UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD

TRANSPORTATION & SYSTEMS PANEL MEETING

March 14, 1991

Albuquerque Hilton Hotel
Colorado-Texas Room
1901 University Boulevard N.E.
Albuquerque, New Mexico 87102

BOARD MEMBERS PRESENT

Dr. Dennis L. Price, Chairman
Transportation & Systems Panel

Dr. Melvin W. Carter, Member

Dr. Ellis Verink, Member

SENIOR PROFESSIONAL STAFF

Dr. Sherwood C. Chu

I N D E X

P R O C E E D I N G S

(8:30 a.m.)

DR. DENNIS PRICE: Good morning and welcome to the meeting of the Transportation & Systems Panel of the Nuclear Waste Technical Review Board. The Board is an independent organization established by the Nuclear Waste Policy Amendments Act of 1987 to evaluate the scientific and technical validity of activities undertaken by the Department of Energy, the DOE, in its civilian nuclear waste disposal program, dealing principally with spent nuclear fuel and, to some extent, defense high level waste. Within this charge, the Act specifically directs the Board to evaluate those activities relating to the packaging and transportation of high level radioactive waste in spent nuclear fuel. To facilitate the Board's work, the Board has organized itself into a number of panels to which specific technical subjects are assigned and of which Transportation & Systems is one.

I am Dennis Price. I am the Chairman of the panel. I am a professor of industrial and systems engineering at Virginia Polytechnic Institute and State University. I am also the director of the Safety Projects Office and the university's graduate industrial safety engineering program. With me today are the other two members of the panel, Dr. Melvin Carter and Dr. Ellis Verink. Dr. Carter is a Neely Professor Emeritus in nuclear engineering and health physics

at the Georgia Institute of Technology. Dr. Carter is an international consultant in radiation protection and an expert on a broad range of issues related to radioactive waste management. Dr. Verink is a distinguished service professor of metallurgy and former chairman of the materials science and engineering department at the University of Florida. Dr. Verink brings to the Board extensive experience in materials selection and corrosion. All of us serve on the Board on a part-time basis. Also with us today is a member of our staff, Dr. Sherwood Chu. Woody is a staff liaison for this panel, as well as for our Quality Assurance Panel.

The sole purpose of the meeting today and tomorrow is to talk about the WIPP transportation program and the opportunities that may be offered to the civilian waste management program in the way of lessons learned.

The transportation program for the Waste Isolation Pilot Plant (WIPP) Program constitutes a large shipping campaign of thousands of shipments over a period of many years. It is scheduled to take place well in advance of the transportation program associated with the civilian waste management program. While there are important differences between the nature of these two programs, similarities exist between the two, such as the size and the scope, regulatory issues, accident prevention, and emergency response measures, just to name a few. These similarities offer significant

potential opportunities for the civilian program to learn from the experience of WIPP as it develops and as the transport campaign itself unfolds. The purpose of this meeting is to explore these opportunities. The panel wishes to learn about the nature and scope of the WIPP transportation program, the programmatic actions that have been taken or are underway, and the activities and perspectives of the states which would be traversed by these shipments. The panel wants to identify how the civilian program can benefit from WIPP experiences to date.

Perhaps even more important are the prospective opportunities to learn from events which are yet to occur. That is, the panel wishes to explore ways to develop and establish mechanisms to learn from the actual WIPP transportation experience after the campaign gets under way. For example, what kind of data bases on transportation events can be developed to record occurrences which are non-routine and which can yield insight into how potential mishaps can be prevented? Such data bases may be of great value to the subsequent civilian shipping campaign.

I would like to remind everyone that the Board's scope is limited to the civilian waste management program. Transuranic wastes and the WIPP program are, therefore, outside the Board's evaluative charter. Simply, we are here to learn and to explore.

At this meeting, the panel will be briefed by the DOE and its contractor, Westinghouse, on the various facets of the WIPP transportation program. After lunch, the panel will obtain the perspectives of the Western Governors' Associations Working Group on Nuclear Wastes, the State of Nevada, and the Environmental Evaluation Group. At the end of the day, time permitting, we will receive brief comments from the general audience. After these presentations today, we will hold a roundtable discussion tomorrow morning with today's participants and representatives of DOE's Office of Civilian Radioactive Waste Management.

Before I turn the meeting over to Mike McFadden of the DOE WIPP Project Office, I would like to ask everyone to speak directly into the microphone. We've had some problem in the past of getting an adequate record of the proceedings. I'd also like to pause to thank Helen Einersen of our staff and other members of the TRB staff for the detailed arrangements of this meeting. And, I want to take this opportunity to express our appreciation to Mike, the Project Office, and Westinghouse for putting this briefing together for us.

Mike?

MR. MIKE MCFADDEN: I want to thank you for the opportunity to speak to your distinguished Board about the transportation program and lessons learned in the transportation program. We're very proud and honored to give you the

lessons learned and, hopefully, those lessons learned can be passed on not only to other nuclear waste transportation programs, but other hazardous materials transportation programs in the United States today.

I am very proud of our transportation program. I think it's the safest transportation program that's not going down the highway today. But, seriously, I do think it's the best transportation program in the United States today and I wish I could take credit for it, because of my knowledge and expertise, that's the reason why we have an excellent transportation program. But, I can't do that. I wish I could give the credit to my staff on the transportation program because of their expertise and knowledge, but I can't do that either.

The bottom line as the reason why we have such an excellent program is our relationship with the State and Tribal governments. They're the ones that have the expertise. They're the ones that have the knowledge. They deal with transportation on a daily basis. They dream about the safest transportation system they could possibly have. And, through those relationships, we encompass their dreams and developed a transportation program based on discussions with them and addressing their issues and concerns in the area of transportation. So, I guess, the biggest lesson learned from WIPP in our development of our transportation program, I think, would

be is to develop a relationship with the States and Tribal governments and try to address their concerns and issues. And, when you do that, you will have the best transportation system going down the highways.

We also have a super relationship with the OCRWM Program. Chris (Wentz) participates in a WIPP transportation task force team. We meet on about a quarterly basis. We talk about issues, concerns, and philosophy about transportation and we address those things at that meeting and he's been a participant in that, a member of that task team. Even before the WIPP task team was developed, we had a transportation coordination group that met on a quarterly basis to talk transportation issues and Chris was a member of that group. So, we've been dealing with Chris quite a bit in the area of transportation and many things that are developed in our transportation program were recommendations from the OCRWM Program.

We have at least a weekly relationship with the institutional program for the OCRWM. That's the Chicago office. In fact, they have detailed some people to us to assist us in developing our transportation program. So, we're in close contact with their institution group in Chicago.

And, the Yucca Mountain Project, they have had a couple of sessions with the WIPP Project Office on lessons learned and they've toured the facility quite a few times.

Even the State of Nevada officials have come to WIPP and toured the facility.

And, that's all in my introductory slide. So, you're probably getting worried if I'm going to take all morning. So, let me get on into it.

This has nothing to do with transportation, but I just wanted to let you know we are getting very close to opening the facility. We think the facility--we just declared base facility readiness. We've still got to do some few things to get ready to bring the experimental waste in, but it looks like late summer we'll be ready to make that first shipment.

I put this one up to show you that our mandate is a little bit different than the OCRWM program. Our mandate is Public Law 96-164 and briefly this is what it says. It says, "You shall demonstrate the safe disposal of transuranic wastes from programs that are exempted from regulatory oversight by the Nuclear Regulatory Commission." Part of that demonstration, though, is not only a demonstration of the safe disposal; part of that is a demonstration of a safe transportation program. And, we will be doing that along with a demonstration of safe disposal.

Quickly, to tell you a little bit about transuranic wastes, it's non-radioactive materials, the type you would get in normal industry, small industry type waste. But, there's

one significant difference between that and ours. And, that is, ours is contaminated with radioactive materials. The radioactive materials. The radioactive materials that has contaminated the waste or trash are heavier than uranium and primarily man-made. And, I guess, the primary difference between transuranic wastes and low level wastes is long-lived. We're not going to decay away in a few years. Our transuranic waste definition is half-life greater than 20 years and most of ours is half-life and thousands of years. But, we don't have drums of pure radioactive materials; again, we have trash that's been contaminated with radioactive materials and it's at quantities too small to recover.

This is typical cut sections of mock-up drums. From the left to the right, we have glassware; we have solidified sludges; we have metals, metallics, used equipment; and, we have combustible type wastes.

To give you a little background into our transportation program, we started our transportation program in 1978. The Waste Isolation Pilot Plant initiated public hearings about that time and out of the public hearings we heard concerns about our transportation program. And, it was agreed with the State of New Mexico that we would develop a new state-of-the-art transportation package and that's when our transportation program for the Waste Isolation Pilot Plant was initiated in 1978. And, that package was called a TRUPACT.

Just in case we ever get Trivial Pursuit and they give a category on WIPP, I'll tell you what TRUPACT means. The TRU portion is transuranic wastes, PAC is for the package, and T is for the transporter. So, it's transuranic waste package transporter. That design was initiated in 1978.

In 1986, we started working with the State and Tribal governments. We did that through regional meetings, the Western Interstate Energy Board, the Southern States Energy Board, and also one-on-one meetings with the State governments. And, that's a big step for the Department of Energy. I remember making a presentation about in 1983 to the management of the Department of Energy which will remain nameless about that we had to start interacting with the State governments to insure that we have a safe transportation system. And, at that time, the Department of Energy manager said we've been making these shipments for the last 20 years and we've never met with the states and we're not going to start now. That shows you how far we've come, we've come a long way. We've been meeting with the states ever since 1986 addressing their transportation issues.

In 1988, Senator Hatfield got a vision that said that the states needed funds to address some of their own transportation concerns in the area of WIPP transportation. And, he passed authorization to provide $1 million to the states from Hanford, Washington, down the corridor all the way

to the WIPP site. One of the outcomes of that funding was a report that the Western Governors' Association issued to Secretary Watkins which said we do need some additional funds to address our transportation concerns. Secretary Watkins met with the Western Governors' Associations and at that time agreed to enter cooperative agreements between DOE and the Western Governors' Association. But, not just only the Western Governors' Association, but in the states that all the transportation shipments would be going through and the Tribal governments which the transportation is going to be going through. I'm not going to delve into this in much detail because Rich Leonard is going to talk more about that, plus you have state representatives here.

DR. MELVIN CARTER: Mike, can I ask you a question before you move on? What specifically did Congress authorize those funds for? Was this to provide training and so forth or to provide information or was it monies for the use of the states?

MR. MCFADDEN: All three. They just provided the funds to address any and all transportation concerns that the states would have in the area of WIPP shipments.

DR. CARTER: What about if they wanted to buy monitoring equipment?

MR. MCFADDEN: They were authorized to do that.

DR. CARTER: To do this?

MR. MCFADDEN: Yes. But, again, you have--Bob Robison and Chris Wentz can talk more details in what they use the funds for.

Our primary goal is develop a transportation system that is as sound and as safe for the public in general. And, you do that by addressing these six elements: the waste package itself; the transporter package which is your first line of defense in an accident situation; routing to make the public and the states aware and knowing which routes you'll be using; qualified carrier, once you start making the shipment, that's the people that are going to keep you from having accidents and actually that's your first responders at the scene of the accident, too; a tracking system to be able to know the status of a shipment at all times; and then once you are involved in an accident, to have your state, Tribal, and DOE emergency response personnel trained to handle an accident situation.

I'm going to be addressing each one of these and, as I address each one of these, I'm going to talk about the states' involvement which helped us focus our programs. So, you might get tired of me talking about the states, but I think that's my primary lesson I want to pass on to you.

First of all, our waste is not waste. Our waste is a product. The trash that you throw out out of your house today would not meet our criteria or our specifications for

our waste that has to go down to the Waste Isolation Pilot Plant. And, that's what we have, we have a waste acceptance criteria and we have a verification system to make sure that the sites meet that waste acceptance criteria. Our package, itself, is a non-combustible Type A package. We don't allow any liquid waste forms, no explosives, and no pyrophorics. The document is fairly thick and goes into a lot more detail than that, but those are the major elements for transportation.

Our transporter package is NRC certified. That is your primary barrier in an accident situation to keep the public and the first responder safe from our waste materials. It's non-vented/doubly contained. It's been tested under accident conditions. It's legal weight and dimensions and we call this TRUPACT-II versus TRUPACT-I and I'm going to describe what happened there.

DR. SHERWOOD CHU: Excuse me, Mike?

MR. MCFADDEN: Yes?

DR. CHU: Just for clarification on the last slide, on TRUPACT-II, you say it was for CH waste. You might just want to explain.

MR. MCFADDEN: Yes, it's contact handled waste. We're in the process of developing another package and that package is called a remote handled waste cask, but that has not been done yet. It's under design, still.

A little history on the TRUPACT. We had a rectangular design initially, one per trailer. It was singly contained, vented through a HEPA filter, and was going through DOE self-certification. The states said, fine, I think you've got a very safe package, but for us to be comfortable and to sell to the public, our constituents, we think you need to go farther than just having a safe package. We would like you to have double containment. We would like you to remove your self-certification and go to the NRC for certification and we would like the package not vented. We listened to that from the states and we changed directions in 1986 to a TRUPACT-II.

The first year of developing a TRUPACT-II, all we were doing is putting a box inside of a box to obtain double containment, non-vented, and going to the NRC for certification. But, that has problems. The problem is it's rectangular and we are going to have pressures during our transportation program developed inside that package because you have to demonstrate that the package will stay safe for 60 days, as if it was lost in the Nevada sun during the summer and in the Colorado Rockies at night in the winter. So, you'll be obtaining pressures inside this rectangular package and it's difficult to do in a rectangular package. So, we did away with that concept and we went out to bid to somebody to give us a container that was doubly contained, not vented, go to NRC certification, get full-scale tested, and also would

hold pressure. We did that. NuPac at Federal Way won the bid and that's what we have today is three TRUPACT-IIs which are cylinder type designs on a trailer. And, you'll be getting more discussion on the TRUPACT by Phil Gregory.

In the area of routing, our effort in route selection again was initiated in 1986, the same time we started working with the states. And, what we wanted to do was present the routes to the states and tell them why those routes were selected and give them an opportunity if they wanted to identify an alternate route within their state. We also showed them the guidelines to do that. The best laid plans, but New Mexico routes, we thought, were designated back in 1982 with the state. We did that mainly because they needed some funds to upgrade/improve the routes that were selected. We did that. We have been improving the routes that were selected.

In 1989, just after the Department of Transportation issued some regulation guidance on how to identify an alternate route within the state, the attorney general from the State of New Mexico ruled that the change in the DOT regulation required the state to designate the routes again. They thought they did a fairly good job back in 1982, but did not follow the letter of the regulation. And, the State of New Mexico is in the process of doing that and Rich Leonard will talk more about that in his speech. I'm sure Chris Wentz

will be talking a little bit about that in his talk later this afternoon. But, I guess, the lesson learned here is Murphy's Law, "If it's going to go wrong, it will go wrong." And, also, the three things that are absolute, that's death, taxes, and regulation changes. And, that's what got us here. The regulation did change and the state already had a designated route, but they had to go back and do it at this late date.

I guess, the biggest emphasis from the states in our transportation program is right here on our carrier. Most shipments going down the highway today use a common carrier and what they do is call up a company that has tractors and trailers and say, I have a product that needs to be moved from Point A to Point B. Do you have a tractor and trailer and permits to do that? And, they say, yes, we do. We'll be right there. They don't know the drivers' experience. They don't know the drivers' training. They don't know the maintenance of that tractor. They don't know the maintenance of that trailer. And, the states had major concerns with that type of program and said, you need to go out and get a contract carrier that you would have specs in there to insist that they go beyond what is required and do additional things in the area of safety. So, we did.

The states said the drivers need an emergency response plan. We had that in our specs. They said you need to keep this thing moving. You cannot be breaking down in our

states. So, we have an equipment maintenance plan that requires them to have down time less than 2% of the time. And then, also, that last bullet is we require them having eight hour replacement capability anywhere within the United States. And, we've tested this out and they can replace that tractor within two hours.

Insured and bonded is just a DOT requirement.

DR. PRICE: Mike?

MR. MCFADDEN: Yes?

DR. PRICE: Is carrier singular? So, you've selected a single carrier to handle the WIPP--

MR. MCFADDEN: Yes, Dawn Trucking out of Farmington, New Mexico was the carrier that was selected.

DR. PRICE: Were there modal considerations before going to trucking?

MR. MCFADDEN: Yes, there was. We did a number of studies in the area of rail versus truck and truck won out mainly because of operational considerations. When you go rail, you lose control of your shipment. Our trucks are running night and day, drivers are with them at all times, and we stay in constant control of that shipment. On a rail shipment, it goes to a rail yard waiting for the next train going a different direction and we lose control of the shipment. That was our primary reason and also cost was our secondary reason. It's much more expensive to go by rail.

DR. PRICE: And, did you have a requirement for actual experience in the shipment of radioactive cargo?

MR. MCFADDEN: I think the requirement--and, Tom Ward, correct me if I'm wrong--I think the requirement was just hazardous materials.

MR. TOM WARD: That was the consideration in the overall evaluation criteria.

DR. PRICE: It was a consideration of hazardous materials or radioactive, specifically?

MR. WARD: I believe it was hazardous materials experience. What we have really found, though, a lot of people say why don't you use a tri-state or a chem/nuclear? What it really boils down to is the quality of the drivers that you get behind the wheel. It's not the management necessarily. It's you've got a good driver. Basically, once you load him up, you're turning him loose. And, as you'll see, we've got an exceptional firm with exceptionally qualified drivers. I think we've got the safest thing going.

MR. MCFADDEN: Thanks, Tom, because that leads into my next line, driver qualifications, part of the specs. The states said we don't want anybody just coming right out of school and start driving these shipments. So, we put a requirement on age in our spec. And, all these, Tom is going to get into more detail. They said they want somebody that's experienced. That's just again not right out of school, that

has some experience with a tractor/trailer rig. So, we put that in our specs on drivers, that they're well-trained beyond DOT requirements. So, not only do we have the carrier required DOT requirements in training, we also put them through our DOE program that we have for our couriers that transfer weapons materials. So, I think we've got the best trained drivers in the United States today. A good driving record, we have impressive requirements in requiring that they have an exceptional driving record. And, Tom is going to go into more detail about that. Single commercial drivers license is not a big deal nowadays, but this is before DOT issued it in their regulations that the states said, hey, we want to stop that and we want your requirement in there about single carrier commercial drivers license. And, the states were concerned about the drug abuse, long hours, that type of thing. So, we have annual physical and that includes drug screening on the drivers.

DR. PRICE: Did you get into a debate about random testing?

MR. MCFADDEN: It has been incorporated in our program. And, yes, the states requested that, too.

DR. PRICE: Um-hum. So, beyond an annual physical, you have a random testing program?

MR. MCFADDEN: Yes.

DR. PRICE: And, were there any requirements beyond DOT

requirements as to hours in service and so forth, just a kind of scheduling that would be done during transport?

MR. MCFADDEN: Tom, why don't you address that?

MR. WARD: I'll get to that, sir. I've got about three slides on that.

DR. PRICE: Oh, good.

MR. MCFADDEN: You've been briefed on the tracking system. This is TRANSCOM. I believe you have. I won't go into any details here except to say that again this was a state concern that was addressed by the Department of Energy. They said they had a concern about our drivers going into downtown Albuquerque and spending the night with their girlfriend or just the location and status of the TRUPACT units. Are they off the side of the road and having a flat tire or have they been in an accident? From that, we developed within the Department of Energy the TRANSCOM program that you are familiar with.

DR. CARTER: What about taking their girlfriends on the truck with them?

MR. MCFADDEN: It's not allowed.

DR. CARTER: Not allowed, okay. I didn't know whether you were trying to save on the motel bill or just what.

MR. MCFADDEN: Although that sleeper cab is about as nice as my son's bedroom. It has more stuff in it than my son's bedroom.

Another area of concern with the states that we addressed was the emergency response training. They said their first responders or command and control officers and, to some extent, their mitigation officers within the state have not been trained properly. And, they asked us to develop a training program to do that. So, we did. And, that was developed in 1987.

I guess the biggest lessons learned here is, one, you've got to work with the states in the training program and we did work with them. And, second is you've got to go to the responders versus having regional or national training courses and requesting that they come to you. Their budgets are very limited in the area of training and those first responders, a lot of them are volunteers and do not have the funds to go to regional and national training. And, that's what we did is we developed a program that went to the people, to the responders. But, we've done this training from the routes from Idaho National Engineering Laboratory all the way down to the WIPP facility and also from Savannah River Plant in South Carolina all the way to the WIPP facility. We've trained over 6,000 emergency responders to date and we provide refresher training on an annual basis. And, that training also will be talked more to in Rich Leonard's presentation.

DR. CARTER: Yeah, I'd be interested in the details of the emergency response planning, as well as the training and

so forth. Let me ask you another question you've had at least a few years. What's the permanency or the stability now of the people that have been trained as emergency responders? How many of this 6,000 are going to be around and kicking when you get actual transportation in route to WIPP? Do you have any idea about that?

MR. MCFADDEN: I don't have the numbers to give you today, but we plan for that. They're going to be around for a long time in the emergency response field, but they do move. They move from one community to another community. They might move away from our shipping routes. So, we do this refresher training on an annual basis. We go back to the states on an annual basis to see if they want further training.

DR. CARTER: You don't really have any figures on the stability or the number of the folks out of the 6,000 or the 5,000 that will be available when you get ready to ship or something of that sort?

MR. MCFADDEN: We certainly have the people that we've trained, their location where they're at. We certainly could find out that information from the states, for example, and ask them. Okay, these are the people we trained in Albuquerque, New Mexico. Are they still in Albuquerque, New Mexico? And, I imagine we could find that type of information from the state if need be.

DR. CARTER: I was just curious because sometimes these

people aren't that stable and, when you train them well in advance of the need, sometimes they move around, they're lost, there are a number of things that can happen to attrite them, in essence.

MR. MCFADDEN: Your feeling is correct. They do move.

DR. PRICE: Thus far in your opening remarks, Mike, you have not mentioned anything about in your operational system the data bases that you plan to use. You've mentioned the tracking of the vehicles, but how about the tracking of incidents throughout the system and so forth that will provide you data bases to alert you in the event that corrective action somehow needs to be taken in some particular area? Go way back to the 1930's when they came up with triangles saying that there were 300 near misses for every 29 serious injuries, for every single fatality; therefore, you need to monitor, if you're going to be on top of things, those relevant near misses. Do you have any kind of monitoring program planned in your operational program for picking up when things start to get beyond what you would consider a controlled stage and maybe need to take some corrective action?

MR. MCFADDEN: Well, I guess, I don't really see the reasoning for your question. I can't come up with an answer. We have expanded in our track rig. We have a computer monitoring that we monitor the rpms, the--I believe it has in there like emergency braking. So, we would know that type of

thing. So, we would know if there's been some reason why they had to emergency brake. But, as far as historical nationwide near misses, I'm at a loss. I don't know how to answer that.

MR. GERALD BOYD: The Department has a new system. It's called the Occurrence Reporting and Processing System that is just going into effect. And, we have coming on line the first of April a computer data base that will track all incidents of any kind within the complex and that includes any transportation incident. And, the guidelines that are established for that allows the particular individuals that are working with the, you know, situation in this case--it would be the WIPP site--to categorize the type of incident that occurred according to some criteria. That goes into a computer data base and is tracked over a period of time to determine whether or not corrective actions are necessary to do some causal analysis of what's happened. So, any kind of incident that occurs with a WIPP shipment will, in fact, go into the overall DOE system and we think that that system is being designed in a way that it will allow us to get at the kind of detail that I think you're asking about.

DR. PRICE: Is that an on-site data base or does it include anything that might happen along any of the routes?

MR. MCFADDEN: It includes routes, too. It's much bigger than WIPP. It goes with all DOE shipments, yeah. You need to define what--

DR. PRICE: Would it include anything that might happen to the container and so forth?

MR. BOYD: The DOE order that is written requires a full report any time there's any kind of incident as to the cause of it, the outcome of it, corrective actions that are necessary. So, it's a rather extensive reporting requirement and will go into a data base. And, that's for all sorts of transportation including WIPP shipments.

DR. PRICE: And, it's called again what?

MR. BOYD: It's called the Occurrence Reporting and Processing System for the Department of Energy.

MR. MCFADDEN: You need to define what an incident is. It's not a near miss.

MR. BOYD: Well, you're right. I mean, I suppose if a driver managed to, you know, miss a car that pulled in front of him or something, according to the criteria right now, that may not get put in there. But, if there is any sort of accident, at all, regardless of the level of it, then it is defined as an incident and would go into that. Now, if you had mechanical problems associated with the vehicle itself, certain criteria that categorizes things as off-normal occurrences which is sort of an oddball name, but the purpose of that is to get at the lower level kinds of things that are not actual emergency conditions, but are recurring problems or problems that you want to keep track of to make sure they're

not recurring. So, the way the system is set up is that it will allow us to look at a full range of incident occurrence. We haven't exactly talked about it at this point how far down into that you go with near misses.

DR. PRICE: Um-hum, okay.

MR. MCFADDEN: Phil Gregory wanted to add to that.

MR. PHIL GREGORY: We will be required under the certification issued by the Nuclear Regulatory Commission to maintain records for the packaging and that will include all of the use of the packaging regardless of where it is. And, any time a non-conforming condition occurred, that non-conforming condition would be recorded and tracked. Additionally, we are required to evaluate those non-conforming conditions on a periodic basis, so that we can establish whether or not a trend is developing that would cause us to go back and seek a corrective action for what might look like a random occurrence, but over a period of time develops a pattern. So, both of those types of record keeping, in addition to all of the routine records, will follow that package throughout its life.

MR. MCFADDEN: Okay. That's what our shipments are going to look like when they do get to move from the generator or storage sites to the WIPP facility, three TRUPACTs on a trailer. And, Tom Ward is going to go into more detail about the transportation program.

I just want to conclude by saying that I do believe we've got the safest transportation system in the nation today. I wish I could take credit for it, but I'm just a facilitator. The credit is really due to the State governments and our relations with the State governments in addressing their concerns and issues in our transportation program.

Let me introduce some of the panel members, especially for the people in the audience. This is Gerald Boyd. He works for the Department of Energy at headquarters. He's representing the transportation program from headquarters.

The next person over is Tom Ward with Westinghouse. Westinghouse is our management and operating contractor at the Waste Isolation Pilot Plant. Tom Ward has been in the area of transportation for--I guess, about 1986 is when he came on board with the TRU Waste Transportation Program. He's the one who was involved with the initial transportation interactions.

Phil Gregory, we call Phil Mr. TRUPACT. He's been on the TRUPACT-II program from its inception back about 1987, I believe, Phil.

MR. GREGORY: '85.

MR. MCFADDEN: '85. So, he knows quite a bit about the TRUPACT and the development of TRUPACT and that's what he's

going to be talking about.

Rich Leonard is a new face, respectively. I think, Rich, you've been with us about a year now. Rich is involved with our institutional program. Definition of institutional program is that's a program that deals with the State governments and the Tribal governments. And, he'll be talking about our interaction with those folks.

I'd like to introduce somebody in the audience, Bob Spooner. He works for me. He's our transportation manager. So, he can add more discussion on transportation. Bob has been with us a little less than a year, but he's had to learn a lot over that year's time. I won't be with your panel tomorrow, but Bob Spooner will be representing me with your panel tomorrow.

And, I'll answer any questions or I'll turn it over to the next speaker.

DR. CARTER: Let me ask you a couple of questions, Mike. I've developed several, but a couple of them may not be appropriate to you. On the other hand, they might. So, let me ask them at this stage and you may want to defer them to someone else.

One, are there any differences--and, I'm primarily talking about major differences--between the transportation requirements in the transportation phase for the experimental or demonstration phase versus the disposal phase?

MR. MCFADDEN: There's no difference in the transportation program, at all. There's going to be quite a few less shipments. In the operational phase, we're talking about 1,000 shipments a year. During this experimental phase, we're talking a couple of shipments a month. So, it's substantially lower. The only other thing that is different is the waste and the waste packaging, itself. The experimental wastes come to us in experimental bins, not in 55 gallon drums. The bins have valves on them to collect gas generation data and things like that from it. Those bins--so, the waste is placed in those bins and those bins are placed in a standard waste box that fits inside of a TRUPACT. So, that's about the only difference in our transportation program.

DR. CARTER: Okay. I presume though that if there are major problems encountered during the demonstration or experimental phase, then all of the waste has to be retrievable and removable from the WIPP site. So, you would get involved in transportation somewhere else if that should occur.

MR. MCFADDEN: That is correct.

DR. CARTER: Okay. The other thing, you mentioned a little bit about the New Mexico attorney general's ruling regarding transportation. I wonder if you would address or someone would the primacy as far as transportation issues are concerned between the Department of Transportation on a

Federal basis and the various states?

MR. MCFADDEN: I certainly can't talk to that. Maybe, somebody else in the audience can talk to that. Gerald, can you--

MR. BOYD: I guess, if you could define that a little bit better, I might try. I'm not sure I can--

DR. CARTER: Well, whose rules are we going to follow, the Department of Transportation or the State of New Mexico or someone else, assuming those rules and regulations are somewhat different? It's that simple or that complicated.

MR. BOYD: Well, let me make a stab at this. Mike, you might or, Tom, you might can help out here. We follow DOT regulations. However, that part of the regulation that relates to state designation is what we're trying to negotiate with all the states at this point. And, I think we've been very successful at that. We do have one concern in New Mexico that yet has to be dealt with and I expect Chris Wentz can probably deal with that from a state perspective much better when he makes his presentation later. Tom, can you--

MR. WARD: I think if you follow the regulations literally if we were to ship tomorrow, for example, we would go right through Albuquerque, around Santa Fe, down to El Paso, east on I-20, over to Pecos, and up. That would be following DOT literally to the letter of the law. However, the State of New Mexico has the option of designating a road

and, if they designate a road, whatever that may be, that's where it will go. We all recognize that by following that route, as opposed to coming down 285, we add several hundred miles. The intent of DOT is supposedly to reduce risk and traveling through populated areas. It would make sense to follow the state's recommendation and use portions of 285, either of the alternate routes that have been proposed.

DR. CARTER: Okay. I presume from what I'm hearing you try to compromise if there are differences of opinion in this regard, but if push come to shove, then you've essentially made a policy decision within DOE to defer to the state's judgment. Is that correct?

MR. MCFADDEN: No, let me expand on that. We follow the Federal Department of Transportation regs. We follow the State Department of Transportation regs. When there's an inconsistency between the two, we solicit an inconsistency ruling from the Department of Transportation. Once they rule, then we go back to the states and we work out that difference.

DR. CARTER: The reason for the question, of course, there have been many differences between the Federal govern-ment and states in the transportation area for many, many years and this is, in effect, a legacy, I guess, of the transportation business at the moment. So, I was curious when it comes to the WIPP thing how it's going to be handled from a policy standpoint. That's really what my question alludes to.

MR. MCFADDEN: If there's inconsistencies, that's how we would address it.

DR. CARTER: Okay. We've got at least two people crying to be heard in the audience. The first is Chris Kouts.

MR. CHRIS KOUTS: I'm not crying yet.

DR. CARTER: Okay.

