to be working well.

Allow flexibility, we keep hearing that, so we're trying to move away from a prescriptive approach to a more flexible approach that helps meet recipients needs. Again, we've heard this, we haven't made the final decision, but adopt a formula-based allocation method.

Consult with tribes individually on their preferences. This is where we are behind. We have not been able to get out to all the tribes. One of our folks, Jay Jones, who works with tribal issues, is out this week meeting

with three tribes in the Northwest. So, we're starting to have the dialogue with tribal governments. We do have a few tribes that participate in the TEC, a the number of tribal organizations. But, there are a lot of tribes out there, as well as states. So, we need to consult with them individually.

Again, keep application and reporting processes simple. Shorter is better. Easier is good.

Again, we're looking at mechanisms to minimize administrative burden. We are looking at electronic submission of grant applications, electronic review, and electronic award through EGO (phonetic). That's being done with other agencies. DOE has done it for a number of discretionary grant programs and research grant programs. That seems to be an efficient way to do it if we can. We'd like to take advantage of the technology that's out there.

And, again, we'll have a number of stakeholder groups and states and tribes involved in the development of this application criteria, as well as with the policy and procedures.

And, the last slide is simply to show you the parallel nature of some of these activities that we're conducting. We do have to start development of that grant application package before we've concluded with the policy and procedures. So, we're looking at parallel tracking a lot

of these activities to get to award of grants, assuming we are in a 2010 shipping horizon.

That's it.

ABKOWITZ: Thank you, Judith.

Let me open up the questions here with I want to try to tie some of these working issues back to the overall safety perspective that we're trying to look at from a waste management system standpoint. It seems to me that the entire 180(c) process that you've described is all about being able to enable the states to have adequate emergency response capability in the event that an incident occurs on a route for which they have jurisdiction, and they, in turn, with these resources, allocate that to local jurisdictions as appropriate.

In the context of all of this, is there any kind of performance standard that has been defined as being sort of the minimum threshold of adequate emergency preparedness that would govern this process? In other words, if I know there is a certain route that a truck shipment is going to be on, is there some definition in terms of the level of training that the nearest responder has to have in order to be considered adequate?

HOLM: Initially, we have looked at awareness level training. In these kinds of accidents, a first responder normally would simply come up, identify the nature of the

hazard and the incident, cordon off the area, do life saving, and call the secondary responders. So, that has been the level that we have talked about.

In terms of this particular aspect, we have not developed strict performance measures at this point. That's part of the developmental process.

ABKOWITZ: Okay, thank you. Ron?

LATANISION: Latanision, Board.

This is a practical question, but given the scale of the project, (a) who are the trainers, (b) what is the time involved in your estimate of training people in various states or regions or tribes, or whatever, and, third, are there resources, fiscal, intellectual, physical, available to do this?

HOLM: Well, the trainers are the states, that is, the system that's in place now, and they're already providing training for hazardous materials. And, so, this is simply an additional increment of training and support for them to find time to address spent fuel and high-level waste. They already have some training in this area. The problem is the time it takes just to be a good responder in general, there are a lot of requirements.

LATANISION: Right. But, I mean, this carries some special requirements, obviously.

HOLM: This carries some additional requirements in

terms of the kind of material and awareness about the package, who to call, things like that. I think resources are there, whether they're completely adequate with all the other training they're being asked to do now, that's a big question, and I think that's probably the challenge with the states and their local officials we need to sort out.

LATANISION: Okay.

HOLM: Yes, we want to integrate it into the existing system as opposed to overriding a separate system on top of it.

LATANISION: Okay, thank you.

ABKOWITZ: Andy?

KADAK: Kadak, Board.

I was looking at your schedule, and I'm just surprised how long it takes to actually get money to the states so that they can implement as yet unclear, at least from what I can gather, expectations for what they need to do for training. And, I was hoping I'd hear what you'd expect people to be trained to do in the event of a spent fuel shipment, but I didn't hear anything. So, can you respond to why does it take so long to get money to the people, given that we've already done a lot of training in similar hazardous substances like in WIPP or other spent fuel shipments on existing routes? Why does it take so long?

HOLM: Well, one is the budget process. That takes a

while to get the program into the system when they're currently planning right now '06's being set. So, that's the earliest, given where we started, having funding coming to transportation in '04. The other is getting a policy and procedures finalized and all the input that's necessary to do that. Changes have occurred, security was not part of the equation. Does that play now in this kind of training? I don't know.

KADAK: Well, let me rephrase my question. Are you doing any kind of training packages so that the people who ultimately get the money know the kinds of things that they should be trained on, which I think would be very helpful, is that what you're doing as well?

HOLM: That's already in place.

KADAK: Oh, that's already in place.

HOLM: DOE developed under the Environmental Management Program, a program called the Transportation Emergency Preparedness Program over the last, what, five years. They put together a series of modules, which addressed radioactive material shipments, and includes low-level waste, transuranic waste, spent fuel. It even addresses the weapons shipments. So, that the first responder who has--I mean, they have defined the functions of a first responder, so that they know what they need to be trained to, and the states have been involved in developing this series of curriculum. So, we

have training materials available. FEMA has training materials available. The states have developed materials, and it's a matter of providing them the resources to allow them to take advantage of whatever training system they determine is important for their state.

KADAK: Okay, I'll go back to my first question.

HOLM: Okay.

KADAK: Why does it take so bloody long to deliver to the states what you've already got done? And, this whole process here is just trying to figure out how to distribute money, as best I can tell.

HOLM: Well, in terms of figuring out how to distribute the money, that is something that takes a lot of discussion. Not everyone agrees on the method of allocation. And, so, that's one of the things that we've been working through with this grant development program.

KADAK: Thank you.

ABKOWITZ: Thank you. One final quick question, Judith, and we'll let you relax. It seems to me that much of this dialogue is predicated on knowing what the routes are going to be. Is the premise on resolving the 180(c) decision making process based on some assumption of what the routes are going to be?

HOLM: The development of the policy is not necessarily predicated on routes. How you do this kind of program, and

what the features of the program are are independent of the routes. Where you do your training is dependent on the routes, and that's why we're trying to get all the policy in place, and it follows the same kind of flow of schedule as the development of the routing criteria, and working on routes together. So, they do converge, and there is a relationship.

ABKOWITZ: Well, I guess where I'm coming from is if there's, you know, several scenarios out there and one of them is that there's 100 route miles in my state that I need to worry about, and the other is that there's 500 route miles in my state I need to worry about, it seems to me that knowledge of that information would be very important in terms of what slice of the pie I'm entitled to.

HOLM: And, if you have an allocation method that takes that into account, then that would take care of that issue once you determine that. So, yes, before you can actually do the allocation, you have to have that information in place. You're right.

ABKOWITZ: Okay. Thank you. We're going to hear now another perspective on this subject, and this is a state regional perspective, and the region that we'll be hearing from is Lisa Sattler with the Midwestern Council of State Governments, and David Crose with the Indiana State Emergency Management Agency. Lisa will go first, and I'll make a few

remarks about her background, and then she will, in turn, introduce David.

Lisa is a Senior Policy Analyst with the Council of State Governments' Midwestern Office. For the past 13 years, she has directed the Council's Midwestern Radioactive Materials Transportation Project, which gives the Midwestern states the opportunity to work with each other and with DOE in identifying and resolving issues related to the Department's shipment of spent fuel, transuranic waste, and other radioactive waste and materials.

She holds an undergraduate degree in geology from Lawrence University, and a master's degree in public policy from the University of Chicago.

Lisa?

SATTLER: Thank you.

I have a number of housekeeping things I need to go through. First, I want to thank the Board for the opportunity to be here today. It's truly an honor. Second, I also have the honor of introducing Dave Crose, who's with the State of Indiana. Dave is the Director of the Technological Hazards Division for the State Emergency Management Agency.

I've known Dave ever since I started this project back in 1991. Dave is Indiana's appointee to the Radioactive--I'm sorry--the Midwestern Radioactive Materials

Transportation Committee. He actually was Chair of the Committee in 1996 and '97, when a lot of the work was being done on the original draft policy and procedures on 180(c).

I also want to apologize for not having any slides like Tim's that explain who we are in the Midwest. Suffice it to say that the Midwestern Radioactive Materials Transportation Committee is the Midwestern's State Regional Group, or SRG. You see that acronym quite a bit. Thor Strawn (phonetic) with the State of Michigan, is currently the Chair of the Committee, and he spoke before the Board back in January, and I was sure his remarks would still be fresh in your mind. So, I didn't see the need to provide any slides.

But, I will say if you want to learn more about the Committee, I have a brochure on the back table. Maybe they passed them out. And, we also have copies of our planning guide. This planning guide lays out what the Midwestern States expectations are for all shippers of spent fuel, high-level waste, and transuranic waste.

