Meeting of the

NUCLEAR WASTE TECHNICAL REVIEW BOARD
Transportation and Systems Panel Meeting

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APPEARANCES:

Members of Transportation and Systems Panel:

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  Transportation and Systems Panel
Professor, Virginia Tech
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WILLIAM D. BARNARD,
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From Department of Energy:

JAMES H. CARLSON,
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RON MILNER,
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BETH DARROUGH

WILLIAM D. LAKE

CHRISTOPHER KOUTS,
  Branch Chief

P R O C E E D I N G S

9:00 a.m.

CHAIRMAN PRICE: We'd like to begin our session this morning. First of all, I would like to introduce those on this side of the room and the table, and later, I'll ask Mr. Carlson to introduce those on the opposite side of the room and those he would care to introduce.

First of all, on my far left is Bill Barnard. Dr. Barnard is Executive Director of the Nuclear Waste Technical Review Board. On my immediate left is Dr. Sherwood Chu, who is Senior Staff Professional with the Nuclear Waste Technical Review Board, and both of these gentlemen provide us staff function support, and Dr. Chu is assigned to the panel which is conducting this meeting this morning, the Transportation and Systems Panel.

On my right is Dr. Ellis Verink, who is a member of the panel. He's distinguished Service Professor of Metallurgy. He's the former Chairman of Materials Science and Engineering at the University of Florida. The White House will announce today its intention to appoint Dr. Ellis. President Bush will appoint Dr. Ellis to his second term as a member of the Nuclear Waste Technical Review Board.

On my far right is Dr. Melvin Carter. He is the

Neely Professor Emeritus in Nuclear Engineering and Health Physics at Georgia Tech, and Dr. Carter and myself are also members of the Nuclear Waste Technical Review Board and members of this panel.

I am Dennis Price, and I am Chairman of the Transportation and Systems Panel and a Professor at Virginia Tech.

Before we start the meeting, let me say something about what this panel is called. The name of this panel was changed this summer from the "Transportation Panel" to the "Transportation and Systems Panel." We've been asked by a number of people whether the name change implies a change in the panel's scope. In fact, the change was made to reflect more accurately what we view the panel's scope to have been.

We, as most of you would probably also, regard transportation as a process which involves more than just shipping casks vehicles and transport between origins and destinations. It includes also the activities, procedures and interfacing subsystems that occur at these nodes as well.

If spent fuel is being shipped from a reactor site to a repository, our consideration should include, for example, the processes involved in removing the fuel from the storage pool and loading it into the shipping cask. To

continue the example, if there is a need for different plans for dry storage at the site, we want to take into account how storage and transportation procedures and technologies can interface.

The considerations that need to be included at the destination site are analogously broad. Indeed, one of the items on the agenda for today, Ways of Minimizing the Handling of Spent Fuel within the Waste Management System, will involve necessarily these interfaces.

The Board is mindful of the fact that the so-called Waste Management System is not a monolith under the control of a single central manager, but comprises distinct players with divided responsibilities and possibly different incentives. The DOE must be responsive to its legislative mandate. The utilities, on the other hand, have obligations to their stockholders and through the Public Utility Commissions to the rate payers. The NRC because of its regulatory responsibilities is the one participant which has some kind of purview over the entire process.

That the responsibilities are divided should not prevent us from examining the process in a systematic way to determine what kind of concepts make sense. We realize that implementing a promising system concept may require the resolution of regulatory and possibly complex

institutional issues. But the first step is determining what's promising. Then for those promising concepts, one can begin identifying the potential regulatory and institutional difficulties.

The agenda today consists of topics that we have discussed before with the DOE and those that we have not. The discussion on DOE actions on our earlier recommendations is an example of the former. The discussion on ways of minimizing handling belongs to the second category.

Over a year ago in August in 1989, we had a three-day meeting with the DOE in Albuquerque on a fairly comprehensive set of concerns. Chief among these was a need to incorporate at this early stage the principles of human factors and systems safety engineering in the OCRWM DOE program including, but not limited to, transportation.

At the meeting, the DOE acknowledged that it did not have in place dedicated functions in human factors or a systems safety engineering. It was, however, responsive to our comments. These concerns and corresponding recommendations, by the way, later became a part of the Board's first report to the U.S. Congress and to the U.S. Secretary of Energy.

Part of the meeting today is devoted to DOE activities in these areas during the past year. We wanted

a meeting with ample time for discussion. Since it is difficult to predict what topic would require extended dialogue, we have provided for a discussion period at the end. However, I think we'll be fairly flexible, and the agenda should be viewed more as a list of subjects that will be addressed today rather than as some kind of rigid timetable that we must keep.

Upon occasion, we will receive comments from the floor. If you wish to make a comment from the floor, please come to the mike, state your name and then make your comment.

Transportation planning and transportation engineering with their associated systems do not require permits from states for DOE to proceed. It is the area in OCRWM without external impedance. It is the area where OCRWM can demonstrate its ability to perform when given a chance.

With that, let me yield to Jim Carlson of the DOE.

MR. CARLSON: Thank you, Dr. Price.

Is this loud enough for everyone to hear?

I want to say that we are pleased to be here to address the panel today, and I will introduce those folks that are here from DOE. I would also indicate we do have a number of contractor people in the audience and other folks

who we will rely on if we feel they can help us in responding to a particular question that the panel might have.