MR. KOUTS: I'm Chris Kouts from the Department of Energy, Office of Civilian Radioactive Waste Management. The Federal regulations, Dr. Carter, allow a state to designate alternatives. Basically, what the DOT routing regulations for route control quantity, such as with WIPP or what our program will ship, says that we use interstate highways and has a few other nuances to it. But, it does recognize that the states do have the right to designate alternatives within those states. And then, the Department or any shipper is duty bound at that point to follow those designated routes. The issue, I think, in New Mexico had to do with the change of the regulations in terms of getting onto the interstate at the quickest point or the shortest distance, if you will. And, the routes that had been designated for WIPP in the past did not deal with that issue and that's why the state wanted to revisit, if you will, their route designations because they felt some concerns, as Tom was indicating, as to where the routes were going. But, the Federal regulations allow states to designate alternatives and the shipper is duty bound to

follow those.

DR. CARTER: Well, that essentially says they're compatible in a--

MR. KOUTS: Yes, there are not inconsistencies in that regard.

DR. CARTER: Well, as you know, it's fairly important because what route is taken, the population distributions, and so forth involve obviously the risks involved in transportation. That's at least the prime reason it's of concern.

MR. KOUTS: And, I think the DOT regulations allow for that. That's what we're seeing here.

DR. CARTER: Okay. We had someone else's hand up that would like to speak. Please, identify yourself, sir?

MR. CHRIS WENTZ: I'm Chris Wentz with the State of New Mexico. And, Chris summed it up very accurately that the Federal regulations do allow states to go through the route designation process following the U.S. Department of Transportation guidelines. Once these states designate alternatives to the Federal highway system, routes that they then have to file them with the U.S. Department of Transportation before they become effective. But, it essentially is a complimentary procedure.

DR. CARTER: Okay. Thank you very much.

One additional question, does the DOE have any concerns with TRU wastes now other than their radioactive

characteristics or radiological characteristics?

MR. MCFADDEN: Yes.

DR. CARTER: What are other concerns with them?

MR. MCFADDEN: We fall under the mixed waste category. We have radioactive materials and we also have hazardous constituents in our radioactive materials. Most of our drums, I think about 80% is the projection, has hazardous materials in it also, although each drum probably has less than 1%, each one of those 80% has less than 1% makeup of hazardous constituents. So, that's the other items that we're concerned about.

DR. CARTER: Okay. So, the training programs and so forth have to concern themselves not only with radiological emergency potential, but also with toxics or hazardous materials?

MR. MCFADDEN: In a transportation accident, the primary factor there would be the radiological concern.

DR. CARTER: Thank you.

DR. PRICE: Mike, in our public hearings, we've heard comments and I'll just try to reflect them as accurately as I can without judgment and ask for any comment that you might have on them.

MR. MCFADDEN: Thank you.

DR. PRICE: A single comment about training anyway, saying that when the spent fuel program comes into effect and

begins to address the issue of training that they would like to have a training program which is fully adequate, not one like WIPP. This is the kind of comment from the public that we hear. How would you respond in comparing the two training programs and even conjecture, perhaps, as to why that particular comment comes from the audience?

MR. MCFADDEN: I would say only one statement. The people who are making that statement have never been to our training classes. The people that we do train, we have statistics on that. Eight to ninety percent rate the thing, rate the training class exceptional to outstanding. So, the people that we are training think the training program is what they're looking for and the comments that you're getting would not reflect that they've gone to the training class.

DR. PRICE: Um-hum. And, do you somehow direct your training program to be sure that it covers all along the routes and so forth? That people are trained with some regularity with respect to distance or geography?

MR. MCFADDEN: Yes, we do. And, I'm proud of that aspect. We go to local communities along the transportation route. We don't just train metropolitan areas. We go to where there is volunteer fire departments, emergency response crews, and we train those people along the transportation route. I think our judgment on the training was we didn't want people to have to drive more than 100 miles to go to our

training class. And, that's how frequent we do the training along the transportation route. And, as far as recurrence, we meet with states on an annual basis. They're the ones that identify to us where they need some additional refresher training or first time training in a community. Maybe there's a lot of turnover in a certain community and they identify those to us and we go do that training on an annual basis.

DR. PRICE: I appreciate it.

MR. MCFADDEN: Okay. Well, with that, I'll turn the microphone over to Tom Ward. He's with Westinghouse and again he's been with the transportation program for a long time. He's the one that developed it and he's very knowledgeable about the transportation program.

MR. WARD: I'd like to thank you for the opportunity to address the Board. I saw in your last two reports to Congress that two of the things you were interested in were human factors and safety. And, as I go through here, I'd like to stress those. I'd like to point out that you're all aware of the safe record we've established with radioactive shipments in the past 40 years. I'd like to point out that except for tracking recently none of those shipments have had the controls that you're about to see.

You asked a question about rail and modal mixes, a little clarification on that. In 1987, the rails came to us and we had a meeting and what we learned from that meeting was

to get from Savannah River or Hanford to the WIPP site would take three rail companies in transit time of between five and seven days. At some point in time, they're going to be left in one of the railroad yards and be transferred. With our particular operation, there's someone with it at all times.

My next comment is not necessarily favorable to the railroads, but it is documented in March of last year in testing our tracking system. Idaho made a shipment--I believe it was a railcar and three gondola cars to go to Oak Ridge, Tennessee. The cars were pinned together and they were asked to go directly to go, do not stop. To make a long story short, all the cars went in different directions and the tracking system arrived after the gondola cars. And, I believe there's one other incidence of that. Also, logistically, at $250,000 apiece, to do rail economically you would have to have a huge inventory of the TRUPACT-IIs. If it takes five to seven days, you have a major portion of your inventory either up at Hanford or one of the sites being loaded. The rest of the people aren't doing anything and then the five to seven days, while they're in transit, they're not doing anything, and then while they're being unloaded at the WIPP site, the other people--you can see theoretically with the trucks you can do just in time delivery. Shipments from Idaho, for example, average about 31, 34, or 38 hours by driving straight through.

DR. PRICE: Is there a lesson to be learned in that with respect to the civilian waste program?

MR. WARD: I think a lot of that will spill out by the weight considerations about what you finally end up with the overall shipment weight and I'll address shipment weights later. If you have an experience similar to what we have had, I suspect you could be forced into either overweight shipments or rail.

Another consideration we had was Los Alamos doesn't have a rail head and Nevada doesn't have a rail road. So, at least two and I believe there's one more--I forget at the moment--that doesn't even have a rail facility. So, the truck to us provides the best option and the most safety.

You asked about--

DR. CHU: Excuse me, Tom. Back on that rail evaluation, the consideration you gave to rail was for general carriage, not--when you say you lose control--

MR. WARD: Well, I think general carriage.

DR. CHU: As general carriage.

MR. WARD: I think your time frame is close to the same even on dedicated shipments and dedicated shipments, of course, are more expensive. So, the figure I think we're using right now, the estimate is about $1.72 mile to do it by truck.

You asked about the difference between the experi-

mental program or the full phase program or operational program. I'd like to point out that in the interest of safety, you're aware that we are only required to use preferred routes for highway route control quantities. For non-highway route control quantities, theoretically we could use any road. But, for our particular purposes, full or empty, highway route control or not, we intend to use the same roads. The civilians, so to speak, will never see a shipment off one of these preferred roads.

The transportation system here has been in the development phase for approximately four years. When we first started, one of our major considerations knowing that your program was coming down was not to create drivers with two halos because, if so, you would have probably required to have three. Discussing this morning, I don't think it's been said anywhere that you have to use us as a starting point with your program. I submit that in view of the safety requirements we have for our program, you would be hard-pressed to say that you're going to do anything less.

We had a choice of three possible means of a carrier; a common carrier, a contract carrier, or what's known as a guaranteed solicitation bid. The Department of Defense uses that and saves a lot of money. Basically, what that is, it's a contract, if you will, of the common carrier that says I will give you all my business if you give me the best rate.

However, we found that a contract carrier can be dedicated and you have total control.

The tractors are totally dedicated to WIPP shipments. You'll see later they're unique. They weigh 18,000 pounds or less. You'll find some tractors that weigh 20,000, 21,000, 25,000. Weight is a major consideration. If you have total control of your tractors, you can be assured of a high level of maintenance. When we started this program, we backed out 18,000 pounds for the tractor. It's parked outside at the moment. It currently weighs 17,960. With fuel, with food, with drivers, or with snacks, with tools, with chains, it gets pretty close. I think the weight is a definite consideration. I believe the civilian program is looking for a weight limitation of 15,000 pounds. We were initially asked to limit it to 15,000 pounds. There was even a proposal at one time to have the drivers go up and down the road with four half empty fuel tanks. We cut the line at 18,000 pounds, allowed 62,000 pounds for the trailer and the TRUPACTs. We also had some unique power requirements. In our request for proposal, we asked for at least 400 horsepower. We have 440. It pulls a load even at 79,960 which we've been at very well.

Our drivers are specially trained. I'd like to hold further discussion on that. I've got a 35mm slide which addresses those requirements. Our drivers are specially trained on the TRU waste program, the nature of TRU waste, as

well as the routes.

One of the things unique to the DOE contracting policy, if you will, after we signed the contract, what we had was a statement of work stapled to a contract. Nowhere in the contracting process did it say how they would perform the work. So, what we did was amend the contract and we required a management plan. The management plan takes the technical proposal that the carrier submitted and ties it to the contract. We had sent the request for proposal out to 94 agencies, 14 responded. From those, a short list of 5 was selected.

One of the major concerns is vehicle maintenance. The public is highly concerned about this. As you know, the DOE has a contract with the Commercial Vehicle Safety Alliance (CVSA) to come up with criteria to inspect civilian shipments. I think we're going to skew your data a little bit because knowing this and not wanting them to find anything, so to speak, on our shipments, we have arranged to have all our shipments in our maintenance facility, Hobbs, inspected to these same criteria before it leaves for every shipment. These are empties going out to generator site. When it gets to the WIPP site--mind you, this has come from the maintenance site. They bring a tractor and an empty trailer to the WIPP site and they drop that trailer. The tractor picks up to a trailer loaded with empty TRUPACTs. The people who are

loading the empty TRUPACTs on check. We have a document holder in the rear placard to make sure that vehicle has been inspected, inspected to these CVSA standards. Our drivers will do a pre-trip inspection at the site of their own. That's written and documented. They do an in-route inspection every 100 miles or two hours in-route. They're subjected to all port of entry and weigh stations and, mind you, this is full or empty. When they get to the destination, they do a post-trip inspection. The shipment is loaded. The states, you see the point of origin, come in and do their own inspection. Our driver is doing a pre-trip inspection. They're also checking it every two hours or 100 miles on the way back and the State of New Mexico, I believe, is going to do a destination inspection also. The intent of the CVSA inspection criteria is that when one state applies a decal and inspects it, it can go through the next state. They recognize the decal and honor the procedure. However, Colorado has its own law and we do have a Colorado permit. Colorado state law requires them to inspect the shipment. So, shipments from Hanford in Idaho will be inspected at the northern point of entry at Fort Collins in all cases. They have modified it slightly and said once you're inspected there you can bypass the next two weigh stations, Trinidad and Monument.

DR. CARTER: Tom, I wonder if you'd tell us the major ingredients of what the CVSA is developing? Now, is this

primarily taking a look at the paperwork or they're going to inspect the truck and its pertinences, the TRUPACTs themselves? Are they going to do any monitoring? I notice that the--

MR. WARD: They inspect the driver's records, the driver qualifications, the vehicle, and do a radiological inspection. There's a meeting up in Colorado Springs next week to finalize those procedures. They've been in review process for, I believe, four years. Four years, I believe.

DR. CARTER: Okay. Now, this is where, I presume, they're working with the conference of radiation control program directors as far as the rad side of it. Is that true?

MR. KOUTS: Chris Kouts again. I might mention that this is basically a cooperative agreement that was issued from our office for our shipments that the WIPP program has allowed us to use their shipments as a model, if you will, to get data and to determine the efficacy, if you will, of the inspection procedures they develop. So, it's really a cooperative agreement that was established by our office that the WIPP people have graciously allowed us to apply to their shipments.

DR. PRICE: The in-route inspection was every two hours or every 100 miles, whichever is--

MR. WARD: Or 100 miles, yes, sir.

DR. PRICE: How do you determine which to do?

MR. WARD: Whichever is first.

DR. PRICE: Whichever is first.

MR. WARD: And, of course, you have to allow some reasonableness in this. I mean, you may have to go another five miles to find a safe place to park to perform that.

DR. PRICE: What does that in-route inspection consist of? They pull off the side of the road and do what?

MR. WARD: If you check the 49 CFR, the only really requirement they have is to kick the tires. But, the drivers are specially trained now and will check the tie-downs, they'll check the lights, they'll check for air leaks, they check under the hood. We have specified that they do not have to document this inspection. They make an entry in a log book. However, if they do find something wrong, then they document what they've found. The reason I say that is if you incorporate all the inspections from the WIPP site to Hanford and back and if all--if, if--all the weigh station ports of entries were open, it's potentially 72 inspections.

DR. PRICE: Yes. Wasn't there some discussion about that being a bit of overkill?

MR. WARD: That may be. By DOT, they're required to stop every 100 miles just to kick the tires. So, while they're stopped, we've expanded that a little bit. We can't get by the 100 mile stop. That's Federally mandated.

Another major concern is weather. The states are working with us. They've developed a weather protocol to

notify us of any weather they're aware of. For example, in the Hanford area, before the shipment leaves, they'll make a check and make sure. They'll check with the state, the traffic manager, the driver, and our WIPP central monitoring room to make sure the route is clear before they depart. In 1989, we signed a safe parking agreement. This is as opposed to a safe haven agreement. Safe haven is for nuclear weapon shipments at DOD installations. We signed one with the DOD for our shipments to be able to park in-route. It's coordinated through the Joint Nuclear Action Coordinating Center in the same manner as the safe haven agreement is. Our WIPP central monitoring room, we have the weather channel in there that's monitored 24 hours a day. We have a separate program called KAVOURAS. It's a PC based system. There's basically two, KAVOURAS and Accuweather. KAVOURAS allowed us to tailor a program which goes right up the route to the generator sites. So, you don't have to mentally interpret the condition in the state and figure out where your routes are. The intent is if the weather channel gives you an indication of severe weather, you can get more specifics from the KAVOURAS system and you can also contact the states, or in small valleys or pockets of whether the state may contact you to advise you of the weather. The ultimate decision is basically left to the driver. I mean, we can tell you that it's snowing someplace and you're in the cab and looking out

and it says, no, it's not. Or you can tell him the weather is clear and he says, no, it's not. So, the ultimate decision is left up to him. Separately, the states are developing their own recommendations for safe parking areas.

I mentioned the weight being a concern. We start off with the overall limit of 80,000 pounds so as not to require overweight permits. I mentioned we backed out 18,000 pounds. Fortunately, the tractor weight hasn't grown. The trailer designed weight was 8500 pounds. They weigh 9860 pounds, I believe, plus or minus 40 pounds, all of them. We've got 17 of them. The TRUPACT initial design was 10,800. That's grown to 12,500. If you have similar weight gains or experience similar weight gains, your payload will be affected. In your particular case, I believe your payload is not divisible. Ours, theoretically, is and we can load manage.

DR. CARTER: Is this wet or net?

MR. WARD: That's net. That's--I'm sorry. That's wet. That's with fuel, ready to go.

One of the questions asked when we had a demonstration of this for the Western Governors' Association last week is what are you going to do when you drop one of these? I have a video on that that I'll show you later. One of the questions, the concerns of everybody is the extent of the damage. You've probably seen the testing requirements for a

Type A package. They're quite severe. What do you do if you puncture this? The recovery guide, which I'll give you a copy of, addresses that. It tells you what to do, if you can make temporary, compensatory corrections to the package, how to transport it. It includes replacement tractors and trailers, as Mike mentioned. The carrier has an eight hour in-route emplacement requirement. We've got approximately 12,000 miles of roads. He has a contract or an arrangement with Ryder and Hertz. We've also identified some smaller companies to be able to do this. On three occasions now, I've basically contacted the driver, pull over and find a telephone, and let me know where you are. Then, you call up the carrier and say your tractor just quit, replace it. The first time, it took three hours and 45 minutes; the second one, I think, was four hours and something. In Colorado, basically to prove a point, we started at 10:02. We were asked to replace a tractor as part of the Transax exercise which was conducted there. The first tractor arrived in two hours and 26 minutes and that was including a vehicle inspection at the port of entry. The second one was 20 minutes behind that. And, mind you, this was at Colorado Springs. The third tractor arrived in seven hours and 58 minutes from Albuquerque. The point is you can do it from a long distance. In a real situation, that wouldn't be acceptable to take that long. But, he does have the capability to replace the tractor.

The tracking system, you'll see later we're developing a system whereby we can transfer that from one vehicle to the other. We estimate--we're testing at a magnetic antenna mount now--we could probably do that in 15 minutes so we don't lose our tracking capability. I'll go more into the recovery aspect when we show the video.

The contract for the trailer called for a commercial over-the-road trailer. The object of the trailer program, of course, is to get the lightest trailer possible to maximize payload. You saw how the weight grew. At approximately the 30,000 mile level we developed a crack in one of the non-loadbearing cross members. I'd like to point out this as a safety concern, but it was not an out-of-service criteria. The cross member was redesigned and I'll show you the slide of that shortly. In order to test or redesign, we've got a 40,000 mile test program outlined. Half of those miles, we've put on carrying empty TRUPACTs, the other half will be done carrying TRUPACTs filled with sand or trailers filled with sand to most closely replicate the experience we expect to encounter. We added a factor of a third to the mileage where the crack occurred before.

We've proposed to do a dipenetrant check on the cross members every 5,000 miles. We may modify that shortly based on experience. At the end of every trip, it will get the CVSA inspection just like it normally would. Ever since

the crack developed, we've been telling the public what it was, showing the corrective action. The State of New Mexico has inspected all our trailers and they all have CVSA inspection stickers at the moment.

One of the things the civilian program ought to consider is conducting dry runs to a site. We have a video produced by Idaho, for example, in which we go through the complete shipment cycle from the WIPP site with empties. We stopped at all ports of entries. Colorado has done their vehicle inspection procedure. They've tested the radiological procedures, so has the State of Idaho. We've purposely had the shipment deviate from the route to see if it could be detected. It was detected in 20 minutes. Since we only get a position update every 15, I consider that quite good. During our trailer test, we propose to do that again. We'll put the advance shipment information in our tracking system and bills of lading in our tracking system and coordinate with the states to do their vehicle inspection protocol. Hopefully, we'll be able to have some adverse weather, pull a couple tractor replacement exercises. It's a good test program to see if your shipment methods are good before you actually have to use them.

Idaho, for example, can take the empty TRUPACTs, fill them up with sand. We can bring them on back, bar code them, label them like we're supposed to, unload them like

we're supposed to, and place them underground. We have done that before with bins, but we've got an opportunity to do that additionally and solicit the state's participation, get them familiar with their tracking function, as well as their hazardous material monitoring procedures.

If you want to save time, I think a common carrier is a non-player. You can't control your drivers. You can't control your vehicles. It's difficult to keep track of your maintenance. You mentioned carrier qualifications. Dawn Enterprises is the largest independently-owned trucking company in the United States. I'll tell you more about those in a moment. Hopefully, I've raised a flag about potential weight problems.

The trailer test, we had a test. We checked an air rod tandem axle, a spring rod tandem axle, and a spread axle air rod trailer. We found the air rod spread axle to be the best. The truck is outside, you'll see it. We had basically two problems with that, fender supports and that crack in the cross member which I'll show you, but you might as well go ahead and do a, say, 40,000 mile trailer test to begin with with anticipated payload and just see how your trailer holds up.

I mentioned the management plan right up front. That will be a part of the contract. And, the driver qualifications, I mentioned that the transportation program

has been in the development stage for four years. We just instituted a peer review program. It's like what can we do to make the driver selection better? The criteria is already high. We have one of the drivers in the back, Robert Avance. He's exceptionally qualified. He was the New Mexico state champ in the flatbed class. He placed 24th in the nation. He knows approximately six or seven drivers from the company he came with, where they came from, and of those, there's only about two that he would recommend to be part of his team. And, in discussing this, it's like that's pretty tight. What can we do to make sure we only get guys with their recommendation? If upper management takes a look at them, let's get their input. So, what we've instituted is a peer review program where upper management does their initial screening and testing. They talk to the drivers. The drivers give a yea or nay and then they have a 90 day probationary period.

In June or July, I forget which, of '89, the National Academy of Science looked at our transportation system and they came up with this conclusion that we're quite proud of. I'd like to point out that they made this conclusion prior to the enhanced driver training program that I'll explain on the slides, prior to our peer review program, and prior to our CVSA inspection program which I'll address momentarily.

Could somebody turn that projector on, please?

(Whereupon, a slide presentation by Tom Ward was shown.)

MR. WARD: He is looking in the toolbox, that part right there. What I have to show you this slide for is to show you the changes we've made in our tracking system. The tracking system you see there is that quadrapod arrangement with the antenna on the top. The little wire whip on the left hand side happened to be the LORAN-C version. The globe type antenna is the one that communicates with the satellite. The intent here was to track the shipment. That's for the trailer, the load, the cargo. That's why it's on the gooseneck. What we found out, however, was that the wire ship, the stainless steel whip, snapped off three times. The plastic base that you see on the outrigger there ripped off the little neural knob that attaches it there. The pipe directly below the round globe there snapped off one time. The cross members you see just behind Mark's head broke one time and cracked twice. We changed that to the location you see it on top of the tractor. If you're going to fire the driver for not maintaining 24 hour surveillance of the shipment and considering what it is, it seemed prudent to put it on top of the tractor. We haven't had a problem with it since. It looks like this (indicating). That's a piece of aluminum. I'm not sure if that's a CB antenna there or the

telephone antenna.

DR. CARTER: So, you assume that the trailer goes everywhere the cab goes. Is that what you're--

MR. WARD: Yes, sir.

DR. CARTER: Okay. That's an assumption?

MR. WARD: That's an assumption. There's two drivers with it. They drive five on and five off straight through. They stop for meals. One goes in and gets the meal. The other one watches the shipment. Like I say, one time they fail to keep surveillance of it and the penalty is termination.

I mentioned replacement of tractors. What we have --in fact, we just mounted it yesterday right behind this and it's from the firm QUALCOM in San Diego that provides this service to Oak Ridge--is a magnetic base antenna. We've taken the globe antenna and put it on the magnetic version. Let me back up here a second. On the opposite, I believe, in there is the black box. They have a keyboard and we've re-wired that, so that basically there's, I think, four bolts in the black box they can disconnect. They have a cigarette lighter adapter. They'll be able to pull off the magnetic mount and change that from one vehicle to another and they estimate now they could probably do it in about 15 minutes. So, tracking capability isn't lost. On our previous version, it would take four to five hours and you'd better be in the shop to do it

because it was basically hard wired in there.

DR. CARTER: My question really related to the fact that you're now tracking the trailer itself, rather than the payload. The truck, itself?

MR. WARD: To give you an idea of the accuracy of the system, those of you familiar with Albuquerque would recognize that that little icon at W-2 is about two blocks west of I-25 and two blocks south of Montgomery. That happens to put you on Candeleria. That just happens to put you at the Freight-liner store. The accuracy is within 500 feet or less. People say 1,000, but from what I've seen, it's actually less. This is hard to see, but these two tractors were parked 10 feet apart at the WIPP site. With LORAN-C, if those tractors were parked there, we would find one icon up over here halfway between Hobbs out in the middle of the desert. With LORAN-C also when they start off sometimes, you'd find an icon way up there in the left hand side on the way to Cloudcroft, 80 miles away. It's induced by the population density of the LORAN-C towers. They're more dense in the coast, they're less dense here. This is a lot more accurate.

DR. PRICE: The LORAN-C on your dry runs, you use LORAN-C set up?

MR. WARD: Yes. We changed to this about, I believe, four months ago. QUALCOM came out, offered the service, we were the first within the DOE sensitive shipments to modify

and upgrade to the dual satellite and we're exceptionally pleased with it.

DR. CARTER: On the LORAN-C, did you suffer mid-continent loss and have lock on problems and so forth?

MR. WARD: In Wyoming, west of Cheyenne Rubber, I believe, we had occasion where it would only get readings from two towers. It needs at least three, I believe, preferably eight. And, it flat locked up and you totally lost your tracking capability. I wouldn't even consider a LORAN-C in the future.

I mentioned the trailer crack. Here's the crack in the cross member. I'd like you to note that the top of this cross member is rolled, the bottom is flat. It's been replaced by a cross member which is rolled here and rolled there, giving added strength. It's also got new gusset material there. It's hard to see, but you can see the change in the dual role in that crack up there.

DR. PRICE: Where is that cross member on the--

MR. WARD: That's behind the last TRUPACT.

DR. PRICE: Is it, do you think, stressed because of the spread axle design or--

MR. WARD: I believe it's just flexing of the shipment itself. I don't believe there's any trailer made that isn't going to develop a crack similar to that in some places at some time over a period of time. The question is to find them

and fix them. Hopefully, this will make the time period extend out, but if you were to pull a trailer that's had several thousand miles--you know, 100,000 miles experience over in an inspection, you'd probably find something similar to this. Robert and Mark went through the CVSA vehicle inspection course in Oregon and were amazed what they found was rolling on the streets. We think our inspection program will, I'd almost say, totally preclude this. It's just checked too frequently and too detailed.

We mentioned routes. One thing that has changed, regardless of what route New Mexico ends up designating, you end up having a designated route within 13 miles of the WIPP site. That gets you to the closest point. My reason for showing this slide is I-20 along the south from Savannah River totally comes out, you go up north to I-40, and on over.

You asked about driver requirements. I'd like to expand upon this. Again, we didn't want to create some super hero. We asked for the basic DOT requirements. We did put these three little caveats on there. 100,000 miles for a tractor/trailer combination is next to nothing. You can do that in one year easily. The two years uninterrupted service was basically designed to allow the driver who had been laid off, but still was a conscientious citizen and a hard worker, to be able to have an opportunity to be hired.

Dawn came back with these provisions; no moving

violations the past three years, the road test, road screening, the driver profile evaluation. They've also entered credit check and now the peer review program and the Commercial Vehicle Safety Alliance inspection class.

The penalties, as you see, are quite severe. Those penalties for moving violations or chargeable accidents apply not only in the WIPP transport vehicle, but also applies in their privately owned vehicle. I'd like to point out that to assist them with their speed control, the speedometers in the tractors are calibrated. They do have a certificate of calibration. The cruise control cannot be set beyond 63 and the fuel pump cuts out at 65. So, unless it's a steep hill, it's almost impossible for them to accelerate--well, it is impossible for them to accelerate by intent beyond that.

After we had those requirements, the DOE came to me and said what can we do to make the drivers still a little bit better? What we did was we talked with the Transportation Safeguard Academy who trains basically, as I understand it, special forces in the police force to be tractor drivers for their weapon shipments, to be couriers. They give us a--basically, it's a two week course because we already have trained drivers. I think it's important to note that the drivers' response to that, what they learned most was safety and attitude. We use our fleet unit, the roads that are mentioned, those particular subjects. We do carry radiation

detection instruments. The drivers are trained in their use. They are re-certified annually.

And, this is our latest institution. What you see there on the right is the president of the company, on your left, you'll see their QA safety individual, and the three drivers we have now. We have two more in the hiring process. I think you'll find it's the only trucking company in the nation there that has pacts with those that has a CVSA certified. They're quite proud of that. What that means is, is they drive down the road, especially in the State of Oregon, when they pull over for an inspection, it's very possible that one of the inspectors there could be one of their classmates. And, also out of the five people that Dawn sent to that course, four of them were in the top five. The fellow that beat them out was a retrainee who was going back for refresher. So, it's a two week course. They all have these certificates. It's not necessarily a gentleman's course. Here's Mark under there. What they do is they have a week of classroom training and the second week, they go on opposite sides, split up into teams, and as a vehicle comes in they pull it off at random and go through a vehicle inspection. It's rather detailed.

In response to state concerns--also interesting enough, it's spelled out in the new reauthorization of the Hazardous Material Transportation Act--we've added

reflectorized placards. I'd like to point out that that's the only thing in the shipment that glows.

(Whereupon, the slide presentation was concluded.)

As far as a recovery guide, pass those out please. I have here a copy of our recovery guide we developed in response to our concerns, as well as state concerns, about how to recover a TRUPACT. The intent of this is to have it implemented by basically anyone the on scene commander, be it state or otherwise, designates. There are copies of this carried in each tractor. Unique to this recovery operation are stainless steel lifting lugs. The truck carries 13 of those. They also carry 12 pounds of stainless steel welding rod. The intent is the lifting lugs and the welding rod are the things you will not be able to find at 2:00 o'clock in the morning. You can find a crane company in the Yellow Pages, you can find welders, you can find flatbed trailers, everything else. This central monitoring room at WIPP also has the capability of faxing this to any location. There's a copy currently in each of the emergency operations centers. This plan does address the use of what I call lifting lugs.

Separately, I passed out a single sheet. What we're looking for here is if something is wrong with the trailer, but the TRUPACTs aren't damaged, how do you move it, say, from one trailer to another TRUPACT trailer? This is designed to enable us to lift it with a crane without trying to find the

world's biggest forklift, safely onto another shipment. It's a strap that we call an alignment strap. It allows us to use a crane provided by a commercial source, their slings to go underneath it, and not have a massive piece of equipment pre-positioned somewhere and worry about the maintenance of that piece of equipment, as well as getting to the accident scene. This item is on procurement now and will be tested shortly.

DR. PRICE: If the container is damaged, do you have criteria for assessment regarding the integrity of the container and people skilled in making such field assessments before you then attempt to move it?

MR. WARD: If you look at Attachment 1 to that enclosure, there's guidance furnished by the DOT and what the criteria is to safely move it. Separately, WIPP is developing sort of an emergency response team, a tractor/trailer expert, Phil Gregory, to be dispatched to the scene. So, the answer is yes.

DR. PRICE: As I think you probably know that this is the recovery in spent fuel area, the cask weighing considerably more, maybe even 100 tons, is an issue.

MR. WARD: Yes.

DR. PRICE: And, if there are lessons to be learned from this to pass on, we'd sure be interested.

MR. WARD: One of the quickest lessons I think to be learned is you'll find on, I think, it's one of the first

three pages on the top, there is an association of--I forget what it is--but, to make a long story short, its rigors or what have you. But, the question comes up in the United States today you cannot find a magic list of train companies, record companies, and their capabilities. If they choose to belong to a professional organization, you can identify where they are. You still have to contact them to find out what their capabilities are. It may be prudent, once you've found these and you've identified your routes, to contact each one and develop a list of those with cranes in excess of 100 ton capacity.

What I'd like to do now is I have a short video. Could someone kill the slide projector for me, please?

(Whereupon, a brief video was shown accompanied by Mr. Ward's commentary.)

MR. WARD: This has no sound. What you see at first is the lifting lugs being welded onto a TRUPACT. People ask me and it's sort of amusing about the qualifications of the welder welding these on. He happens to be the one that taught the welders how to make TRUPACTs. So, I think he's probably overly-qualified. It takes approximately 30 minutes to weld each one of these on. Basically, he centers them at a third of the way around. He tacks them in place. He'll run one bead on one side and then he may switch to another one. The heat buildup is not a concern. You'll find in one of these,

he puts on a lower one. There is a little plug on the side, no smoke came out. It doesn't damage the TRUPACT. I'd like to point out that when you weld these on, the intent is to get the package off the street. You're not worried about maintaining the certifiability of the package. You're trying to resolve the accident situation. You can address whether the package will be re-used later or not.