I'm glad that Judith went before me for a couple of reasons. Judith is a mentor for me. I don't know if she knows that or not. If it hadn't been for Judith, I wouldn't have this job, because when I was an intern and took the job in '91 as a graduate student, she promptly hired away my boss. So, they kept the position open for me, and I was the

first person in my graduating class to have a job lined up.

Another good reason it's good to follow Judith is she covered probably 25 to 30 per cent of what I was going to say. I know Dave had some other things he wanted to talk about. The last reason it's good to follow Judith is she sort of provided a buffer between me and that discussion on routing, which I was ready to jump into. I'd just like to second Gary's suggestion that the Board revisit the issue of route selection maybe at the next meeting.

You'll find, if you hear from all four of the State Regional Groups and DOE, you'll get five different perspectives on how the route selection process should unfold. I would say that in the Midwest, we're the group that Tim was referring to when he said some groups want to take a local to national approach. That's the one that we advocate, and that's the one that we're actually pursuing, and I'm proud to say I think we're farther ahead than the other regions on this particular task.

I also want to say that what Dave and I are going to talk about, this is really just the views of the Midwest. Again, if you want to get a broad spectrum of what the states perspective is on any issue, you really need to make sure you include representatives of all four regions. Otherwise, you might be left with the impression that this is how all the states feel, and I can assure you that this is

definitely not the case.

All right, thank you for letting me go through those. Dave and I are going to share this time. I've asked him to take a seat so that the two of us don't look like we're up here announcing the nominees for Best Motion Picture. I'm going to go through a brief history of the Midwest's involvement in developing the Section 180(c) policy and procedures, including our general philosophy for how the program should work.

Dave will then discuss the experiences that Indiana has had in helping to plan and prepare for the shipments of transuranic waste and spent nuclear fuel that have gone through the state. He will also present the Midwest's proposal for a 180(c) allocation formula, which Judith alluded to in her comments, and that formula is based on the U.S. Department of Transportation's Hazardous Materials Emergency Preparedness Grants.

After Dave is finished, I'll briefly review some of the unresolved issues pertaining to Section 180(c), and I have to say my list of unresolved issues is different from Judith's, which I thought was pretty interesting.

The Midwest has played a role in shaping the 180(c) policy from the very beginning. From 1995 through 1998, the Midwestern Committee commented on five Federal Register notices. Two of those were notices of inquiry, and three

were draft versions of the policy and procedures.

I wanted to emphasize that all of our comments came in before any of the states in the Midwest actually had experience working with DOE to plan shipments. the Department published the latest version in April of 1998, and it was a full year after that that any of the Midwestern states really got a taste for what it's like to work with DOE to plan and prepare for shipments. In that case, the shipping campaign we worked with was the Foreign Research Reactor Program shipping across country shipments of foreign research reactor spent fuel.

Since that time, we've also had the opportunity to work with DOE on shipments of transuranic waste, both going to WIPP and to Hanford, and also on other spent fuel shipments, including West Valley and Oak Ridge spent fuel. So, the states have gained a good deal of experience in working with DOE and seeing what it's like to get ready for a shipping campaign, although obviously the ones we've worked on pale in comparison to the RW one.

Also, in 1999, DOE and the states started working on the consolidated grant proposal, which Judith also mentioned. Many of the issues that we talked about back in those years are coming up again with regard to Section 180(c). For example, hospital training, state fees, and the funding allocation method.

So, with all this experience and recognizing the need for DOE to finalize the draft policy and procedures, and getting a new cooperative agreement with RW and having Gary emphasize projects, the Midwest identified Section 180(c) as a key issue just this past spring, and it's one of the four issues that we're focusing on right now.

The scope of work which Gary mentioned earlier, and DOE approved, that includes, for us, the task of working with DOE and with the other regions to finalize the 180(c) policy and procedures. And, in June, the Midwestern Committee identified four states that would take the lead for the Midwest. Those states are Indiana, Iowa, Kansas and Michigan. These lead states are members of the Section 180(c) topic group, as am I. We have participated on all seven conference calls, which, by the way, began in July, actually. I only seems like we've been working since May on this.

We attended the one meeting that the group has had, which was in Minneapolis, in conjunction with the TEC meeting, and we have submitted extensive written comments on all four of the draft discussion papers that DOE is preparing to support the recommendation to management. The lead states for the Midwest are going to report back at the Committee meeting on November 9th and 10th in Columbus, Ohio. We're devoting quite a bit of time to 180(c) discussions at that

meeting, and that will be the opportunity for the rest of the Midwestern states to provide feedback on what it is that the lead states have been doing.

Over the years, a few overarching themes have emerged from the Committee's discussions of financial and technical assistance with DOE. First, keep it simple. Judith referred to this one, too. And, it's good to see that DOE is getting the message.

In our experience, the more difficult it is for the states to obtain funding, the less likely it is they're going to apply for it. We recognize that DOE as a funding agency has a legitimate need for accountability, but we do feel strongly that the application and reporting processes should be as simple as possible.

Second, we think that DOE should follow a formula-based approach instead of the needs-based approach proposed in the 1998 policy. This is a change from our position of the Nineties. One could say that we've flip-flopped on this issue, but I prefer to think that our position now is better informed as a result of all the experience we've gained working with DOE on shipments.

One reason to prefer a formula approach is just the simplicity of it. The administrative burden will be much less than if we were to go with the needs-based approach. Also, basing awards on the state's needs would require us to

define a baseline level of preparedness, and that would be very difficult to do. Even when dealing with the exact same shipment, one state's assessment of what needs to be done could differ drastically from another state's.

And, to illustrate this point, I can tell you that in 2001, I asked the Midwestern Corridor States what they would need in terms of financial assistance to prepare for the West Valley shipment, which was a single shipment of spent fuel going from New York to Idaho in two casks by train. The assessments of need ranged from $1,500 to $105,000. That's a pretty big span. And, in this case, it had nothing to do with the relative mileage through the states. It simply was a reflection of two different states having different ideas for what they needed to do to prepare for that same shipment.

So, in the Midwest, we think a formula-based approach would work best, and we have proposed a formula to the other regions for their consideration. Dave will talk more about that in just a minute.

Back to the philosophy, which I think is gone now. The third point is that the states need flexibility in choosing how to prepare for these shipments. The revised policy we think should not specify levels of training, nor should it define the increment of training necessary for shipments, and we think that these decisions should be left

to the states.

One more thing I wanted to note before I turn it over to Dave, I've heard a couple of people mention Section 180(c) as being related to emergency response, and it is, but the big part of it is safe routine transportation. So, I want to remind everyone that we're talking not just about, you know, what happens after an accident, but also making sure that we avoid accidents, to the extent possible.

With that, I'm going to turn the floor over to Dave Crose.

CROSE: Thank you. I'd like to thank the Board for the opportunity to be here.

Also, I would like to make a couple of quick comments. I'd like to thank Gary and Judith for deciding to ask DOE to continue funding the TEC Working Group. I think you heard Gary mention this morning about probably having two meetings a year. I attended the first TEC Working Group meeting some ten or eleven years ago, and it's been a very effective tool. Some of the questions I've heard the Board ask here about some of the issues on routing, and as you'll see when we talk about some of the funding approach issues, the working groups, four of those working groups taken in all the states in the country, and it's a good forum to get together and work out issues, and reach compromises on issues that we don't totally agree on. And, I'd like to thank Gary

and them for continuing that group.

We suggest that DOE follow the HMEP grant formula. I suggested this to the group back in 1998. I've been involved with the HMEP grant manager since the program started. We're in the twelfth year of that program. It's funded by fees that are collected. It's a very simple program. As you'll see, it's talked about factors tied to risk. I'll get into that a little bit more later. I've heard a couple Board members ask how you're going to decide on some of these funding issues. Those grants are, half the money goes to planning and half goes to training. You can buy some training equipment, but you cannot buy response equipment out of those grants.

It's a very simple process. They have a grant application package similar to other programs in the country. You fill the application out and, of course, after you do the initial one several years ago, now it's what's you call continuing grant applications, so each year, you just do a continuing application based on what objectives you completed the year before, and any additional objectives that you want to take care of in the upcoming year. We were just awarded our twelfth grant.

Those grants go to training for hazardous material. Also, real quick, which is not on the slides, under the grant guidance for that program, on the planning side, by

law, 75 per cent of the funds have to be passed through to local emergency planning committees. And, then, the training funds, you have to commit at least half of that to training of local responders. That's in the grant guidance.

States do have considerable latitude in deciding how best to use the funding. On each side of that grant, there's broad, I think it's seven items that you look at that you can use for training, and then there's about six or seven things you can look at for planning. And, I've advocated this to the--on the telephone calls we've had, especially on training, I advocate that the states decide what training they're going to give their responders and what level of training they give their responders.

I'll respond to one of the questions that one of the Board members raised a while ago about training levels. Most states in the country currently train to what they call 1910/120Q requirements of the OSHA standards. The other standard a lot of the states train to is that FPA 472. And, then there's a new standard coming out now for emergency management, which is called NFPA 1600.