I'm joined today by Ron Milner, who is at the far end, who is the Acting Associate Director for Transportation and Storage in the Office of Civilian Radioactive Waste Management. The office did undergo a reorganization in August, and we are now operating under an interim organization, and Ron is responsible for the Transportation and Storage, which have been combined into a single unit, which I think will -- I think it looks at the system similar to the way you've described it, where the interface with the utilities and transportation and the storage as the lead elements of the program are combined in a single organizational unit. Ron is going to talk a little bit about that when I finish the introductory remarks.

Dr. Beth Darrough, who you met in Albuquerque, will talk about the transportation operational planning activities.

Bill Lake will talk about the cask safeguards activities.

And Christopher Kouts, who you've dealt with on a number of these meetings, is the Branch Chief for the Transportation Branch, transportation activities, and he

will be essentially hosting the DOE part of the meeting, and he will give you an update on the prior Transportation Panel concerns and recommendations.

My current position within the organization, I am the Acting Director of the Division of Storage and Transportation Logistics, which has the responsibility for the utility interface and the waste management contract activities and the Transportation Branch.

So we have combined those activities where we do have our greatest interface with the external -- or with the utilities under a single division to provide some of the continuity and make sure that the dealings do fit properly.

I think with that brief introduction, I'll ask Ron to maybe say a few words about the new organization and introduce himself.

MR. MILNER: Good morning.

As Jim mentioned the fact of a reorganization in August, Dr. Bartlett's reasons for that reorganization were to more clearly focus the lines of authority and responsibility for the various aspects of the program. Prior to that, we had been more of a matrix type of an organization. Now, we're organized along the functional lines.

The structure of that organization is done in

several new offices and some offices that existed prior to that within the organization. We have an Office of Strategic Planning and International Programs. Its area of responsibility pretty much is described by its name, as is the Office of Quality Assurance. Both of those offices report directly to the director.

We also have created a new Office of Contract Management -- Contract Business Management -- excuse me. That office's primary responsibility is for the business management of our various contractors, not the technical management, but strictly the business management.

A new office was created called the Office of Systems and Regulation looking at the entire program from a systems engineering perspective. Within that office also is the licensing responsibility and regulatory responsibility.

We have an Office of Geologic Repositories. The name is pretty much self-explanatory there as well.

My office is called the Office of Storage and Transportation. It's responsible for both the Monitored Retrievable Storage Program as well as the Transportation Program, also manages the contracts with the utilities.

I think I pretty much covered the various offices there.

MR. CARLSON: Thank you, Ron.

I'd now like to turn the agenda over to Christopher Kouts who will be the DOE lead.

MR. KOUTS: Thank you, Jim.

What I'd like to do in the first presentation to the panel today is to essentially update the panel on activities that have transpired since we last met with panel in Albuquerque in August of last year.

So if we can get on with that, I think you know who I am and where I'm from. If I could have the first slide, please.

(Slide presentation)

There are essentially five major recommendations that were contained in the March 1990 report to address RADTRAN transit validation, to look at transit needs assessment, to work with DOE to implement a Transportation System Safety Program, to also with DOE to implement a Transportation Human Factors Program and also for the Department to consider the evaluation of risk-based planning tools in its operational planning.

What I'd like to do now is to -- if I could go to the next slide -- essentially explain to the panel what activities generically have undergone over the last year.

After our meeting in Albuquerque, of course, there were a variety of action items that came out of that. The panel is probably aware of the fact that we

transmitted a letter with essentially responses to all the action items with about 79 attachments. So I believe that took us a several-month process.

Also, at the beginning of the fiscal year, I requested field offices and the contractors' report to those field offices to provide some perspective to the Board's recommendations and options on how the Department might implement those recommendations.

We went through an internal assessment of our current activities. I'd also like to draw attention here to the fourth bullet, which I feel is very important in responding to the Board's comments.

In June of this year, I personally with two other contractors traveled to Europe and interacted with the major organizations in Europe that move fuel throughout the world. We're talking about organizations that move between four [thousand] and 5,000 metric tons of fuel per year. We met with COGEMA. We met with -- which is the French holding operating company. We traveled with -- we met with the French CEA, which is their Atomic Energy Commission, essentially, and their regulatory body. We went to La Hague to see their reprocessing facility, also their cask maintenance facility.

After that, we traveled over to England to meet with BNFL, British Nuclear Fuels Limited, who operate

Sellafield, their reprocessing facility. We also went to Sellafield and looked at their cask operating facilities. We also visited their port, Barrow and Furness, where essentially they received the Japanese shipments for spent fuel.

In each of these meetings that we held with them, we asked their perspective, some of the recommendations that were provided by the Board. And as we moved forward in the presentation where it's appropriate, I'll essentially give you what we learned.

I should mention that we will have a report that will come out on the European experience later this year based on what we've learned from them, and hopefully, we'll be able to integrate that into our planning for the overall system.

After going through those four basic steps, what I wanted to discuss now is what actions we're implementing in response to the Board's concerns. And I should mention when the panel is essentially asking me a question about DOE's actions, that my management concurs in these actions, that it's not myself acting independently. It is essentially this presentation has been reviewed by senior management within RW -- within the Office of Radioactive Waste Management. So again, these are actions that have been essentially management actions that have been taken by

the entire management structure.

We can go to the first slide -- the next slide.

I know, Dr. Carter, this is a -- I think a near and dear subject to you in terms of validation of the RADTRAN TRANSNET package. I know the panel -- the Board discussed this at length in their comments.