As you go through here and through the recovery guide, you'll note that it's significant that these cannot be used as tie-downs. If they were used as tie-downs or attached to a Type B package, they must meet NRC requirements. Okay? The tie-downs on the TRUPACT when you see it outside, the part that's not part of the TRUPACT itself meets DOT. Basically, NRC says it has to hold the package down within 10 times the forward weight, five times the lateral, and two times the vertical. Department of Transportation says the aggregate total of the tie-downs must be time and a half times the payload. So, if you were to use any of these for a tie-down, they have to meet NRC requirements which they don't. Therefore, to preclude the need for a special bra or something to go across the top of the package and tie it down in a vertical position, in this particular case, unless we're able to put it on a replacement TRUPACT-II trailer, it's always transported in the horizontal position. The separate reason is if you happen to get a standard flatbed, as opposed to a

lowboy, and put it up on top vertically, you're over height. So, you're illegal.

What you see here is a--well, the two lugs on here. It's a rather simple demonstration. This does weigh 19,250 pounds. It is filled with sand. They're just going to pick it up and swing it around and load it on a flatbed trailer. The changes you'll see to this in the future, I think in June or July, the DOT has changed its rating of tie-down slings. So, instead of three straps being placed across this, you'll see four. And, as soon as we have an opportunity to test the single page lifting method I've shown there, that will be incorporated in the plan. This happens to be a 60 ton crane. The operator had been doing this all his life. It was an extremely easy proposition. If you look closely, you may see some lugs on the top of the TRUPACT. There's one here, I believe, and one there. They don't apply to the demonstration. They were put there because when we do a demonstration like this, it's for demonstration purposes. We have to put it on a trailer, take it out to the accident scene, we have to take it off, we have to tip it over. Then, we pick it up and put it on a trailer, do a demonstration. After you're through with your demonstration, you've got to take it back off the trailer, stand it back up, put it on your trailer, and take it home.

One thing I forgot to mention about human factors on

this. On the tractor, the next time just take a look at it or when you see it outside, please notice we have two stacks. We tried to add all the creature comforts, but drivers, being some of them macho, I guess, wanted the first tractor that came with one stack. And, that wasn't quite good enough and hurt the appearance of it. So, we swapped the link tight chains we had for wire chains and saved enough weight to put two stacks on it.

We tested this procedure one time in-house using our own crane. Then, we hired Sullivan Crane Company, chosen at random from Hobbs, did this demonstration, and then having successfully done that, we invited the Western Governors, as well as representatives from the DOE regional response areas, to come down and watch the demonstration so they would be aware of procedures and how this was done. And, he drives off into the sunset.

(Whereupon, the video presentation was concluded.)

MR. WARD: Again, the only thing that we provide is the stainless steel lifting loads--perhaps, Robert will drag one out from the tractor to show you--and the welding rod. Everything else, we believe we can find locally. There is also--I mentioned crane companies. There is a national directory of records.

Can I answer any questions before we take a break and go out and look at the truck?

DR. PRICE: One incident in the past involved a radioactive container. Evidently, the trucker was making a turn and the trailer bed flexed, as I recall, and the unit turned over. And, I understand from what I read anyway that he was going relatively slow when he made the corner and it was just a problem with the design. And, what have you done to insure that these kinds of problems will not exist in the tractor/trailer union and the trailer container union that you're going to use?

MR. WARD: Phil, maybe you can help me on this, but I think one of the things that was done on this, I mentioned the trailer test that we did. We took the three trailers and we had a test track up in Washington State. We had pylons set up and we did a obstacle course basically, if you will. We videoed behind it. We had the packages instrumented and we found what limits we had. Basically, they were safe. I think the test was conducted at 55. In our particular case, we were allowed to go 65 on the interstate. That is straight travel. They tested the various things, on/off ramps. It was well instrumented. The split axle air rod proved to be the safest means of transportation or safest configuration.

Along the same lines, the trailers, as a result of that Transportation Safeguard Academy course, we chopped off the trailer disconnect handle so you couldn't casually go up there and yank it and the driver drive away and drop it. We

had locking fuel caps, power door locks, and power windows for the driver's side and external mounted fire extinguishers. But, the drivers having used it, I think, are exceptionally pleased with both the tractor and that trailer, as opposed to the tandem axle trailer.

DR. PRICE: How fast, for example, could the driver take a right turn, a 90 degree turn, on a flat surface?

MR. WARD: I don't have a magic answer for that. I don't think that was part of the test.

MR. GREGORY: It would depend upon how sharp the turn was. Specifically, to the incident that you referred to, that trailer had been inspected and a failure of the frame discovered prior to the incident that occurred. I believe that an inspection and a discovery occurred in the southeast portion of the country. The manufacturer was contacted, repairs were described, and drawings sent, and repairs were made not according to the manufacturer's recommendations. The welds were not done according to the manufacturer's specification and no adequate inspection was done after the repair was made. The failure was later determined to be a buckling of the main structural member of the frame due to the improper welding of this gusset that had been added.

The trailers that we have were specifically designed for the TRUPACT load distribution and you'll notice that the tie-down configuration is attached to coincide with where the

TRUPACT package is set up. We've put in excess of 100,000 miles on these trailers now, both in a loaded and an empty condition, and we, I think, can say that without exception we can travel posted speeds, negotiate turns at posted speeds, whether it be an off-ramp or an on-ramp or a city corner and we've experienced no problems, whatsoever. So, from that standpoint, we feel very comfortable. There is also an ANSI standard that's in draft. That standard, as it has been prepared, has been reviewed at each step by the designer of the trailer that we use and they have concluded at each step this trailer will meet that standard in its draft form.

DR. PRICE: With the spread between the two rear axles being as great as it is, what are the implications of that that you've found?

MR. GREGORY: The reason for the spread is to allow you to distribute the load over a wider section of the beam. This allows a lighter weight trailer than would otherwise be possible for the same load. It also has the effect of adding stiffness in a crosswind or--because you spread the load over a greater distance.

DR. PRICE: But, there are penalties associated with that spread?

MR. GREGORY: The penalty that most frequently comes up with that is an increase in tire wear of the front axle. And, experience that we have been able to glean from other people

using spread axle trailers, particularly on the west coast, is that your front axle tires on the trailer wear out about 20% faster than the rear axle tires. That's because when they make a corner, they're being drug sideways. They very quickly scuff off a rounded corner. After that, it does not seem to be a problem. So, if the 20% penalty entire life is something you're willing to accept as a tradeoff, it seems to be a very good one. Other than that, we're not aware of any difficulties with the spread axle.

DR. PRICE: You don't think that there's any penalty with respect to stress on the frame, itself?

MR. GREGORY: No.

DR. PRICE: Because if you're dragging those tires across the pavement to scuff them off and so forth in turns, it would seem like that also must be associated with stress to the frame.

MR. GREGORY: This is one of the things that we're looking at to verify. If this trailer were being used in an urban or a city type of a environment where you were doing a lot of turns, that would probably not be the trailer of choice. But, in a case like ours, 99% plus of the miles are a straight line down the interstate kind of miles. And, you find that the negotiation of turns is done only at the origin and the destination. So, there are very, very few turns given the total number of miles traveled.

DR. PRICE: Um-hum. Well, the first thing that came to my mind with the cross member cracking was whether or not that might be associated with that axle design.

MR. GREGORY: I'd like to address that cross member, if I could. There was a team of people from Sandia National Labs and the Department of Energy that came to Carlsbad about a year ago and looked at this cross member and their conclusion was that there were two possible reasons for the failure. One was a torsion. The location of the crack and the way the crack propagated indicated that it was possibly a torsional failure. The other possibility was a high speed vibration. Structural analysis for static conditions indicate that it's adequate to carry the load. And, it's not really easy to model the dynamics of a trailer going down the highway.

The solution to either of those problems was to increase the section modulus of the cross member and to move the edge where the crack initiated closer to the neutral axis of the beam to reduce the stress. By redesigning the cross member beam to bring that flat edge up closer to the neutral axis, they accomplished both of those goals. Additionally, there was an air valve mounted on the cross member which may have contributed to the vibration. That air valve was moved to another location. The gussets were lengthened to spread the load closer to the center of the member and with these three things done based on the engineering judgment of the

people who designed the trailer, this will solve the problem. If you ask why didn't they do it that way in the first place, it adds weight and in the trailer business you're always fighting this problem of strong enough, light enough, and there's a continual battle between strength and weight. If you built a trailer that never cracked, it probably wouldn't have much payload. So, that's always a battle going on with the trailer design that we have in this country.

DR. CARTER: One, I have a request and then I have a question. The request is, I guess, there was one or two of your viewgraphs that we did not have hard copies of. Because we did not have hard copies of your slides, I wonder if you could provide those for us?

MR. WARD: Sure.

DR. CARTER: The other question, you mentioned when you began quite a bit about the carrier that was selected for the TRUPACTs and the transportation involved in WIPP. I just wonder if you would run through a little bit the background and experience of this contractor and related sorts of things? You know, I've heard of Hitman and Superior and TriStates and a lot of carriers, but I guess I've never heard of the one that finally got selected. So, I was curious.

MR. WARD: Well, I'm trying to stretch my institutional memory now. I looked at this about four years ago. I believe, they had a mill tailings program in Colorado which

they did successfully. Their primary role has been in moving oil rigs and water trucks. They were competing against, if you will, arrangements with TriStates, Hitman, Chem Nuclear. It was a factor, as I recall. I think about five different areas that were looked at and went through the proposed--on the positive side was the proposed equipment, the quality of the drivers. The other people didn't come up with as stringent penalties and controls as these people did. I think the rates were relatively competitive and proposed supervision and management of their drivers, as well as the criteria they set for the drivers. And, our philosophy was at the time, I believe, that it's where the rubber meets the road where it reaches the final safety criteria. I was a tech advisor. I was not in on the final selection process. That was all DOE.

DR. PRICE: Were they the low bidder?

MR. WARD: I don't believe they were. I think they were about second. And then, after it was initially presented as a per mile basis and then we realized the uncertainty of the actual opening date and the question is how can you get the carrier to go out and get this equipment--they're leased, it's about $1200 and some odd a month, the drivers have a guaranteed salary. They're paid by the hour or mile when not driving. How do you get that equipment, those drivers here ready to use, and we use them on our road shows, like the prints you're bringing up right here now, and keep them there

and not having them used in some other shipment or mission, so that the carrier can make money on this. So, let's change to a cost plus basis.

DR. CARTER: Essentially, the answer to my question was they did have experience with some of these other companies that are fairly well known. They also had some with moving, I presume, low specific activity materials of the uranium business, whether this is uranium ores or tailings itself or yellow cake or whatever?

MR. WARD: Yeah. I think if you take that--and, I missed a couple and I'll make my point in a second. What I didn't tell you about was they do a driver profile evaluation to make sure they're suitable for the job, compatible for the driver they're going to drive with. I didn't mention they have radiation worker training, use of dosimeters, they're taught separate emergency response training. We give them public affairs training. They get special training on our tie-downs. I mentioned the use of radiation detection instruments. They have special training they have to go through on the tracking system itself, their own company safety program. We give them a special course in transuranic waste characteristics, as well as the mobile phone. And, I think if you would take basically this list of qualifications, I don't think there's another company in the U.S. who will match those.

DR. CARTER: You sound to me like you've covered

everything except Arthur Murray.

MR. WARD: Well, that sort of gives you--we just thought it would give the civilian program a good starting point.

If there's no further questions, the truck is parked out on the north side. You're welcome to come take a look at it. We're quite proud of it and I think the drivers are quite proud of it. And, we're quite proud of our drivers and what they've done, so far. What you see on there is what we call the road show models, the same general shape. One of them has a cutaway. We expanded the cutaway to include a cutaway barrel so you can see the type cargo it would contain. It shows you the foam and the construction of it. The unit on the front, I suppose, is a little bit heavy at first. It happens to be our recovery unit so you can see how the lugs are attached on there for recovery. And, we'll be out there to answer any questions you may have.

How long a break do you want to take? We're a little bit--just a few minutes early.

DR. PRICE: I think if we plan to be back in here by 11:00 o'clock, that would be all right. Is that enough time?

MR. WARD: 11:00 o'clock, did everybody hear that?

(Off the record.)

(Whereupon, the panel was given a presentation by Tom Ward of the TRUPACT road show. The following are excerpts for the record from Mr. Ward's presentation.)

MR. WARD: Okay. We started off with an 80,000 pound weight configuration, backed out 18,000 pounds for the tractor. That left 62,000 pounds for the trailer. What you see here is a split axle air ride trailer. This was compared against a closed axle air ride trailer and a closed axle spring ride trailer.

The question has arisen about the tie-downs. The tie-down configuration that the u-bolts go over are part of the Type B package. Therefore, they must meet NRC requirements which require a capacity weight factor of 10 times the forward direction and five times the lateral and two times the vertical. The DOT regulation says the aggregate total of the tie-downs has to equate to time and a half the expected load. It does not differentiate between the type of the load. The trailer you see weighs about 9860 pounds. We have 17 of these. They've all been weighed and are within about 40 pounds of each other.

You also see we've modified the placards. Rather than have the standard book, we have a special book. The one says "drive safely" and you flip that down and you'll see a Radiation 7. And, if you'll note, there's a little lever at the top of the placard holder. If you have a highway route control placard which happens to be square, what you do is open that little lever, flip it over, and behind that is the highway route control placard. Therefore, they don't have to

take the placards on and off. They're always with a particular tractor.

The tractor is a 1989 Freightliner. It has 440 horsepower. It has an 18-speed Road Ranger transmission. It does not have a tagalong axle. We can engage the second axle to get eight tire drive, if you will, in the case of an emergency.

Let's see, what else do you want?

DR. PRICE: This is Dennis Price. Just to point out what Tom Ward was saying, there are two sets of requirements that are met in the tie-down interface. One is the NRC requirements which have to do with the attachment plate to the container and the other is the DOT requirement which has to do with the u-bolt that fastens the trailer to the attachment plate. Is that correct?

MR. WARD: That's correct.

DR. PRICE: And, those two sets of requirements are different. The weakest requirement in terms of strength is the DOT requirement.

MR. WARD: I think part of that design was influenced by the fact that--and, I'm not positive of this--that it was felt that it would be better if the container were to break away than all stay in the trailer and have, you know, potentially three containers permanently fixed to the trailer, if you will, involved in an accident and the potential of any damage

that might cause.

DR. PRICE: Um-hum.

MR. WARD: Okay. Repeating that, the intent was to have a capability by default to break away from the trailer rather than having the containers almost permanently attached to the trailer and the resulting damage that a 62,000 payload could possibly do.

You'll note that the trailers are all numbered on the goose neck and in the rear placard holder is where the certificate of origin is maintained, as well as the vehicle inspection record. The intent there is so that can be checked out prior to loading empties to make sure they're loading them in a serviceable vehicle. You'll also note that each trailer is equipped with a hubodometer to record its usage and detect any--if you have a maintenance problem, you can check the mileage at which it occurred. It's also used as the basis for establishing your maintenance criteria for periodic service based on either time or mileage.

This trailer is not equipped with automatic slack adjusters. In the future for the civilian waste program, I think I would recommend the use of automatic slack adjusters. This is not to say that they're maintenance-free. It just helps them keep an adjustment. Another consideration is the industry now has the anti-lock brakes. The civilian waste program may want to pursue having their tractors and trailers

equipped with an anti-locking braking system.

For exploratory reasons or ideas, the civilian waste program may wish to explore, I think it's called, a Red Arrow anti-jackknife device. Basically, it involves a mechanical constraint which can be controlled from inside the cab. It limits the amount of travel the trailer can have in basically bypassing the trailer in the event of an accident. This can be released for tight mountain passes or turns or what have you. Okay?

DR. PRICE: Okay. I was just commenting to him on the low road clearance that you have here.

MR. WARD: Road clearance for us is a problem. There is --I say a problem. I think there's one location. It happens to be east of Roswell on a bypass, it's the Roswell bypass, but you go over a railroad crossing which goes up rather steep and I think empty we clear it by bout that much.

DR. PRICE: Um-hum.

MR. WARD: So, you'd have to travel your roads to make sure you can clear it.

DR. ELLIS VERINK: What would the consequence be if you had a leak in one of these?

MR. WARD: A leak in one of those, it would collapse and have to be replaced.

DR. VERINK: It looks like it may be pitting. Is there some problem potential for corrosion on the outside?

MR. WARD: I would assume that would be correct, you know, with the salt. So, that would be maintained.

DR. VERINK: It looks like that ought to be looked at.

MR. WARD: One other thing I'd like to point out is the carrier is prevented by contract from doing anything other than normal maintenance. I mean, they can replace components. They can't modify the design.

MR. VERINK: It seems to me that's something that somebody ought to take a look at. It needs a protective coating over it or--

MR. WARD: Okay. You should look at the method of placarding. The new Transportation Safety Act requests you to look at the possibility of increasing the visibility of placards. We chose to make our reflectorized. They were custom made. We have specially designed holders. So, it allows you to have just the "drive safely", the Radioactive 7, or you reverse the whole paddle, if you will, to have the highway route control placard on. They're permanently fixed. That avoids having the drivers having to carry them in their cab.

There is a torque requirement. The torque requirement is met. There are six Bellview washers in here. A Bellview washer is a washer that's bent. Two are put in this way (indicating), the next two are stacked this way, the next two are stacked that way, and you torque them down. You

can do it without a torque wrench. You have a feeler gauge. It's a go/no-go gauge. You put it in this crack. So, when they go by, they can actually check all those in a minute and a half just by going up and sticking in one end and flipping around the other end.

DR. PRICE: And, this is a vibration type lug?

MR. WARD: Yeah, that's a captive type nut.

The alternate method we have and this is recommended by Oak Ridge. What I'm holding is something called a click stud. It's a plastic mounted stud. It has epoxy in here. It has a cleaner or a cleanser. You got up to your Hertz or Ryder truck. You figure out where this aluminum plate has to go. You clean off the area, mix up this epoxy. It sets up in 15 or 20 minutes. It supposedly holds on there with a 1500 foot pounds of holding force. You go on your way. When you're through, you un-do the nut, touch it with a soldering iron and heat it to 300 or 400 degrees, and it lifts off. So, our new constraint for transferring the tracking system is waiting for this to cure, but that's only 15 or 20 minutes. And, each truck carries six of these.

(Whereupon, the presentation of the road show was concluded.)

(Off the record.)

DR. PRICE: Okay. Let's get started again.

MR. GREGORY: Members of the Review Board and the

audience, it's a pleasure for me to be here today to tell you about the TRUPACT-II program and, in particular, to give you an engineering perspective of those things that we have learned that might be applicable to the program that you're looking at.

I'd like to address six areas from a engineering perspective being the design of the packaging itself, the tests that one might do, specifically how one certifies a package like this, the fabrication, the safety aspects of all of these things--safety really covers or overlaps everything --and then, the operations and the maintenance.

I think that those people who are in the business of designing packagings for transporting radioactive materials will agree with these four points, but they're worth repeating. The use of codes and standards allows the NRC to do their review against a quantifiable reference. But, when you deviate from the use of codes and standards, you now put it into the hands of the reviewer to determine whether or not you have met an adequate criteria, whereas the use of a code or a standard establishes that criteria. So, this can be as simple as selecting codes like the ASME boiler and pressure vessel code. Section 3 deals with the part of the code that TRUPACT-II was designed to.

Use of accepted materials, specifying materials like ASTM grade steels, as opposed to a steel that doesn't have the

ASTM designation behind it. In some cases, it's not possible to use a standard material. An example of this in the case of TRUPACT is the foam. This is a foam that does not have a "standard" that it meets. However, the fabricator or the manufacturer of the foam has developed the data and presented that to the NRC which essentially gives the foam the credibility that a standard would carry.

A conservative design is easier on the reviewer. If one does an analysis of a beam and finds that the safety factor of that beam is 10 to 1, the review process is fairly short. If one reviews a beam that has a design safety factor of 2 to 1, you're going to be a lot more concerned with how carefully you looked at that analysis and how carefully all of the details have been addressed. So, conservatism in the design is very important, are relative to the difficulty of the review process.

The last point is one that TRUPACT broke a lot of new ground and this has to do with new concepts. We were advised that the NRC would never certify a package that did not have a bolted closure mechanism. They had never done it in the past and they wouldn't start now. Initial discussions with the NRC relative to the closure mechanism indicated that they were receptive to a different type of design if there was a good technical reason for it. A number of presentations were made and this led to scale model testing which I'd like

to talk about next.

Some of the reasons that you find yourself in a test program are listed here, the non-standard materials. If you want to use a material like a new foam for an impact limiter, you would probably do some scale model bench testing or some prototype testing to validate the impact properties of the foam. You might do some stress-strain curves using a compression machine and measure stress and rebound of that foam.

In our case, we got into a rather unconventional design for Type B packaging in that we used a rotating locking ring to attach the lid to the body, rather than a more conventional bolts with a gasket. The rotating locking ring is similar in design to the lid of a pressure cooker except the lid doesn't move, just the ring. The closest thing I know to it is the camera lens mount for a Canon 35mm camera where the lens plugs into a hole and a ring rotates the lock. So, it's a bayonet with a lock.

This concerned the NRC because they weren't familiar with it and they asked us--when I say us, actually it was nuclear packaging, but there was a team approach to this entire project. They asked that a sub-scale model be built. The scale model that was built was about two feet in diameter, consisted of two o-rings and a locking mechanism. That was deformed 25% of its diameter without loss of a vacuum. Based

on that, the NRC said, well, maybe it will work. Why don't you build a full-scale model? So, a full-scale locking mechanism was built. That was tested at the University of Washington. That was deformed about a foot without loss of vacuum. At that point, they said we think maybe this will work. Why don't you build a full-scale test article, the whole TRUPACT, and test it? So, by doing testing of sub-scale and larger and larger pieces, the NRC gradually got comfortable with the concept of a locking ring.

Another reason that one gets into testing is an inability to analyze for both the normal and hypothetical accident conditions. The TRUPACT-II is a Type B packaging, as the OCRWM package will be a Type B packaging, I understand. And, for Type B packaging, the NRC is really concerned about three safety aspects; sub-criticality, shielding, and containment. In our case, only containment was a concern because the payload does not contain sufficient radiation to require shielding and the amount of fissile material is limited to a quantity that will always remain sub-critical, regardless of the configuration or the moderation. So, our concern became one of containment. The package design itself is a soft yielding package. It's basically quarter-inch stainless steel with a foam sandwich construction.

And, you'll notice here that the outer protective skin on the right hand side is quarter-inch or three-eighths

stainless depending on where the section is located, ten inches of foam, a layer of ceramic paper called lytherm that's between the foam. So, you have a five part composite sandwich. That makes up the outer containment vessel. The inner containment vessel is a quarter-inch stainless steel pressure vessel inside.

It's not possible to do a dynamic analysis for the hypothetical accident conditions and predict with great accuracy what the deformation will be. For this reason and this reason only, we went to full-scale testing. It's much preferable to do an analysis and establish a safety factor because when you do a test your safety factor is 1. It's a go/no-go test, you passed or you didn't.

DR. PRICE: Could you provide us that slide? It wasn't in your pack, I don't believe.

MR. GREGORY: Yes, I can.

DR. PRICE: I'd like to have that.

DR. VERINK: What is the foam material?

MR. GREGORY: It's a polyurethane type of foam. It's a proprietary compound that has the ability to act as a shock absorber and an insulator.

DR. VERINK: The foaming agent is what, a fluorocarbon of some sort?

MR. GREGORY: I don't know the answer to that. I can find out for you.

DR. VERINK: I'd be interested to know that.

MR. GREGORY: I can find out. I don't know. I may not be able to find out because it is a proprietary formula and they will not let anyone present when the foaming process is taking place.

The thing that makes this foam unique is that in the fire or the thermal test it has the ability to form a char as it burns. That char then seals and insulates the foam behind the char so that it self-extinguishes if the source of a flame is removed. So, you could expose a large block of this foam to a fire and it will burn while it's in the fire. As soon as you remove the flame or the flame burns out, the foam self-extinguishes, regardless of how large an area you have exposed.

So, in the design of the package, being soft and being deformable, we actually punched holes in the upper sections and the lower sections of the outer protective structure. Those have no detrimental effect in the fire or the ability to survive other drops or punctures. So, the inability to do an analysis is what drove us to the need to do full-scale testing.

DR. PRICE: By the way, do you happen to know what the ignition temperature of the foam is?

MR. GREGORY: No, sir, I don't, but I'll try to find out.

DR. CARTER: Did you consider, at all, compression in

terms of criteria of the TRUPACT? I know it's not part of the Type B criteria, per se, but I didn't know whether you folks in the TRUPACT took a look at compression or not.

MR. GREGORY: I'm not aware of any compression test that we applied or analyzed for or would analyze for. The IAEA rules have a crush test that they apply to packages that weigh less than 500 kilograms. But, TRUPACT weighing 19,000 pounds, it really doesn't apply there. The regulatory test sequence that we go through with the TRUPACT, if you go to the 10 CFR 71 regulations, they require four tests or analysis for those four tests. And, the first three are done in sequence to a single package oriented in the most damaging orientation. The fourth test, submersion, is done on an undamaged package and that's usually done by static analysis since it's a static situation.

DR. CARTER: So, you didn't look at crushing and compression, in essence?

MR. GREGORY: I don't know of a test that would fit that definition.

DR. CARTER: All right.

MR. GREGORY: The tests that we did consisted of the 30 foot regulatory drop onto the unyielding surface, the one meter drop onto a steel bar. In the case of the TRUPACT, when we went back to the NRC to discuss the orientation that the package should be in, we proposed that either a slap down at a

about a 20 degree angle or a flat side drop was probably the most damaging, but we weren't sure. The NRC then asked the question, well, what about a slap down where it hits the top versus one where it hits the bottom? What about a flat bottom drop or what about a flat drop on the top? We ended up with six possible 30 foot drops that we could impact. When we got into the discussion of the puncture, we came up with a dozen different punctures in sequence with the six drops. The NRC said we would be comfortable if you did all of those tests, not just the one 30 foot drop, the one puncture. So, we split the test sequence between two packages, did three drops, six punctures, and a fire. And, we applied the same test to the other package.

After the Challenger disaster, the NRC was focused on o-rings and they said we think you ought to test it or prove to us that it will work at 20 below zero. So, we chilled the package to 20 below zero before we initiated the test sequence. However, before we could start the fire, we had to warm it up to 100 degrees Fahrenheit. The insulation is so good, it took us two weeks to get it cold. It's very, very good insulation. It's like a giant thermos bottle, if you will.

The fire results after the first test indicated that we had in some cases burned all of the foam away. So, a layer of ceramic paper insulation was added which was equivalent in

the foam engineer's estimation to about three additional inches of foam. The remaining two fires, we had at least five inches of foam in every area, even those that had been punched through, and the foam itself was exposed directly to the fire. There was still about five inches of foam left.

The outer containment vessel from the first series of tests was used again in the third series of tests and used again in the fourth series of tests. That same outer containment vessel has been through nine times the regulatory amount of drops and punctures and twice the amount of fires that the regulations require. The degree of conservatism that the NRC is now comfortable with from the test sequence more than makes up for the lack of an analysis that allows them to go back to a safety factor. The degree of overtesting was incredible.

The issue that one gets into, though, with a certification by test is the inability to specifically quantify a safety factor. And, for this reason, from an analytical perspective, the NRC would much prefer to have an analysis with a safety factor, so that if you later come back and want to make a design change, they plug the new numbers in and rerun the analysis and now the discussion is our original safety factor was 10, it's now 9, is that okay? And, it becomes that kind of a discussion, rather than you want to make a change, will it survive the test? And, that's why an

analysis is much preferred to the test.

The most important thing when you're dealing with the regulators is their comfort level. At what point are they comfortable that you've done enough? Because they're the people that put their name on the line that are going to have to stand up and say this package is okay.

Some lessons we learned in the testing program or the certification by test is that you have to consider the initial conditions that will cause the maximum damage. In our case, we ran into a situation at Sandia National Labs where we did the test that they wanted to be able to depressurize each containment vessel prior to approaching it after the test. The NRC wanted us to test at maximum design pressure which was 50 psi. The process of pressurizing and depressurizing between tests and the addition of multiple test sequences and the chilling to 20 below zero created a condition inside the TRUPACT that would never, ever occur in natural transportation situations where you never pressurize in a normal transport from zero to 50, up and down, nine times over one transport. We managed to work some grid from the payload, which was an artificial payload of concrete, around behind the containment o-ring due to the pressurizing and depressurizing. That grid kept us from going leak-tight on the top containment o-ring of the inner containment vessel in one of the tests. The bottom o-ring was leak-tight. There would have been no release of

anything from the package. But, since the top o-ring was designated as the containment o-ring, technically we failed the test. So, we then redesigned and added a foam debris shield to keep the grid out. Then, we discovered that we had some water inside due to the cooling down. This is the containment o-ring on the top. We added the debris shield to keep the grid out and then we added the wiper o-ring to keep the water out. In a real shipment, it's my opinion as an engineer neither of these serves any useful purpose. But, in order to pass the test, they have to be in there.

So, the conditions under which you test need to be thoroughly thought through and this is the kind of thing that, how do you get experience? You get experience by making mistakes and we've got a lot of experience. So, you can't spend too much time thinking this through in the beginning.

The multiple test sequence, if you choose to do testing, it's going to be important that you be able to tell the NRC what sequence of orientations will cause the maximum damage because that's a question you're going to have to answer. And, the issue of inducing a failure due to a test condition is one that we, frankly, were not turned onto before we started this series. It just didn't occur to anyone that we might cause the failure due to the test sequence, not due to the test itself.

Again, listen to the regulators. This is something

that was stressed over and over to us. Sandia National Laboratories was our advisor on this program. They told us this repeatedly and it's good advice. You need to listen to the regulators because it's their comfort level that you have to get inside of. And, until you get inside that comfort level, it's going to be difficult if you're going to go in with a test program.

Once we had successfully passed the test, as soon as the NRC certification, it's now time to fabricate the packages, build what you've tested. And, the point that I would make here with the first bullet is that you need to bring in outside expertise who has no preconceived bias or no gain by their opinion being expressed. In several cases during the fabrication process, we ran into a problem. NuPac made the disposition, Westinghouse and the DOE bought into the disposition, and we discovered that had we brought in some outside expertise we might have caught the problem quicker. So, regardless of how good your people are, get some external review to come in and look at your fabrication process. ASME boiler and pressure vessel code experts would be the kind of expertise I'm talking about.

Don't assume that anything is easy. This seems rather simplistic, but what we discovered is those areas that we thought would be easy turned out to be the ones that bit us. The ones we expected to have trouble with, we put the

effort into and solved those problems. It was the easy ones that snuck up on us. So, this is just a caution that any time you think that this isn't a problem, that's the one that will sneak up on you.

Following procedures, I think again is obvious, but this is a lesson that we learned. We got into a situation with the initial production where welds were ground below the wall thickness of the base material. I think that's been well-documented and discussed. It wasn't that they didn't follow the procedures, it's they didn't understand the procedure. They followed it verbatim, but the procedure didn't address the right issue. The procedure made no caution about going below wall thickness because it hadn't been identified as an issue at that time. So, make sure that the procedures are there and that they're followed.

Quality assurance needs to be a part of the team from the beginning. Too many people made the mistake of treating quality assurance as an us versus them. You need to get quality assurance involved up front. Quality assurance role in my opinion is not to establish the criteria, but to make sure that whatever criteria the engineer establishes, he gets, and you need to be very careful when you establish that criteria because you might just get it. So, it's very important to get quality assurance involvement in the design, in the fabrication right up front. Don't wait until you're

through and then ask them to come in and tell you if you did it right.