Also, there's a new system that's being mandated by Homeland Security that has to be in place by the end of 2005 that's called the National Incident Management System. And, on funds that come down from FEMA, you're going to have to have that in place in the states in this country, and that's

to coordinate a lot of these activities for response related to Homeland Security and other response issues.

This is the HMEP formula. As you can see under the planning grants, it tells you how it's divided. I'm not going to spend a lot of time on that. But, if you'll see under the measures of risk, 20 per cent is total population, 40 per cent is HAZMAT truck miles, and 40 per cent is SARA 302 chemical facilities. That's where there will be a variance for what we're looking at as far as the DOE funding for the activities that we'll be doing.

For those of you not familiar, 302 chemical facilities, one of the reports they turn in is what they call a Tier II report. They're required to file those annually based on 364 chemicals that are called EHS chemicals, and that's what that side of the form is about.

The other side on the training grants, you see 50 per cent is on population, 30 per cent is on highway miles, and the other 20 per cent is for percentage of total number of Census Bureau chemical facilities in your state.

I was involved in helping put this form together when they first put it together. I will have to say that DOE is getting a lot more input from the states than what DOT did. DOT had a group inside their agency. They did get some input from just some key agencies across the country, and that time, I happened to be Chair of a group involved with

HAZMAT issues.

This is the modified approach that we're recommending. This has not been totally agreed on. We did have consensus. The TEC Working Group just met in Minneapolis, and all four of the Regional Groups had representatives there, and we got together and we sort of ironed out some of the differences. I think you heard earlier that the Western Governors Association advocates this form to being on 75 per cent of it bases on mileage. This is one of the issues we have in the Eastern part of the country that needs to be some kind of a compromise reached on.

You see a $200,000 planning grant, that's a one time grant. There's a $100,000 base grant each year. And, then here's the funding formula. This is not totally agreed on yet, so I don't want to get cross-ways with the Western Governors, but we did have a consensus that everybody was going to present this to their Regional Working Groups, and the last group meets the first of December, and then we'll probably be able to go back to DOE.

But, 30 per cent based on affected population, 30 per cent route miles, 30 per cent of your shipment numbers, and 10 per cent based on shipping sites. And, the reason shipping sites are in there is for the states that have nuclear power plants that have to get involved in planning, especially if they have to take it from the actual power

plant out to a location outside the boundaries, that's the reason that is included in there.

Modified HMEP approach. Like I just said, we're going to be reviewing this, and if we reach a consensus, then we'll get this back to DOE.

And, I think I'll turn it back over to Lisa. But, I'll be glad to answer any questions at the end.

SATTLER: Okay, the 180(c) topic group has addressed a number of broad issues, such as the funding allocation method and allowable activities. But, there remains several unresolved issues, many of which we haven't even begun to discuss. I think our meeting, we're getting together December 7th and 8th in Washington, D.C. just the topic group members. At that meeting, I expect we'll be trying to resolve some of these issues.

First, from the Midwest's perspective, the issue of state fees is particularly important because we have five states that charge fees on radioactive waste shipments, and three others have shown some interest in establishing fees. In the 1990's, as we reviewed the draft policy and procedures, there was a lot of talk coming from DOE about deducting the cost of fees from the state's award, so that the Department would not wind up paying twice for training. But, none of the Midwestern state fees generate revenue solely for training. Instead, depending on what state you're

in, the fee could cover escorts, inspections, public information activities, shipment tracking, equipment purchase, maintenance and calibration, all kinds of shipment related expenses.

So, if DOE maintains its interpretation of Section 180(c) as being assistance for training, then the state fees should not be deducted from the awards, except perhaps for that portion of the fee that does go towards training activities.

The Midwest and the other regions do insist that training for hospitals and emergency medical technicians be included as an allowable activity. And, it was good to see that Judith seems to be indicating that that's the direction DOE is heading in. I know DOE right now is working on a definition of public safety official, and my assumption is it's going to now be broad enough to include emergency room personnel and also EMTs.

One concern that I've heard a couple states in the Midwest raise is the issue of private hospitals. If we're talking about public safety officials, can they train the private hospitals. So, we'll be interested to see how broadly DOE defines public safety officials.

Given the turnover within DOE as an agency, there's an argument to be made for establishing regulations on Section 180(c), instead of just issuing a policy. This

suggestion was first raised by the Western States a number of years ago, but like I said, the topic group has not yet begun to talk about this one.

We also have not discussed contingency planning at all, and we only recently started to talk about equipment and the matter of technical assistance.

With regard to funding levels, the states have always maintained that for them to truly benefit from Section 180(c), the funding levels need to remain consistent from year to year with some fluctuation due to the relative impact of shipments. Now, we know DOE is at the mercy of Congress when it comes to appropriations, but we feel DOE should make it a high priority to request sufficient funding for Section 180(c), aggressively defend that request, and then if they have a short fall, commit to fully funding Section 180(c).

Lastly is the issue of funding for shipment operations. In 1998 when OCRWM put its transportation program on hold, the regions moved on to focus on route shipments and other shipments taking place under the Environmental Management Program. The financial assistance that the states received from those programs was not limited to training. They could use the funding to pay for everything, including travel to Regional Meetings, conference calls, shipment tracking on transcom, all kinds of shipment-related activities.

While Section 180(c) limited to training, it isn't clear how or even whether the states are going to be compensated for their shipment-related expenses. Because of the precedent set by these other DOE programs, and because of the shear size of the OCRWM program, the states do expect to have most, if not all, of their shipment-related expenses reimbursed. So, there seemed to be three options, one, the states could charge fees; two, DOE could provide additional funding through some mechanism besides Section 180(c); or three, Congress could amend the Nuclear Waste Policy Act to expand the scope of the Section 180(c) mandate.

The 180(c) topic group is actually looking at the second of these options, and they've begun to compile a list of activities that DOE should consider funding through a separate mechanism from Section 180(c). I expect to see all four regions turn their attention to this matter once we wrap up the work that we're doing with the topic group.

In closing, I just want to make one more routing-related observation. I can't resist. Many states regard the WIPP program as a good model for the transportation program. In fact, in testimony before Congress, and in remarks before the Nuclear Waste Technical Review Board, some very high ranking DOE officials have pointed to the WIPP example as one that OCRWM would follow.

In terms of the financial and technical assistance

for the WIPP corridor states, one of the most critical decisions DOE made was to identify a single route from each shipping site, and then specify those routes in the contracts with the carriers. WIPP could have left decisions on routing up to the carriers, and DOT regulations would do, but it didn't, and I think it didn't because unless the states knew exactly where to concentrate their training activities, they would have to train along every possible route, and the cost of that financial assistance program would have been enormous.

The WIPP program had shipments planned from 23 sites. OCRWM has 77 sites. So, we in the Midwest feel strongly that for 180(c) to work, OCRWM has to narrow the universe of available routes down to a suite of routes, an acceptable suite of routes, and then specify those routes in its contracts with the carriers. And, I know that points to the need for a policy decision to go with dedicated trains, and if that's the case, then so be it.

If we do fact a situation where the states are going to have to train along every conceivable route, then you're going to be talking about real money, as they say.

And, with that, I'll just let you know if you have any questions about the Committee or 180(c) and our involvement in developing it, here's how you can reach either Dave or me. And, of course, now Dave can come up here and

we'll field questions.

ABKOWITZ: Okay, thank you, Lisa and David.

It sounds to me that the next time that the Board focuses on routing, we have a willing participant in the program. I'm going to actually start off by asking a question that's not so specific to 180(c) as it is to just the entire relationship that's evolving between the State Regional Groups and DOE, and what that means and what it doesn't mean.

There's sort of two sides to the argument to how this is--I mean, this is all about stakeholder involvement, and there's two sides to the argument. One is that in order to make any practical sense, DOE needs to reach out to the states and ask them, in a regional fashion, to provide input to decisions related to routing, emergency preparedness, and a number of other things.

The counter-argument to that is by doing that, the agency is marginalizing the involvement of local entities and the public in general. Are you comfortable that as a regional enterprise, that you're able to, you know, be an advocate for these individuals and local constituencies as you're reaching your points of view?

SATTLER: I'm comfortable with our ability to do that in the next few years. Two things to note. One, the Midwestern Committee is unique among the four regions, in that we have

State Legislators serving on the Committee in addition to the governors' appointees. Right now, we have five legislators on the Committee. By the end of the next legislative session, I hope to have ten.

We regard the input from these legislators as being our avenue to reaching the affected public. The legislators who serve on the Committee are usually people who have nuclear power plant in their district, or they're likely to have shipments passing through. So, that's one area in which we try to reach down to the grass roots level through legislators, and their role is to take it back to their colleagues in the legislature and make sure that they are aware of what it is that this Committee is doing.