We are in the documentation process right now of RADTRAN IV, and we are documenting that code to OCRWM QA standards. That documentation effort should be completed early next year. That's after several review processes. Again, what that documentation process is attempting to do is to go back and look at each assumption in the code, to provide the basis for that assumption, or if there's data, to provide the basis for the data bases and reference it for each assumption within the code.

I want to draw attention to the panel that RADTRAN has applications in DOE besides OCRWM. It's used by the Office of Defense Programs. It's used by the Office of Environmental Management and Restoration. It's used by the Office of Nuclear Energy. And what we're doing now is exploring with those offices the best way in order to independently peer review the code, and we hope to have that taken care of so we can undertake the peer review this fiscal year, hopefully in about the June-July time frame. We have to go through a contractual mechanism. We'll have

to identify members outside of DOE. I know the panel is very interested in having a peer review by people totally outside of the Department.

Right now, we're in the process of trying to identify who would be appropriate for that peer review, and we're very much interested in any comments or thoughts that the panel might have as to who should sit on that peer review. And we will keep you informed of progress and any actions in that regard.

If there are any questions, I can take them now or --

DR. CARTER: Let me comment about my only suggestion on the peer review. Even though we're quite interested in this and we are certainly interested in having external members of the DOE to sit on such peer review panels, we feel it would be inappropriate for the Board to make such recommendations. We deal with that as a conflict or at least bordering on a conflict.

MR. KOUTS: Could the panel recommend the types of individuals that we should look for on the peer review?

We're looking at essentially to go to academia. We're also potentially going to pick people in national laboratories that, again, are not under contract to the Department to evaluate it the various areas of the code. But if the panel is uncomfortable with recommending

specific individuals, could you recommend skills mix or basically the disciplines that we should have on the peer review?

DR. CARTER: Well, I certainly have no objection to that sort of thing. But I would defer to the panel Chairman for a proper response.

CHAIRMAN PRICE: You know, I think as far as a type of person, we can make comments. I would have a concern myself, and by the way, I might comment that when we speak our individual opinions as they may occur during the day, they may not necessarily be a panel consensus, and it certainly may not be speaking for the Board. But there would be a concern about the use of people from national labs, especially if their source of survival is heavily dependent upon DOE and DOE funding.

MR. KOUTS: I'm taking about the Transnet User Needs Assessment. I think this is an area where we need to have some more dialogue with the panel.

Right now, a user manual is being developed, and we are -- as we brief the Board or the panel in Albuquerque -- we are coming to an end of an effort which will be the development of data modules specifically for our shipments, which people will be able to access RADTRAN to do a lot of these data modules.

There is also a periodic assessment that the

Office of Environmental Management Restoration undergoes with the code. And I have to express some -- it's a paradox in terms of a comment we received from the Board report that I feel is inconsistent with what we received through our institutional network, and let me be specific in that regard.

When the repository EAs were completed -- and this is essentially when the Department was evaluated -- was the eight repository sites -- transportation analyses using RADTRAN were done at that time, and we received comments from the people who reviewed those reports, from the states and various organizations. They felt that the analyses were not specific enough, that we needed to essentially make the code more specific so that it could be used to get down, if you will, to the routes of specific level.

And as we briefed the panel in Albuquerque -- in fact, we went over presentation where, in fact, we addressed that specifically, and I can refer to the viewgraphs, if you like.

But what the Board report recommended was that we, in a sense, simplify the code, make the assumptions more generic, make it more specifically usable to shipments of this program and also, in a sense, take away whatever specificity. If we took that action and yet we put in more

specific data, we'll be essentially going the other way. We'll have far more specific data if the code will be more, shall we say, bland or the assumptions in it will be more global. And this was from the perspective of the Board report to be something desirable.

And I think the Department is struggling with exactly how to deal with this issue. On the one hand, we have people telling us to make the code more specific so that more specific analyses can be done, and when I mean specific, I mean analyses on individual routes with individual accident rates on those routes, meteorological information and so forth.

And again, it would be helpful for us to hear again what the panel's perspective of the Board's comments were.

CHAIRMAN PRICE: Chris, I don't see the Board's recommendations the same way as evidently you're interpreting it. I'll certainly go from other members of the panel also if they see it differently than I see it.

When we asked for a user needs assessment, actually, that's specifically what we were requesting. That is you go to the users and find out what their needs are and compare it with what RADTRAN can provide and look at what RADTRAN can provide and also what their needs are with respect to it's being friendly and usable by them and

then come up with a package that can be used by the people who will be using RADTRAN for civilian waste.

You mentioned in the previous slide, I think, that it has a number of uses within DOE, and that's part of our concern, that there are lots of things in this extraneous to this specific application that requires the user to weight through this or to weight through that in order to get to the use of this tool that specifically they may be after. And user needs assessment would be to go to the users to find out what the specifically -- as I see it, specifically what the needs are and then look at the code and see how we can make it a little slicker for those people who have to use it for this application.

MR. KOUTS: I see. We -- the panel is aware, as we brief them, that we do hold regular workshops on RADTRAN. We would like the people who use the code entity to come in and explain to them how to operate the code, and during that process, which is an interactive process with Sandia National Labs, we get one-to-one, if you will, interaction with them.

What the panel is suggesting is that the Department take -- undertake a survey of users and ask them specifically questions related to whether or not they would like the code to be made more user friendly, if you will, so they don't have to go through several menus in order to

get to spent fuel shipments? Is that --

CHAIRMAN PRICE: I would be looking for a formal needs assessment, and it would involve going to the user, and it also may involve going to the creators of the code so that we know what their understanding of the needs are and then getting a wedding of these two.