The last bullet is the one that's caused us the most grief on the program since we received certification. This was caused primarily because the NRC reg guide specifically requests that the dimensions not be toleranced unless they're critical dimensions. But, in the absence of a tolerance on the certification drawings, you have not established that boundary to which you can fabricate those drawings. And, interpretation of the lack of a tolerance is what led to all of the frustration that we had with the wall thinning. In fact, the units that passed the certification had grinding almost identical to what was actually built in the first 15. But, it was not reflected on the drawings; therefore, it was not allowable. The NRC was correct in their ruling in my opinion, but it's something that if we had toleranced the design drawings up front, we would have avoided this problem. It's one that no one really thought about again because the TRUPACT was the first of its kind. Typical Type B shipping cask is two or three inches thick. And, if you grind the weld off and undercut it 1/32 of an inch, it really doesn't make any difference because you've got so much material to work with. But, when it's 1/4 inch thick and you undercut the base material 1/32, that is significant. And, it was not identifying that 1/32 undercut on the drawings that got us in

trouble. So, as a result of this, the NRC has told us that they will probably require all future applications for approval to have tolerances on the drawings and this will hopefully keep people out of trouble, but strongly recommend that every dimension be toleranced to minimize the risk of a question later, is it okay?

To talk about some of the lessons we learned from the operation and maintenance side of it, if you start off by designing safety into the operations, you'll find that it's a lot easier than trying to control safety by administrative means. And, at each step of the way, it's important that the ALARA concept, or as low as reasonably achievable, be looked at. This is not a quantifiable thing. This is one where you have to make a comparison and then use good judgment.

There are a number of examples of human engineering or designing safety into the package that don't depend on administrative control. One is the fact that we will do a leak test prior to each and every shipment. This is in contrast to the ANSI M-14 which normally requires a leak test for the first, third, and annual. We will do a leak test every shipment. This insures that if the package is assembled and the o-rings are there it will pass the leak test. If you leave an o-ring out inadvertently, this leak test would catch that. So, you don't depend on someone checking off that says, yes, I think it's there or, yes, I saw it there. You actually

do a proof of performance by doing the leak test prior to shipment.

Another example is the use of one lifting fixture to lift both lids and the payload out of the package. The bolt circle for the lift is identical in all three cases. So, there's no need to change lift fixtures and no risk of the wrong fixture being picked up. One single fixture handles all three jobs.

Another example is the tie-down u-bolt tension on the trailer is adjusted and calibrated against a go/no-go gauge. So, the driver is able to have a go/no-go gauge and the loader is able to have this gauge. And, it's simply a matter of the gauge, either it fits on the go and won't fit on the no-go and that gives him his range of tolerance. He doesn't have to worry about torque wrenches and calibrations and all of this. So, these are some examples where we've tried to design into the process ways to make it easier for the human being and to eliminate the risk of a human error.

DR. PRICE: What is the feedback on the lid that it is secure other than the leak test? That it's rotated into--

MR. GREGORY: When the lid is installed, the locking ring cannot be secured with the retainer bolts. Once the lid is rotated into a locked position, then three bolts are installed. Those bolts have been wired and tagged to indicate that it's been rotated and locked into. So, you've got a

visual inspection that gives you the condition. If the tag is present in the hole and the locking bolt is present in the retainer, that lid must be locked into a locked position. It cannot be--you can't get the bolts in if it's not in the right position.

There was a concern initially that if the TRUPACT were ever in an accident that the lid would somehow unscrew itself and the lid would come off. And, I can assure you from having done the test and removed the lid after the test that as little as a three foot drop on its side makes that lid almost impossible to get off. And, after a 30 foot drop, the only way to get it off is to destroy the outer protective shell and actually cut through the locking ring. The precision of the mating surface is so tight that once you just store it, you effectively lock it into place. So, if it's ever in an accident, the lid isn't going to come off. That lock ring just will not rotate.

The maintenance requirements have to be reasonable and achievable and again it's back to the quality assurance thing, ask for something that you--because you're going to get what you ask for. We had a lot of discussion with the NRC of what was reasonable. And, the case in point was the life of an o-ring. At one point, there were suggestions that we replace the o-ring every shipment. At another point, there was suggestion that we let the o-ring go until its shelf life

had expired. And, we essentially agreed that a once a year replacement, whether or not the o-ring was bad, even if it still passes the test, once a year we'll replace it, regardless. That's a reasonable and achievable kind of a goal. So, the maintenance requirements need to be looked at very carefully. And, also the acceptance criteria needs to be quantifiable. Do good work is not a quantifiable kind of a requirement and that was a case in point we got in trouble with on the fabrication. We did not have a quantifiable acceptance criteria for the requirement to grind the well smooth. The requirement was grind the well smooth. Did we meet it? Yes. But, had we a minimum thickness along with it, we would have avoided a lot of trouble.

The NRC safety concerns, again sub-criticality, shielding, and containment, this was well-known by all the packaging designers. NRC is going to look at both normal and hypothetical accidents. The normal conditions are fairly straight forward and easy to survive the test or the analysis. The hypothetical accident is where you have to put your concentrated effort.

The NRC is now concerned about flammable gas over the shipping time. The design pressure must be analyzed for one year. With the payloads that we're now shipping in TRUPACT, the maximum pressure we will see in one year is 12 psi. So, we have a very conservative design pressure. But,

what the NRC has told us as an extra regulatory request is that they do not want to see hydrogen gas or other flammable gases in excess of the lower explosive limit or lower flammable limit. In this case, about 95% of our gas is going to be hydrogen from the radiolysis due to the alpha, radiolysis primarily of water or organic materials. And, we find that we will in some cases reach a 5% hydrogen concentration. That 5% hydrogen concentration is what has driven our payload restrictions from the beginning. So, all of our payloads are evaluated and compared for their potential to generate gas, the gas release rate through the bags, and there are a series of calculations and a fairly complex set of tables that the NRC has bought into that all of the waste must be characterized for gas generation potential. We maintain less than 5% hydrogen in any layer of confinement inside the TRUPACT.

DR. CARTER: Let me ask you two questions about the gas. What's your experimental or test programs shown as far as taking actual material in the quantities that would be shipped and in the proper configuration of gas pressures and gas characterization that have been done over this period of one year and what do those data show? Primarily, the pressures, the buildup of pressure over time, and also the characterization of what gases you have in the--

MR. GREGORY: We've looked at the worst case in terms of

pressure and, over a one year period of time, 12 psi is the maximum pressure we would see.

DR. CARTER: Okay. But, is this a calculated value or is this measured?

MR. GREGORY: This is calculated based on laboratory measurements of actual waste samples.

DR. CARTER: Okay. But, you've not really done measurements over that period of time. Is that true or not?

MR. GREGORY: For actual waste--

DR. CARTER: I'm trying to separate now whether you're doing calculations or making actual measurements.

MR. GREGORY: We have not made any waste shipments. When the shipments arrive at their destination, we will measure the head space gases and the pressures. So, we will maintain that data. But, since we have not shipped any waste yet, we don't have any actual numbers.

DR. CARTER: Well, you don't need to ship it. I presume you can do this kind of testing at each generator site if you wanted to. You know, put material in and leave it a period of time and measure the actual pressures that are generated.

MR. GREGORY: This has been identified by a study done by Tom Clements at Idaho where he sampled over 200 drums that had been sent with known waste materials and he measured quantities and pressures in those drums. These were sealed drums, not vented. All of our drums are required to be

vented. So, we will have no pressure buildup within a drum of waste. All of the drums at all of the generator sites now are vented, as are the liners, and the bags all have a known release rate.

DR. CARTER: What about the determination of the specific gases that are generated? Do you have a good handle on this based on experiment?

MR. GREGORY: Yes, we do. We have samples and there is a report by Clements and Kudera at the Idaho National Engineering Lab where they have sampled and quantified the gases in the head space of the drums. Based on that, we put together a chemical list which addresses the chemical compatibility of the materials and the chemical gases which would be produced, the volatile organic compounds, and the flammable VOCs. We have a further restriction of less than 500 ppm for flammable VOCs.

DR. CARTER: Okay. The other question, because it would appear to me that your entire transportation program, the design of the TRUPACTs and so forth and, in fact, the operation of WIPP itself is based on, essentially, the waste acceptance criteria. So, your program is based on what waste you're going to be transporting and so forth. So, I had a couple of questions about this. Obviously, the pictures you show of the TRU waste, it's fairly obvious that it's completely non-homogeneous. And, my question is--

MR. GREGORY: Some of the waste, that's true.

DR. CARTER: Yeah, well, what you showed I think obviously fit that category quite well.

MR. GREGORY: Right.

DR. CARTER: And, the question is how well can you characterize such non-homogeneous waste? Because obviously your TRUPACT and so forth obviously depends on what you put in it and so this is why the waste acceptance criteria is extremely important.

MR. GREGORY: The waste acceptance criteria as was established for storage at WIPP dealt with primarily operator safety considerations. The transportation criteria which is based on the same kind of criteria or the same requirements, but with a different set of criteria, is based on the 60 day shipping period that we would be transporting the waste. The concern over 60 day shipping period was really compatibility with the materials of construction, the butyl o-rings and the 304 stainless steel. So, once you've evaluated your waste for compatibility with those two materials, you've satisfied that requirement. And, we've done that through the chemical list.

The second issue was 5% hydrogen. In order to calculate the 5% hydrogen, you need to know the number of layers of confinement. You need to know the rate at which the gas is generated and the rate at which it's released from the layers of confinement. We have done laboratory tests and

experiments to determine the rate at which it's generated for the various materials and these are broken down into categories. We have the rate of release of the hydrogen from the layers of confinement and the sites identified the number of layers of confinement. Given those three pieces of information, you would then go to a table with the knowledge of the isotopic inventory in the drum, which we know given the analysis and the measurements that can be done by assay. We then can calculate or determine the wattage of each drum. That wattage is then compared to a table to determine whether or not you'd exceed 5% hydrogen. If you exceed the 5% hydrogen, you may not ship it. There is a fourth test category which allows you to put drums through a test program to determine the actual amount of gases that are generated. Remember, all of these tables are based on worst case scenario. The real amount of hydrogen is significantly lower, we know, than what the maximum theoretical amount could be.

DR. CARTER: Well, what, for example, is to preclude someone putting more cesium-137 in one of these things than should be so that you end up with a shielding problem?

MR. GREGORY: In order for waste to be shipped, the generator site has to first prepare a site plan known as a TRAMPAC, TRUPACT Authorized Methods for Payload Control. There is an attachment to the safety analysis report, Section 137, which is a generic TRAMPAC that all the sites have to

meet. They submit that to a committee known as the Waste Acceptance Criteria Certification Committee, or the WACCC as we refer to them.

DR. CARTER: That's located at WIPP?

MR. GREGORY: That's at WIPP, but it is a committee that works for the DOE. It's staffed by DOE, by Westinghouse, and by outside consultants. That committee then approves the site-specific TRAMPAC or how this site, whether it be Idaho National Engineering Labs or Rocky Flats or Los Alamos or anyone else, will do business. In that plan, they would reference their site-specific procedures. The WACCC would then review that plan and approve it. They would then go to that site and audit those site-specific procedures to verify that those procedures were, in fact, being met. One of the criteria on that is a limitation on the fissile content. Another criteria would be the shielding. So, in order to pass that audit by the WACCC, they would have to have a procedure in place that they measured the shielding, measured the dose rate at the surface. Shielded drums are not allowed if the shielding is there to reduce the radiation level. Now, if the shielding is there for ALARA, it would be allowed.

DR. CARTER: Okay. Now, I presume at some time in the operational history of WIPP that it will get waste material from somewhere, whether this is Rocky Flats, Savannah River, or wherever, that may not meet the WACCC criteria. Now, what

happens to this if it comes in and it's got, for example, too much gas pressure, if it's got too much liquid, if it's got too much plutonium-239 in it, or just what?

MR. GREGORY: The waste would not be allowed to be shipped to WIPP if it didn't--

DR. CARTER: No, I'm talking about if there's an error made at the generation or the shipping site and I presume that's possible. You'll never have a completely fool-proof system. My question is if you get such a thing that you find when it gets to WIPP that it does not meet all the criteria, what do you do with it? Do you treat it there to make it compatible with the criteria or does it go back to the generator? That's really my question.

MR. GREGORY: WIPP does not have a treatment facility or processing facility. That's why so much emphasis is placed on the certification of the waste before it leaves the origin site or the storage site. The waste is certified for storage prior to being shipped. It's not certified after it gets to WIPP.

DR. CARTER: I see. So, you assume then that you've got a fool-proof system and you're never going to have any waste received that does not meet the waste acceptance criteria. So, you have no contingency problems to deal with those if they should occur?

MR. GREGORY: We could have a situation where the waste

was shipped in a certified state and arrive at WIPP in an uncertified state. We do have contingency for that. As an example, if we discovered contamination on the outside of the container, the drum or the standard waste box, we have an overpack room built that we would go into with that waste, overpack it, and decontaminate the TRUPACT. So, those situations that we expect are possible or probable to occur, we do have that contingency. But, a tremendous effort is being placed on certification prior to shipment because we don't want to deal with the situation that we've now got this waste that we can't ship it, at all. That it doesn't meet the criteria.

DR. CARTER: Well, the only--yeah, I understand. You do have a contingency plan then for treating wastes that does not meet the criteria, wherever that happens to have occurred?

MR. GREGORY: Yes, sir.

DR. CARTER: The other area I wanted to ask you about, you mentioned several times that in dealing with the NRC or the regulatory agency in this case, as far as TRUPACTs are concerned, that you've got to satisfy their comfort level. I wonder if you'd expand a little bit on comfort level which, I presume, is a pretty subjective thing versus what I would consider objective numerical criteria of the NRC?

MR. GREGORY: The comfort level, as you correctly identify, is very subjective and it has to do with the fact

that as individuals we all have things that turn us off or turn us on. That's why in my opinion an analysis is much preferable to a test because then you're talking about quantifiable numbers. Talking comfort level or evaluating a design without a test or without an analysis, it's really like trying to compare two horses before the race. Until you go out and do the test or do the analysis, do you know. Once we did the test, the NRC's comfort level came up to a very nice --a warm, fuzzy feeling is the expression that we use. Prior to the test, it was difficult to gauge their comfort level other than it was obvious that it wasn't very high because this was a fairly new design. And, it was trying some things that they had never seen before and this is why their comfort level was maybe not as high as if we'd come in with a conventional bolted design that they would have looked at and said, oh, yeah, that's just like all these other casks we've approved and we know that three-quarter inch bolts are about right and it takes one about every six inches, that kind of an experience.

DR. CARTER: Well, that's helpful. It's a combination of the two, rather than either/or.

MR. GREGORY: That's correct.

DR. CARTER: Okay.

MR. GREGORY: It is a combination of the two. And, that's really where the test program was developed. Why do we

do this regulatory test? This is not the most severe accident that could ever occur, but it is an extremely severe accident. And, Sandia National Labs has done a number of tests to try to calibrate this against a real accident. And, in all the tests they done, including crashing trucks into walls and locomo-tives into casks, the 30 foot regulatory drop and the puncturing and a fire has been more severe than a real life kind of a highway accident. But, could you come up with a more severe crash? Of course, you could. So, it's a very quantifiable, repeatable test and that's what's so good about it.

DR. PRICE: And, we're going to have to decide how we handle Rich Leonard and lunchtime and so forth, but I do want to ask you a question. Did you run into any problems or much flack due to the difference between the DOT tie-down requirements of one and a half times the weight versus the NRC requirements and the compatibility and the logic involved between two sets of requirements there?

MR. GREGORY: I think the difficulty that we ran into, we created ourselves because we put out a story that described it as a "breakaway tie-down system". It's not a breakaway tie-down system. The NRC's concern, as you know, is that if anything happens to the tie-down, they don't want the packaging compromised. When we explain to people that those tie-downs meet the same rules that every other tie-down system

across the highway is using, it's just that the one on the packaging is so much more massive, it makes the u-bolt look small. People accept that and understand it. But, this is a common question that we get when we sent this unit out on the road show demonstrations. People look at it and they comment on the tie-down system. That really looks like a small tie-down. And, once we explain the process, that tie-down meets all of the rules that every other transport going across the highway meets, then they start to get comfortable because basically loads don't come off by themselves. You know, we travel millions of miles with the loads right where they are. So, the DOT rules seem to be about the right place. And, we need all of those DOT rules.

DR. PRICE: Um-hum.

MR. GREGORY: But, there is a discontinuity. I recognize it and it's a fact of life, two different agencies have a set of rules that go together like this.

DR. PRICE: Do you think that for this particular case, DOT ought to be involved in an exception to their tie-down rules and provide stouter tie-downs?

MR. GREGORY: Well, I would ask the question back. What would you propose? That DOT increase the margin of safety for their rules?

DR. PRICE: That's what I meant by saying stouter or a more robust tie-down.

MR. GREGORY: I don't think that's necessary because if you do, you'll start to infringe on the packaging itself and get into a situation that the NRC doesn't want to see, that maybe the packaging fails. The other side of the coin is that if you make the u-bolt so strong that it won't break, you're now going to tear the trailer frame. So, in any given system where you have a test to failure, something is going to fail if you make that stronger. You just move the failure mechanism somewhere else. So, the question is would you rather have a replaceable u-bolt fail so that in the field you can put a new u-bolt on and continue the trip or would you rather rip a hole out of the side of the frame or out of the side of the TRUPACT? And, I think the--

DR. PRICE: Um-hum. But, there is a big difference between the requirements specifically on the TRUPACT and the tie-down and could they not be closer?

MR. GREGORY: You're asking the wrong person. You need to talk to the DOT about that. I, personally, don't see any problem with the rules the way they are. And, we've put over 100,000 miles on these trailers with road shows and simulated weight TRUPACTs and we've had to my knowledge one broken u-bolt and we replaced that and that u-bolt, by the way, was an earlier design. The material has been strengthened. So, I don't see a problem.

DR. PRICE: Thank you.

Mike, I'm wondering if we could not get Rich Leonard in or should we break for lunch now? It's about noon, coming up of noon. And, we could have Rich as the first speaker right after lunch if we prefer to break now or we could get him in and have a little later lunch. Which is better?

MR. MCFADDEN: Rich is definitely going to need 30 minutes.

DR. PRICE: Um-hum.

MR. MCFADDEN: So, it's your call whether we can do it after lunch or go to lunch at 12:30.

DR. PRICE: Well, from a subject matter standpoint, it makes a cleaner break to have him here with this part. However, it's sort of like a toss of the coin, I think, because we have time later. So, why don't we go ahead and go to lunch now and try to come back a little bit earlier than scheduled. We were scheduled to leave for lunch at 12:15. We'll leave at 12:00. We were going to be back at 1:30. Can we try to be back here by 1:15 and begin at that time? Would that be all right?

MR. MCFADDEN: Yes.

DR. PRICE: All right.

(Whereupon, a luncheon recess was taken.)

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

DR. PRICE: Let's begin our afternoon session.

Rich, it is all yours.

MR. RICH LEONARD: I'm Rich Leonard with Westinghouse Governmental Affairs. I would like to thank the Board and the audience for this opportunity to talk about the WIPP Institutional Programs. I am going to be giving a different presentation than my predecessors here. I probably have a louder mouth than they do and in the interest of making up of some time I hope to have maybe a faster mouth. I also have to admit whereas they seem to have years of experience with the WIPP as Mike McFadden introduced, I've only been here for about a year, so I may not be able to quote firsthand the old testament of some of these issues and may inevitably have to draw upon my associates and maybe the members of the audience to reflect on some of these matters.

I want to address three areas. The first one should say New Mexico and other states and tribal cooperative agreements because certainly I'll be reflecting on the Western Governors' Association Cooperative Agreement even though we have representatives from the Western Governors' Association here this afternoon; emergency response training and transportation route selection.

Getting into New Mexico and the history of WIPP in

New Mexico and institutional affairs, the State passed their Radioactive Materials Act in 1979, which established their Radioactive Waste Consultation Task Force, which is an executive branch task force reporting to the Governor, and which negotiates with the DOE on WIPP matters. They also have a Radioactive and Hazardous Materials Committee which provided legislative oversight of WIPP.

The Environmental Improvement Division of the State is a regulatory body to monitor WIPP and has gotten its mixed waste authority from the U.S. Environmental Protection Agency.

What has been traditionally considered a New Mexico Institution is the New Mexico Environmental Evaluation Group. Mr. Neill with the EEG is here this afternoon and he is going to make comments, and in the interest of time I really won't get into the specifics of their role other than they provided independent assessments of WIPP operations and that sort of thing.

Now before I show you the next slide, it came quite of a surprise to me as the new person to WIPP who no sooner got there than all the talk was cooperative agreements and that sort of thing, when going back in time we have to consider that there was a period of time where the state and the DOE weren't seeing eye-to-eye over just what the agreement for consultation and cooperation should cover if the DOE back in 1981 was thinking that perhaps it would be limited to the

site boundary where the state was thinking it should be, possibly include matters covering the entire state. That resulted in a suit brought by the State of New Mexico, over a lack of an agreement for consultation and cooperation. But for which the suit was settled through a stipulated agreement in 1981, and to which there was a consultation and cooperation agreement attached as an appendix to get into the transportation issues, the DOE and the state signed a supplemental stipulated agreement in 1982, which addressed the state's off-site concerns including emergency response training and equipment, WIPP transportation route selection and funding to upgrade portions of the routes. Perhaps not a transportation issue itself but it also addressed independent environmental monitoring for the state and Price-Anderson coverage for WIPP incidents.

Since that time this agreement for consultation and cooperation has been amended three times. In 1984 to require compliance with all applicable EPA regulations. In 1987 to require DOE support for the state in its efforts to obtain federal funding to compensate the state for WIPP impacts and to build relief routes around six New Mexico cites on WIPP transportation routes. And in 1987 to require additional testing at the site.

I'd like now to move into some aspects of the emergency response training and public information that the

WIPP site has undertaken. The WIPP teams visited the state government of each state on WIPP transportation routes from Idaho and Savannah River in 1987 and 1988 to address first of all emergency response training and a public information tour that would be undertaken. The emergency response training was completed in its first round you might say, even though we have retraining every year, it was completed in its first round for the corridor from Idaho National Engineering Laboratory in 1988, and refresher training has been provided ever since then. And an initial public information tour was also completed in 1988.

In the State of New Mexico, we have a specific two-year agreement on emergency training and equipment. It was first of all signed in 1988 and made provisions for financial assistance and emergency response equipment. And then in 1990 was renewed for another two years. Here again all around emergency response equipment and financial assistance. When we cite the numbers of $203,017 for financial assistance, that was actually funds provided to the state so they could procure personnel, some equipment and other financial assistance that they had requested in regard to the $60,000. For in 1990, the $30,000 that was actually equipment which the Department of Energy procured directly and provided directly to the State rather than financial assistance rather than the monies.

I'd like now to move onto the agreement between the

Western Governors' Association and the U.S. Department of Transportation. You might say, why are we talking about the U.S. Department of Transportation cooperative agreement? Well that was the predecessor to the cooperative agreement between the Western Governors' Association and the Department of Energy and many of the same activities you find in the Department of Energy's cooperative agreement with the WGA, were preceded by those very same activities under the Department of Transportation Cooperative Agreement.

In 1988 Congress provided $1 million to the states along the Hanford to WIPP route to address safety concerns related to WIPP shipments. The activities were implemented through a one year cooperative agreement between the WGA and the DOT. And the significant product out of that was a report to Congress saying that the states were most concerned with three major areas, accident prevention, emergency preparedness and public information.

That was followed by the five-year cooperative agreement with the U.S. Department of Energy and the WGA, which provided in its first year $1.515 million to what might be regarded as the seven states in the Hanford to WIPP corridor plus three additional states of Arizona and Nevada and California were provided the funding to attend the WGA meetings in that first year. Their funding will be increased in the second year as shipments from or shipments through

those three states approaches. And each of the corridor states provides a work plan under the cooperative agreement citing specifically what each state is going to do to address its individual concerns even though in general the cooperative agreement is intending to address state's concerns on a regional basis.

In the general category of accident prevention, the cooperative agreement addresses activities involving driver and vehicle audits for contract compliance. That's where the State of New Mexico would come in and actually audit Dawn Enterprises to provide verification of their complaints with the contract. There's independent inspections of the shipments, advance notice of the shipments and shipment status information which a central focus to those two issues is the use of TRANSCOM. There are procedures being worked out between the Department of Energy and the states in avoiding bad weather and adverse road conditions as well safe as parking under abnormal conditions.

Under emergency preparedness, we have activities involving mutual aid agreements, emergency response plans, radiation detection and protection equipment and training of emergency responders.

Public information, I think a focus of public information is not that it is just one-sided. Department of Energy provides information but the states are a party to it

and even moving towards having the public, getting public interaction or reaction to public information. And in fact this Spring, there is going to be what is called a risk communication seminar with the Western Governor's Association and the DOE to talk about the very aspect of productive interaction with the public in passing information.

Department of Energy is negotiating cooperative agreements with the Southern States Energy Board and is in the process of negotiating with two Indian Tribes; one, the Fort Hall Shosone-Bannock Tribes in Idaho, the other the Confederated Tribes of the Umatilla Indian Reservation in Oregon and other tribes and they have the implementation plan to negotiate cooperative agreements with other tribes as shipments through their area approach.

DR. CARTER: Do the routes go directly through reservations, or are they just nearby?

MR. LEONARD: No, they go directly through reservations. In fact there are times when you have the Pueblos in New Mexico, you have to sit there and judge whether or not their reservation is adjacent to the route or possibly over beyond what would be an impacted area. But those two we are talking about go through the reservation.

One thing we have learned is that the cooperative agreements between the Department of Energy and state regional organizations provide a uniform approach to problem

resolution, that's getting back to the WGA, is actually approaching the resolution of the state's concerns on a regional basis. Now that is not to say that states don't have their individual concerns and through the work plans under the cooperative agreement are allowed to do state specific activities, but for the most part the cooperative agreement is addressing the state's concerns on a regional basis.

In contrast to the states which have their cooperative agreement through state organizations, the tribes should be dealt with individually of sovereign states, and as we are discovering through negotiations over cooperative agreement with those two tribes I've mentioned, cooperative agreements are a viable way to address the concerns of the tribes.

I'll pause here to see if you have any questions on what seemed to me like a pretty fast presentation on cooperative agreements, although I would mention that later on we do have the representatives of the states from the WGA who will be providing you probably more information or possibly reflecting on what I said and that sort of thing.

DR. CARTER: Yeah, let me ask you a couple. One, are there any differences other than legal in terms of the context or the content for example of cooperation and consulting agreements, stipulated agreements, supplementary stipulated agreements and so forth?

MR. LEONARD: I'm certainly no lawyer, but my impression is that the stipulated agreement and it's appendix which is the agreement for consultation and cooperation and the supplemental stipulated agreement are actually all one document or agreement, and I'm not sure what else I might say about them. They are not viewed so much independently as one building upon the other. They are like a building block to the entire agreement with the--building blocks to the entire agreement with the State of New Mexico.

DR. CARTER: Okay. The other couple of questions, do you work directly with or have any sort of agreement with the Western State Energy Board?

MR. LEONARD: Western Interstate Energy Board?

DR. CARTER: No. Western State Energy Board.

MR. LEONARD: No, we do not.

DR. CARTER: Which I presume is a creature of Western Governors' conference. But, I just wondered if you dealt with them directly?

MR. LEONARD: We do not.

DR. CARTER: Do you have any agreements directly with the Conference of Radiation Control Program Directors?

MR. LEONARD: We do not.

States Training and Education Programs--the Consultation and Cooperation Agreement of 1981 with the State of New Mexico commits the DOE to emergency response training

in New Mexico. And then later on in 1987 had a meeting with the Western Interstate Energy Board, DOE committed to training outside of New Mexico within the corridor states.

And the emergency response training program was initiated by the Department of Energy's Joint INtegration Office back in '86. It was transferred to the Westinghouse Waste Isolation Division in '87. The curriculum was presented by Westinghouse and the program was presented by Westinghouse by the Western Interstate Energy Board in 1987 and 1988.

Basically what is in the states training and education program, we have the first responder of course, which is geared to just as it sounds, the first responders to the scene, which might be local fire fighters, emergency medical technicians or law enforcement personnel. It's a one day course. There is a command and control course which starts out the first day presenting the first responder course which moves onto the second day into the command and control of the scene, typically by a state official, an official of the State Police. It might be the on-scene commander for controlling the entire scene. There is a mitigation course which is typically attended by a radiation protection drill person or environmental improvement division person.

The whole idea is there is an assessment of the radiological impact of the accident and what mitigating action should be taken to protect the public in the environment. And

then there is a train-the-trainer course which is offered in case the states would like to do their own training of first responders. They can take this train-the-trainer course and thereafter train the first responders themselves. That particular course has not been widely utilized thus far. Thus far it has basically been the Department of Energy through Westinghouse Electric Corporation that has done all of the training for first responder command and control and mitigation. There is also a first responder refresher course offered which is a half-day course in recognition of some of the first responders, they have already taken the first responder course but want to come back whether it is on a yearly basis or whatever and take a refresher, mainly concentrating on the radiological aspects of the training.

DR. CARTER: Is most all of the training done in the field where the people are located rather than at the WIPP site or is it some combination of the two?

MR. LEONARD: Oh, it's all done in individual states, and I might at this point pause to mention that the training sites, meaning the locations, and the training dates are all negotiated with the state. It's not that Westinghouse develops a training campaign of locations and dates and simply publishes it, it's that it is in cooperation with the states. In the end it is the states who actually invite the students and select who will attend, but it's all a cooperative effort

and negotiated between Westinghouse and the states.

I mentioned earlier that the training was initiated in 1988. It started in Utah of April of 1988, and within five months we had completed the training in the first five corridor states of Idaho, Utah, Wyoming, Colorado and New Mexico.

In that first corridor over those five states thus far, we've trained almost 4,500 responders. We also provided training in the six southern states in 1989, total of 1600 students. And altogether there's been more than 6,000 students trained as of February 1991.

DR. CHU: Excuse me, Rich, these numbers, do they reflect direct training or pyramided through train-the-trainer?

MR. LEONARD: Actually the train-the trainer has very little impact. It hasn't been used by the states up until now.

DR. CHU: Okay, so these are direct--

MR. LEONARD: We have offered what might be a half dozen train-the-trainer course basically just to show the states what they consist of. The train-the-trainer course has not been utilized by the states as the means of providing training to the first responders or the command and control or anything like that. So train-the-trainer has its prospects in the future as being widely utilized as the states may decide to take over the training themselves. But up until this point it

has not been widely utilized.

We have enjoyed success in the students evaluations of the courses and 86 percent have rated the courses at above average or excellent. And we attribute the reasons for the success in that our instructors are former fire fighters, police officers or emergency medical technicians themselves, and this develops a rapport with the students that they can relate to rather than having what might be a very slick presentation by somebody who they can't really associate with ever having been on the ground as they have to in an emergency.

We've said the training is taken to the students eliminating their travel. It is actually provided in sites that the state selected, hoping to be able to attract students to them up and down the corridors. And through our evaluations that we get back from the students, we have tried to tailor the course to what the students actually expect to see and want to see and need to see and that sort of thing based on their reaction.