The second thing is one of these special projects that Gary talked about in his presentation, from us, we proposed a local workshop. We'd like to pilot test a workshop in Minnesota near the Prairie Island Plant, and bring together the county, the affected cities and towns, the tribe, the power plant, DOE, the state, have everybody together to talk about what it is that this Committee, this State Regional Group, is doing with regard to having input into the planning process, and make sure that they are aware, one, that we're doing this, and, two, that we would like their input. We would like to take their concerns and their comments back to our group to discuss, and then pass this on

to DOE.

Our goal is if DOE funds this special project, that we'd be able to do this in the spring time frame, and then if it's successful, and I trust it will be, we would, in future years, request more fundings to go out and do this in more states and in several locations within each state.

CROSE: Mark, can I follow up on that real quick?

ABKOWITZ: Sure.

CROSE: To give you a quick example, when we had the funding given to us for the West Valley shipments, WIPP shipments, what we did is we'd go out and take the training to the local responders, and we'd take the training to them. We do not make them come into like a central location. And, also any time we have a shipping campaign that DOE lets us know about, we contact all the local communities along that shipping corridor through the state of Indiana. We contact the fire chiefs, emergency medical directors, elected officials.

To give you a quick example, when the Frenault shipments started about three years ago coming from Ohio, coming out here to Clive, Utah, there's a 60 car shipment that goes through every two weeks, we held public hearings along that shipping corridor. We had DOE officials there. We had officials from our agency there. So, we let those people know exactly what was going to be going on. And,

that's, we're a strong hold rural state, and that's the way we operate.

We've trained over 4,000 responders in the State of Indiana along shipping corridors that were specific to DOE shipments up to this time. And, we furnished instrumentation along those shipping corridors, and we've also given technical level training to HAZMAT response teams.

ABKOWITZ: Okay, thank you. Ron?

LATANISION: Latanision, Board.

If the DOE were to adopt HMEP or a modified version of it, and if that were to give states the local control that you both advocate, what provisions or mechanisms are in place to ensure or measure or determine the effectiveness of the preparation in a given state? What provokes this thought is Lisa's comment that was relevant to the shipment of these two casks to Idaho, that one state came forward with a proposed budget of $2,500, and another with $100,000. What assurance would you have that both states would be adequately prepared. I mean, it isn't just a question of money, of course, but what's the reason for that big discrepancy, and how would you ensure that all the states in your region would meet some sort of effectiveness or preparedness standard? How would you deal with that?

CROSE: You need to do a needs assessment to see exactly what is needed along that shipping corridor as far as

training, equipment. This is one of the things that was done, started about two years ago in Homeland Security. That still is an ongoing evolution each year. Like, for example, all the states have to do this. You had to go out to the local level, and they do their own needs assessment on what they needed, and tell us that. And, you do the same thing for this specific shipping campaign. You would do that, you'd get needs assessment.

The money issue, we're one of the states in the country that have fees on high-level and low-level, and one of the reason our legislature back in 1995 decided to set a high-level fee, was in case we needed more money than what 180(c) would make available to train responders in our state. And, you're talking about the inequity in funding, so that's it.

LATANISION: I understand the issue of training, but how do you determine whether the training has been effective? I mean, is there a mechanism for doing that?

CROSE: Oh, yeah, you have, like, you do testing and you also do exercises. Exercise is one of the best ways to see if your training is effective. And, it was mentioned earlier about having exercises to see if your responders, how they respond, and you critique those exercises.

LATANISION: But, let's return to the two states that were in question. How do they come to such disparate

requests?

SATTLER: I think what we're going to face, no matter what approach DOE takes, is that states just do things differently. And the State of Illinois, for instance, they charge a fee on shipments, and they provide with that fee, they do an inspection at the border, and then they escort the shipment. It's not just a security escort, it's also the people who are going to respond first. The state has a team travel with that shipment. That's not the approach that every state takes.

So, in Illinois, you have a situation where they're not going to go out and do awareness level training all along the route and reach out to first responders and make sure they know how to handle an accident. That's not what they do right now, because they have the state team escorting it.

In Iowa, their approach is to train regional HAZMAT teams. Everybody will get awareness level training. There are 11,000 first responders along the probable routes through Iowa, and they're all going to get awareness level training. And, then, the regional HAZMAT teams will get additional training.

Those two approaches are very different, and they're going to cost different amounts of money. Illinois is not going to need as much from Section 180(c) to go out and do this first responder training, because that's just not

what they do. So, to some extent, I don't think you can avoid a situation where you have one state saying we need $1,500 for travel to go out and do awareness level training in a couple of counties, and another state saying we need $105,000 because we want every hospital to be trained at the facility, you know, not bring them in and do a big training session, but go from one hospital to the next all along that route, and training for everybody, and new equipment. You're never going to avoid that situation.

That's why a formula based approach, it sort of gets DOE out of being between a rock and a hard place if they can say well, here is what you're going to get under Section 180(c). Then, the states that might be inclined to do more than other states, perhaps more than other states would feel is necessary, those states will have to rethink what it is that they were going to be doing with that funding.

LATANISION: You know, I hate to belabor this, but that answer doesn't give me very warm feelings, I have to admit. I mean, if a state, given this local control, can make decisions that are so wildly different as what you've just described, then what assurance is there that both are prepared to deal with an emergency?

SATTLER: Well, getting back to the home rule issue, it's the states' determination. If Illinois is comfortable with the idea of having emergency response escorts accompany

the shipment, that is their prerogative. They're not going to try to--

LATANISION: Why would you oppose a universal standard that's country-wide, nation-wide?

SATTLER: You were asking earlier about the schedule?

LATANISION: No, I'm really quite serious. That could be one theory.

SATTLER: And, I'm serious, too. Dave?

CROSE: Different states, just for example, we've gone to the State of Indiana, all the fire fighters have to be trained to at least operations level. That's a change from previous years. They used to, and there's some states probably still train to the awareness level for fire fighters. I'm talking about HAZMAT training now, to meet certification for fire fighter standards. But, pretty much across the country, there is no standards.

As I mentioned earlier, the standard, 1910/120 OSHA standard says that the employer is responsible, that the employee that's involved in response is trained to the level of response that they have to make, and that's the reason that's the national standard, and that's what you do. You train to that, and different states do it differently.

And, for example, a lot of our larger fire fighters in the State of Indiana, they're training, when they have fire fighters go through a fire training academy, they're all

being trained to the 80 hour technician level for HAZMAT response, which is higher than a lot of communities in the country. Is that the answer to your question?

LATANISION: Thank you.

ABKOWITZ: John?

GARRICK: Garrick, Board.

I had some of the same questions of trying to resolve the issue between the DOE need based approach for awards and the formula based approach, and I think you've clarified some of my concerns there. But, I also have a concern. Let me ask you how do you get this resolved? When will this issue be resolved?

SATTLER: The issue of whether to go with needs based?

GARRICK: Formula based?

SATTLER: Well, as Dave mentioned, the four State Regional Groups now have that proposal with the 30, 30/10 split. We're all going to meet with the Committees in November and December, and just try to get each regional group to buy into that formula or propose an alternative to take to the other groups. And, after the last meeting, which is the first week of December, we'll get together and see can we go forward with this proposal to DOE. That December 7th and 8th topic group meeting in D.C. is, I hope, the point at which we'll be able to present our compromise solution.

GARRICK: So, you have to get the states to agree, and

then you have to take whatever you agree to to DOE?

SATTLER: Yes.

GARRICK: To get their buy in? And, you think that's going to happen in a few months?

SATTLER: I do.

GARRICK: Amazing. One of the things that fascinates me is that when I look at where this institutional issue fits in the grand scheme that Gary presented to us this morning in his Slide 20, and I see the list of unresolved issues that you have, and how few boxes you occupy in this total of 1,191 activities associated with getting to a point where you can make a decision about rail system, I can't help but believe I'm looking at Mission Impossible.

How are we going to possibly get, you know, if you look at each box and you conclude that they each have an equal number of unresolved issues, there's an old probabilistic assumption called the Hume's Assumption that kind of tells me that the coordination and integration issue is monumental and may be beyond comprehension. How are you going to play your role in such a way as to not be--as to be part of the solution rather than part of the problem?

SATTLER: Oh, we completely feel we're part of the solution. I mean, that's one of the reasons why for years, we used to hammer the argument that the State Regional Groups, and actually I don't like that term, we're just the

regions, DOE coined the term State Regional Groups, but that the regions can be--we can be an ally to the Department, not by promoting the program. In the Midwest, we accept the fact that these shipments are going to come through. We have a lot of nuclear waste that we want to see taken somewhere, whether it's Nevada or somewhere within the Midwest, we have to be a part of the solution, not stand in the way.

And, I think the fact that DOE came out with the Transportation Strategic Plan that labelled the four State Regional Groups as the anchors in its collaboration with the states, I think that says something about DOE getting the message over the years that the Environmental Management Program worked with groups like this one, that we can help them with their transportation program.