And rather than having a RADTRAN TRANSNET setup that's widely used and disbursed for a variety of things, that we come up with a version of it, which is unique for this particular program and useful for this particular program.

MR. KOUTS: I see. Could you address the concern that the assumptions for the code should be more level or more simplistic, if you will? That is a major area of concern that we have.

CHAIRMAN PRICE: If after the user's user needs assessment -- and that would be going to not only people who presently are using it of record and that have accessed it, but to the people that you would like to use it or not you, DOE, who ought to be using it including all kind of groups and find out what they need in order to make it useful for them. And then out of that needs assessment, there may come this cry for specific route evaluation. I'd be surprised if it didn't come out of that, and that would be one of the targets, to enable those who need such

specific route evaluation to be able to do it.

One of our concerns that we voice in Albuquerque was the ability to compare routes on risk and that we weren't really getting out of RADTRAN the ability to make the specific route comparisons and so forth.

So I don't think we've gone down quite the route that -- maybe that's a poor pun or choice of words -- that it seems that you're interpreting that we have on this against route specificity. I don't think we have it at all.

MR. KOUTS: Well, that was a major comment with the EAs is that the Department should undertake essentially an effort to assure more route-specific analyses are capable.

I would want to also remind the panel that RADTRAN has never been built as a decisionmaking tool, and I think what the panel is suggesting is that RADTRAN now become a decisionmaking tool. It is essentially a tool we've used historically to evaluate impacts of transportation. We do not look at it as a decisionmaking tool.

CHAIRMAN PRICE: Well, have you looked at your target populations and who are they, and how do they look at it, and what do they want to use it for? That's part of the user needs assessment.

And you're telling us how you look at it right now. It's not a decisionmaking tool. But DOE isn't, you know, the only use of this thing or may not be the only use of it, and if you're going to have other users, you certainly want them to use it appropriately, and if it is a -- if there is a narrow application of this and you can't use it for this purpose, but you can use it for this purpose, then certainly it has to be specified that way, restricted that way and made sure that it's used that way. That may not be the best interest to the overall picture if it's narrowed down.

MR. KOUTS: The historical use of RADTRAN by state agencies has been to evaluate routes, if you will, within their own states to designate alternatives other than the interstate highway system is required under DOT regulations. And basically, the application of RADTRAN is made gratis to those states if they choose to use it. They can use whatever tools they feel are appropriate.

Again, we're talking about a DOE code that was developed essentially for us to conduct our environmental analyses which we make available or gratis, if you will, and update with a substantial amount of resources every year to outside parties to use. And what we -- what the intention of making RADTRAN available was so that people understand the analyses that the Department conduct in

trying to evaluate their shipments, and that's basically that historical perspective that the Department use the code. It doesn't address it as -- or it makes it available as a benefit, if you will, to outside parties who would like to use the same analyses.

Our specific interest in the code, again, is for our environmental analyses that we will conduct for our shipments, whether for a repository. And what the panel is suggesting is that we -- the Department move off into an area and modify the code to essentially assist other uses outside the Department, and that's, again, an area that the Department has been reluctant to move into simply because the code from our perspective is, again, for our own use in evaluating the shipments.

CHAIRMAN PRICE: If other people other than DOE are going to use the code, then DOE has a stake in it in its not being misused. Is that not correct?

MR. KOUTS: Yes, sir. And that's essentially what we do, make the same code that we use available to other people so they can use it in the same way that we use it, and hopefully, we'll come up with the same result and the same conclusion.

We don't -- we don't in the sense -- well, that's basically how the Department has historically viewed the code, and we are sensitive to outside comments. As I

mentioned, there are periodic user trends that are assessed by the people who use the code, and we advertise the code in our Institutional Program, the TCG meetings, which you've attended on several occasions. No hesitation is made for people to make themselves aware of the situation. Sandia will train people to use it. But we are not, again, in any way hiding what we're doing.

What we are doing is making our tool, if you will, for analytically evaluating our system -- our transportation system from risk and -- on a risk basis available to outside parties to use it.

Again, what the panel is suggesting is that the Department modify the code or assess a trend -- assess user needs outside the Department and modify the code for outside uses, where in relation to the historical perspective of the code is, again -- or making the code available is for people to look over our shoulder, if you will, to make sure that what we're doing is reasonable.

I think we basically have a difference of opinion.

CHAIRMAN PRICE: I'm sure we do.

MR. KOUTS: I think we hear what the panel is saying, and we'll take another look at it again.

What we want to do is to involve ourselves in this dialogue with the panel so, I think, the panel more

fully understood the Department's perspective on what the basis for transnet is and why the Department makes it available to outside parties.

CHAIRMAN PRICE: The Department in making it available to outside parties, I think, then assumes a responsibility that it be used by the -- be able to be used by those outside parties in an effective way, and I think that there is an obligation to make it available to the outside parties. And therefore, I think there is an obligation to make it useful to parties other than DOE, so that DOE is not involved in magical hand-waving and that it is transparent to other people in order to enhance public confidence, and RADTRAN certainly could be a tool which could help instill public confidence in what you're doing.

At the same time, you can put a barrier over that tool and make it difficult to use or be in a catbird seat to say that when you use this, you misused this, simply because it's a little bit difficult for the population to get to.

So I see the obligation is standing with DOE toward the external parties, myself, and I don't see that you can simply pull the sheets over your head and say they don't exist.

MR. KOUTS: Well, we're certainly not doing that.