Some benefits of the program having a central training staff that's able to go into each of the states, it's less costly than if each state had developed its own training program. It provides some consistency between the states in that the same training staff and same program is presented throughout the states, and allows the materials to be updated

at a central location instead of having to keep our number of states informed of changes in the WIPP transportation system even if there are things like the TRANSCOM system or the look of the trailer, that's something we do cover in the training to familiarize them with what the transportation, the WIPP transportation system actually looks like so they will recognize it in an emergency.

Here are some trends that certainly points to the future for the training program. We find that more law enforcement officers attend than the other two emergency responders of fire fighters and emergency medical personnel. Actually that is not so much dis-serving but something of note.

Now here is something we would like to promote in the future though that more local officials attend the training even though they may not be emergency responders, it is important to have the local officials cognizant of what the WIPP transportation system consists of, what the emergency response training is providing for, and just the whole aspect of what is WIPP about and what are these shipments coming through their community. How are they being provided for as far as emergency response training is concerned.

Attendance at the courses decreases 40 percent per year, and we still have yet to figure out exactly why that might be. On the positive side you might speculate that well

the emergency responders have received the training and are satisfied and don't care to come back the next year. You might also say that maybe even those that haven't attended have heard from the others that the WIPP transportation system is the safest of any hazardous material in the United States today as was concluded by the National Academy of Sciences and therefore maybe they are not so much considering it a threat for which they need training.

On the other hand, it may be that we are not providing the training and hours that they continue to be attracted to. We are keeping that in mind as we negotiate with the states that maybe we have to provide training in off hours in the evenings and on weekends. If one of these responders might be volunteers, maybe they can't readily take off to attend the training.

There's been some speculation also that maybe the attendance is dropping because the responders don't see imminent WIPP shipments. That at first it as a novelty that here is the prospect for WIPP shipments and they attended the training and thereafter they have not seen WIPP eminently opening and so maybe they have lost interest.

This is all speculation because actually we are still trying to get a handle on what is it that has caused the attendance to drop. On the other hand the acceptance of the courses by the students has increased each year. The

percentage of students rating the course as above average or excellent has gone up.

DR. PRICE: What are the objectives of the training course? If that isn't a general question then I don't know one.

MR. LEONARD: Well, it's pretty general and I might just kind of give you a thumbnail sketch of the first responder course. I'll not take up the time to read down through this entire course outline. But, under introduction we talk about a WIPP overview and the definition of transuranic so they can get an idea of what the waste is. We even talk about the waste acceptance criteria so they have an idea of what is actually in the waste. We talk about radiation, both naturally occurring and what is represented through the WIPP shipments, concentration on alpha as being something that discriminates transuranics, alpha radiation from the other sorts of radiation that they might be encountering in other shipments of radioactive materials.

We talk about radiation terminology and protection principles and possible exposure from WIPP shipments. We go onto address the transportation system itself including how the routes were selected and what the history is of transportation of radioactive materials and what regulations affect transportation. We get into the TRANSCOM tracking system. We talk about the TRUPACT package, both in its

physical characteristics and what sort of certification requirements from the NRC were imposed upon it. And then we get into emergency response training course itself, talking about the former transportation emergency response guidebook as we refer to it. We talk about the Department of Energy's response which is the radiological assistance program and what it provides as the secondary or tertiary response to an accident. And we talk about the specifics of what fire, medical and law enforcement personnel should do in response to a TRUPACT accident. And in the end we have a question and answer period. And that's the first responder course.

Like I was saying the command and control course, the first day is the first responder course. And the second day it gets into actually addressing how to control the scene and what the on-scene commander is having to deal with. The integration of agency, the communication which is going to have to take place. And it ends up with table-top exercises of a scene complete with models of a scene with cars and trucks and that sort of thing.

DR. PRICE: Does it differ--much of what you have presented sounds quite similar to what would occur in most hazardous materials type training course for first and emergency responders.

MR. LEONARD: It draws on that although it doesn't really address response to the hazardous materials constituents

themselves. A lot of it has to do with the emergency response and protocols and that sort of thing. It doesn't concentrate on hazardous materials constituents as much as it does of the peculiarities of radioactive materials, and in particular the Transuranics.

DR. PRICE: Does it use instrumentation?

MR. LEONARD: No, it does not, because first responders are not expected to have radiation detection equipment. That would be expected to be a role of the state mitigation teams. In fact that is a policy which has been upheld by the conference of radiation control program directors and that is that state responders as the focus of their response is fire suppression, control of the area, rescue, it is not doing the job of the state responders, the mitigation teams of assessing the degree of release, contamination, the environmental impacts and what mitigation activities should take place to protect the public and the environment.

DR. CARTER: I am not too sure I would agree with you maybe in the WIPP program. But certainly over a period of years in many, many cases, first responders did have monitoring instruments and so forth. A number of the states for example the State Highway Patrol has instruments. They are trained in their use and also highway personnel and so forth.

MR. LEONARD: Some of them may. I guess a perspective

could be drawn that you wouldn't want their primary roles of fire suppression, rescue and control of the area to be delayed with them pursuing let's say a survey of the area and that sort of thing.

DR. CARTER: Yeah, but the question is whether you evacuate the immediate area and how far you evacuate it and that sort of thing is one of those functions of first responders if you've got the proper training and so forth.

MR. LEONARD: Well to answer your question, that is not part of our first responder course.

Well one thing we've learned is that even though the cooperative agreement with the Western Governors' Association allows us to address states concerns on a regional basis, when it comes down to the states training program, we are pretty much convinced that you should deal with the individual states just because it is through that mechanism that we can more readily negotiate the dates and the locations and work with the states on how many students are expected and that sort of thing. And as we have said before we should take the course to the responders.

About WIPP transportation and route selection, our big concern at this point is obtaining a New Mexico designated route. The New Mexico routes were initially envisioned in the supplemental stipulated agreement signed in 1982 and the other routes were laid out and of course with DOT regulations in

1986 and were introduced to the Southern States Energy Board in individual western states and through the National Congress of American Indians and to the Western Interstate Energy Board.

I am going to show you a map here that I could spend quite a bit of time talking about what it does and doesn't show. One thing I might mention is that it doesn't show Interstate 20 which comes across the southern states from Savannah River. And the reason for that is if we were to use Interstate 20 it would be within the context of the old Department of Transportation regulations which basically said you will use the Interstate routes.

They didn't say, as do the current Department of Transportation regulations, that you will use the Interstate routes that are the closest point to your destination, unless a state has designated an alternate route through its state designation process. So, in the context of that and perhaps keeping in mind that the State of Texas is not taking actions, as is the State of New Mexico, to designate a route. In the absence of a Texas designated route to connect Interstate 20, let me start pointing, Interstate 20 would come across here to Pecos, Texas. In the absence of Texas designated route to link Interstate 20 with the WIPP site, we'd have to be relying on the New Mexico designated route which we are hoping to get which is generally depicted here (indicating).

If we did a New Mexico designated route which is generally depicted here and I'll have a blow-up map here in a minute of what we are hoping to get or what the state has been proposing. If we get a New Mexico designated route coming from the North, then all WIPP shipments would be utilizing that route from the north.

This is reflected under the Department of Transportation modifications of the regulations of 1989 which is the point in time at which the Department of Transportation said, "It is not just a matter of using the Interstate routes with a lot of discretion of where you jump off of them to continue your journey to your destination. It is a matter of you will use the interstate routes at the closest point of your destination, unless it is stated or designated other-wise."

And in recognition of that, the State Attorney General of New Mexico ruled that the state must designate routes. It couldn't just simply say that they were included in the supplemental stipulated agreement. And that the New Mexico Environmental Improvement Board was the state agency authorized to designate the routes. The Environmental Improvement Board has undertaken that task. The State Highway Department performed an analysis of the routes, public hearings were held, it will be approaching a year ago. The EIB designated a single north to south route that avoided

Santa Fe and Carlsbad on October 12, 1990.

We see that route here, which is basically depicted as having come down Interstate 25--I might pause to say that the EIB was interested only in designating a route to serve the WIPP test phase, feeling that it would be five years or beyond before we would have to address other shipments. The route would utilize the interstates down 25 from Colorado until they reached point near Las Vegas where they would jump off on U.S. 84, take the state road 219 and other U.S. Highway 84, 285 down to Artesia. At this point in time it would deviate from what was expected from the supplemental stipulated agreement by heading east on 82 and avoiding Carlsbad.

I might of at the top pause to say that this route is also different from what was expected from the supplemental stipulated agreement, in that under the SSA we would have taken Interstate 25 all the way close to Santa Fe and then jumped off on U.S. 285.

Having indicated or having designated a route, even though it hasn't become official that was different from what was expected in the supplemental stipulated agreement, the Highway Department had objections to that route. They said the designated routes were not designed for heavy vehicles and in particular Route 360, which avoids Carlsbad, was subject to damage from subsidence from the potash mines underneath it.

Despite objections from the Highway Department, the EIB met again in December and actually if not refused, actually declined to reconsider the route which was chosen until under further petitioning from the Highway Department, in February it decided to go ahead and reconsider that southern part of the route that avoided Carlsbad and have hearings in May of this year.

And that's where we stand. We still don't have a New Mexico route and so it is kind of a trite lesson learned, but I guess the issue here is start early in the hopes of having your route designations accomplished by the time you are ready to ship so that when you are addressing shipments, routes aren't one of the things that has to be brought up.

If there are any questions, I'll certainly be glad to address them.

DR. CARTER: Let me ask you a couple about the training program. In your various training programs, are there inherently built-in evaluations of the students in each of those by the instructors?

MR. LEONARD: If the states request and they have, we will give the students tests. And we consider those tests basically for the use of the state and whether they want to use it for credentials or continuing education purposes or whatever they may be, at the state's discretion, we will give the students tests.

DR. CARTER: You don't necessarily feel that those are desirable or necessary?

MR. LEONARD: Well, I think we consider them desirable but we still have left the choice to whether or not to give the students tests is up to the state.

DR. CARTER: Well, what about evaluations of the instructors? Are these routinely done by the students?

MR. LEONARD: Yes, they are. In fact--

DR. CARTER: Without the state request, necessarily.

MR. LEONARD: When I'm reflecting on the student evaluations and the 82 percent of above average or excellent, that is the overall--we are reflecting on the overall critique of the course, but there are certainly questions within the evaluation specific to the instructors.

DR. CARTER: The other thing is is all of your training staff that are involved in the training of the trainers ultimately, are these all full-time and dedicated to this particular program?

MR. LEONARD: Yes, they are.

DR. CARTER: Now you mentioned table top exercises. Do you ever have actually simulated drills or exercises to essentially orchestrate response and see how the trainees perform under those circumstances?

MR. LEONARD: We have had one last November with the State of Colorado called Transax and was pretty highly

renowned for having the TRUPACT transporter or at least the road show as we see outside there, for the local responders to respond to an assimilated accident of which there was some damage to the exterior of the package and to have the state response on top of that along with DOE radiological assistance team respondents. That was just the first of what may end up being a series of exercises throughout the states.

I'd be letting the cat out of the bag to get into the details of the proposal that Westinghouse has developed for the Department of Energy. And, I'm somewhat reluctant to simply report what has been proposed. If it doesn't end up being funded, or whatever, might be disappointing to the audience to have gotten their hopes up that we will, on whatever basis, have something similar to transact. But certainly, I can certainly address that there is a proposal in the works to have a series of exercises in the corridor states for the very purposes of exercising the training and the planning and that sort of thing.

DR. CARTER: Well I personally feel, not speaking for the panel necessarily, that that would be a very good idea. I think, you know you can train people all you want, but you try them under simulated or actual circumstances, sometimes it is difficult to really know how they will respond.

The other thing, since the Governors are responsible for the health and safety of their citizens in each state, who

normally will be or what agency will have the on-scene commander?

MR. LEONARD: That is definitely, if it is not the local government, it is the state government having taken over from the local government. The Department of Energy response to an accident will simply be to provide technical assistance and support to the state.

DR. CARTER: Thank you, sir.

DR. PRICE: In listening to your route selecting presentation, the question arose in my mind, were any of the selection criteria technical in nature, at least initially? Evidently some of the technical aspects of the adequacy of the infrastructure have been left out. Is your assessment generally that the route selection was on the basis of political considerations or to what extent did technical reasons get into it?

MR. LEONARD: I can't really address that directly, because I really don't know what all deliberations, the EIB went under. If I were to reflect on comments they made in the public hearings when they selected the route, for instance, they were addressing minimizing radiological risks to the public and that was their reasoning behind choosing the routes which avoided proximity to both Santa Fe and Carlsbad.

DR. PRICE: Did they get into in minimizing the risk to the public the accident experience by segments of highway and

so forth and avoid those that had higher incidents of accidents say involving trucks carrying hazardous materials or involving trucks or whatever?

MR. LEONARD: There again, I can't vouch for what deliberations EIB went through behind the scenes. At their public hearings they did not address that to my knowledge. They may very well have in their deliberations. I'm just reflecting on when they got up and designated the route, what they were referring to when that was the radiological risk of going through or close to populated areas.

DR. PRICE: Thank you very much. All right. We'll switch our presentation mode. We have some additional places and name plates at the table. And bring up the state and independent perspective presenters.

Our first presenter is Bob Robison.

MR. ROBISON: Good afternoon. I am Bob Robison, that's pronounced Robison, from the State of Oregon, that's pronounced Oregon. I work for the Oregon Department of Energy. I also coach the Western Governors' Association WIPP Transportation Task Force. It is working on many of the details you've heard about so far this morning.

On behalf of the ten western states participating in that WIPP Transport Work Group, I want to thank you for the invitation to me with your Board. We are both flattered and honored that our work has caught your attention.

Before proceeding with some short introductory comments, I want to introduce my colleagues. Bob Halstead, the person with whom I co-chair the task force is here representing the State of Nevada. Bob's work has lately focused on issues relating to the transport of high level waste to the proposed Yucca Mountain repository. He is on our agenda later today to speak to you from that perspective. But, he agreed to help us with our presentation this afternoon by being available to answer any really difficult questions.

Also I would like to introduce Chris Wentz with the State of New Mexico. Chris represents Governor King's WIPP task force and is an active member of our work group. Chris will describe our work as outlined in the report to Congress that we submitted. You've heard about it several times yet this morning.

And, to my left is Ron Ross with the Western Governors' Association. Ron is a policy analyst and manages many of the multi-state regional aspects of our project. Ron will describe what lessons have been identified, that we have identified as having learned so far. He will also discuss the organizational work group as we believe it may be useful for other groups considering this question.

DR. CARTER: According to the sign he is Rich Leonard.

MR. ROBISON: Again, Chris, Bob and myself are from state governments. One of the way you will know that is we do not

have any view graphs. However, we want to say that Ron did bring four view graphs, which I think is appropriate, because one of the things that Ron helps us do is bridge the gap between state perspective on these issues and the federal perspective on the issues. Again I think his view graphs are symbolic.

I've taken the time to draft out some opening comments. I don't believe my other colleagues will be reading their comments. I don't think it is a very good way to make presentations. Once Ron and Chris are done making their comments, I am also going to take some time to discuss some of the things that we are doing in Oregon having to do with public confidence and public involvement and I won't be reading those. But with that apology, I want to bore you for a few minutes and read a few statements.

Western States and your Board share a common interest in the safe transport of nuclear waste. If our national plan for nuclear waste continues on its present course, western states will bear the major effects of that transport. Western states will likely see all the nations shipments. The west is where the majority of road miles will be logged-in.

For these reasons, we appreciate your Board's interest in our work. We think that interest is appropriate. I would like to also say that we recognize this as our first

discussion between the states and the Board, and we hope it is not the last.

Our Governors have given our work group a broad assignment. In a resolution passed in July, 1988, the Governors direct us to "...secure the commitments necessary to reach a high level of public confidence that nuclear waste can be transported in a safe and uneventful manner."

There is a couple of things that I think are important in that mission statement, if you will. One is that it talks about nuclear waste, not just WIPP shipments. The second is that our Governors have told us to work on the problem from a perspective of what is necessary to reach a high level of public confidence that the waste can be moved safely. And I think the term public confidence is one I'd like to see us be using more often.

Our first step has been to develop complementary state-federal safety procedures of the shipments to WIPP. We recognize clearly that our Governors also expect us to pave the way for the safe transport of high level waste that will begin sometime later.

Our work will affect high level waste shipments in at least three ways:

First, we are developing safety procedures that will be in place when the high level shipments begin to move. As you will hear later those will involve preventing accidents as

well as being prepared to handle accidents. We will be continuously fine tuning those procedures during the WIPP shipping campaign. Some of these procedures are specific to transport by truck, such as the exchange of information and the controls that we have established with USDOE to keep trucks off the road in unsafe weather. But, other procedures will be applicable to high level waste, even if it is hauled exclusively by rail, such as the satellite and computer system to be used for advanced notice of shipments and to track the shipments.

The second way in which we recognize that our work is going to relate to high level waste has to do with the fact that we intend to document the lessons learned form the WIPP shipments to help design the high level waste program. Again, our first job has been to get ready for the WIPP shipments and that is what we have been spending most of our time on to date. We will next evaluate our efforts to prepare the safety program for those shipments, and then at the same time we'll be documenting the lessons to be learned. We look forward to working with groups, with other groups, such as your Board in this area.

There is a third way that we recognize that our work will affect the high level waste shipments. We recognize that elected officials and the general public will be looking carefully at the WIPP shipments. This is the nation's first

underground waste disposal site and these are the first shipments to such a site. Public confidence and the ability to move nuclear waste will be affected by our work.

And let me stop to say we understand that and we take that responsibility very seriously.

Western states began to work with USDOE on the WIPP shipments in about 1986. This early work was through the help of the WIEB. I had the pleasure of chairing many of those early discussions. We had some successes in those early discussions and I want to underline some. As I recall those early WIPP WIEB sponsored meetings were the forum where USDOE agreed with the states to train emergency responders. This was also where we began to define the content of that training.

But we hit a major roadblock early in our meetings. Western states agreed that because these are federal shipments and because the waste result from national defense, that the financial costs to states for our safety work should be borne by the federal government. Said more simply, we asked for money. But we were told by USDOE managers that Congress had not given them the authority to provide us such help. So, we went to Congress.

Earlier, Mike McFadden commented on Senator Hatfield's vision back in 1988. The Oregon Department of Energy would like to take a little credit for helping Senator

Hatfield shape that vision. Our concern of course is that not only the transuranic wastes that are now in storage at Hanford, but the high level waste that we know are bound for some place sooner or later.

In 1988, Congress appropriated $1 million to the U.S. Department of Transportation to help the seven states affected by shipments from WIPP to Hanford, INEL and Rocky Flats. Those funds were channeled through the WGA.

These funds allowed the Western states to draw the blueprint for the states' role in safety. That blueprint became our "Report to Congress..." that Chris will describe in detail. Our Governors handed that blueprint to Secretary of Energy Watkins in the summer of 1988. Secretary Watkins endorsed our report as "hitting the mark", and reversed his department's position on state funding. He directed his staff to help us turn our blueprint into a real safety program.

But we like to think that part of Secretary Watkins' decision to work with us may have been based on the straight forward nature of our report. We spoke in plain English about what we could do to enhance truck safety. We avoided the sometimes arcane language of risk assessment and public policy analysis. We spoke in terms of truck safety where the rubber meets the road.

We also recognize that our request for federal funds was also quite reasonable. We estimated then that the first

seven states could do the job for about $1.5 million for those first years. We have lived within that budget. We are about to include three other states for a marginal increase in cost. $1.5 million is not an extraordinary cost for seven states, especially when compared to the projected national cost of managing both commercial and defense nuclear waste.

We also recognize that some of the success in our report to our Governors and to the Secretary of Energy Watkins was that our report was also to Congress. We think our report was quite well-received in Congress. We recognize that it may have helped the Department of Energy change its position.

Secretary Watkins decision was a major turning point. It addressed our concern about who pays. But just as importantly, it recognized the states as having an important role in safety and we appreciate the Secretary's decision to do so.

But we still do not have a clear message from Congress that USDOE must continue to recognize states' needs for ongoing funds. Our Governor's have recommended that Congress send this message to the USDOE in a Congressional Land Withdrawal Bill of the WIPP site for other legislation.

Perhaps this question of funding is a message from the high level waste program to be applied to the WIPP shipments. States want clear recognition that they are to be partners to design and implement a safety program. States want

clear assurance of ongoing funds that will enable them to remain partners for the full length of the shipping campaign.

Before turning the discussion over to Ron and then to Chris, there is one "lesson to be learned" that I wish to speak to. That has to do with the constantly changing schedule and the planned number of shipments.

Four years ago I told Oregonians that by today several TRU shipments would be on the road each month from Hanford, throughout the state bound to New Mexico. That was the national plan then. So Oregon began to get ready four years ago. I have had to revise that schedule constantly. Now Oregon is being told that the shipments are still a few years away, but we are not sure when.

This constantly changing schedule and the shipment plan creates a very difficult environment for state and local planning. In some states, emergency responders were trained too early. The time is near for retraining, but no shipments have yet to occur. Many of these responders will wonder if it is really worth their time to sit through more training, when all they see is a constantly delayed shipping schedule.

Here is another example: Last June I met with local safety officials to discuss parking areas in Oregon. That very same week I learned that Hanford shipments were delayed by at least two years. Available parking areas will likely change a lot in the next two years. So in Oregon we have

decided that this level of detail will be addressed within the last year or 18 months before shipping.

These constantly changing dates and the constantly changing plan on the number of shipments from each site, makes it difficult to schedule and to plan our work. It also undermines the credibility of the professionals responsible for that work.

I am not sure what can be done about fixing a date for WIPP shipments. I am also not pointing fingers at any person or group as having been responsible for the constant delays. Indeed, many of the delays have provided important new information and important time. Decisions about nuclear waste disposal should not be made in haste, or for the convenience of we transportation safety planners. After all, these are decisions that will be around for the next 10,000 years.

But if there is some way that the nation can fix a date certain for the high level waste shipments it would greatly help those of us responsible for state and local safety programs. I would like to recommend fixing a date certain, and then allowing the states time to work backwards to do our preparedness.

I would like to respond to a couple of questions that came up earlier in the presentations in your discussions today. One of those had to do with the study being performed

by the Commercial Vehicle Safety Alliance that is addressing the inspection of these shipments.

Our WGA has worked very closely with the CVSA. The plan for that study grew out of an organization called the Pacific States Agreement that is an association of the states of Oregon, Washington, Wyoming and Idaho. So I have some familiarity with the purpose of that. The question was asked what is the objective of that study? And, I think it is two. Number one is to develop and test an inspection standard that can perhaps later be applied to high level waste. We recognize that there is significant differences between both the container and the nature of the waste and those differences will have to be addressed.

But there is an important second objective in that study, and that is to determine what is the reasonable frequency that inspections should be done. As you heard the discussion earlier this morning, you recognize that these shipments are going to be inspected a lot. One of the things that happens in state government when state legislators and concerned citizens find out that nuclear wastes are coming through their states, is they would like to assure that those shipments are inspected.

In Oregon and Colorado we have state laws that require inspections of highway route control shipments. In Oregon we have agreed with the State of Washington to honor

their inspection at Hanford. One of the purposes of the CVSA study is to apply some science to the question of public policy. What is a reasonable level of truck inspection? At what frequency and at what rate do trucks--does truck equipment deteriorate and need inspection? We hope to be able to apply some science sooner or later to that question so that the drivers aren't stopping at every state border.

There was also a question asked a minute ago about equipment of first responders. I won't speak for all the states, but in Oregon we have provided radiation detection equipment to first responders. One of the things that we find, there is a couple of problems that typically come up. The first problem is they don't know how to set the meter and they don't know how to read it. We've helped them with that through both training and we've made the meters a little more simple by providing some guidance to them to help them set the dial right and read the meter.

But the most important thing, quite frankly, in terms of emergency responders having equipment is to provide them technical assistance as quickly as possible through radio frequency or whatever you can so that we can have health physicists on the other end of the telephone helping them understand what they are seeing and how to use that meter.

And I bring this up because this has been a somewhat contentious issue between health physicists and emergency

responders. And in my belief emergency responders can be trained to use this equipment, and they need adequate backup.

With those comments, I'll then turn it over to Ron and to Chris and I'll be back a little later to talk about some of the public involvement work we are doing in Oregon.

MR. RON ROSS: Okay, it's my job to dispel the myth that the West comes lean. I've brought view graphs and as Bob mentioned it's always a joke in our group because we know the Feds by the view graphs they carry. So if you will bear with me, I'll try to connect to the mike up here and go through a few things that I think are important.

First of all I wanted to tell you that WGA is an association of 21 Governors. Three of those Governors are Pacific Territory Governors and 18 are State Governors in the West. We go as far east as Minnesota and Kansas and Nebraska, and we cover everything, as I said into the Pacific including the three Pacific Islands.

The other things that kind of stand out as an organization and that is is that we tend to try to use our states as much as possible. We have seven professionals on staff out of a total group of twelve. Two of those twelve are actually in Washington, D.C., doing a certain amount of lobbying for us. The rest of us are in Denver. We are out here in the West.

The other thing is that we tend to use the resources

in our states and this is the premise of what you'll see today and why we've got some of our people here today with us and that the states number one, know their needs. They know the issues and they know the resources needed to address those issues. So, from that perspective, Chris will get into his presentation and give you an idea of how our group works.

The other thing is is that we view states as a laboratory of how to do things. What is done in one state is tried, if it works then other states pick it up. For instance, Colorado has been somewhat leading in the particular exercises that Chris will be talking about on Transax. Oregon has led in the area of looking at alternatives for expense of alpha meters with attempting to evaluate possible adaptation of standard civil defense meters. In one case, the training will be carried on and the other Bob found with limited use to the civil defense meters and probably will recommend not going that way, although Bob can speak to that specifically and we'll give you some idea there.

I would like to quickly, if I figure out how to turn all of this on and quit walking on things. The Governors have adopted numerous policies over the period of about five years or six years that we've been in existence as the WGA. Boiling down, about four of those directly deal with the WIPP program, WIPP transportation specifically. I'd like to go through those quickly with you so you can see where the Governors are

coming from. The Governors are actively participating in this process. They have committed to working cooperatively with DOE. They have not chosen to take on the issue of whether WIPP is good or bad, whether the site is good or bad. We assume that shipments will occur and how best can the states deal with that.

The cleanup transport and permanent disposal of radioactive waste are vital concerns to the governors. And in fact there will be a meeting in May at the White House to discuss that specific issue. DOE has the overall responsibility for shipments of nuclear waste and the Congress' intent was that DOE in cooperation with corridor states, Western Governors' Task Force on nuclear Waste and WIEB that a national comprehensive transportation plan be prepared.

The Governors have gone on record of asking for shipments from all of the western sites indicated here, Hanford, Rocky Flats and INEL during the first five years. Additionally, they ask that DOE cooperate with and fund the states to look at three specific general areas. And what you will see in the report to Congress is that these particular areas are broken out even further to get into some specific issues which are essentially safe transport, emergency preparedness and public education and confidence. The latter part of that, the public confidence is very, very important to

the Governors at this point. And I will get into that in a few minutes.

And then lastly, is that the Governors are requesting that this program that we are in right now be made permanent. The states must continually upgrade their response, their training, retraining has to occur on a continuing basis. Equipment must be maintained and etc., but states must begin the mode of being able to respond, to be able to provide that public confidence through safe drivers and safe vehicle inspections. And the Governors believe that the best way to do that is through the land withdrawal legislation which is hopefully going to be pending in Congress fairly shortly.

Boiling all that down, and Bob basically read the entire paragraph, this is the objective of the Western Governors' Association. That is, the safe and uneventful transportation of nuclear waste and spent fuel from current temporary storage facilities to more suitable, interim and permanent repositories. They feel that this is the key to what we are doing and why the WIPP process as we see it is successful.

Quickly give you one more additional item, and that is that generally this is how the organization of what we are doing is organized. This will give you an idea that it is not just a group of staff people operating here. The Governors

are reported to at least twice a year at their semi-annual meetings. They have their own task force now made up of ten state governors. The ten states that are involved in the WIPP transport program, with their policy advisors making up a working group.

The technical group which Bob is co-chairman and Bob Halstead from Nevada is the other co-chair represent ten states. Additionally, those meetings are open and we have been having a fairly large attendance and a fair amount of participation. We also count upon WIEB to provide technical assistance to us, and we are utilizing, or would like to utilize the WIPP shipments to assist CVSA and CRCPD to evaluate their inspection standards. So we have essentially this kind of an organization in place.

To give you one more slide and that will be the end of the slides for right now, I want to tell you who the ten states are. Essentially the DOT grant originally named those states along the corridor from Hanford, Washington to the WIPP site outside of Carlsbad. Essentially, that is this black line here (indicating.)

When we negotiated with the DOE, we said there are a couple of things that are missing from that particular designation. One of which there are some shipments now that could be used for test purposes from Lawrence Livermore to the Nevada Test Site. Additionally shipments out of the Nevada

Test Site and Lawrence Livermore are in the future and it would be beneficial to everybody if those states were brought in early in the regional process so that when we experience shipments, they will have already been part of the interstate agreements, the inspection standards and the other activities in preparing for the shipments on a regional basis.

The report to Congress which makes up the premise basically of what we are doing was funded from the Department of Transportation. It should be on your desks. There is a copy provided to Woody's staff or your staff. So, essentially though, Bob hit it on the head as far as what this report has done. This report was written specifically to be in plain english. It is to be provided to people who are lay people, who are more interested in what we've been calling the sleep factor. If they can sleep at night, the system is going to operate right. And that is essentially what we are looking at here. This report went from the Governors to Congress.

Secretary Watkins during our 1988 meeting requested time on the agenda. He came, sat down with the Governors and said this makes sense to me. We basically bounded, if you may, the issues for the western states to those which would support the transportation system, and put them in such a way that the concerns are not only indicated here but also means for addressing those. The million dollars that DOT provided to us for this started the program. Of that the states have

planned, the states have worked regionally to put together various kinds of agreements, and also though the states individually have developed their programs to buy equipment to do their own state plans and to initiate public education processes. We have essentially come to that agreement under Secretary Watkins' mandate with the DOE and that is a five-year agreement renewable annually on a work plan basis.

What WGA does is we provide an umbrella agreement. Each of the states then provides their own singular work plan of what they are going to do with the funds provided to them. That is approved by the Department of Energy and funded through WGA. What that provides is a couple of mechanisms. One is is that it is easy if you make DOE to contract and provide guidance, but it also allows the states to do what is necessary in each of the states. We have states such as Wyoming that have tremendous needs down to the need for radios. And we have other states such as Colorado that are fairly well prepared with emergency response vehicles designed for nuclear kinds of accidents. So those are the kinds of breadths that we are dealing with here. Any program that is attempting to address this kind of a system needs to have that kind of flexibility in it.

So with that, I can entertain questions now or you can let Chris talk and then we can all answer questions.

DR. CARTER: I just had a request. In order that we will

not be accused of favoritism, may we please have a hard copy of your slides.

MR. ROSS: You may. I will have to send them to you because I just made them up as we came in last night.

DR. CARTER: Thank you, sir.

MR. ROSS: Other than the one from DOE, I had to borrow that one.

Chris?

MR. CHRIS WENTZ: Thanks Ron.

First I would like to say on behalf of Governor King and my boss, Secretary Anita Lockwood who chairs the Governors' Wipp Task Force, welcome to New Mexico.

I personally want to thank the panel for holding this hearing. I think there is a lot of lessons that can be applied to the OCRWM program from the WIPP program.