The ideas that we have are not in any way intended to stand in the way of this process. We want to see it work, too. We have a lot of rate payers in the Midwest who have seen their investment, well, I won't say squandered, but not exactly pay off. So, whatever we can do to help without compromising our objectivity and independence, we're willing to do that. That's why the issue of routing is one that is upsetting me right now, because we feel like in the Midwest, we have a workable solution to route selection, one that can be accomplished more quickly than the one DOE has proposed, and with fewer headaches, I think. And, it's frustrating to

us that, you know, what seems obvious from the Midwestern point of view, is not so obvious to the other three regions, or to the Department of Energy.

We will continue to work in good faith on the projects that we've outlined in our scope of work, and in the Midwest, we produce a lot for this project. We take great pride in the work that we do with DOE.

GARRICK: Are you equally optimistic about resolving your unresolved other unresolved issues?

SATTLER: The list of unresolved issues?

GARRICK: Yes.

SATTLER: Yes, I am. I'm not optimistic about the possibility of DOE coming up with an additional source of funding to cover the operations, costs for the states. I think many of the states, in the 1990s while developing the draft policy and procedures, I don't think it occurred to anyone that Section 180(c) would not fund these activities. The plain language for training seemed to have escaped notice, I have to say, and it was only after the states in the Midwest started to receive with funding, and we started to realize all the activities that, you know, all the things Dave and his counterparts in the other states do in order to coordinate a shipping campaign.

It was only after we realized the scope of that task that we started to think, well, wait a minute, you know,

everyone is counting on Section 180(c), and that money is only going to be for training, the issue of equipment. Right now, the policy and procedures, there are caps on equipment purchases, which we don't think there should be, but also you can buy the equipment for training, but can you use it for an actual response to an emergency, or to conduct an inspection at the point of origin. That's not clear. It's worded in such a way that it might be possible.

So, that is the one issue that I do not think will be resolved to all four regions satisfaction. However, I will note that there are five, and possibly by the time this shipping campaign starts, there might be eight or ten states in the Midwest that charge fees on shipments. And, if DOE does not make an alternative source of funding available, those fees will suffice.

GARRICK: Thank you.

ABKOWITZ: Okay, thank you. Andy, you have the last word.

KADAK: Kadak, Board.

I'm still hung up on Ron's question of assurance of adequacy relative to preparedness. And, let me just phrase it in a way that is a proposal. If your first objective is to be aware that you have a problem, and let's just take the Illinois example where they've actually put people apparently on this train with the shipment, what if the DOE were to,

say, establish a dedicated train with people on the train in the caboose that would provide the awareness, would that greatly simplify the overall need for training and response if awareness is the first priority?

CROSE: I think that we probably need to have local responders just be able to be aware that there is, like, radioactive materials, if there is an accident, whether it be a train or truck shipment. But, with them having people on that train, for example, West Valley was that way, DOE had people on there with monitoring equipment, and so forth. They would be right there at the scene, and it would involve a quicker response. But, the states would still have to have local responders like, say, a HAZMAT team cover that scene until DOE could get other people besides who was on the dedicated train to the scene of that location. Does that answer your question?

KADAK: What I'm hearing you saying, I think you said it would make it easier, because you've already been trained to a certain standard in the HAZMAT area.

CROSE: Right.

KADAK: And, the big issue is radiological protection, I would guess.

CROSE: For example, what we did, we have all our people, like fire fighters, trained to the operations level, we just have to go back and make sure they are trained to the

appropriate level as far as radiological materials. And, we talk about awareness of radiological materials, you're basically talking about just being able to read a placard that says it's radioactive material, and then--I mean, I'm making it real basic now, but that's sort of what we teach first responders, and then just back off, and then call in what we call regional HAZMAT team. We have 37 of those teams in the State of Indiana, and they're all within like 60 minutes probably, and they've got additional protective gear, plus, they have a lot more sophisticated monitoring equipment, and so forth.

KADAK: Thank you.

ABKOWITZ: Okay, thank you.

We're now going to move into our public comment period, and there are eight people that have signed up to speak, and I'm going to take them in the order that they signed up. What I'd like to ask each of the commenters to do is to actually use the podium in the front so everyone has an opportunity to see and hear from you. And, when you get to the microphone, if you'd please identify yourself so that the transcript can appropriately recognize you?

And, I will apologize in advance if I mispronounce names. I will do the best I can, based on the handwriting that I am looking at.

Our first speaker will be Dan Beets, and in the on

deck circle will be Bob Halstead. I might also point out that if you go longer than five minutes, I'll probably start saying something. Thank you.

Okay, Dan is finished with his public comment. So, we're off to a roaring start. Bob, you're up, and Jim Reed is in the on deck circle.

HALSTEAD: Bob Halstead, Transportation Advisor, State of Nevada Agency for Nuclear Projects.

Thank you for the opportunity to make some comments on the topics discussed today. I've provided the Board relative to Topic Number 1 with copies of the lawsuit filed by the State of Nevada against the Department of Energy regarding the selection of the Caliente Rail Corridor on September 8th of this year. And, that is Issue Number 1, the DOE selection of the Caliente Rail Corridor.

To make a long story short, the Caliente Rail Project would be the longest new rail construction project in the United States in the last five to eight decades, about 319 miles long, cost estimated ranging from less than $900 million to more than a billion and a half dollars. The only comparable private sector project is the Dakota Minnesota and Eastern Powder River Basin extension approved by the Surface Transportation Board, and possibly it will start construction next year, and possibly that one won't.

So, this is, by railroading standards, a big

project. And, our lawsuit reflects the fact that since 1995, we've been advising DOE that they should have chosen northern access corridors and not looked at the Caliente Gene and Valley options. And, the lawsuit says simply that DOE has not provided a legally sufficient environmental impact statement. They've usurped the regulatory jurisdiction of the Surface Transportation Board, and they have not adequately examined the impacts of a hybrid transportation mode legal weight truck casks on rail cars.

And, specifically, we believe that the data in the Final EIS does not support selection of the Caliente Corridor. We also believe the Final EIS does not provide a legally sufficient analysis of the impacts that that corridor would have on the specific uses of land, and current users of land along the corridor, and specifically impacts on ranching and mining, the cultural resources, including, but not limited to that big sculpture installation that Gary referred to, Heitzer's City (phonetic), and also impacts on Las Vegas.

Let me briefly go over a couple of other issues in my three minutes here. Issue Number 2, radiological risk modeling. I thought that Dr. Weiner gave a very thorough overview of RADTRAN and its relationship to RISKIND and TRAGIS. It's very important, and I will not go into the detailed critiques that we have made of both the use of RADTRAN and some supporting documents like NUREG, CR-6672. I

state them for the record. What I'd like to say here, and obviously, Mr. Chairman, I'm fishing for an opportunity to come back at greater length and explain those differences of opinion.

It is no small accomplishment that the major participants in the debate over RISKIND impact now almost uniformly use the primary model developed at Sandia National Labs, and the associated models, including RISKIND, developed at Argonne, and this is a very significant development, that whatever disputes we have, we now largely hammer out those disputes using common models. We may disagree over the assumptions and the data inputs, but this at least has made the debate more civilized, and perhaps more likely possible to resolution.

Issue Number 3, security risk assessment. Nevada is encouraged by and supportive of the approach that DOE is currently taking. It acknowledges the serious threats to transportation, and the significant consequences. We believe that DOE has been much more responsive than the NRC, which five years after we filed our petition for rulemaking in 1999, we have still not heard anything substantive from the NRC. We would say specifically the definition of radiological sabotage has to be expanded to include economic sabotage.

Issue Number 4, NRC role in regulating Yucca

Mountain shipments. I helped write that line, which in the Act in '82, I believe that Congress assumed that NRC would regulate these shipments. Think of it logically, NRC regulates the shipping sites, NRC regulates the receiving site, NRC doesn't regulate the shipments between the two, and we believe that Congress should reconsider this issue, certainly to assure the public that the NRC QA/QC provisions, and other provisions apply to these shipments, but also because there's a delicious opportunity for the State of Nevada and other states to assert jurisdiction over the regulation of these shipments because the normal constraint of federal preemption does not exist.

Finally, Issue Number 5, and I'm wrapping up, Mr. Chairman, regarding the NRC's proposal for full-scale cask testing. Earl had it right when he said all these cask testing programs had warts. And, I sure wish you'd invite me to come back and spend 30 minutes telling you about 30 warts. The bottom line is that the cask testing program that is currently being debated at the NRC does not reflect the demands that the stakeholders made during an otherwise admirable three year process, where the stakeholders said they wanted, one, regulatory confirmation testing; two, testing to failure. And, now we have a 40 plus million dollar testing proposal that doesn't answer either of those questions. The State of Nevada will make an effort to

present our views to the Commission.