Did the panel come to this conclusion on their

own or were there outside parties that perhaps we could interact with that made this comment to the panel? Because if indeed we are getting comments or the panel is getting comments from people outside the Department, that the code needs to be user friendly or more user friendly, we'd like to talk to those people directly. So if there are people outside the program that we aren't picking up in our user assessment needs right now and we're not picking up through our institutional effort, we certainly would appreciate at least some idea from the panel. If you have some specific organizations or whatever in mind, we'd be happy to talk to them.

CHAIRMAN PRICE: Well, we'll talk to you, I guess, later.

DR. CARTER: Let me make a couple of comments of mine. This is a little confusing to me.

First, let me ask you a couple of things. Now, I would assume in the use of RADTRAN, it's being used by a lot of people outside of DOE, as you well know. It's being used by the European countries and a number of other folks. So I don't know if it's used universally, but certainly, it's one of the more popular models.

Now, I would assume that just as a matter of course of business, you would check things, for example, like population distributions along right-of-ways and

whatnot, whether it's highway or rail, but that you do this using a sensitivity analysis primarily based on economic feasibility. What are you losing if you don't actually count the people and determine the specific population along the route, for example?

I would assume this sort of thing is done routinely.

MR. KOUTS: Yes, indeed we have done that.

In response to the comments we received in the environmental assessments --

DR. CARTER: And that determines whether, you know, you're going to need or use or want -- or you're going to lose something if you don't -- you cite specific information. At least that's an example of it.

MR. KOUTS: Yes, sir. I totally agree with you.

And the modules that I talked about in the previous slide addressed issues just like that. There were comments related to RADTRAN historically used three population zones. Now, we're updating that to 10 or 12.

The national highway statistics that we were taking, we're putting in state data where it's available. We're also putting in state meteorological data wherever we have it.

Again, when we receive comments from outside groups in relation to our analyses, we respond to them, and

that's what we have been doing and will continue to do that. So I don't -- I totally agree with your comment. We do do that as a regular course.

DR. CARTER: Well, to me, that's a generic thing, you know.

MR. KOUTS: Yes, sir.

DR. CARTER: You normally do that.

The other thing, I presume if you should be unfortunate enough to have an accident involving radioactive material that belongs to DOE being transported, you'd use RADTRAN to determine exposures.

MR. KOUTS: The --

DR. CARTER: You said it's not a decisionmaking tool.

MR. KOUTS: That's correct.

DR. CARTER: If you have an accident, then people have been exposed. Is it a decisionmaking tool or isn't it?

MR. KOUTS: It could be used to model what happened, and in a sense, to look at the disbursement models to look at the impact of -- if there is any release of radionuclides. Yes, sir. It could be used for that.

DR. CARTER: It's not going to help you guide to the decision whether you --

MR. KOUTS: My sense is by the time we'd be able

to put a RADTRAN analysis together after an accident happened, I don't think that -- I think that all emergency response measures would have taken a long time past.

So it's not that type of a real time code, if you will, where you can determine its immediate --

DR. CARTER: I think in some cases it might. But certainly, in generally, it probably would not be.

MR. KOUTS: I'm familiar, in any case, where it has been used for that purpose.

Again, it's more of a predictive model. It does model the potential for accidents. It does model the potential for releases and how those releases would be disbursed and the population zones, and it adds things up, and it comes out with a number.

DR. CARTER: It calculates exposures.

MR. KOUTS: Exactly. Yes, sir. That's correct.

DR. CARTER: Okay. The other question I've got -- I'm not so sure I've seen it so far. My prime concern personally as a member of the panel in RADTRAN was whether or not it could be validated.

Now, you've mentioned peer review. You've mentioned this, that and the other. But you've really not, in my opinion, gotten down to the issue of validation.

Let me define what that issue is. It's a question of whether or not there are some specific sites in

the United States -- and perhaps other places -- that you indeed -- there's enough shipments -- whether they're DOE shipments or low level shipments by the commercial sector -- I think there are some specific places in the United States where you can actually measure using either TLVs or pressure ionization chambers or other devices, the exposures, say, on an annual basis, that you can actually make positive measurements of exposures either to strategic places along routes or to individual residents that might be nearby.

The question is whether or not DOE has any plans to go through such a validation study where you would actually make such measurements over a period of time using appropriate equipment and then compare those with the predictions of the RADTRAN model. That, to me, is a validation study.

MR. KOUTS: Yes, sir.

DR. CARTER: And this, I guess, has been simulated. There have been computer runs and all this sort of thing. But I'm talking about an actual validation study where you compare measurements with predictions.

MR. KOUTS: Yes, sir.

What I neglected to mention in the previous slide is that we feel it's very important for the peer review to address this issue, and we would be looking for input from

the peer review specifically on that issue to ask them in their evaluation of the code whether or not such a validation is feasible and how it should be done.

DR. CARTER: Okay. I didn't necessarily draw that conclusion.

MR. KOUTS: I neglected to mention that, and I appreciate you mentioning that, Dr. Carter. But that's certainly one of the very key aspects of the peer review.

In addition to that, we're also planning on asking the peer review team to evaluate exactly what Dr. Price is suggesting, whether or not, in essence, the code should be, in a sense, simplified, made more user friendly and some of the assumptions made more generic. We feel that this -- we'd like to ask the peer review that specific question, also. We feel that's very key. I think -- and perhaps they can provide us some insight on that.

CHAIRMAN PRICE: But if you couch that request in the direction that you've presented it to the panel -- that is if you do this, you cannot have route-specific information -- that's a misunderstanding.