Some of these benefits that I would like to stress include, we sincerely believe that most of our programs will result in the enhanced protection of the public health and safety. Another item is that a transfer of technology in the adoption of an integration of certain program elements, where it is applicable and appropriate, can avoid duplication of effort and result in considerable economic savings.

The final thing is is that we believe that through some of these programs, enhanced public confidence will result. And I think that is very important in these times of

DOE's credibility or lack thereof. The key programs that I would like to focus on and give you some of the nuts and bolts on that were outlined in the Governors' report to Congress, focus on three primary areas. And basically my presentation will mirror that which I presented to the Board in the letter of November 30, 1990, the three key areas are accident prevention, emergency response preparedness and public information education and awareness.

The first program under accident prevention that the states have established is what we are terming the driver audit program. This is a program that is designed to verify the driver and carrier compliance with all of the applicable state and federal regulations. It will also verify compliance with contract requirements that are in the contract between the DOE and Dawn Enterprises. There are also other requirements that resulted from that contract that are outlined in what is termed the Dawn Management Plan. The plan that the carrier developed for the transportation of the shipments.

What we've done in that program is work cooperatively among the states with New Mexico being the lead state and developed a check list of all the different requirements in the contract in the management plant, in the federal regulations. We developed that, circulated it among the states and the DOE, got feedback and have essentially come

up with a final check list that everybody agrees is the full program of requirements that the driver and the carrier will have to comply with.

What we are going to do then is go out to the drivers and the carriers office and do an audit of their records to see if the drivers are in compliance meeting all the requirements. We are also going to be monitoring the carriers training program both formal and informal training. We've developed a draft evaluation plan for the training and that's circulating among the states and that will be used to determine whether the training program is meeting the needs as the states see it.

The next program that we are involved in that has been mentioned is the independent inspection program. This is a program that has the involvement of the OCRWM already through cooperative agreement between OCRWM and the Commercial Vehicle Safety Alliance. This program will essentially involve independent state inspections of the WIPP shipments both radiologically and mechanically. The way it is going to work is the CVSA through that contract has developed a number of committees and let me just name the four committees. There is a research design committee, an inspection committee, a training committee and a data analysis committee. The research design committee developed the overall program on how this inspection program should be

handled. That has been turned over now to the inspection committee. What they are going to do is start with the CBSA mechanical inspection procedures and criteria and with the Conference of Radiation Controlled Program Directors draft criteria and tailor that to the WIPP shipments.

The idea is that these states will end up with a set of standards that they all accept and will inspect the shipments to. Right now the plan is that the inspections will occur at least at the generator sites and at the destination point at WIPP. They are still working out procedures as far as inspections en route, although it is anticipated such as in the State of Colorado which has a statutory requirement to do inspections that there will be en route inspections.

The next program--I would like to mention one that Dr. Carter had asked about as far as waste certification, and as part of this inspection criteria. When the State of New Mexico entered into some of these agreements in the early '80s with the DOE, we recognize the issue that Dr. Carter pointed out about waste certification and how important it is. And we negotiated the right to go to the generator sites and perform independent verification of compliance with the WIPP waste acceptance criteria. Our Environmental Improvement Division which is the State RCRA authority is planning on going up there and doing random periodic verification of compliance with the WIPP-WAC.

The other thing that Bob Neill might be bringing up is that this certification committee that DOE has established, it is DOE contractors and basically DOE people. The Environmental Evaluation Group and other independent technical reviewers are accompanying that certification committee to verify compliance with the WAC.

The next program involves one of the development of procedures and protocol to address bad weather and road conditions. These procedures focus on several areas. One is the optimization of shipment schedules. We have essentially asked DOE where they can, to schedule the shipments, if possible, to avoid bad weather, winter conditions, sending shipments from a site to avoid rush hour traffic. Things where they can make a difference, we have asked them to look at those things and try to optimize their shipment schedules.

The other thing is that the procedures and protocol addresses shipment dispatch decision-making. These are procedures and protocol that would force DOE to look at what weather conditions would be out on the road, say out 200 miles, to see if there are such things as tornado warnings, severe wind warnings and things like that. And to make a decision on whether to go ahead and ship from a site.

The other thing that these procedures and protocol have established is that we provided fairly detailed contact list for who to call in case there are problems encountered en

route. These would include mostly state police and other individuals who would have that decision-making authority within the states to determine where a shipment should be routed, where they should park.

Significantly, DOE is now in the process of incorporating all of these procedures and protocol within their own internal system of standard operating procedures. We think this is a significant point that DOE has conceded.

The next area involves a system of criteria for safe parking. We have worked with the WGA through the WIEB and basically developed a three-tiered approach to the selection of safe parking areas. This three-tired approach basically entails pre-designated areas such as Department of Defense sites. These were established by the DOE with the Department of Defense and our various defense facilities where the WIPP shipments can go when they--if they should encounter bad weather and they are free to use these sites.

The second part of the tier is outlining generic types of facilities, such as National Guard Armories, Ports of Entry where the WIPP drivers would be instructed to look for these types of facilities.

The final thing is the various avoidance factors that we've listed that would include such things as schools, hospitals, poorly lit areas that the drivers would apply this set of avoidance factors and select a place to park that is

not in these areas.

Another program area that we've focused on has been advance notice and information on shipment scheduling and status. This area involves the TRANSCOM system which has been developed by DOE. DOE has provided the states software, training on the software and in some cases hardware for the system. It basically entails an IBM computer and satellite tracking system. The types of information that is available on the TRANSCOM system, includes shipment schedules. The TRANSCOM system provides advance shipment schedules, seven day advance shipment schedules, to notify the states when these shipments may be coming. It is also going to contain information on the manifest or shipping paper information, the contents of each shipment.

The system will largely be used to allow the states to track the shipments within their states and can also serve as an emergency response tool. The states have been reviewing the TRANSCOM system and are providing an analysis of the system to DOE and pointing out where improvements might be made and where the system might better accommodate the states' needs.

Recently we have been working with the DOE on procedures to address how the TRANSCOM, if the TRANSCOM system goes down, how the DOE might provide backup notification to the states as far as information on shipments and scheduling.

The next area under the general heading of emergency response preparedness involves mutual aid agreements. The states believe that they can significantly enhance their own emergency response capabilities through execution of mutual aid agreements. These agreements have the potential to maximize the availability of both human and physical resources. There has been two types of mutual aid agreements to date. One is for execution between the states, adjacent states and then one for execution between DOE and the individual states. We acknowledge that there is the federal radiological emergency response plan, but most of the states are interested in getting a greater level of detail regarding the timing of a DOE response and the resources that they will respond with. We feel that these mutual aid agreements will take it to that level.

Another area that Rich Leonard touched on earlier is the emergency planning and training. Emergency response plans have been reviewed, updated and tailored to address the WIPP transport program.

We've also, as he pointed out, we've also gotten DOE to develop a suite of six training courses. These training courses include the first responder mitigation, command and control, medical emergency management course, taught by the RE/ACTS folks out of Oak Ridge, a train-the-trainer course and a course out on the use of certain WIPP emergency response

equipment. It's important to note that these training programs were not just developed by Westinghouse and forced on the states. Westinghouse developed these programs initially. They then came to the states, presented to the states, went back and forth with Westinghouse and had them change certain things and then that is the program that is taught. I should also mention that at a meeting of the WGA last year in San Diego, the DOE agreed to bring some of their instructors out to San Diego and walk through a general overview of the course. The WGA commented on those course and recommended some changes into the credit the DOE has or is incorporating those recommended changes in the program.

In response to a question earlier today about lessons learned regarding the training, one important thing that we found out is that in the West, somewhere upwards of 75 percent of the first responders are volunteers. This has played havoc as far as keeping the training current. So, we have had retraining over the last three or four years.

The other thing is is that because they are volunteers there is constraints on their time and also they have I guess a different focus on what training is really important. Do they attend a WIPP training class or do they attend a hazardous materials class that might offer them something on an incident that they might be involved with everyday. So, in this year's training session we are trying

to tailor the courses to the volunteer's needs such as scheduling classes on the weekends, in the evenings. We've used some of the federal money that's been available to pay for travel and per diem costs, and things like that to encourage these folks to attend the training.

The other important thing that we've been involved with, once we have updated the plans and gone through some of this training to actually test the knowledge of procedures and protocol as far as emergency response preparedness. And this had been down through the table tops and full blown exercises.

It was mentioned that Colorado recently had a very large, probably one of the largest field exercises that has been conducted. DOE committed significant resources to participating in this. Various states attended, but it was basically designed to test all of the DOE procedures, protocol and that of the states also.

The other thing that Tom Ward touched on today was that the states felt that it was necessary to do a demonstration of a TRUPACT II recovery. DOE did respond to our request and last week, demonstrated that they could recover a TRUPACT II container.

On the issue of equipment, I guess one of the most important lessons that we've learned and to DOE's credit is that they recognized that each state has individual equipment needs. So they have structured the cooperative agreement with

enough flexibility to allow the states the equipment that they feel is necessary. As Bob pointed out that their state has been providing first responders, radiological monitory detection equipment, other states have not. In the area of equipment, the general categories of equipment have been essentially limited to radiological protection equipment and radiological detection and monitoring equipment.

Finally, the last area is public information and education. An important lesson that we've learned is that meaningful early participation among the states and the public is very important. I think you can alleviate a lot of problems down the line or OCRWM could alleviate a lot of problems down the line by involving the states and the public early on in the decision-making process. It can be very painful at times as I'm sure they fully realize. But, I think the benefits far outweigh any of the early costs in that.

For our purposes within the WGA, we focused on such things as developing various types of public informational materials. The State of Idaho has developed a video of the transportation system and the various safety programs I've discussed here today. The State of New Mexico has developed a chronology of the WIPP project that traces it from as far back as 1955 with an early national academy of sciences report up to the present time. We've also developed various slide presentations for delivery to the public.

We've also taken a look at the Department of Energy's information packet and are reviewing that and providing comments on where we think improvements could be made. As with most of these programs, we've worked cooperatively and disseminated the program outlines and almost all the components of the program out to the various states, DOE and public for a widespread consensus building.

The other areas of public outreach and public participation, in the past we've participated with the DOE on what they term public awareness tours. A couple of years ago the State of New Mexico went out on the road to 14 different communities and met with members of the public, elected officials and the general public and were there basically for a day or two days in each community. And were there to answer their questions on an informal basis. The other things that we've done and that many states have are various task forces that have public meetings out along the route for the public to voice their concerns and to solicit input on the various program elements.

That essentially concludes the major program elements that we've been addressing. I'd be happy to go into more detail. I know I kind of ran through that fairly fast.

DR. PRICE: Okay, that was interesting. Are you going to provide additional comment?

MR. ROSS: What we have are two states that will make

specific comments. I think Bob has some comments. And essentially what I would like to at least from the regional perspective and from what Chris is saying, leave you with a couple of thoughts.

First is that the public officials need to be involved in the process right now, when the decisions are being made as to the direction of the program. That way it can be a consensus as to the direction of the transportation program.

Other elements though of the state involvement and corridor states as what I am speaking to here, take place towards the end since there is training. We are finding that training too far in advance, you will lose interest, you lose participation and it creates some difficulties there.

Additionally, as you see the people at this table, we are counterparted on Department of Energy. People are empowered to come and make decisions. They represent their governors, DOE sent Susan Denny and Gerald Boyd, headquarters Mike McFadden and Rich Leonard from WIPP. They are able to make decisions. And as you can see they have incorporated many of these things into their training materials and into their public participation and information programs.

Second to last is the flexibility of the program which I talked to earlier, and then lastly is that there must be a mutual trading of trust in information. This did not

occur prior to the Governors getting involved with Secretary Watkins. It is now a very good information exchange and there is trust between the two. There is no animosity in that typical fight that seems to go on between states and federal government in this particular case.

So I'll leave that and Bob, I think you had two wrap up comments?

MR. ROBERT HALSTEAD: Yeah, I'd like to make just one general comment on the scope of the state DOE interactions that have taken place with regard to the WIPP transportation planning of data I think stands in contrast to the way that OCRWM has viewed the scope or the proper scope of state interaction in the civilian program.

I've been very pleased by the fact that the scope of interaction in the WIPP transportation program has not be limited to emergency response planning and training, particularly the training of which I agree as Ron said a few moments ago is an activity that is more likely to be appropriate towards the end of the planning process as you get near the shipments. And indeed the civilian program at DOE has, I think, correctly argued that to the extent that the civilian outreach program to the states is going to be focused on emergency response planning and training, it should be done later rather than earlier in the planning process.

The problem with that approach and this is a problem

that specifically applies to the timing of the implementation of Section 180(c) of the Nuclear Waste Policy Amendments Act of 1987, is that it means that the states, the potential corridor states affected by MRS and/or the repository transportation don't have the opportunity to be involved in defining the larger system in all of these components, whether it is operating protocols, the development of the hardware for this system, the development of the risk assessment methodologies, the debate over the extent to which route specific data is necessary for risk assessments and so forth.

And I think there is a real lesson for OCRWM to learn--I'm not sure I've communicated it properly, but it is that a strong case can be made based on the lessons learned in the WIPP program that there should be as early and broad involvement of all the corridor states as early as possible in the process. I am not dismissing the work that the Department of Energy civilian program has done through the regional organizations. From an early date they've supported the WIEB and the Souther States Energy Board and I think now they are catching up with this in the midwest, and presumably at some point the northeast will join that as well. Without any effort to diminish the work with those regional organizations, there is a great benefit to having a greater share of those resources go directly to the states and then have the states coordinate their activities on a regional basis and provide--

that really provides the basis for a cooperative development of the transportation system.

I think that is a real success story, not a panacea by any means, but there is a real success story here in the WIPP transportation planning program. I think there is really something to be learned there in the civilian program.

MR. ROBISON: I'm going to make a transition here. I am going to quit speaking from the perspective of the WGA and start speaking from the perspective of the State of Oregon. But, before doing that I want to hit on a couple of themes that you have heard that I want to reinforce perhaps for a third time.

When I was first involved with these discussions back in 1986, we seemed to have had an adversarial relationship with the DOE. The states disagree with the department on just about everything. We struggled though a lot if, if you will, positional bargaining where we would take strong stands and would find ourselves finding some common ground and things started to work. Frankly, that was frustrating.

I am not a person who--I don't find those kind of adversarial discussions either worth much time or very pleasant. We have changed that. I think Secretary Watkins directed to his staff to work with us to agree with us, to provide us funding and to enable the states to be able to work

as partners with the department on the safe shipments of WIPP. It was a very important change. We don't have that anymore. We do--one of my goals as the co-chair of the group and the persons who intends to facilitate the discussions is to create a forum where we can bring issues to the table and work them out. And, we don't leave the room until we work them out.

What we found instead of the stone walling we were getting early on in funding, we found that the operational staff down at WIPP as well as their bosses in headquarters have agreed to work with us and to try to understand where we find common ground.

The second thing I want to hit to before I change gears here and speak from the Oregon perspective, is this question of clear authorization of state funding. And again I'll say it again. Perhaps this is a lesson to be learned from the high level waste program to apply to WIPP. We do not now have clear statutory authority or clear direction from Congress that the Department of Energy will continue to fund the states.

We were told five years ago that that Congressional authority didn't exist. Then Secretary Watkins changed his decision without, it appears, any statutory change. We would like to ask the Department to consider, very seriously, supporting the states' request that Congress make it clear that the states will be enabled through funding for ongoing

involvement, and as a partner in a partnership for the safety of the WIPP shipments for the full 25 years of that shipping campaign.

With that, I will change gears. Now I am speaking from the perspective of the State of Oregon. What I would like to do is talk a little bit about some of the public involvement programs we've been doing in Oregon. Please remember that our Governors' charge was three-fold. Now they told us to make sure that the shipments were safe and to make sure that we did what was necessary to prevent accidents and to make sure we did what was necessary to handle an accident if it came along.

But, there is a third component in that and that had to do with the question of public confidence. And it is important, I think, that we recognize that given the nature of the problem that we are addressing here in this country, public confidence is not 30 percent of the problem. It's not a small piece of the problem. In fact I would venture to say at least from my personal opinion it is at least half the problem we are looking at.

I am not an engineer, but based on my experience in hazardous materials transportation safety and my look at the transportation nuclear waste, in my personal view, I think we can transport this stuff safely as a nation. Not everybody agrees.

The problem of public confidence in transportation gets mixed up with the question of the Department of Energy's management of the waste program. Not only the commercial program, but the defense program.

Speaking as an Oregonian, we have a real mess up at Hanford. We have high level radioactive waste in tanks that was not built to contain high level waste for as long as they have been there. We have waste in those tanks which has the potential of exploding. We are real damn mad about that. And we would like to see that mess cleaned up. We have transuranic waste that is in trenches which was not built to dispose of transuranic waste. The drums are beginning to rust and they are going to sooner or later head for ground water. Now the ground water is going to potentially contaminate water that will be used by Oregon farmers and it could potentially contaminate the Columbia River.

We in Oregon remember a legacy of the Columbia River being the most radioactive river in the world when the early production reactors were single pass-through reactors. Let me say it again, speaking as an Oregonian, we want Hanford cleaned up and we want it cleaned up as quickly as possible.

We recognize that shipping waste out of Hanford is part of that process. So, we recognize the need to work with the public on their confidence of our ability to ship that waste out.

I am trained as a community organizer. Early on in our project, looking at Hanford cleanup, my boss came to me and said, one of your assignments is going to be to go out and work with the communities in eastern Oregon through which these shipments are going to take place, and work with them on the confidence of the USDOE's ability to transport plutonium through their downtowns. I asked my boss if it wouldn't be a little more--if it might not be more acceptable to him that I might sit around at my desk and hit myself on the head with a balpine hammer.

As a community organizer I recognize that an important thing to do is to find yourself on the right side of an issue. Supporting the safe transportation of nuclear waste is not an easy issue to take. My boss didn't give me the option of not doing it, he told me to get out there and do it and so we did. Frankly, I found it to be a difficult process, but one well worthwhile.

One of the reasons I want to talk about the public involvement program we are doing in Oregon is that it is funded in part by civilian and high level waste funds. We requested--we suggested to the department that they use they TRU waste shipments and they use Oregon as a potential laboratory to demonstrate and to look at some questions of public confidence on nuclear waste transport. So, I think it is appropriate that Oregon speak to you about our work.

Basically what we are trying to do is to test and evaluate formally a belief that we have. That belief is a meaningful public involvement in decisions will result in better decisions, a safer system and will enhance public confidence. Mike McFadden said earlier that he has learned that as the USDOE has engaged the states in the discussion about safety, it has resulted in a safer system. I would like to take that one step further. From a state perspective I think I have learned that engaging the public in those discussions also gives you a better and safer system. Again, we are trying to formally evaluate our belief in that.

Our program consists of four elements. The first element is formal input through an advisory committee and through town meetings. Our second program component is a transportation safety plan. Our third program component is public survey work to better understand the public's concern. And our fourth program component is public information, a formal public information program. Now, I will speak to each of those four elements very quickly.

First, our advisory group. You have before you a copy of a report and I would like to ask you to notice that it is dated in December of 1988. This is before we became involved in the WGA group and drafted the report to Congress. It's based on our belief that we would take the message and the concern to Oregonians quickly. Our advisory committee was

made up of representatives from the following kinds of groups: The Oregon Environmental Council, the Sierra Club, the League of Women Voters, the Chief of the LaGrande Fire Department was involved in our group, the Sheriff of the City of Baker was involved in our group, the Oregon Trucking Association. This report and these recommendations have also been reviewed by then Secretary of State Barbara Roberts, now our Governor.

What I think is important in this report and I would strongly encourage you to take a look at it later is that it is reasonable. We brought together a well balanced mix of people who had different perspectives on the problem. Again, I told my boss early on that I wasn't looking forward to going to the towns in Eastern Oregon and talking about the safe transport of plutonium through their communities. I was concerned that we would get some odd ideas.

What I found was just the opposite. If you read through these recommendations, they are not crazy, they are not silly. Many of them are quite sound. And let me emphasize again that these are recommendations that were made before we became involved in the WGA group and they are recommendations that have been not only, if you will, discovered by the people of the State of Oregon, but reinforced by safety officials.

Some of the important ones I think I would like to ask you, as you read through it, to recognize is that

Oregonians found that the risk of transporting nuclear waste could be acceptable, especially given the benefit to be gained by cleaning up Hanford. They also discovered that winter weather was a serious problem in the west. If you leave Pendleton Oregon, you go up over the Blue Mountains. The Blue Mountains have some pretty severe weather. The winter before last, the snow was so severe that trucks got stuck in the city of LaGrande for as long as a week. The people along the route asked us to work with the DOE to make sure that the nuclear waste trucks don't find themselves in the same predicament.

The people of the State of Oregon also understood the importance of inspections, the importance of emergency readiness and that there is emergency readiness not only for nuclear waste shipments but for all hazardous materials is now incomplete. And you'll notice in those recommendations a finding on the clear identification of the trucks. They asked that the placards on the outside of the truck be retro-reflective and to the extent possible fire retardant.

It is with some irony that I recognize that Congress just directed the DOT to do some work on the question of placarding. The people of the State of Oregon again were ahead of the federal government on the issue.

There are however, and again I want to make clear that I am speaking from the perspective of the State of Oregon. There are some unresolved issues that are pointed out

in these series of recommendations. People in Oregon would like to see the trucks traveling down the road in tandem. That means two trucks together. That has not been an issue that we put on the WGA's plate, because we thought out first priority would be to work where we have agreement.

We have exchanged several letters with the department. The answer we've gotten as I read it is that tandem shipments are inconvenient because the unloading procedure at WIPP is geared towards unloading one shipment at a time. And if another truck is sitting around idle while that one truck is being unloaded that it won't be a good use of resources or good use of that transportation equipment. They argued that the perceived safety benefits do not outweigh that inconvenience. I'm not sure I agree quite frankly. And, I think there is some work to be done.

I want to make it clear that Oregon is not taking the strong position that the shipments must be made in tandem, but we are not sure the debate is over. We think that there might be some safety benefits made from those trucks going together. And if not, I can tell you for one thing in Oregon, there will be some benefits in terms of public confidence if those trucks go together.

The other recommendation that you will find in here that I am not satisfied with our discussions with the department has to do with--well I'll just read the

recommendation. The results of the cask test should be extrapolated to the failure points to determine the margin of failure. That was a recommendation that again came from our advisory committee.

The discussions that I have had with cask engineers is they have meant the regulatory requirements of the nuclear regulatory commission. They have demonstrated the cask will withstand the tests. They have demonstrated the cask is safe enough. They are reluctant to go the next step of saying, well at what point will the cask fail. And as I can read their comments are for two reasons. Number one, that is difficult engineering. I am not an engineer and quite frankly sometimes the difficulty of the engineering I don't understand.

But I would like to suggest there is a second reason why they don't want to do that work, and that is that they would be tipping their hand that yes, there might be a situation in which the cask would fail. I believe it would be important as we go forward training emergency responders that we start talking about under what circumstance that cask might fail. I think we will find that emergency responders have a very sound, intuitive sense about safety. These are indeed the people who go into burning buildings and who respond to other truck accidents involving other hazardous materials. I think if we told them the kinds of crash forces that would

result in a cask failure, they would understand that. And they would understand the concept of acceptable risk. So again, speaking from the Oregon perspective, I'm not satisfied with what we've gotten so far on that question of where the cask fails.

The second component of our public involvement program has to do with the transportation safety plan. We have held back in Oregon on some of the details of that plan because we know that shipments aren't going to made for a couple of years yet. Again things like parking, things like training, things like distributing of equipment, we believe should be done closer to the time of real shipments. There are some important issues that have to be resolved in Oregon before shipments occur. Those have to do with upgrading the general level of readiness for hazardous materials.

The third component of our public involvement program has to do with public surveys. We have conducted-- last July we conducted a survey of public attitudes about nuclear waste. We did that for two reasons. First we wanted to establish a baseline that we could use to evaluate the effect of our public information program. Again, our belief is if we take the question to the people of Oregon we will enhance public confidence. This was our baseline test. We will later do further public surveys to see if we have made a difference.

The second reason we did the survey was to find out if the kinds of recommendations that you have before you that came up from our advisory committee, are indeed the kinds of recommendations that the public has.

We found a couple of things that we didn't get from our advisory committee. Oregonians are concerned about economic stigmatization of their region along the route. I want to point out that not only do we have a problem at Hanford in eastern Oregon, we also have at the Umatilla Army Depot the incineration of Army nerve agents that is going to be of concern. We are also talking now about shipping nuclear waste. They are concerned that people are going to find their food products and their tourist opportunities not very attractive. It might be considered a region of danger.

We also found something different than our advisory committee concluded or that we as staff concluded. Again, we have concluded that the risks of transporting the TRU waste outweighs the benefits--is outweighed by the benefits of moving the waste out of Hanford. Many people along the route don't believe that. In fact, 56 percent found that the transport risk to be greater than those of leaving the waste at Hanford. We've got to disconnect between those of us who are looking at the question seriously, and those who live along the route.

But we found some other things. We found that

opinions aren't set, that people are open to new information. We also found that opinion leaders are more concerned about this than the general public. I'm not going to go into great detail about the other things we found in our public survey. We have some reports available and we'd be happy to make those available to you. Quite frankly it is an area of thin ice that I am not very comfortable venturing out on. Interpreting public surveys is very tricky stuff.

We contracted with the Oregon State University's survey research center who has experience in designing those surveys. We also contracted with Decision Research, a firm out of Eugene, Oregon, in the analysis of that data. We've retained Dr. Slovak and Dr. McGregor to help us with that. Those are names as you may know that are involved in this question. In further discussions we'd be happy to talk to you about what we found about what Oregonians believe.

The fourth element of our public involvement program is public information. And I want to stress that that is the fourth element and not the first. We are not talking about public education, we are not talking about public information, we are talking about public involvement. We are talking about meaningful dialogue with the people who live along the route to get the kind of recommendations that we've got there. We believe strongly in Oregon that we will find the public reasonable. We will find that they will help us enhance the

safety program.

But we are also going to take the time to let them know what we are doing. We are going to talk about cask safety. We are going to talk about the extraordinary things we are doing for these shipments that are being done for other hazardous materials. We think that will make a difference. We are just now beginning that work. We thought it honest, in fact we were strongly directed by our advisory committee to do so, to first get our safety program in order before we started to talk to people about how safe it is.

That's the Oregon perspective.

DR. CARTER: I have a couple of questions. Several of you have mentioned of course about the way the DOE program used to be and problems with it. I'd like to put it in perspective of the moment. Is there general state satisfaction for example with the WIPP transportation program. Certainly Bob from Oregon has mentioned some specific questions. I would like to get a response from the three states that are represented here. They are certainly some of the key states involved in this transportation as far as WIPP is concerned. And I guess I would also like to ask Ron perhaps if he would address the question whether some of the other states that are not represented here, namely some 18 of them in the Western Governors' Conference, whether you three truly reflect the views of those states or whether there is

some that are unusual or anomalous compared to yours. I'd like to start out with those two questions.

MR. HALSTEAD: I'll give you an easy, quick answer, Dr. Carter. I think that whatever the other problems between the DOE and the State of Nevada, we are very well pleased with the way that this program has gone to date. And I say that also from the standpoint of a state that has not received any money yet for being involved with this. As you know, our WIPP shipments are further down the line, or certainly not likely to occur in the next five years. So, in some ways we've perhaps been able to more objective, since we are not as immediately affected by this, and yes, we see a lot here that we think should be the model in developing the civilian transportation program.

DR. CARTER: So what you are saying, if you had some money, you'd be ecstatic?

MR. HALSTEAD: Money is not our major problem right now.

DR. CARTER: Chris?

MR. WENTZ: Yes. Dr. Carter, I'd echo what Bob just said that in dealing with DOE on a lot of other issues relating to Los Alamos and the other programs, we found them to be more flexible with this transportation program than almost any other program. I think some of the concessions that they've made that I ran through too quickly, indicates their flexibilities things like changing from the TRUPACT I to the

TRUPACT II design, accepting the procedures and the protocol that we developed for shipment dispatching for shipment scheduling and decision-making. Incorporating those type of procedures and protocol that the states developed into their own internal standard operating procedures is a significant move on their parts.

And there are other examples. Again, the training, they didn't just to meet the commitment to the State of New Mexico to provide training, they didn't come in and try to force this program down our throats. They presented us a program, allowed us to make quite a few changes, and then would go out to the locations at the dates and the number of times we wanted the courses taught and presented that along the route. So, they have been very flexible I think in a number of these areas.

MR. ROBISON: Our task force met last week here in Albuquerque. Mr. Halstead explained to us what a prestigious and important group you are. And if you will, we spent some time very carefully discussing what should be our message to you and what should be the tone. I think the consensus of those states, I don't think it was, the consensus of those states was that our tone and our message to you should be that we have indeed turned the corner in preparing for these WIPP shipments. We have created a form where we are working together to solve problems. I want to also emphasize that I

don't want to over-emphasize the importance of money. We are not just for sale.

Money is the thing that enables us to work as partners. It costs money to travel to meetings. It costs money to have trucks inspected. It costs money to organize training programs. The money is secondary. The commitment from the Department that we have seen from the WIPP operations folks and from their headquarters to work with us as partners has been real and we are pleased that we could turn that corner.

DR. CARTER: Well, of course, we didn't realize that Bob Halstead had done that and we appreciate it very much. But in Nevada everyone should know that that is called being a shill.

The other part of the question now was whether or not you three states, the three states represented here are essentially in concert with the other 18 states in the Western Governors' Conference.

MR. ROSS: Well I think first of all, Dr. Carter, I think the states here represent essentially the breadth of the states involved, New Mexico of course being the host state for the WIPP facility and there are resources there that are not available to the other states. Oregon being a state on the route from Hanford, we are hoping to see some shipments within the five-year test period there, and Nevada a little further down the road.

I think what I would like to do is reiterate what Bob Robison has said. We have in the last three years turned a major corner. We are still adversaries in that we take our roles of states very seriously with the federal government taking their role very seriously. But, I think that we have come to the table to solve the problems. And I think the key here is that we have all agreed that here is a bound set of problems we can solve.

From the other states perspective, I think that they would agree with that. We have gone that far and there is a ways to go. I think that we will continue to do the battles to get us to where there is a system that operates as effectively as the current trucking system in this country for say other hazardous materials. I tritely go out on a limb and I'll do it again on two counts. One, all the states agree that probably the second or third person called in any accident involving TRU waste will be the Governor's office. The Governor can confidently say I know what is going on, we are prepared and we've worked with DOE and it is handled and the whole thing goes without incident, whether it is a flat tire or cask on its side. The other part is is once the citizens have a comfortability factor equal to that with what they have with gasoline trucks today, I think we've managed the system on the public confidence side that we can be proud of.

So, essentially what I am saying is that we have turned the corner, we've got good dialogue, we've got great cooperation, the states are making progress as is DOE, but we've got a ways to go yet. So, essentially that is wrapping up what I see in your question.

DR. CARTER: Okay. I am personally very pleased to hear this. Normally we hear other kinds of problems as far DOE relationships are concerned. So, I can say I am personally pleased to hear this.

Let me ask you another question about your report to Congress. It's almost two years old. And I guess the concerns that you expressed here and the recommendations are still pretty much current. And, I've not had the opportunity to look at it of course. Or, do you anticipate for example upgrading or putting out a new report sometime in the future?

MR. ROSS: There is works this Spring to re-evaluate this report. I'll let others comment, but essentially the overview is that we have achieved some things that were outlined in the report. Those can be put on the table as being achieved. There are some new things that have surfaced. Those will be added to the report and then the status given on those things remaining to be done. So, yes, this report will be revised. We are anticipating July being the date for that release.