Ironically, if you read the Commissioners' individual comments on the staff proposal, they sound a whole lot like the State of Nevada's critique of the staff proposal. So, it's possible we'll be able to resolve this at the Commission. But, it should be understood that the State of Nevada's Congressional delegation is preparing, both through the budget process and through direct legislation, to redirect the NRC's cask test program, so it reflects the needs that were expressed by the stakeholders.

Again, thank you very much for the opportunity to make these comments.

ABKOWITZ: Thank you, Bob.

Our next commenter is Jim Reed, and Irene Navis will follow him.

Jim, Andy would like to ask a question of Mr. Halstead, so if you'll just stay there, that's fine. Bob, if you'll kindly use this microphone right here?

KADAK: Kadak, Board.

I wish you had more time, because I'm new to the Board, and I'm not familiar with many of the issues that you've raised. And, I guess what I'm interested in is you have documented all these things somewhere else, or do you have something available in writing to explain some of these issues in a shorter version?

HALSTEAD: Yes, we have provided them in a number of conference papers, and comments. And, some of these have been made available to the Board, but I would be happy to put a package of materials on these five topics together as a follow-up action and send that to you in the aftermath of the meeting.

KADAK: Thank you.

ABKOWITZ: Thank you. Jim?

REED: Yes, thank you, Chairman Abkowitz. Jim Reed with the National Conference of State Legislatures. I'm the Transportation Program Director there.

I did present to this Panel last year in Las Vegas, and I appreciated that opportunity. In a second, I'll talk about the book I just handed out, but briefly, NCSL is a national organization that supports the 50 state legislatures, are members of the 7,400 state legislators who are elected in each state, and the 35,000 or so staff that assist those legislatures. Our job is to provide information to them on a variety of policy issues that they are dealing with in their legislatures from education, health, transportation, the environment, really anything a legislature would take up.

As part of that charge, we have had cooperative agreements with several federal agencies over the years, and we have worked with DOE for 20 years now with a cooperative

agreement. And, the basic goal there is a two-way communication between the Department of Energy's staff and contractors, and with the state legislatures who are part of our various committees that are interested in this, as well as legislative staff. We've had a strong transportation emphasis over the years.

Needless to say, and I think Lisa alluded to this a little, the states have a variety of views on all these issues, and individual legislators within individual states have a variety of views. So, one size certainly doesn't fit all on a lot of these issues.

A recent significant effort is this book I've handed out to you called Spent Fuel Transportation History Status and State Involvement. We tried to put together kind of a plain language report here that is intended to help state legislators and other interested parties to evaluate the safety of spent fuel transportation in their state, give some background on DOE's program, a brief history of spent fuel transportation, the overall regulatory structure, and what states have been doing over the years to make spent fuel safe.

So, I would commend that for your attention. Others that are interested in that document, if you'd leave a card with me, I'd be happy to get that to you in the mail.

In closing, let me mention one new development

that's related to some of the issues we raised in the book. One of the topics of the book is the State Permitting Process. A number of states do issue permits for spent fuel transportation, as well as other HAZMAT, hazardous materials.

The federal government has recently gotten into the permitting business as well. Under a new federal rule that just came out recently, starting next year, the first of January, the Federal Motor Carrier Safety Administration will issue permits to motor carriers of hazardous materials in four categories. And, one of those is highway route controlled quantities of radioactive materials. The others are poison gas and explosives, kind of the high risk, and this relates to, of course, the greater concern over terrorism.

Actually, Congress passed this a long time ago. It's been on the books since 1990, and it simply was not implemented until recently. Essentially a lawsuit by a public citizen forced the Federal Motor Carrier Safety Administration to do this. What they're using now is a security enhancement in transportation.

One of the nice features about it, states are always concerned about some duplication, as are carriers, duplication of efforts. One of the nice features is states that have equivalent programs will be able to issue--will be able to do a review of the carrier and a federal agency will

issue the permit automatically essentially, if the carrier passes the state review of an equivalent program.

So, that was something I wanted to bring to your attention. I'd be happy to talk about it at another time, or you might want to invite the Federal Motor Carrier Safety Administration to discuss that as well.

Thank you for your attention.

ABKOWITZ: Thank you, Jim. Irene Navis is next, and Gracian Uhalde is in the on deck circle.

NAVIS: Good afternoon. Irene Navis with Clark County Nevada's Nuclear Waste Program. I'm the Program Manager.

I want to thank you for conducting this meeting in a Western state to allow those of us out here the ability to get here easily and hear all of the good information that we heard today, and also to participate in a public comment period.

I wanted to call your attention to an article that was in our local newspaper, the Las Vegas Sun this past Sunday. It's called Moving Deadly Cargo, and despite its ominous title, it's a pretty balanced and lengthy article, and I'd like to just give you a few highlights from it, but I hope that you will be able to print this article off the state's website or off the Las Vegas Sun website. The date on it is Sunday, October 10th.

A couple of key issues that were discussed in this

article covers a time frame of shipments by rail, 1975 through May 2004, it talks about a number of accidents that occurred just in Nevada alone, 497 non-crossing train accidents, 274 were trains and motor vehicles actually collided at roadway crossings. This included 119 fatalities and 2,742 injuries.

Another issue that was addressed in the article is across the United States, the lack of inspection resources, and, of course, that impacts the condition of infrastructure and adequate assessment of security issues. The article also goes into quite a bit of detail of the risks and impacts related to human error that we've heard something about today as well.

Another issue that I want to talk to you about relates back to the time that your Panel came out to Las Vegas last year and heard from the state and local governments regarding impacts to our communities related to the shipments. I want to remind you of our public safety impact assessment that addressed $360 million worth of impacts for unincorporated Clark County, five cities within Clark County, and two tribal entities within Clark Counties boundaries.

I wanted to bring that up to you again to let you know that we are planning, through our 2005 work plan, to do an update to that public safety assessment, focused on a

mostly rail scenario.

One of the things that was brought up today was an issue that we brought up many, many times in several forums where we talked about that there's no overarching agency currently responsible and accountable for all program areas related to Yucca Mountain at the repository itself, and also the transportation campaign, and that remains a concern to elected officials in Clark County, as well as many of the residents that I've talked to over the last three years I've been responsible for this program.

We believe that one way to ensure that these things occur well is to ensure effective enforcement of NRC conditions of license approval. We believe that that's going to be state and local government's best hope in this regard, and we hope that that's a recommendation that you all can make to the NRC and to the DOE in this arena.

One of the other issues of concern for us is the inability to accurately assess what mostly rail means in terms of some truck shipments for each of our communities. And, this is due to many of the things that Gary talked about earlier, and others, uncertainties in funding, planning, timing, and the policy decisions that are yet to be made. And, it's perfectly understandable, given the funding constraints that the Department is operating under, but there are lot of us sort of hanging in the balance waiting for

these decisions to occur and progress to be made in these areas.

Also, I want to point out, and I think I heard this from one of the Panelists, as well. Rail preference does not mean rail certainty. We believe that even though WIPP is a good example of many good things that can happen in a shipment campaign, it's also a not so good example of certain things, like a rail spur that was built and has never been used, or a ten year delay in a shipping campaign. So, those are a couple of areas that we look at for examples of what might happen to Yucca's shipments as well.

And, finally, I want to just say that the uncertainties related to fuel mix, routing, and the impacts to communities, all reinforce our view that a national transportation EIS should be conducted related to Yucca Mountain shipments.

Thank you for your time. We appreciate seeing you again, and being able to present our views to you. Thanks.

ABKOWITZ: Thank you, Irene. We're now going to hear from Gracian Uhalde, and I have Jason Groenewold in the on deck circle.

UHALDE: Good afternoon. I'm Gracian Uhalde, and I had the chance to speak to you in January, January the 20th, in Las Vegas. I would like to bring you up to date with my experience with DOE from there as far as I've encountered it.

I see there's new people here, so I'd like to go back in the past a minute. I don't think I can do as good as Bob Halstead and be done in three minutes, but if I get to jumping too fast, or something, and you have some questions, please ask.

In January, well, the first news that I got from the DOE that the train or the railroad was going to come through any part of my life, or anything like that, was when it was in the Federal Register in the end of December. No one at that point came and talked to me. And, since then, things haven't changed too much.

When I spoke to you in January, after that, first of all, let me give you a little family history, because I think there's some personal issues here, or human parts of this story that should come out to some extent. My grandfather immigrated from France in the late 1880's, early 1880's, about '81. I'm the third generation rancher next state over, Nevada. I live at the end of the dirt road, and when I say that, I really mean it. To get here today, I got up at a quarter after 3:00, drove 40 miles of dirt road. It doesn't matter what direction I go, there's 40 miles of dirt road to the first highway.