MR. KOUTS: We will make every attempt to be as non-committal, if you will. On our perspective of the peer review, we're very concerned that if we're going to enter into this process that we're not going to be running it. It's going to be run totally by someone outside the

Department. It will be up to the peer review chairman to run it. However, we are sensitive to that, and we will make sure, again, these people will not be part of the DOE contractor structure. They'll have no axes to grind, if you will. There are no apparent conflicts of interest, and it will be up to their judgment as to how they will assess it.

We will ask them if the Board would like to suggest or the panel would like to suggest specific language to put into the peer review -- language as to what they're going to address -- we'll certainly entertain that and incorporate that.

CHAIRMAN PRICE: I was concerned that maybe your concept of validation was fundamentally different from ours when you did indicate, as your first bullet under validation, that RADTRAN is being documented, documentation and explanation of the basis for assumptions and so forth. That's not validation at all.

MR. KOUTS: Sure.

CHAIRMAN PRICE: And to my view and as Dr. Carter presented validation, that would be what I think validation is.

MR. KOUTS: I absolutely agree with you on that.

What we want to do is to make sure that there's no question as to what each assumption is in the code and

what documentation backs it up, and that's very important to verification of the code.

When we get to talk about validation, that's a separate issue, and I think that needs to be addressed separately by the peer review.

Are there any other comments or can we move on to the next issue?

(No response)

Excuse me while I take a sip of water here.

One of the key issues, I think, the panel mentioned in Albuquerque, as Dr. Price mentioned earlier and as came out on the Board report, was the need for the Transportation Program specifically to undertake a System Safety Program.

As we mentioned earlier, we have a new organization. We have an organization that deals -- we now have a separate office that deals with systems in compliance which has overall responsibility for developing our safety requirements, and that's provided more for information for the panel. And of course, the panel has been briefed that safety is embodied in NRC and the DOT regulations regarding transport.

However, we feel sensitive to the Board's comment, and what we're in the process of doing right now is bringing on an outside consultant that has specifics in

safety -- a specific systems safety background to help us write the Transportation System Program plan that will address all aspects of the program; cask design, operational planning, systems safety engineering and the application of risk-based planning tools.

We're in touch with the American Society of Safety Engineers, the Association of Energy Engineers and the National Safety Council in attempting to find a consultant that we feel can bring to the program what the Board desires.

CHAIRMAN PRICE: How about the Systems Safety Society?

MR. KOUTS: We'll add that to the list, Dr. Price. If someone could write that down, we'll also add that.

We're very sensitive to this. What we will do is develop a program plan. We will share that with the panel and with the Board, and hopefully, that will get us on our way to having our own safety program. We feel the panel and the Board report was exactly right, as we said in Albuquerque and as we said in response to the Board's final report.

And basically, we're in the process now of bringing that consultant on board, and he will -- he or she will be giving us recommendations as to how this program

should be developed. We'll write a program plan. We do this because we have to know what resources we need to commit to it. Maybe the panel is aware of this, but the latest budget mark for the Offices of Radioactive Waste Program is cut back $50 million. We need to determine what resources we need.

CHAIRMAN PRICE: Basically, it sounds like, in a sense, the original Board discussion in Albuquerque a year ago is required in about a year to come to that basic decision to now get at least a consultant on board in this specific area. That's a fairly correct statement.

MR. KOUTS: Well, I guess I would differ with the panel Chairman on that.

I went over the list of activities that we went through. We went through an internal evaluation. We received a variety of options as to how we might implement it. We looked at the European experience involved. I think we undertook quite a bit of activity in evaluating this.

CHAIRMAN PRICE: I wasn't indicating you didn't take any activity. But it did take whatever activity that you took to arrive at the decision to go ahead. It required about a year's time. Is that correct?

MR. KOUTS: Well, there were a variety of considerations, one of which is we write a separate program

plan for Transportation or should it be embodied in a new overall program plan for the office? We feel that the overall office plan will not be coming out of the near future. So what we did was decided to move off on our own, if you will, and develop our own.

So in essence, we are a large organization. We have to try to move together forward. But in this specific area where we felt that the rest of the program was going to be a little bit behind us because they're, again, dealing with facilities that will be deployed later, nonetheless, we are a little bit further ahead, and needed to take some specific action.

So again, we're deciding to march off on our own, if you will, and develop this plan without even having the overall requirements that would be laid down normally for this type of activity.

There's been a lot of internal discussion in the program as to whether or not we should take that course. But nonetheless, we feel we should, and we are committed to doing that.

CHAIRMAN PRICE: We're glad -- I'm glad to hear that you're not going to wait.

One of the critical things about systems safety, also human factors, is to be in on things at the conceptual level or at the earliest phase possible, and one of the

mistakes that administrators tend to make is putting off this particular input until late in the program, and then the inputs that may come from such activities are always too late and always deferred because if they come earlier in the program, we could have implemented them. But now they are here, and we can't implement them. So they need to come in early.

And the idea of deferring a systems safety activity for OCRWM in general is something that should not take place. We shouldn't be waiting for other requirements for the rest of the OCRWM activities.

MR. KOUTS: Yes, sir.

I'd like to -- the evaluation of risk-based planning tools, the next slide, essentially will be incorporated into this program.

CHAIRMAN PRICE: Before you leave this slide, could I ask you, does OCRWM have anybody that considers themselves professionally qualified as systems safety engineer?