Additionally, next year we are looking at putting together a process which will look at evaluation. We've spent

all of our time getting ready right now because of the crisis in which we had to do that in anticipating shipments two years ago. We are now ready and so now we are going to look at the evaluation process. So, those two things are in the works as a regional effort.

Bob, did you have something to add to that?

MR. ROBISON: Nothing to add. I just want to reiterate that we are--our first priority was to meet the requirements that we set out for ourselves in terms of helping the Department to prevent accidents and then handle accidents. We believe we have met those. Our next step will be to evaluate ourselves on how well we've done. We are now discussing program evaluation and how to evaluate what we had in that report. And as Ron said we will be drafting the report to our Governors about how well we've done with that.

We have concluded that we are ready for the shipments. We've also concluded quite frankly that emergency preparedness is an ongoing process. We are never done with it. We are going to be continuing to upgrade our

other subtlety in the report that I would like to comment on and that is if I had it do over again, I would put a work program in there, work element that has to do with exercises. We've been dealing with it as a subset of training. You discussed it earlier. It is my strong belief that as an emergency planner that exercises short of real accidents, in fact I'll say even better than real accidents, are the best way to demonstrate your readiness. It's the best way to demonstrate that the equipment works, that people understand their training, that they understand their procedures and that at a local level the hospital and the sheriff and the fire department and the local police department can all work together to handle an accident.

We look forward to working with DOE and Westinghouse as they unveil the secret plan on emergency exercises. We think that is very important.

DR. CARTER: Thank you. The other question I had, is since you folks are on the firing line in dealing with the members of the public in this area as well as many others, do you see any change as far as the public attitude or the public understanding as far as transportation in this case mixed waste or the particular radioactive side of it. Is progress being made or are we just spinning our wheels?

MR. WENTZ: I think there is progress being made. I think we could all do a little better job on public

information, education and involvement in that I do think some points are relevant though that there is the faction out there that this is the first of its kind in the world, geologic disposal, and what is being done here is going to set a precedent for the high level waste repository and for waste disposal options in other countries. And there are folks out there that are not going to budge as far as acquiescing to the geologic disposal. And so I don't think those attitudes are ever going to be changed. And I don't think that we really try to change them.

The tack that most of us take is that we are going to try to make this as safe as possible. And the only way that we can proceed along the lines of what you said earlier, that it is the primary responsibility of state government to protect the health and safety of the public and that is the key thing that we have to proceed as if WIPP is going to happen and take every precaution to protect the public.

MR. ROBISON: In five years I would like to be able to answer your question with real data. You are an engineer and you are a scientist, you understand data. That is the purpose of what we are trying to do in Oregon. We surveyed the public as a baseline. We are shortly going to start providing public information. We expected that we would have TRU waste on the road by now. I think quite frankly, running some trucks down the road is going to be part of the demonstration that will

change public attitudes.

Given the opportunity I would like to come back in five years and talk about what we found.

DR. PRICE: Is there a sampling of public confidence going on elsewhere, for example in New Mexico?

MR. WENTZ: We have had some public opinion polls conducted. It was interesting to note and I don't have the figures, but along the lines of 58 to 65 percent said that WIPP is not safe now, but could be made safe with some changes. The poll didn't specifically address transportation, but some of those are planned in the future.

DR. PRICE: Who conducted the poll?

MR. WENTZ: This was a group out of the University of New Mexico, called the Institute for Public Policy, the director of that is Dr. Hank Jenkins-Smith.

MR. HALSTEAD: Now, I wish I had something positive to say on that, but one of the concerns I do have and I differentiate public opinion as opposed to official opinion on this, and I think we see the best or worst example of this in the reaction nationally to some of the problems associated with some low level waste facilities. I feel there is still a tendency on the part of the general public to confuse all radioactive materials in transit and to be excessively concerned about those which most of us in the business see as being of lesser hazard.

That is something we really have to do some thinking about. I know Woody and I have talked about how to--without it in any way diminishing people's appropriate concern about certain types of hazards to educate them so that they at least have some sense of knowledge of the different hazards associated with different materials.

DR. CARTER: I completely agree that this particular thing, the differentiation gets blurred as far as the public is concerned.

MR. ROSS: One of things I might reiterate is the State of Colorado is working very hard at trying to sample this and trying to differentiate the public versus the political opinion. I think that the political opinion is being worked on now. We can educate those people. But until we see shipments going down the road safely in whether a limited number or in large numbers, until that is demonstrated to some satisfaction, I think it is an open question. Although we are continuing to work with the states to try to sample that for you.

MR. WENTZ: I do think an important aspect of our program is that we are going to have to do better job of getting the word out is, and I don't mean to do any DOE bashing here, but since this is the first new facility that DOE has brought on-line, they are carrying a lot of the baggage that is associated with the problems at all the other DOE sites, that

we hear at Hanford and that--and so I think an important part of our program is stressing that we are not taking it on DOE's faith that these things are going to run smoothly and everything is going to be okay. That we are doing independent inspections along side the DOE personnel doing these audits, you know, instituting our own programs to verify the safety of these shipments, and I think that can go along way to building public confidence in the shipping campaign.

MR. ROBISON: Dr. Carter, I told myself before doing this that I would not venture out on that thin ice of telling you what we found in our survey in great detail. If it would be of interest to you I can give you some highlights though.

DR. CARTER: Yes.

MR. ROBISON: Again, our survey was a baseline. We will measure the change later. We found that people basically don't like nuclear waste. One of the questions on our survey is a word associated question, "What do you think of when you think of nuclear waste?" Overwhelming the responses were negative. Words like dangerous, death, contamination, these were words that came out. People don't like nuclear waste. Forty percent of the people in Oregon believe that nuclear waste transport will have a harmful effect on them personally. I think that is significant. That is 40 percent of the population think that those trucks might hurt them.

Seventy-seven percent of the people along the route

through Oregon, believe that the shipments would have harmful effects on their region. Again, these are economic effects. On the other side of the coin, and again, what we found was a mixed bag, was that 54 percent of the people think that nuclear waste can be transported in a way that is acceptably safe. That was a positive finding that we've got at least half of the population to work with from a base standpoint.

We asked people to help us evaluate the precautionary actions that you see in our recommendations from the Hanford Advisory Committee and mirrored in our report to Congress through the WGA. We found that things like exceeding regulatory requirements and drug testing for the drivers, choosing prudent drivers, having controls in place to avoid shipping during road and weather, were generally seen as positive things. People expected that to be done and they were pleased to see that.

We also found that there were some things that the public didn't expect or tended to see as enhancing the dread aspect of these shipments. They don't necessarily think they are going to be escorted by police. We tend to agree with that. We don't think a police escort does a whole heck of a lot of good. I will say again that we believe that tandem shipments might get us a ways down the road.

There was a surprise for me. I had always assumed that having first worked with hazardous materials and then

later worked with radioactive waste and finding if you will the vitriolic response that some people have to the concept of nuclear waste, that the general public perceived nuclear waste as being more dangerous and hazardous materials. We didn't find that to be the case. We found that if people were asked to judge personal risks, they tended to cluster the transport of toxic and explosive materials along with radioactive waste, along with motor vehicle accidents and the threats of chemical pesticides in the environment.

We also asked the questions about levels of trust. Who can be trusted to give you straight information about nuclear waste. What we found was that way up at the top of the list were environmental groups. And I think that is significant, because I think the public doesn't see environmental groups, if you will, a vocal minority, but rather listens to what they have to say.

We found that on a scale of 1 to 10, environmental groups were finding an average of about 6.3 on that scale. Shortly behind them were the drivers and state agencies who clustered together. Are our drivers still in the room? They should know how important the public perceives their prudence and their judgment in moving these shipments down the road. At the bottom of the list were the industries that produced the waste.

DR. PRICE: Has there been any discussion among the WGA

on the issue of demonstrating things to the public in order to enhance public confidence such as was done with spent fuel casks in the train crash in England and also some of the other things that have been here at Sandia? Doing that in some sort of a way for the purpose of enhancing or improving the concept of the public?

MR. HALSTEAD: We really haven't gone that far in the program, Dr. Price, I think to actually do those, although I don't know about the other members, I plan to give some advice to the Westinghouse and DOE people on ways to utilize the documentation from the TRUPACT testing for just this purpose. But I would draw a very sharp distinction, and I am glad that this came up, because I want to talk about it again in my later remarks. Good public relations video footage in our opinion is footage that is honestly done to demonstrate compliance with regulatory requirements. I think it must be acknowledged that the British films have not been shown widely in this country and if you know the background, some of which is addressed in the report I've provided you, that Dave Snedeker provided for us, that was strictly a public relations effort. I would argue against that.

I would similarly argue against the use of the old Sandia test films. Not because those tests were not of value. If you read the technical reports at Sandia Transportation Technology Center, the reports are excellent. And the

reports were very--the tests were very useful for their limited objectives and particularly in light of the constraints on the resources available to be tested. That is exactly what we shouldn't be doing, because those tests could not be precisely measured.

You've heard Conan Furber argue from the railroad standpoint about the lack of credibility that those tests have with PhD engineers. You'd probably know about the comments of Ludwig Benner who was head of the National Transportation Safety Board, Hazmat Division at the time, said he thought that they were terrible and were the wrong thing to do, because they looked spectacular on film and not because they actually proved the point.

You know, I'm just speculating my own opinion and based on discussions with people in my own office in terms of what we would like to see for the civilian program. A type of documentation that really carries weight and does not fuel further debate, seems to us the type of documentation you get when you subject four TRUPACTS to a dozen drop tests, 21 pin puncture tests, four fire tests and you honestly acknowledge the lessons that you learned in the testing process that you fed back into the design and that you end up with a package that even a person who approaches this very critically and skeptically can say, yes, this is the kind of documentation that we want to show.

I think that is a really extraordinary development to come out of the WIPP transportation program relative to the work that has been done in the past. And I notices when both Mike and Phil were talking about the testing effort earlier, they had listed up there on their list of things you accomplish through testing was public perception. I believe there were good technical reasons to conduct those tests, some of which may not be directly transferable to spent fuel casks. But in this case, because of their non-homogenous nature of the contents of the TRUPACT and that the difficulties in modeling heat flow. Particularly, I think there were some special reasons that the NRC wanted them tested. But, boy, I think that public perception argument is a real powerful reason in and of itself and I am really glad they did those tests. It makes my job a lot easier when the time comes for these WIPP shipments to start in Nevada.

DR. PRICE: Has this information that you have just been cited as the desirable kind relative to WIPP, been actually presented adequately to the corridor states and to Nevada as far as you can tell?

MR. HALSTEAD: I find it peculiar, and maybe there is literature I don't know about, but the piece of literature that I know about is the skinny little report that I gave you that we commissioned from the State of Nevada in which we are highly impressed by and positive towards these tests. And

admittedly we feel that it is a benefit to us to use that as a precedent to encourage similar testing in the OCRWM program. But, I would say no for the life of me, I don't know why we haven't seen more information--I mean this information has been done in the training programs and among those of us who were involved in the program, but if anybody else is aware of a real broad-based public outreach program, using them, I am not.

MR. WENTZ: I would just like to say, as far as the Transax-90 exercise, field exercise and the recovery exercise done at WIPP recently, we do--well we have incorporated some of that into some public information materials and we will be using that more.

As far as the TRUPACT testing we have made that known to the public as far as the DOE going through full-scale testing, going beyond what the test requirements were, but it also has the potential to back fire generally, because the public doesn't understand I guess the significance of that testing procedure with an unyielding surface. They see it as a 30 foot drop and then they come back and say well these are going to be traveling 55 or 60 mph. It's not significant.

The issue about the crush test, there wasn't a crush test performed. The NRC requirements don't stipulate that one be performed. So there is a positive and a negative to presenting that type of information to the public. And, we

tried to incorporate it where we can, but it does has its draw backs.

DR. PRICE: I think we could carry this discussion on, but I believe we have to move on on the program, and we should take a little break now and come back in about ten minutes if we could.

MR. ROSS: Dr. Price?

DR. PRICE: Yes.

MR. ROSS: I would like to provide you with a video tape that the State of Idaho has prepared which attempts to take those tests and put them into a public knowledgeable type of format and those are being distributed and very well received, where 30 foot drop test equals so many miles per hour.

DR. PRICE: I'd like to see that.

We'll take a break now.

(Whereupon, a recess was taken off the record.)

DR. PRICE: Could we reconvene please? And Bob Halstead, the floor is yours.

MR. HALSTEAD: Thank you, Mr. Chairman. As always it is a delight and a privilege to be able to talk to the Board and Transportation Panel. I'll dispense with some of the usual formalities. I want to begin by saying that I like and respect Mel too much to take offense at his characterization of me as a shill for the Board, but there is a certain amount of truth to that. And I hope it is understood by the Board

that when I talk up this Board and its panels as one of the few, last best hopes for working out some of the conflicts between the state and the Department of Energy that that reflects well on the way that we view the Board and its panels in the State of Nevada.

And frankly there was some trepidation on the part of members of the WGA and I think possibly also on the part of some of the DOE contractors about what was going on with the Panel's interest in the WIPP program and exactly what might the Panel and the Board expect from the WIPP program that could be really interpreted as lessons learned. And I am really glad that you have had the opportunity to hear the range of statements that you have heard today.

My statement this afternoon as I take off my WGA hat and put on my State of Nevada hat, will look at some lessons learned and some lessons to be learned. Briefly, before I get into those let me say a few comments about some of the limitations on the lessons learned from this program. They have certainly been discussed in bits and pieces by various speakers today, but I think it is important to keep in mind there are significant differences in the waste characteristics, the hardware characteristics, the anticipated shipment characteristics and differences in the regulatory structure that we need to keep in mind when we are trying to make these lessons learned.

Obviously in the waste characteristics area with TRU waste, we don't have the enormous concern with gamma and neutron radiation that requires the attention to shielding in the design of hardware for high level waste. And I might also say that on the part of the official public in the affected states and the public of first responders I think there is an appreciation of these differences. But, as I said earlier, I think that the general public has a real problem distinguishing those waste characteristics.

The hardware characteristics, I think several members of the Panel pointed out that the particularly because of the shielding requirements and the thermal characteristics of spent fuel and high level waste, obviously the shipping containers are considerably different and that has to be kept in mind.

The shipment characteristics are also likely to be different. Now, the state believes it is going to be very difficult to put a rail line into Yucca Mountain. But, nonetheless, we continue to push for an emphasis on rail planning because we believe that's the best way to move waste to a repository whether it is located at Yucca Mountain or some other place. That's an important difference to remember here. We are planning a repository system, based either exclusively or primarily on rail transportation. We are now talking about a WIPP system that looks like it is going to be

primarily or exclusively truck. If we did have a 100 percent or predominantly rail transportation system for the repository, it would be further important to remember that if there were no MRS in the system, there would be some considerably different shipment characteristics.

I don't have the precise number on the average length of shipments to WIPP, but I believe it is somewhere in the 1,000 and 1,500 mile range, whereas an all truck system feeding waste to a repository at Yucca Mountain would involve much longer truck shipments, averaging somewhere between 2,000 and 3,000 miles. And that would be an important factor to consider in many aspects of the system.

One example of how these differences must be kept in mind is when we evaluate the DOE sponsored CVSA and CRCPD inspection programs. They are very valuable programs, but we always need to remember those shipment differences and if we do have the opportunity to expand those programs to include utility spent fuel shipments or spent fuel shipments to DOE facilities, we believe that we should do that, that those shipments may be closer in their characteristics to the kinds of shipments we'd be concerned about in the civilian program.

Finally, I think the fact that the civilian program is going to be fully regulated by the NRC and that many of the things that we have talked about today that are positive aspects of the WIPP transportation program, although they are

in a sense, extra regulatory, because they are not required, we are assuming that the full regulation of the DOE transportation system by the NRC will in some ways make it easier for us to address many of the issues that have in effect had to have been negotiated here.

Let me turn to the first page of my handout. I tried to keep it short this time, to two pages. There are five important lessons learned in our opinion from the WIPP transportation program which can be applied to the civilian program. I was very happy to hear this morning in Mike McFadden's presentation that from his view lesson learned number one is early participation of the states. I had a discussion obviously of my statement for you with Bob Loux, the director of my office yesterday. He said, number one, early involvement of the states. That's the issue you want to stress.

The others are significant, but the really important one is to drive this point home of early state involvement and not just the host facility state of course, but to get the corridor states. And frankly the State of Nevada is involved. We are going to continue to be involved. We think lesson number one is to get the corridor states involved in planning the overall transportation system early enough so that they can raise their concerns about operating protocols, cask design, risk assessment methods, issues that should be

addressed in the environmental impact statement for the repository. Should there be a separate EIS on transportation issues. This is the time to start getting the input from the potentially affected states.

We realize that there are some difficulties in identifying the corridor states because of uncertainties about the role of an MRS in the system, and uncertainties about the location of an MRS. Our response to that would be to try to determine at this point those stakes that are obviously going to be involved either because they are between Yucca Mountain and a federal facility or because they are located on a major funneling portion of a highway route from say the northeast or the southeast. We realize that it is very difficult to fairly identify all the states that might be included over time, but certainly we can begin now and we can identify many of them. This is really a lesson learned under point two as we talk about WIPP and let me turn to that.

By the way, I say that lesson number 1, early identification involvement of corridor states, that is a lesson I think that DOE/OCRWM needs to learn from the WIPP program.

Lesson number two, that the key transportation planning assumptions are likely to change during the lifetime of the project and everybody involved with it better be prepared for this, that is a lesson that the State of Nevada

and the corridor states as well as OCRWM need to learn from the WIPP experience.

I gave myself the benefit of spending a few hours with the 1980 final EIS from WIPP on Monday in preparation for coming here. And those of you who have been around with this business long enough to remember those changes, it is pretty amazing when you go back and look at the changes in the shape of the WIPP proposal and in turn the transportation systems implications of that over the last 11 years. Twelve years if you go back to the draft EIS. You know originally WIPP was a multi-purpose facility. It was going to receive not only transuranic waste, but it was going to receive some radiated reactor fuel. It was going to receive some canisters of vitrified high level waste. The original plan called for, I think the original, original plan if I am not mistaken, called for almost exclusive reliance on rail transportation by the time the 1980 EIS came out, that was about 75 percent rail, 25 percent truck. And now of course we know the planning basis while it could change to accommodate rail, looks pretty surely like it is going to be a 100 percent truck operation.

And I think these are important lessons for those of us affected by the civilian program to remember that any program that grows out of a congressional mandate in last decades is likely to have to experience considerable changes. So the way you have to accommodate that is for all parties to

plan accordingly. It puts a lot of burdens on all of us. It puts burdens on our, for example in our office to say, yes, we've got to plan for a 100 percent truck transportation system, a 100 percent rail transportation system, and some range of mixes in between.

It means for example that we have to not only be concerned about receiving 70,000 metric tons of high level waste, but if there is no second repository and if Congress lifts the cap and all the operating reactors in the country have their licenses extended for 60 years, and even if we don't have any new reactors sited, we could see a significant increase in the amount of waste and then of course in the number of shipments. And there are many uncertainties about what wastes will be included in that nebulous category entitled miscellaneous waste requiring geologic disposal, which could include commercial TRU waste, TRU waste from an MRS facility, radiated hardware from decommissioned reactors and so forth.

So I think lesson number two is that in federal nuclear waste projects that extend over a decade or more of their planning time, one needs to expect major changes in the assumptions which shape the transportation system. And as I said, that's a lesson directed I think at all parties.

Lesson number 3, it's a more limited and specific one and deals specifically with the issue of how one does

routing, and since most of our work to date on routing has been either focusing on rail lines that are not built for the repository or on highway routes which might be used to WIPP, let me limit my remarks here to highway routing. The State of Nevada has as you know a small amount relative to the other sites of transuranic waste at the test site which will eventually need to be shipped to WIPP.

We have also had some recent experience with exit shipments of spent fuel from the test site to Idaho and we occasionally get some through shipments of utilities spent fuel or other highway route controlled quantities through our state. So, because of the concern with the WIPP shipments and because of the concern over the last set of shipments from the test site to Idaho, the legislature directed the Nevada Department of Transportation to conduct a routing study and to designate alternative routes for all highway route control quantity shipments, without really considering the Yucca Mountain project, although all of us know that because of the peculiar coincidence of geography that Yucca Mountain is near Mercury where most of the shipments would occur, it is likely that the highway routes that would be designated for these other shipments would certainly set something of a precedent for highway shipments incoming to a repository at Yucca Mountain.

The Nevada Department of Transportation hired the

University of Nevada Reno College of Engineering to conduct some route studies for them. Without getting into all the details, these were studies done for the most part using the RADTRAN version that is available through STATENET. And the long and the short of it is that in evaluating a number of routes, there were some routes when you calculated the routine and accident risk down and whether it is in person rems per year or person rems per shipment, there are some routes that obviously look better than others.

But the problem is that you often, in our experience here and from what I know of the New Mexico situation, come down to your last two routes, the two that look best, and there isn't much difference between them. There isn't much difference in the absolute value either in person rems per year or shipment and the percentage value isn't different. And then it is really complicated if you use different sets of accident data. If you get one result say if you use the most recent years route specific accident data. You get another result if you use the last five years of available route specific accident data.

The conclusion again without driving the point incessantly here is that, there isn't any easy way to designate highway routes. I think that's the lesson from our WIPP exercise and I think the way that we apply that lesson in selecting routes for a repository at Yucca Mountain or at any

other site, is to do a range of probabilistic risk assessments, possibly using codes other than RADTRAN, but that we recognize that in the final analysis in most states it's a politically accountable body or person that makes a route designation. And that in addition to receiving information based on probabilistic risk assessment, they need to see very plainly revealed to them, what are usually the key criteria. That is the acceptability of the routes chosen in your state with your neighboring states, the accident rates and the varieties of the accident rates between heavy truck, all traffic and those kinds of disaggregations. And also of course where the population concentrations are located along routes, and where you may have what may be appear peculiarly hazardous stretches of a route either because of some physical characteristic or recurrent weather conditions or so forth.

Lesson number four, I suppose we could spend a great deal of time on and I'll try not to so that we can answer some questions. Put simply, we believe the experience in WIPP with the full scale testing of TRUPACT, certainly supports a conclusion that full scale shipping cask prototypes in the OCRWM program should be tested prior to NRC certification.

Let me clarify that we are not saying that we should get away from the scale model testing and the computer simulation techniques that we use now. Those are extremely

important and it is not an either or situation. We are asking for full scale confirmatory testing which reflects the fact that the new cask designs have greatly increased payloads. They are in--I would say dramatically innovative in their designs in order to accommodate those payloads. And, we are talking about using materials which, while we have some experience with them, we don't have a whole lot of experience in using those materials in the scale that they will be involved in in these new cask designs.

I am particularly thinking about the use of depleted uranium and the Babcock & Wilcox proposal to use the borated cement with copper fins. Nonetheless, even if I felt there were no technical reasons for this full scale testing, I would ask that you consider the public perception benefit which I believe will be borne out as more publicity is given to the results from the TRUPACT testing. I think I'll leave that one because I suspect that we will have questions about it.

Let me turn to the fifth point which is an easier one. You know there has been a great deal of concern both among people outside of New Mexico and I'm sure with people in New Mexico about the meaning of those thin spots near the welds in the 15 TRUPACTS that weren't certified. And there is also that issue of the thinning of the dome tops, which I don't believe was discussed earlier. And I've heard a number of opinions as I am sure you have as to; A, whether these thin

spots are significant from a safety standpoint; and, B, I've heard several different stories as to who gets credit for discovering these thin spots and discussing them with the NRC.

To us the important point is that this is a good reason to have an NRC inspector actually certifying the components and the assembly of the cask components in the OCRWM program. This is of course not a new argument. It's a point that we've been raising since 1987 in the transportation needs assessment that Mountain West Research did for us.

I am not going to say that you can argue beyond a reasonable doubt that you need to have an NRC inspector doing those inspections. It may well turn out that an NRC certified QA program with diligent inspector would find these problems and correct them. But we think that it would certainly be an advantage to be able to say that there has been an NRC inspection, which in effect certifies that each transportation container that rolls out actually complies with the regulations and with the specifications with that particular design.

Let me turn briefly to the area that Woody had asked me to sketch in a little detail, and I am going to be brief in going through these so we have some time to discuss them in questions. From the State of Nevada's perspective, the WIPP shipments are going to provide a very significant laboratory in which we may study transportation operations. Obviously,

we want to collect data on accident frequency and severity. If an accident occurs, how long did it take the emergency responders to get there. How well did they handle the incident?

We also would include incidents and near misses, and we haven't had a chance to do a lot of thinking specifically yet about how we would document this, and in general, we tend toward a position that says we are better having a short list of data needs and collect those data needs on every shipment.

But the thought occurred to me, when you raised the issue and I don't remember whether it was Mel or Dennis, the issue of near misses, that one way that we might investigate this would be simply to mount a camcorder in the cab or by the cab or have an escort car with a camcorder and simply document every second of a certain number of these shipments. But, to actually to that issue of near misses, which I think is very important, is potentially time consuming and expensive, but it is something that we shouldn't dismiss and we should try to find an effective way to collect that data.

DR. PRICE: Bob, may I interrupt just to say since I introduced the term near miss, I would like to point out that a near miss is a hit, and that is probably not what we really mean a near hit, but it is a common terminology. Yes.

MR. HALSTEAD: Again there does raise the issue though of how you document those and it had not occurred to me before I

heard you discuss it that you know, geez we get camcorders out to take pictures of our children's birthday or a child's performance in an athletic event or even pictures we might want to save ourselves. This is one of those applications where the camera, as you know from using high speed video in test applications, that this may be one way on a certain number of those runs to collect that data. Another area where I think some innovation in data collection will be necessary is the second one. I am very much concerned about the issue that Mel brought up about waste classification and certification. And I think that is one of the most important areas where potential human error needs to be examined here. But, I also would hope that we would pay attention to developing some mechanisms for collecting information on performance in those other areas.

Obviously, we are going to want to have a complete data base on inspection results, route deviations, weather delays, Transcom performance. I was very pleased to hear in Tom Ward's presentation the attention that had been paid to the Transcom--to the installation of the Transcom antennas and then of course the whole decision to move away from LORAN-C to a satellite tracking system.

But I think developing a data base on the performance of that system, which we assume will be in its "nth" generation used on shipments to Nevada if a repository

at Yucca Mountain should be licensed there, that is a very important area for us. And a very important area in which public confidence can be built, if it is actually demonstrated that the real time tracking system works.

Maintenance requirements, I define that very broadly, for example, to include all the concerns that you raised about stress on the trailer. And finally, to make sure that we are not just collecting desperate bits of data and storing them away I think most importantly we need to develop some plan for a system safety analysis based on the data that we collect that gives us an opportunity to compare for actual with predicted results.

You should know that there is kind of a semantic problem. We use the words program evaluation within the WGA group to talk about really the same thing, how we are going to document the safety accomplishments of the different program elements that we are involved with.

And with that, I'll say, thank you for the opportunity to raise these issues with you and I'll be happy to answer any questions.

DR. PRICE: Thank you, Bob.

DR. CARTER: I have a couple of things, Bob.

Bob in the fifth lesson learned, I guess, where you essentially recommend that the NRC have an inspection. Of course that would be contrary to a lot of present practices.

In essence now, they have engineering specifications and perhaps others, and I am assuming that the product meets those specifications. This obviously, like a lot of other things would increase the cost. A lot of people have given us suggestions and the DOE is gluing a lot of those things onto the programs in this case, the WIPP program, not necessarily this one, but many others. So I guess you end up with the question really of how safe is safe enough? Whether this or other things are needed.

Certainly right now, I think most people are dispassionate if they took a look at the WIPP transportation program, they would say it is overkill in spades in many, many cases. Now, not everyone necessarily would agree with that, but I think many people would, particularly if they have been involved with transportation of toxic substances and hazardous materials. The two are completely inconsistent as far as the requirements.

Anyway, I just wondered if you would talk on that?

MR. HALSTEAD: Certainly a fair question. It goes right to the heart of any kind of cost benefit analysis in showing there is a benefit there.

I would answer it in a couple of ways. First of all, I would like to think that the way we are going to go is to apply the standards we've developed for handling nuclear hazards and apply them to the other chemical hazards rather

than arguing for something less. I think on this specific issue of an NRC resident inspector, the cost is not likely to be great, and I think the benefit--I would address the benefit in public confidence the way that I believe there has been increased public confidence in those instances where a resident NRC inspector is available to check out a cask when it leaves a reactor. Now we are not shipping a lot right now. We haven't shipped for awhile. But, I remember from my recent experience with the Monticello and Point Beach shipments, there certainly was a great public confidence benefit of having an NRC inspector at that stage of that operation. And to me this is a comparable one.

Frankly, this is one where I think the cost is less significant than the cost on testing. And that's a concern that we have because we are proposing these testing requirements. It frankly is not a lot of useful literature right now to address some of these questions. We hope that in the next nine months in a cooperative project that is going to be funded by Clark County's nuclear waste program and conducted jointly with the state to hire a couple of consulting engineers, if we can afford them. We haven't gone very far in the solicitation, yet we've actually got recent experience taking casks through the NRC certification process, and got them to develop some preliminary protocols for how we would actually test the BR-100 and the GA-4 and the GA-9 to

meet the current NRC performance standards.

And then from that, I would hope in 12 months or so to be able to give you a little better answer on what the costs are and how we would justify those costs, when in fact the major benefit may be an intangible, such as increased confidence, rather than in an empirical sense, any defensible improvement. But, it's a fair question.

DR. CARTER: Well, for example, earlier today we heard the discussion of a crack in the frame of something that was probably not significant in terms of safety and health consideration. Now, yet if you are member of the public or a member of a political establishment, if you hear that there are cracks in the trucks that transport this material, that is awful, without really looking into whether or not those kinds of things are of any significance.

And I think we do this many, many times. We tend to pass over these things without really doing a good evaluation of them in terms of health and safety is that is really what we are primarily concerned about.

MR. HALSTEAD: I would make the argument that we are in-- it's a particularly difficult dilemma precisely because of the political controversy of the overall waste program, the tendency on the part of many observers in the general public and among officials to associate the DOE civilian program with things that Chris Wentz's said with incidents that have

occurred at DOE facilities, which frankly should never have occurred that are going to be costly to clean up. And so in some ways it is more--I guess if I were evaluating making these kinds of--imposing these kinds of requirements frankly on a well-regulated commercial utility that had a fine track record and we could name a few, it would be harder to justify this, but I think the public credibility issue is something that needs to be given special consideration in doing kind of a traditional cost benefit analysis on additional regulatory requirements.

But, I agree with you, it's a very difficult--from an equity standpoint it is very hard to justify that kind of regulatory approach.

DR. PRICE: Do you know if any other states than Nevada in the selection of WIPP routes used RADTRAN as a very important part of their selection process?

MR. HALSTEAD: Yes, and I won't speak for them. I don't know if Chris--I know that New Mexico made some use of RADTRAN. I was told that Colorado had and I believe Bob they used it in Oregon. But, yeah there have been efforts to use it.

DR. PRICE: And is your concern about waste classification which I see as kind of a different problem for WIPP type shipments as compared to civilian waste, the classification issues, what are the factors that you are

concerned about and does it have to do with blending for heat or are you talking about--what are your concerns?