I drove over 400 miles to get here. I apologize because I missed Mr. Lanthrum's first talk, and maybe he shed some light on some issues that I'm concerned about and are

going to be repetitive. As I said, my grandfather came here in the late 1800's, started our ranch. I'm the third generation. I've got a daughter and four sons. The daughter is a veterinarian practicing in Idaho. Two of the four sons have graduated from college and came back to help me run the ranch. The other two, one's a senior at Notre Dame and he's going to graduate as an electrical engineer. The youngest son is going to school in Montana, and he's going to graduate next year, hopefully, in Secondary Education. So, he can come home and help in the summers. So, the basic point here is my children want to come home, and they will be the fourth generation.

Okay, since January, sad but true, not too much has changed. Since no one had contacted us in the beginning, and I understood in January that this had been studied for 20 years, I don't know how many man hours or how many millions of dollars had gone on through into this study, it seems like it's been an immense task listening to the people. Since no one decided to contact us, we thought, well, in my training growing up, my folks told me, you know, if you've got a question, ask it.

So, we got together and sent a letter to Secretary Abrams, who is with the Energy Department, sent a letter to Secretary Norton of the Interior Department, and what we asked was four basic questions. We'd like to know how this

rail is going to affect us, our family, our ranch, and our neighbors. And, the four main concerns we had was during the planning stages, during construction, during operation, and during closure.

We got no reply. Thank Heavens, the end of July, Mr. Lanthrum sent me a letter signed by him personally, and as many hats as he wears, I figured that was quite an effort. Along with that, he sent a disk, and things sad but true, I'm totally computer illiterate, I'm kind of proud of it. The day I have to sit at a keyboard and a screen to run my life, I think I'll jump off a cliff someplace. Anyhow, so basically, your disk has not done me too much good.

In Nevada, or in most BLM grazing districts, and things, our biggest concern is the BLM. We have Forest Service permits. We have BLM permits. To give you an example, what we call where I live is the South Ranch, we have four basic grazing allotments that cover just over 175,000 acres. The railroad is basically going to dissect them. I've got some neighbors in between that the railroad is really going to go right through their allotments, and part of one of our allotments, if it's the Caliente route, as it looks like it's going to be now.

Along with sending letters and not knowing too much about the computer world, I wrote Mr. Lanthrum back a letter and asked him to please send his knowledge in writing to me.

On August 16th, the Grazing Board, which is kind of a representative organization of ranchers themselves that elect people, sent a notice that there were going to be two meetings in Pioche on August the 16th. And, so, I made plans to attend the second one. One was at 1:00 p.m., and one was a 7:00. This was very illuminating, I have to tell you. I spent a lot of sleepless nights.

There were five or six DOE people there, several range managers. DOE has contracted with Resource Concepts, which is a resource outfit out of Currant City, very well respected. I'm very familiar with them. They do very good work. They're reputable range people, and when you start talking about range out in Nevada where your precipitation is ten inches or less, I mean, any disturbance is a critical issue.

So, anyhow, I attended that meeting, and lo and behold, they wanted us to help them. They needed to know how this rail line was going to affect us. Well, folks, I haven't gotten an answer yet. I don't know how high the railroad tracks are going to sit, how high the bed is going to be, if it's going to be fenced, if there's going to be underpasses. I mean, I've got a million questions. Most people are focused on the mile wide corridor, but like I say, we've got 175,000 acres, kind of on both sides, that we manage. I need some answers before I'm going to give some,

you know, before I know how it's going to affect us.

There were five or six DOE people there. I asked them some pointed questions. I asked them the questions that I've just said, some of my main concerns, you know, we don't know how, how are we going to answer you what it's going to do to us when we don't know what you're going to do. I mean, that's pretty simple. How many gravel pits are you going to have. Where the water is going to be located. How many people are going to come into this country? Our values are basically undisturbed. I mean, when I say I just live at the end of the dirt road, it's not a gravel road. I mean, you take your chances and you go on your own.

Then, all of a sudden, on the 16th, they want us to help them, us to tell them what's going on out there. I mean, there's something drastically wrong with this picture. Here, they've been 20 years, how many millions of dollars, how many man hours, and all of a sudden, they need a dumb sheep herder like me to tell them what's going on out there? I mean, to me, there is something drastically wrong with this picture. And, I really don't mean to be disrespectful of the DOE or anyone else. I'm trying not to be. I don't want to be. But, the reality is somewhat different, or my reality anyway, maybe sheep herders live in the past, I don't know.

And, I think that's about all I have. I asked you

folks to keep their feet to the fire in January, and I appreciate the chance to come back and talk to you and kind of tell you how it's been and what it's gone to since then. As I think I said, or meant to say, we didn't get a letter back from either Secretary Norton or Secretary Abrams. Gary Lanthrum did take the time to do it himself. I don't know where we go or what we do. All I can tell you is I'm still spending sleepless nights, and I'm not getting many answers. And, if you have any questions, Good Lord willing, I can answer them.

ABKOWITZ: Okay, thank you. First of all, I appreciate the distance that you travelled and the time that you got up in order to be with us today. That's certainly appreciated.

Before you got here, there was some discussion about ranching issues with Mr. Lanthrum, and he indicated that there was an open process for collecting information, such as the kind of information that you want to be involved in, and I got the impression that you can get with him on this matter, that knowing where your water is and where your grazing areas are and what the patterns are of your livestock, and so forth, are the kinds of considerations that they want to take into the planning process.

So, you do have a contact there, and I would encourage you to work through him, see if we can get some of these issues addressed.

UHALDE: Mr. Abkowitz, one more thing I'd like to add is that this process, they needed my information telling them how it was going to affect me within three weeks, so they could get it in a Transportation EIS. Now, like I say, it's been 20 years and an umpteenth amount of hours, and they're going to give me three weeks to tell them how it's going to affect me. I'm somewhat ruffled.

Thank you, folks.

ABKOWITZ: Appreciate it. Thank you. Jason Groenewold is next, and then he will be followed by Dianne Nielson.

GROENEWOLD: My name is Jason Groenewold. I am the Director of a local group in town called the Healthy Environment Lines of Utah, or Heal Utah. And, I would like to thank the Review Board for coming to Salt Lake City and holding this hearing, and asking the questions that have been asked today.

The issue that comes to mind, especially from the previous testimony, is that to me, it seems unfair that the states, the two states that are going to be bombarded and affected most by these proposals are the ones that didn't produce the nuclear waste that could potentially be coming to our communities. And, just as a fairness issue, it seems unfair that we're the ones that are going to bear the brunt of the burden for the shipments of nuclear waste.

I have a couple of comments generally, and one of

them has to deal with security of the shipments themselves. It was discussed earlier that the Nuclear Regulatory Commission is planning a series of tests, but it wasn't at all clear to me whether or not those tests would include some realistic scenarios that played out in the studies that were done about terrorist attacks, and whether or not those would be put to a test to find out whether or not these nuclear waste casks could actually withstand a terrorist attack on them. And, I would like for the review board to encourage that type of assessment to be done, given where we stand today in a post-September 11th world.

The other issue that wasn't clear to me as it related to security is who will actually, at the end of the day, review the work that was being done on security measures and the assessments and scenarios that were being put forward by the Department of Energy in their consideration of what the plethora of attacks that may occur.

Another issue has to deal with the integrity of the waste casks themselves. It was difficult to understand if tests could be done in Germany on specific scenarios, why it is that we've gotten this far in the process and those haven't been done yet to date here in the United States. And, when it was pointed out that the casks that were tested in Germany are uniquely different than what we plan to utilized here in the United States, it makes me wonder if

that isn't worth the investment to go ahead and run through a few scenarios.

I understood from the NRC that they plan to test one cask, and I guess one of the questions that brought up to me is is that the only cask then that would be utilized in the transportation of this material. And, the second part of that had to deal with the computer modeling. If, for whatever reason, the computer modeling is invalidated as a result of those tests, what gives way? Do we assume other computer modeling that has been done up to this point is invalidated and, thus, we have to do more physical tests to try and get computer models to match up with the physical tests themselves? I would just encourage a very thorough review of that, given that we're planning on, you know, at least two decades of nuclear waste transportation based on the assessments that will be done as a result of this activity.

The third issue that came to mind had to deal with the emergency responders. And, that being how much resources are available for local communities. There was a fair amount of discussion about that. But, you know, we have situations here currently where just recently in one of the local papers in Davis County, which is just north of Salt Lake City here, one of the emergency responders talked about how if there were any type of major accident, that the equipment they have

available is quite outdated at this point, and wouldn't be sufficient, in his opinion, to handle any type of major activity.

And, so, we would ask that there be guarantees that there's some kind of baseline for emergency responders who would be the people putting their lives on the line in a potential situation, to make sure that they have adequate resources.

And, it brought up questions of if there is an accident and we have numerous shipments that are moving across the country, what happens if there is a bottleneck? For example, what if we have an accident on Interstate 80 coming through Salt Lake City, and it causes that corridor to be shut down for some time, will shipments be stopped at the point of origin, or have to return to the point of origin if that's a significant duration of a shutdown?