MR. KOUTS: Certainly, in our contractor structure -- I'm not aware of any DOE employee that has perhaps the pedigree that you're suggesting, Dr. Price, but I think we do have it in our contractor structure.

CHAIRMAN PRICE: And in writing things for the systems acquisition process that comes from DOE, how do you

get a systems safety input into, say, contracts to be sure that enter our criteria document, that bid the documents that would lay on their contractors, require them to perform certain systems safety functions?

MR. KOUTS: We went over this somewhat in Albuquerque. There are a variety of DOE orders that have to be complied with in designed facilities, which indeed embody systems safety engineering. And the way that those requirements are into the contract is essentially they reference the DOE orders if there's any design work that's appropriate. So the basic way that's brought in is through the DOE orders.

What we're suggesting here is a little bit more comprehensive at the Transportation Program. But in answer to your question, that's the simple answer.

CHAIRMAN PRICE: I guess the application of those DOE orders -- and I do remember Albuquerque conversation on that. The application of the DOE orders, say, to the Cask Program, I would think would lead to some things that we don't -- we haven't seen in the Cask Program. So I would feel that if that is your mechanism for accomplishment systems safety engineering that it at least in the past hasn't been adhered to.

MR. KOUTS: As the panel is well aware, we are designing our cask to comply with Part 71, which are NRC

requirements, and all the safety requirements associated with those casks, as put forth by the NRC, will be addressed by our contractors in their certificates of advocation for their design certification. That's an area that the Department is not self-certifying these casks. They're being certified by the Nuclear Regulatory Commission.

CHAIRMAN PRICE: Yes. But if the NRC doesn't have a systems safety criteria document and a systems safety program and people who are applying to the program who are systems safety aware, then you don't -- you don't -- you can't revert over to the licensing process there because there will be some documentation that you would expect in the systems safety program that should accompany for your own evaluation of -- we're just picking on casks because that's the one we can pick on.

There will be documentation such as preliminary hazard analysis, certainly right at the start of an operating hazardous analysis system, hazardous analysis -- your FICA study would have fallen out of some of the things you ran into. You wouldn't have been in a position of need to generate some separate contract for FICA or Near-site or something like that with the human factors and the systems safety requirements. Those things would have come head-long into the attention of people who had that

obligation.

You did become aware of the need for these studies. But that would have been part of it. So it just speaks that obviously the functions aren't being done with the mechanisms as they exist today, and the reason I mention it is, is there not a need for that kind of capability within DOE? Because rather than relying on the contractors to reflect back, unless the gorilla contractor makes these kind of provisions, if you rely on a contractor to have the expertise and provide that program that you do not require of the contractor -- these kinds of programs -- you probably, because of the low-bid process, are not going to get these kind of programs involved.

MR. KOUTS: Let me address that issue. And I'm glad that you brought it up, Dr. Price.

In the area of cask design, since we are talking about cask design, there's been a long established process as to how these casks are designed. There are -- as we briefed the panel in Albuquerque, the regulations sit on top. Underneath the regulations are reg guides, and there are reg documents, and then there are industry codes, ANSI standards, ASME standards and so forth.

Why don't we begin to talk about modifying the process, supplementing the process under which these casks are designed? The Department feels very strongly that we

need some type of guidance from the regulator in this regard. It does not need to be rule making. It can be a modification of a reg guide. It can be a new reg document.

And there are instances where the Department is embarking on areas that are not specifically addressed in those areas. But those areas that we are addressing, such as burn-up credit, source-term evaluation, we worked with the NRC over a period of several years to educate, to conduct analyses as they would like to see them and basically to bring them along in a path so they feel comfortable with the utilization of either a specific type of analyses or a specific type of mechanism to prove cask safety.

We are not adverse to considering the implementation of what you're suggesting, Dr. Price. What we are suggesting is that we need some guidance from the regulator as to what he wants to see and how he wants to see it. The reg guides are very specific in terms of how the NRC wants us to implement their regulations. They provide us very specific guidance on the type of analyses, the type of factors to use.

In fact, if you'd like to talk to Bill Lake, who spent 15 years -- he's on my staff. He spent 15 years at the NRC and about three years in our program. He can give you a perspective as to the long process that this was

developed under and the specificity that we have in the NRC in proving cask integrity to them when we begin to talk about modifying that process and supplementing it or whatever. It's not something that from our experience that we see that happens overnight. It happens after a long gradual educational experience with the regulator so he can give guidance out to the people who are designing these casks so they know specifically how to apply and show what the regulator wants to see.

What I think would be helpful in this regard is for the panel to provide specifically to the NRC staff -- and they are not reluctant to sit down in meetings. There are open meetings to discuss this issue about the application of such an analysis and how it should be embodied in cask design.

We're really getting the fundamental issue here as to what should drive the design, and our perspective is when you get to that kind of fundamental issue, we feel -- since Congress directed us to certify these casks -- to have the NRC certify these casks -- that we need some guidance from the regulator as to how to embark on that type of modification, if you will, to the standard practice that's been used for over 20 years in this country.

CHAIRMAN PRICE: I suspect that maybe a perspective might change just a little bit after you bring

the consultants on board and delve into a systems safety plan and so forth, and maybe we ought to be looking forward into a few months from now, and we can talk about when that ought to be -- to sit down and review, once again, this particular topic and perspective and the NRC interactions with the DOE and the DOE with the NRC, but with this organization on board having perhaps provided some kind of input before we do so.

MR. KOUTS: Okay. That's a fine suggestion.

If we can -- I think I addressed the next slide, but you can put it up.