MR. HALSTEAD: Well, in terms of the WIPP shipments, maybe I should be more concerned, but from what I know of the materials at the Nevada Test Site, I think they are going to be relatively less of a problem from a classification standpoint than say some of the wastes from Hanford may be. So, I certainly just acknowledged that as an important procedure to look at from the standpoint of documenting human error.

There is of course a direct application with the issue of administrative controls, if we continue to pursue the burn-up credit issue for the new casks and without going into detail, I do have some concerns about the need for administrative controls in classification at the time of loading of casks.

Again, I personally always thought of criticality as a pretty far-fetched issue and maybe it still will be. But, I think that is a related issue.

DR. PRICE: Related to the mixed waste problem of WIPP?

MR. HALSTEAD: I guess it's not as direct a parallel. From Nevada's standpoint, we are less concerned about the materials coming in for shipping for waste--they seem to be less of a problem from a classification standpoint.

DR. PRICE: Thank you.

Our final speaker for the afternoon is Robert Neill.

MR. ROBERT NEILL: Thank you, Mr. Chairman.

I guess I got to the right panel finally here today, although after that excellent introduction by Bob Robison before I found that it was for Ron Ross. And many of them I have worked with in the past, certainly Bob Halstead on an advisory committee to the State of Tennessee for the MRS, and certainly with Chris Wentz continuously.

In fact the first course I ever had in this area in radiation protection was given by Mel Carter in 1956. That was 35 years ago. I was only six at the time.

DR. PRICE: And he was 12.

DR. CARTER: No wonder you didn't graduate.

MR. NEILL: Right. Right.

And I might mention that we got set up here in 1978 to establish an independent technical review group of the WIPP project, one of the interesting things is that I think there is a comparability in the purpose of EEG to that of the Board, in that we have no regulatory authority nor responsibility. We do an independent technical evaluation of the impact of WIPP on public health and safety. We also run a monitoring program both on-site and off-site. We have the right to comment. We have no regulatory clout. The DOE reads us their rights, they say, you also have the right to remain silent, but we do and we have published something like 46 major

reports that were funded at the level of $1.5 million a year, have a multi-disciplinary staff of 18, located in both Carlsbad and in Albuquerque as well.

Our input--we have no regulatory authority, but giving you an example from the last couple of weeks, last week I briefed the Governor on some of our activities. I'll be briefing Chris and his boss in two weeks. We work with the office of the Attorney General to provide input. For example, a few years ago, we said there is no lock on the routes for the carrier to follow taking materials to WIPP. And at that time, the attorney general chose not to acknowledge the validity of our conclusion of a group of engineers. About two years later they agreed we were right and it would be necessary if we wanted to have a lock on the routes to specify them.

I think it might be helpful since we talk about radioactivity, and I've always been after DOE on this, is the first thing you are really going to talk about are curies. And the inventory of WIPP is about 15 million curies of radioactive waste. Two-thirds of it contained in the contact handled transuranic and the other third in the very small volume of remote handled. But rarely does one emphasize to groups that the maximum gamma dose rate can be as high as 1000 R per hour for 5 percent of the RH-TRU waste.

People get confused when you point out that the

external gamma dose rate for the unshielded RH-TRU containers is higher than the output of some of the gamma dose rates of the DWPF which would be a few hundred R per hour coming in.

Now, we also pointed out in the training course it is important to include a slide to that effect to show that it goes to 1,000 and the initial feedback was that that could be, not inflationary, but it could cause concern with people. Well that is always a problem we have in trying not to be an alarmist but at the same time to be factually correct is not to denigrate the hazards associated with these materials.

Some of the estimates are difficult to come up with because two-thirds of the waste that gets slated to come to WIPP has yet to be generated. And one of the reasons that we've been adamant over the years in insisting on wanting to get a very good system for the shipment is that we would anticipate that probably a lot of the very TRU waste would be excavated and triple the volume to be brought to WIPP. And since today we've been talking about a total of shipments of about 30,000 shipments, 25,000 for the CH-TRU and perhaps 5,000 to 7,000 shipments of the RH-TRU, it is essential that we have a very, very good system. Because, if you are going to have 100,000 shipments perhaps in the next 50 years and even though the frequency of the probability of an accident or a release may be low, when you multiply the two together, you do get a finite discernable calculation.

Over the years we have published about almost 50 major reports in different areas. I might mention a few of them in the area of transportation. First when we got started in '79, we did some calculations--we did the derivations of a moving point source, kind of the classical thing and checked calculations of DOE and agreed with the numbers. Jim Channell in 1980 went through some calculations involving doses involving accidents, both if you didn't clean up and you cleaned up and the moral of the story, which is not surprising that it is essential that one decontaminate. Jim looked at the dose associated with ingestion, inhalation, re-suspension and along the customary lines like that.

One of the other ones that we looked at in 1983 was that there was a problem associated with the generation of hydrogen on some of the heat source plutonium 238 waste that are located at Savannah River and also at Los Alamos. And we concluded that there was a major problem associated with hydrogen generation and that we probably would not be able to ship those wastes to WIPP in the current form that they were in. We took a lot of flack on that report and it is interesting to note today that the DOE is agreeing verbally but not in writing, that we probably will not be able to ship those wastes, which may run around a few hundred curies per drum of the RH-TRU waste.

In 1986 we looked at the adequacy associated with

the TRUPACT I design. Now that is sort of ancient history, but a lot of people have been bringing up ancient history today, and that was a rectangular design that was set up in 1978 in knowing realization that it violated the standards of both AEC, DOE and subsequently NRC. And that it was intended to ship more than 200 curies of plutonium and yet did not have double containment.

The report that we got on it much later was to the effect that the plan was to go with single containment and then try to convince the authorities that double was not required. We informed DOE in 1985 that that rectangular design with the single containment invented was unacceptable for use in New Mexico. DOE countered by doing three things. First, was they funded an ANSI committee to look into the concept of merely requiring single containment and allowing it to be vented and ANSI rejected that and said, no, they didn't think it was a good idea.

Subsequently, we petitioned the DOT to do the same thing which I will categorize as watering down the standard. DOT noted they were not in the business of regulated Type B designs for shipping containers, that they had a memorandum of understanding with the NRC whereas NRC would take care of those.

The third thing that came up at that time, as I remember, the contractor was going in and out of offices in

the Governor's previous administration saying that the insistence by EEG and specifically Bob Neill to adhere to these standards that really weren't required would result in a drastic decrease in the payload if you had to increase the weight of the container with double containment, there would be a lot more shipments and there would be more deaths from transportation and a much higher cost associated with it. In fact, the cost estimates which were never published were about a half a billion dollars. I repeatedly requested those, but never did those cost estimates.

It is gratifying to note that when DOE finally did submit the design to NRC and abandoned the rectangular TRUPACT II design and that TRUPACT II is when they tried to put a double containment and not vent it, that it resulted in a cheaper design with a higher payload. So, sometimes these things do work out to where it wasn't that much of a problem.

A few other recent reports that have just been published was that Dr. Matt Sylva who is here right now, joined us a year and a half ago, had looked in the question of the explosion potential associated with these volatile organic components in CH-TRU waste, and although we had only gotten the information on it in a short time, I think Matt put out a very good and an excellent report. Subsequently, we have gotten some more data. I haven't heard any of it presented today on swollen drums and on some explosions that occurred,

but it wasn't clear whether it was in TRU waste or not. And Matt is getting that material from DOE and is going to be publishing a second report in the not distant future. And I might add too, that DOE is also working on this to publish a similar report.

Mr. Chairman, you asked a few moments ago regarding the use of RADTRAN IV on those calculations and Dr. Tony Gallegos of EEG is also here with us today and would be in a position to respond to any questions you may have on that use of RADTRAN IV. These were some detailed calculations performed using various probabilities of major accidents from minor ones to the major ones that have been set up and why don't I present or give for your library one set of those reports in the transportation area.

One of the other things that we have tried to do is to get the message out, not just on our calculations and analyses but to make presentations at various national meetings, and there is a paper presented at Tucson a few weeks ago relating to some of those. And as I say, both Matt and Tony are here to respond to any of the questions you might have in that area.

I would like to comment a little bit here on the experimental program, even though I realize this is not within the immediate scope of your addressing in the transportation areas, but I think it is relevant because Bob Robison brought

up the question about all these constant and chronic delays that have occurred.

Basically the Department expects to complete its demonstration of compliance with EPA standards, 40 CFR 191 for the same disposal of nuclear waste in 1995. It is interesting that Carl Gertz estimates, I believe that NRC--they will complete the same effort in Nevada in the year 2001.

But the Department has looked at the question of bringing waste for purposes other than disposal in the interim period and has identified the use of something like a half of a percent of the total volume for experiments which would entail about 107 truck shipments.

Now, remember again that we are only talking about the contact handled waste. We don't have a shipping container designed yet for the remote handled transuranic waste, which after 13 years is a little bit surprising. But the laboratory tests, which used some simulated known radioisotopic mixtures, they are not wastes, they are in progress in other states, Florida, California. There are some engineering problems associated with these other tests. The bin tests--the first shipment is scheduled--someone asked, when will the first one be? Well, according to the DOE decision Plan 6, it is scheduled August 1, of this year.

The tests that involve the addition of brine to the waste form where one can evaluate the affect of the gas

generation through anoxic corrosion, cannot be conducted at WIPP, because, the facility was not designed to do research with radioactive waste. There is no radio chemical capability. There is no facility to dispose of rubber gloves, cotton--you know, materials such as that type. The Department has not yet identified where they will do these tests. And I was told just yesterday when I inquired again, that a decision on these will not be made until the first of the year.

Now in lessons learned, one of the ironies here is that the estimates of the solubility of the waste form varied by a factor of 10^6, that's about the best you can come up with. It is very difficult to even--when you go through the analysis and the calculations to convince your own brother as to the validity of some of these solubility limits, and in fact in talking, just during the break to Dr. Verink, he was trying to convince my brother in his work on some other illustration, and I always use my brother as an example, but right now you cannot do those tests underground at WIPP. And DOE has not yet decided whether to do them above ground, at the facility or elsewhere.

With respect to the ALCOVE tests, this is where we carve out a room, put the drums in the room, seal the room and measure the net quantity of gas being generated. There are some problems with that in that we have been unable to establish a seal for the room. The inflatable seals haven't

worked. The crushable seals of polystyrene don't work, and the latest is to come up with a massive 50 foot concrete plug which would be designed sometime in the next year, tested and constructed the year later and be not available probably in my estimate for at least two years. So there are some problems with the ALCOVE test that comprise 75 percent of the waste.

Going back to the drive-in tests, one of the questions that come up is that EPA has said, hey, under the RCRA requirements you've got to be at 50 percent of the LEL for hydrogen and methane at the time of emplacement, which would suggest a maximum concentration of 2 percent. Westinghouse is not talking about limiting the concentration to that level during the experimentation. If that occurs and if you generate hydrogen at a rate of roughly a mole per drum per year, which is not an unreasonable estimate. The spread is from .85 to 2.5, you would have to purge the darn things once a month or every few weeks. That problem could result in affecting the gas generation rate giving good data.

I won't have time to go through these others, but let me mention one other. On the floor and roof stability, we have a problem here that the floors have had to be reconstituted every two years. It's no big deal in an empty room where you can do this. This is a result of the lithostatic stresses of the rock over pressure which is about 2100 psi. The problem is when you put the bins weighing two

tons apiece in this room, it's not going to be an easy task to be able to move them around and shuffle them around and reconstitute the floor.

Of greater significance is the fact that DOE has estimates on the stability of the roofs which suggests that you can take credit from anywhere from 8.5 years to 16.5 years with ten foot rock vaults in the room. They have two reports to that effect. And you say, well what is the big deal. If you want to do experiments for five years, you've got a factor of safety of 3.5 years. Well the answer is that the rooms, Panel One, Room One, at the time of emplacement in October will be five years old. And a five year old room with a five year experiment adds up to ten years. So there are problems associated with the experiments that can result in some delays with the waste being brought.

One of the other ones that I wanted to cover here relates to the four-fold effort in trying to ensure safety in transportation. By the way, we think that the CH-TRU package is a pretty good package. But, I've gone through the legacy and the history of how it took EEG and we fought with DOE for five years on this to get them to abandon that design which violated the room standards. And had it been licensed by NRC would not have been permitted to operate on the highways.

The second point which I alluded to a little bit earlier, related to the designation of routes. We were

convinced we didn't have a lock on the routes. The C&C agreement that we set up identified potential routes to be used in bringing waste, but there was no commitment to it. Now, we said we are asking Congress for money to upgrade some of these rural roads, and if the carrier did not adhere to those roads and then he went over to visit his girlfriend or what have you for what reason, gets into a fender bender with a school truck on another road which had not be upgraded and paved with public monies, you would have a problem.

Now, we identified three ways that DOE could solve the problem. The first was to put it in the contract of the common carrier. Real simple. You either adhere to these routes, any deviation or violation the contract is null and void and the driver is fired. The Department is very reluctant to do this on the basis that it would establish a precedent in the other areas. We are shipping two to three million shipments of radioactive materials a year. And if the government started getting into the precedent business of setting routes, you assume all kinds of problems with liability. So, DOE didn't want to touch that one with a ten foot pole.

The second was to amend C&C agreement between DOE and the state to do that, but even that wouldn't help unless there was lock with the carrier.

The third mechanism was that the Department of

Transportation as was mentioned earlier, gives the state the authority and the responsibility to establish routes, if interstates are not, you know readily available and useable. That's an excellent example of how rarely does Washington delegate back to the states authority of where they say, hey you guys would know more about this than we would in Washington.

So the point is made today that the AG required the state to do it. No, that is not the case. It goes like this, that if an accident occurred and the state had not exercised its authorities to designate the routes, the state would be in a very awkward position to complain about it. And rightly so. So at this point, the agency that is charged with that authority, has only designated one route from the north which is supposedly the only waste that would be needed for the first five years. But there is a complicating fact I might mention to you, and that is that we are requesting Congress for funds to upgrade certain roads. And it might be difficult to convince members of the Senate or the House to expend public monies to upgrade certain roads if the state hadn't specified them yet. That could be a tough one to carry through.

Carrier safety I think has been carried off pretty well, and I think the emergency response efforts are very, very well covered. I think there is nothing new in what I'll

comment on that. Namely, because of delays and because of the turnover of personnel, things that we have done, we are going to have to do over and over and over again.

In fact it was the old joke of the line of the guy that got married, and he told his bride, I want to tell you something once and I don't want to have to repeat it everyday. He said, I want you to know I love you, and I just want to say it once. Well the same--it's a bad joke I guess. But, the same problem I think relates to emergency response where we are going to have to keep doing it over and over again. It must be the hour.

I mentioned earlier that the limits on hydrogen gas may preclude shipment of the 238 heat source waste in two of the facilities. I note now that that is a third of the total radioactivity coming to WIPP. And that problem hasn't been addressed. We all talk about CH-TRU, but nobody talks about the problems associated with a remote handled transuranic waste, that after 13 years we don't even have a modified high level waste shipping cask design that's been submitted to NRC for certification.

The third point in the transportation area, if in the unlikely event that DOE cannot meet the EPA standards for waste disposal in 1995, what do you do with these bins with brines which are not authorized for shipment by the NRC. They make a big deal out of it saying that they should be dry

waste. Now you can add some cementaceous materials, but there is not guarantee that if the bin is filled with brine at a pretty high level.

Fourthly, very recently, the Hanford problems which were alluded to earlier that the metallic components in the Hanford high level waste tanks have been recently redefined now as RH-TRU waste. And this may be an addition 2 million curies. You can also get into a legal question as to whether if a piece of metal has some high level waste on it, is it high level waste or isn't it. And that is some problems associated with that we've identified.

Some of the other things which I think have been mentioned, namely that only one route has been currently authorized for shipment into the states. Some of the monitoring procedures at the point of origin have yet to be defined. There are a number of boxes out there in the system that can't be shipped. They are just too darn big for the existing design of the TRUPACT, although there are plans to perhaps modify the design that would accommodate those kinds of things.

In the area of self-regulation which we have on WIPP, some of the drums are now 21 years old and that is no big deal, but they had a 20 year design life. That doesn't mean that that drum is going to self-destruct, but from the standpoint of public perspectives and concerns, that does

raise a problem.

DR. CARTER: Bob, can I ask you a question about that last item?

MR. NEILL: Yes.

DR. CARTER: Do you really consider that a big deal, that these things be put in ones that they will fit?

MR. NEILL: No. I think you can redesign the shipping container to accommodate these, but this is a subset of--

DR. CARTER: Well, either that or change the box, you know, at the generation site. I mean that is a mechanical problem.

MR. NEILL: Right. That can be done. But there are a lot of things in that category that I think we have to face up to and address. For example, the tunnel waste at Hanford is whether we start carving up these locomotives and things like that or whether it is safer to leave those kinds of materials there or not, or the buried transuranic waste. These other materials, some of them are under one foot of dirt, and if you tell the public, look it is necessary to spend 3 billion dollars to truck these materials a half a mile underground, then the public says, gee, what are you doing about this stuff that is under one or two feet of dirt here that we buried prior to 1970?

I don't mean that these are insurmountable problems, and I hope I didn't convey that, but these are issues that

need to be addressed.

At the last NAS-WIPP Panel meeting, the gentleman from Sandia who is in charge of the characterization of the waste form in Idaho and there is a major effort going on on that and the questions were raised. And in order to be able to match the amount of gas being generated with what is in the drum or in the bins, whether it stems from aerobic decomposition of the waste or anaerobic decomposition or radialysis and I might add that the radialysis is probably less than 10 percent of the total gas issue, wherein half of it comes from the anoxic corrosion, the carbon steel drums, Al Lappin had commented that the frequency of some incidents may be greater than those which we have been using and we are looking at that. If that is the case, then we do have some greater problems associated with, not so much with the transportation systems, but in the handling systems at the sites.

One problem that we have and you may have a similar one and you may never have it, and that is, trying to get the bad news and there is a tendency in all of us, myself included, to minimize the bad news when we tell people about things. I didn't hear anything today as to why the 15 TRUPACTS that have been constructed are not certified by NRC and the thickness of the shipping half-inch steel plate has been reduced through grinding to levels that are unacceptable

by NRC. Although, I think it was alluded to that it was an interpretation of the drawings. But, when I was in the boiler business, if you went to ASME and you said you removed 60 percent of the thickness of a pressure vessel, you are in trouble. And regardless of what the drawing said.

I think that it is essential that we have a system here that is scrutinized and checked over thoroughly and completely. If we wind up shipping something like 100,000, I look at the TRUPACT as the kind that is going to be the DC-3 in the transportation industry. That when they came up with the design of the DC-3, it is still out there since 1932 to the present, and I think it is essential that we have a very good system because one can get in the calculations releases associated with these, even though the calculation involving a release is extremely low, but the consequences for the cleanup can be, you know can be considerable.

One point that I get into personally, I really don't believe that it is necessary to educate the public on the hazards of these things, but as I see it it is necessary that we have systems in place that the public is confident that we have a formal, structured system to address differing views, differing concerns.

For example, as I pointed out very quickly, in this project the Department of Energy is not differentiated between those who are the regulators and those that are the regulated.

Who determines that they've met the standards and those that they have not. And in fact in contrast on I believe, Dr. Verink is chairing the Engineered Barrier Panel, that these waste forms at WIPP, there is no commitment to Engineered Barriers, despite the report on the minimum standard, that the waste form is soluble, it is respirable. You can have up to 1 percent less than 10 microns of a two kilograms of respirable material in a drum, and it is interesting that NRC has a greater requirement for certain low level waste forms, namely greater than Class B and C, than DOE has imposed upon itself for the waste form on the transuranic waste which is considered by EPA and the standards would be more comparable to high level waste.

And one thing I am not probably going to go into and I don't think you are really interested in this one is that you may be curious as to why New Mexico is less than euphoric at this administrative land withdrawal because it may have some implications in Nevada later that occurred in January, that in order to bring waste you've got to either get the Secretary of the Interior to give you a ticket or you get Congress to give you permanence. Well, there is no limit on the amount of waste that can be brought prior to demonstrating compliance with the standards. And the agreement with the statement permit up to 125,000 drums which isn't that dissimilar from the amount that is currently being stored up

in Idaho, the RH isn't precluded. The other concern is there is no external oversight authority that EPA has made it clear that with respect to disposal they have no authorities in that area. And that would go through the other ones on that.

Just a few of the points in here which you may have, and that is unless there is a clear, regulatory authority, people, and I am not beating on DOE now, and I'm including myself on my income tax if no one is going to audit me, I would probably send in a smaller check, they don't tend to be as thorough in the work that they do than if there is external regulatory control. And I'm not speaking just of oversight now. It took DOE seven years to abandon that rectangular TRUPACT design. It was a long bloody fight. I just had an example I talked with yesterday that WIPP is a mine and the Mining Safety Act of 1977 requires four inspections a year and when I asked what they are doing about the fact that last year there were only two inspections, I was told WIPP is exempt from those laws, which is not exactly the answer I was searching for.

And I can't help but note that when we are talking about credibility and confidence with the public, the amount of plutonium in the waste that DOE would like to bring to WIPP for the experiments for the first five-year period, is not that dissimilar from the amount found downstream of the HEPA filters in Rocky Flats which is 28 kilograms. And that is not

unique. The NAS report issued pointed out that at Hanford there is 11 kilograms of plutonium downstream of the HEPA system in that facility. And so we all have a major job and as I say, one of the problems in the disposal end, the way the laws are identified now, while we have oversight authority to comment, basically, DOE will decide how well DOE will meet the standards at that DOE facility.

And, I guess what I'm saying also is that I see the responsibility of a Board such as yourselves as being a very heavy burden. I note that the Ahearne Committee is scheduled to go out of operation on the first of the year and the Secretary is not planning on reappointing a blue ribbon panel. So it is essential that on these oversight functions, we all do a good job. And as I say, the transportation of these materials to WIPP probably will involve 100,000 shipments through 23 states over a 50 year period. And it is essential for public confidence at all that we really do a first-class job and I am not inferring that DOE is not. I think we have got a good design. NRC has gone through it thoroughly. They put the Good Housekeeping seal of approval on it and I think we are going to have a good one.

Another last point relates to this keeping people on their toes. If the EPA standards and Mel Carter is very familiar with these are a modified substantively in their recommendations now to delete the probabilistic approach and

to delete the human intrusion scenario, it is conceivable that there could be a delay from the expected date to begin disposal in 1995 to something later, for two reasons. One, if the standards change you may have to go back and restart the clock in part. DOE is taking 10 years to demonstrate compliance with those standards. They were promulgated in '85 and they expected to complete the job in '95. But, secondly if the standards are changed or if it is necessary to modify the waste form and you have to construct a facility to modify the amount of gas being generated, or the rate of gas being generated, you could spend up to a half a billion of a billion dollars and it can take anywhere from five to ten years for those efforts. So, I think the bottom line of merely getting that is that it is going to be a long-term project and an effort.

Thanks.

DR. CARTER: Bob, let me ask you a couple of things. I think one thing for records, you mentioned when you began in your preamble that you were going to brief Chris's boss next week or something to this sort. We have had two Chrises involved in the program today. Both of them have spoken. I assume you are talking about Chris Wentz and not Chris Kouts. Is that correct?

MR. NEILL: That's correct. And the structure in New Mexico and it may be helpful elsewhere is that there is a

committee composed of the cabinet secretaries that are involved in WIPP and it is called a task force and Ms. Anita Lockwood is the chairman of that task force.

DR. CARTER: Okay. The other thing you mentioned 40 CFR 191 in closing, of course I think as most of the audience probably knows that the EPA started on this standard some 12 years or 13 years ago and it is still not on the books officially. The standard has been remanded and currently it is under review by EPA as you know for possible rulemaking, negotiated rulemaking. And I presume that they will have an answer to that question. I've got a contractor looking at it and I believe it is due out in about May or June of this year.

Now the other thing of course is as our chairman pointed out early on this morning, it seems like a long time ago now, of course the Nuclear Waste Technical Review Board does not have responsibility for the WIPP. We have no direct responsibility for them at all, so you have raised a number of issues of course that are a lot broader than the subject of the meeting, namely transportation. But, let me ask you one specific question now, I notice that your 46 reports that you have turned out and I've certainly read a number of them, five of them are in the transportation area and as I recall, the latest one of those or the most recent, if you will is 1986. So that is four or five years ago.

So, my question is, right at the moment, and I guess

WIPP is either or on the verge of indicating that they are ready to receive the experimental transuranic waste, what is the current evaluation by the EEG now, WIPP transportation program as it involves contact handled waste? I am not talking about any other problems, but just that particular one.

MR. NEILL: The most recent reports were all in the past year. Dr. Gallegos there who I identified earlier has just published the one involving the RADTRAN analyses and calculations of the alternate routes. Matt has published one a couple of months before that regarding problems associated with a potential of explosiveness of the waste forms and is out to publish in another few months. And DOE is scheduled to also publish one as well.

So, we have been doing a lot of work, and we also reviewed and got into calculations of the does published in the supplement of the EIS which is published by DOE in January 1990 and our review is a few months later.

One other point you made was on the EPA standards for disposal, although we criticized DOE, unless we have a yardstick to measure the performance of these repositories, we note that the standard will have been vacated four years in June. And that means that none of us have a yardstick to measure the performance, and although we go ahead and do certain things, and in New Mexico we have agreed to make

believe the standards exist, and we signed a formal agreement to that effect, if they change drastically, they can.

Tony, would you care to comment on Dr. Carter's question regarding the adequacy of the transportation calculations on that and also the chairman had raised the point earlier on the--

DR. CARTER: Well, I guess my question, Bob, is a little broader than that. What I am asking you, in spite of either of the other problems related to WIPP and you've identified some as far as your organization is concerned, and you've mentioned certainly some of the past ones in the transportation area, the rectangular container and so forth, well that presumably is hopefully in the distant past. The real question is now at the moment, namely today in March of 1991, what is the evaluation of the EEG as far as the transportation program of WIPP with the advent of receipt of waste presumably coming up fairly soon unless there are blocked legal actions or something of this sort.

MR. NEILL: The transportation system, I think is in pretty good shape. It really is. We have other concerns relating to the operational readiness and provided a 25 paged document to DOE on January 15 relating to the operational readiness. But, that is not your question. But, on that, that looks pretty good in being able to transport safely these materials. I don't think that the inference that WIPP is

truly unique is something, I think we've made a mistake in telling the public. Because, since 1970, we have shipped 200,000 of these drums up to Idaho and we have shipped them in box cars, you know rail cars and it hardly has resulted in a swath of death and destruction on the way. We have been able to deal with these and cope with them. There is a concrete slab in a tennis bubble, and you go up there and these guys are moving these six-packs back and forth all day long.

And so it is not going to--in fact even on the thing that we really need to bring waste for operational demonstration purposes and there is Nobel Laureate for rolling back the frontiers of science in doing that. But at the same token, we don't see that a small amount of waste for experimental purposes poses an undue threat to the safety and security of either the people on the route or to either the workers at the WIPP site who will be engaged in there.

DR. TONY GALLEGOS: I am here to answer any questions.

DR. CARTER: You concur with your boss, is that right?

DR. GALLEGOS: Incidently, the documents that Bob put on the table a while ago, the EEG 46 which is the analysis, I'll answer specific questions on the analysis if you wish. I can give you a summary if you wish or I can sit down if you wish.

DR. CARTER: What is the bottom line on your calculations using RADTRAN?

DR. GALLEGOS: We found that the dose received due to

incidental transport which didn't involve any accidents and those that did were statistically insignificant when you compared them with backgrounds.

DR. CARTER: Okay, the other question I would have, did you find any other code that you could compare to RADTRAN as far as some verification?

DR. GALLEGOS: No, we used the--I did look for different codes and really I think the RADTRAN IV code is far superior to anything I saw. One of the reasons that we went to it was because it was the only one at the time that could do specific highway segments. We cut the segments in New Mexico up to about 43 segments and analyzed them independently. But then it was a task to put them back together and give a generalized analysis for the whole state.

So, I am very confident that RADTRAN IV is a good code. It has a sensitivity analysis attached to it. Right now uncertainty analysis is not in it, but other than that, I think it is a very good code. I really can't think of any other one I would use.

DR. CARTER: That's what scares a lot of people. I think it is rather unique.

DR. GALLEGOS: Yes, and it becomes more and more user friendly as it goes along because they have someone taking care of it and checking it and so on.

DR. CARTER: Well, I don't know if Bob Luna is still in

the audience but there may be some other Sandia people. I imagine they are pleased to hear this.

Thank you, sir.

MR. HALSTEAD: If I could just add on that.

DR. CARTER: Sure.

MR. HALSTEAD: My comments earlier were certainly not to mean in anyway that we are not interested in RADTRAN IV too, although there are portions of it that we are not satisfied that we have seen all the changes, particularly in the accident analysis. But the difficulty that we had with it was simply that because of the peculiarities of the particular routes we were looking at, and remember we were comparing, two essentially four hundred mile routes and there simply wasn't any basis for discriminating between those two routes on either the person rem per shipment or the person rem per year numbers that we were satisfied with from RADTRAN.

So even of the code is working properly and you have confidence in it, it doesn't necessarily mean that it gives you a handle to stand before an angry crowd and the town that is going to be on the route that is chosen and justify to them why you've picked that particular route.

DR. CARTER: Probably for the record I should say, Mr. Chairman, if you will allow me, when I made the statement that it is a unique code and that is what scares some people, I meant that probably in a complimentary way. The code is one

that is unique. There are very few others that you can apply to transportation situations.

So, that is what I'm saying essentially there are not three or four more that you can use to compare the results and give you some perhaps more degree of satisfaction or comfort in the calculations.

DR. GALLEGOS: That's true. I might add though, that I didn't mention earlier that we did find that the truckers were more susceptible to radiation risk than the others. I think there dose per year is like .2 rems or 200 millirem per year. When you are looking background at around 300 millirems, you probably ought to be careful, because when we did run the code, we noticed that the exposure rate to some of the truckers with some of the waste coming in from the sites did exceed the 2 millirem per hour limit and so one of the precautions we put in there was to make sure they monitor these guys because when you put a different set of waste every time TRUPACTS, the does rate in the cab is different. They are like four meters away from it. So we did find that result in RADTRAN IV to be true.

The other thing was that we found that the radiation dose to the people that might be surrounding stopping places was second to the highest. It had nothing to do with population densities or accident rates. And so we also recommended that the regulators or the authorities in New

Mexico judiciously select stopping places where they don't expose people to radiation without a reason to do so.

DR. CARTER: Thank you very much.

DR. PRICE: Ladies and gentleman, I think we have about run out of day. And I wish to thank the speakers today very much. Mr. Neill we appreciated it.

I did say at the beginning of the day that if time allowed we would receive comments from the general audience. We are out of time, but that is not deliberate and what I would like to do is extend that offer until tomorrow morning and when we start instead of at the end, when we start, you will have an opportunity for any out of the audience who want to make a comment perhaps with respect to this day's activities. And if you are not going to be able to be here tomorrow and you have something you really would like to say, I would like to really extend that opportunity to you right now.

If not, I want to thank you very much for attending and we will declare the session ended and thanks very much to the speakers this afternoon.

(Whereupon, the meeting was concluded.)

CERTIFICATE

This is to certify that the attached proceedings before:

UNITED STATES NUCLEAR WASTE TECHNICAL REVIEW BOARD

In the Matter of:

TRANSPORTATION & SYSTEMS

PANEL MEETING

Location: ALBUQUERQUE, NEW MEXICO Date: MARCH 14, 1991 was held as herein appears, and that this is the original transcript thereof for the file of the Board.

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