Same with the rail shipments itself, you know, to make sure that that coordination doesn't result in nuclear waste stockpiling along the way in rail yards if there's a delay in the process.

Also, if there were a leak that were to occur and it resulted in having to excavate either a portion of the interstate highway system or rail system, what happens to that waste material itself. Will that follow the shipment? If there was an accident with the shipment, would the cask

return to the point of origin, would it be sent on to the disposal, would it go to the nearest reactor?

And, then, you know, I guess the final issue that I wanted to talk about had to deal with private fuel storage. And, while the discussion has been focused largely today around Yucca Mountain, I know that it will shift gears tomorrow to private fuel storage proposal, we lack a lot of specificity with what the plans are related to that proposal, yet they seem to play off of each other.

And, one of the major issues of concern is if your computer modeling or tests or assessment of physical tests on a cask is done right now with a cask built today, what about 40 or 50 years down the road after it's been subjected to substantial amount of heat, it's been in an open desert in a fairly hostile environment, what will the integrity of a cask be at that point? And, why is it that we're here at a point where a license is being considered to be issued, but yet there's no real discussion about, you know, the exit strategy and where the waste will move once it gets here.

So, I appreciate again your attention to these issues, including Salt Lake City in the discussion, and I would hope that, you know, we continue to rigorously ask pointed questions to make sure that as this proposal continues to go forward, we don't end up in a situation where, you know, the public is adversely affected.

Thank you.

ABKOWITZ: Thank you, Jason. Dianne Nielson is next, and then she will be followed by our last commenter, Pete Litster.

NIELSON: Mr. Chairman, members of the Panel, I'm Dianne Nielson. I'm the Executive Director of the Utah Department of Environmental Quality. Thank you very much for travelling here to Utah for this meeting.

I have just a follow-up question to the discussions this morning concerning the RADTRAN model. And, as I understood the discussion, the model is going to be utilizing a dose rate for an adult male. There's been significant research recently on environmental exposures for both children and pregnant and nursing women. And, in fact, a recent Safety and Licensing Board decision specifically directed that there be a dose limit consideration for children.

And, so, my question is how Sandia and DOE are establishing utilizing and evaluating doses for children and pregnant and nursing women within the model, RADTRAN as well as other models that they're running? If they are not doing so, why not? And, what differences do those evaluations or those doses make in the outputs from the models?

ABKOWITZ: Okay, thank you. I'm going to ask Ruth Weiner to address that question.

WEINER: I'll be glad to address it, and thank you for pointing out something I simply didn't have time to go over.

We use in RADTRAN the breathing rate, the defaults that are the breathing rate and dose conversion factors for adults. However, if you want to assess the risks for female, for children of any particular age, you can put in the values for those. We have used, for dose conversion factors, that is, the factor that relates the curies taken up to the dose, we use ICRP 72, or Federal Guidance Report 13. And, these also, we had to put some values in for people to use. But, you're perfectly free to substitute the values from Federal Guidance Report 13 for children or pregnant women, or any organ doses that you feel you want to substitute and calculate the risks that way. RADTRAN just sees numbers, and you can put them in.

NIELSON: Mr. Chairman, if I might follow up, I guess my request is not that we would have to do that, or the evaluation ourselves, but that DOE would make that information available, and the calculations and interpretations specifically relative to those populations.

WEINER: If we have a project to do that, we'd be happy to do that.

ABKOWITZ: Okay, thank you. Our last commenter is Pete Litster.

LITSTER: I also want to thank the Technical Review

Board for coming out to Utah. As we're all here to discuss, we have a lot of issues out here in the Great Basin. All sorts of nuclear issues going on out here in the Great Basin. I'm the Director of the Shundahai Network. It was started ten years ago, as a cooperation between long-time nuclear disarmament activists and indigenous communities who were concerned about the exploitation of their ancestral lands for nuclear projects. And, on a weekend about five days, I was on the Skull Valley Goshute Reservation, put together a political event to discuss the private fuel storage facility, and braved, you know, 50 to 60 mile an hour winds, punishing sand storms, and a location that, you know, is subject to extremes of heat and cold, depending on the seasons, all sort of things like that.

Most of my comments some from observing the process today. One question that came out of the discussion of the Section 180(c) presentation was I had a question about what's the reason the Department of Energy has been trying to sunset the tribal topic group, and what is the nature of the tribal topic group's resistance to being sunset. That's a question I have. I'm going to also be submitting all these questions in writing, I guess by e-mail or fax. Is that acceptable to the Board.

ABKOWITZ: Either way.

LITSTER: Great. Also, we have federal and state

government represented with formal presentations here, but no tribal representation. So, I'm wondering what efforts were made by the Board to invite tribes to present at this event, specifically those from the destination sites in the case of Yucca Mountain. That would be the Western Shoshone. In the case of Skull Valley, that would be Goshute representatives. I would like to have seen some formal presentations, given that you're here in this location, from the tribal communities in question.

Also, given all the sabotage scenarios that were not necessarily discussed in detail, but were alluded to regarding the casks, the safety of the casks, and also given that the Defense Department can spent so much to supply our military with armor piercing and other high impact weapons, given that we expect to pay for potentially tens of thousands of casks for shipment on our roads and rails, my question is why can't we afford to supply sufficient study casks? You're saying you only want to buy one, or the NRC only has the budget to buy one. Why don't we have the appropriations available to supply sufficient casks, and to conduct worst case accident and sabotage tests to failure--to failure?

So, you know, given the comments on funding shortages for full-scale cast testing, we would like to see explanations as to why such testing and validation is not a higher budget priority when other agencies seem prepared to

ask, and Congress seems prepared to spend seemingly ad infinitum on other energy related projects, like global war and foreign occupation, for example. For us, it's a basic question of overall priority in terms of security for America, and primarily for Native America.

The next is I participated two years ago in an IEER workshop in Washington, D.C., Institute for Energy and Environmental Research, that offered instruction on models that calculated human radiation exposure, calculated specific health effects per radionuclide. And, I'm wondering within the RADTRAN model, what, if any, specific efforts have been conducted to integrate the dose exposure models that we saw here to specific or cumulative health effects, if that's something that could be accounted for and integrated within the RADTRAN model. And, if there hasn't been any effort to do that, do you see any usefulness to such integration, and would you be open to some kind of collaboration with groups like IEER on integrating these models?

Final thing is the former Governor of the State of Utah, Mike Leavitt, who's our beloved EPA administrator, said that he would lay down on the railroad tracks to block shipments to Skull Valley. And, this type of civil disobedience and obstruction is a common and predictable tactic to disrupt shipments. It's used all over the world, notably in Europe. And, I'm curious with the RADTRAN model,

if it would be correct to assume that it would be useful to interests who might be inclined to engage in civil disobedience, to help determine potential dose and exposure risks if, say, they did succeed in stopping a shipment.

ABKOWITZ: Thank you. Ruth, I think the question was directed at you. You look anxious to respond.

WEINER: I'm delighted to get all these questions about RADTRAN, and I can say right now, something I didn't mention before, RADTRAN is free of charge. You can download it. You get free help. The help desk is standing right here, and you can use it.

On the question of health effects, integrated health effects and organ dose, we do get, and I simply didn't have time to show a picture of an output, but RADTRAN does output effects by organ dose, including ingestion dose, and as well as the committed effect of dose equivalent.

I'm not a health physicist, so I'm getting a little beyond my area of expertise. However, there are some doses from emitted material and from external radiation which are external doses. Groundshine dose is an external dose, as is cloudshine dose. There are other doses if you have material that is emitted that is inhaled, and these we calculate as committed doses, both to organs and to the whole body dose. Because once material is inhaled, it has a certain lifetime in the body.

I have not looked, and we allow people externally to do that, to look at the total health effect. RADTRAN stops and I think that's where we logically would stop at looking at where we do now. That is, incorporating organ specific dose conversion factors, where that is appropriate and incorporating the committed dose equivalent, where that's appropriate.

ABKOWITZ: Okay, thank you.

That concludes our program for today. I want to-- it doesn't conclude our program.

HOLM: I wanted to address the question about the tribal topic group and the issue of sunsetting. In the TEC, the way the system works, we have topic groups. When they finish their work, they are basically sunsetted and go on to other things. The tribal topic group had completed most of its work. Many of the members wanted to joint other topic groups. However, when we asked the question as to what they preferred to do, because we consult with them about these things, they decided they would rather stay together, to be able to have a body of tribal representatives who could consult with each other about the issues. And, so, we're keeping the tribal topic group, based on their recommendation to us.

I wanted to clarify that. It was not something to get rid of the group that wasn't ready to be finished with

its work.

ABKOWITZ: Okay, thank you. That concludes our program for today. I want to thank everyone that's participated and that has been part of the audience as well.

As you know, we will be continuing our Panel meeting tomorrow morning, and the session will begin here at 8 o'clock. Thank you.

(Whereupon, the meeting was adjourned.)

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