We're essentially going to cover -- we did look at MORT, and we feel it does have applicability and operational planning, and we're going to have our outside consultant give us some perspective as to how we integrate that into our planning.

But as we acknowledged in Albuquerque that we weren't using MORT, we did take a hard look at it. It was developed by EG & G in Idaho, and we feel it does have application, and we hope to have that also addressed by this consultant.

CHAIRMAN PRICE: And it is maintained by EG & G. It wasn't developed.

MR. KOUTS: It's interesting how contractors when they operate sometimes think they developed it. But I

stand corrected.

CHAIRMAN PRICE: At least that's my understanding. I could be wrong.

MR. KOUTS: In the area of human factors, as we acknowledged in Albuquerque, we did not have dedicated human factors personnel on our cask design teams. We have directed our contractors to acquire people or individuals with specific human factors personnel, specific human factors capability and training to our cask designers. We felt comfortable in doing this.

As we mentioned, in Albuquerque, we feel we were getting human-factors types of input from the operational reviews that we had of our cask designs. But nonetheless, we do not have anyone trained specifically in that discipline.

We are also adding to our technical review groups specific individuals who are trained in human factors, and we have a list of about 35 resumes. A few are from Virginia Tech. So I'm hopeful we'll be able to find someone with the right training.

We're also -- we've also directed that human factors considerations will be incorporated into our operational planning, and we have a report right now under preparation on human factors considerations and truck transport, and we'll be happy to provide that to the Board

as soon as it's completed.

CHAIRMAN PRICE: I'd like to comment there's very fine human factors personnel from institutions other than Virginia Tech.

MR. KOUTS: Yes, sir.

DR. CARTER: Mr. Chairman, first, you mention the evaluation of the European experience. I wonder either now or perhaps later, Mr. Chairman, during the discussion if we could -- and ask Chris if he would comment on a number of things related to this evaluation of the European experience.

I'd be particularly interested, of course, because some of those involve rail, road and water transport of used fuel elements and also how waste -- particularly things like the West Germans sending their fuel outside the country and particularly to the U.K., for example, for reprocessing and the return of various ingredients from that reprocessing back to West Germany. I'm interested in their accident experience, their emergency planning, relationships between the government and the contractors -- because it's quite different in the many cases in the United States -- but essentially their overall safety experiencing in handling and transporting radioactive materials in the sense of used fuel elements and high level waste and the relationship, of course, of

their rules and regulations to the IAEA transportation system.

CHAIRMAN PRICE: Chris, go ahead.

MR. KOUTS: I'll try to address as many as I can remember, and you can prompt me.

DR. CARTER: I'll help.

MR. KOUTS: Okay. In terms of their relation to the regulations, they comply with IAEA on regulations for all their cask transport.

The individual entities, depending on what country they're in, will certify the casks. But they're certified under IAEA regulations.

Just a general comment on the European experience was that they believed in very robust transportation systems. We saw a great deal of equipment, many casks, sitting out not being utilized, and the perspective, again, that more is better. They did not want a transportation link to affect their operating processes, which essentially is to get the fuel to the reprocessing facilities and get them processed.

Their emergency response, I was very much interested in that issue with them. In France and England, we're not talking about as large a country, certainly, as this one. But they essentially rely on their existing infrastructure. There is no specific training as far as I

can discern. They do have -- they expect response to come from fixed facilities, such as the nuclear facilities. France has many, many nuclear facilities. The Brits do, too. And if there is an incident, they will respond -- they expect response to happen from the fixed facilities.

Some institutional issues, like routing, are just simply not a concern to them. They just route the shipments. In fact, we asked them that question: What routes do you take? "We get on the road, and we go there." I mean, they turn it over to the railroad, and the railroad gets it there. They don't have dedicated train shipments except in one case where the British do use that since they bring in many casks at one time.

Their perspective on cask integrity -- although you didn't ask that question, I'll bring kind of an interesting comment to the Board. I was talking to a gentleman from BNFL, and remember we showed some pictures of Operation Smash Hit, which was the 100-mile-an-hour train smash into a British flask. Their estimates was that was only 85 percent of the stress that a cask undergoes on a 30-foot drop. So they bring it up to the design of regulations in that regard. In other words, the test wasn't up to providing the same type of impact that a 30-foot drop would get.

CHAIRMAN PRICE: Did you get involved in nodular

cast iron in any comments?

MR. KOUTS: Yes. They are far more supportive of that, certainly in France and in England, than the Nuclear Regulatory Commission has been.

They think it's --

DR. VERINK: And Germany.

MR. KOUTS: Excuse me?

DR. VERINK: And Germany, also.

MR. KOUTS: And Germany, yes. They are far more supportive of use of nodular cast iron in cask designs, and again, it's a difference of opinion between -- internationally between the NRC and other regulatory bodies.

But the French CEA, specifically, they saw the same data. They evaluated the same data the NRC had, and they just didn't come to the same conclusion.

Dr. Carter, do you want to refresh your list a little bit for me?

DR. CARTER: Well, I want to talk a little bit specifically about their accident experience, how much of it have they had. Have there ever been any cases where the integrity of the cask has been breached or violated and that sort of thing, any exposures, measurable exposures to personnel?

MR. KOUTS: Yeah. The answer to that question is

they've never had a cask that's been breached and exceeds beyond IAEA limits.

They have had accidents, and the report that will be issued, we can certainly get that report to you. I could go through my notes here and pull it out, if you will. But they've never had a cask acc