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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE

136th MEETING

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WEDNESDAY,

JULY 24, 2002

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ROCKVILLE, MARYLAND

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The ACNW met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 8:30 a.m., George M. Hornberger, Chairman, presiding.

COMMITTEE MEMBERS:

GEORGE M. HORNBERGER, Chairman

RAYMOND G. WYMER, Vice Chairman

B. JOHN GARRICK, Member

MILTON N. LEVENSON, Member

MICHAEL T. RYAN, Member

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1 ACNW STAFF PRESENT:

2 JOHN T. LARKINS, Executive Director, ACRS/ACNW

3 SHER BAHADUR, Associate Director, ACRS/ACNW

4 ANDREW C. CAMPBELL

5 MEDHAT EL-ZEFTAWY

6 TIMOTHY KOBETZ

7 MICHAEL LEE

8 RICHARD K. MAJOR

9 RICHARD P. SAVIO

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

8:34 a.m.

CHAIRMAN HORNBERGER: The meeting will come to order.

This is the second day of the 136th meeting of the Advisory Committee on Nuclear Waste. My name is George Hornberger, Chairman of the ACNW. The other members of the Committee present are Raymond Wymer, Vice Chairman, John Garrick, Milton Levenson, and Michael Ryan. Richard Major is the Designated Federal Official for today's initial session.

Today the Committee will:

One, be briefed by representatives from Illinois and Texas on the activities of the CRCPD E-34 Committee. I trust that the audience knows what that is.

(Laughter.)

MR. CAMPBELL: Conference on Radiation Control Program Directors.

CHAIRMAN HORNBERGER: Conference on Radiation Control Program Directors E-34 Committee, as well as the Materials and Radiation Control Programs in their states.

Two, receive an oversight from the NRC staff on technical issues under consideration by the

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1 NRC Program for the Control of Radioactive Materials.

2 Three, discuss with the Director, Office
3 of State and Tribal Programs, the NRC Agreement State
4 Oversight Program Integrated Materials Performance
5 Evaluation Program.

6 Four, receive an information briefing by
7 NRC staff representatives on materials and waste
8 considerations associated with advanced reactors.

9 Five, continue preparation of ACNW
10 reports.

11 This meeting is being conducted in
12 accordance with the provisions of the Federal Advisory
13 Committee Act. We have received no written comments
14 or requests for time to make oral statements from
15 members of the public regarding today's sessions.
16 Should anyone wish to address the Committee, please
17 make your wishes known to one of the Committee's
18 staff.

19 It is requested that the speakers use one
20 of the microphones, identify themselves, and speak
21 with sufficient clarity and volume so that they can be
22 readily heard.

23 The first part of the program this morning
24 continues our interest in issues on sealed sources and
25 greater than Class C waste in general, and the

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1 cognizant member is Raymond Wymer. I am going to turn
2 the meeting over to Raymond.

3 VICE CHAIRMAN WYMER: There's been a
4 change in the agenda this morning. We previously had
5 a greater than Class C presentation scheduled from
6 8:35 to 9:40. Unfortunately, the DOE representative
7 is not able to attend and will not be able to give
8 that presentation. So we have the option of either
9 using that hour and a five minutes for letters or go
10 right ahead, jumping to the 9:40 part of the agenda,
11 which may not be the best thing to do because people
12 may plan to come in for specific presentations.
13 However, we can do it any way that the Committee
14 chooses.

15 CHAIRMAN HORNBERGER: It turns out that we
16 would like to accelerate the morning because we have
17 a couple of appointments later in the afternoon. The
18 Chairman is coming down at one o'clock to present a
19 plaque to Mike Ryan. That never happened to me,
20 either, by the way.

21 (Laughter.)

22 MEMBER LEVENSON: Mike, your attendance or
23 your appointment is obviously upgrading --

24 CHAIRMAN HORNBERGER: It is upgrading this
25 whole operation.

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1 (Laughter.)

2 We would like to finish a little early, if
3 we could, either noon or 12:15. So if we could move
4 the presentation up, I would prefer that.

5 VICE CHAIRMAN WYMER: Well, let's go ahead
6 and do that then. Then our first presentation will be
7 on the source control, the state perspective. It will
8 be given by, the first presentation is by Bob Free,
9 who is from Texas, the Deputy Director of Emergency
10 Response and Investigation Program.

11 MR. CAMPBELL: Joe Klinger from the State
12 of Illinois is actually going to go first.

13 VICE CHAIRMAN WYMER: Is he? Well, I saw
14 the viewgraph for Bob Free up there. Well, let me
15 change that.

16 (Laughter.)

17 MEMBER GARRICK: So far, you are doing
18 great, Ray.

19 (Laughter.)

20 VICE CHAIRMAN WYMER: Our first speaker
21 didn't make it. Then I introduced the wrong person.
22 It is a typical day.

23 So Joe Klinger from the Illinois
24 Department of Nuclear Safety, who is the Chief of the
25 Division of Radioactive Materials and the Chair of the

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1 Conference on Radiation Program Control, will make the
2 first presentation.

3 MR. KLINGER: All right. Good morning.
4 Can everyone hear me? All right, this is great, I get
5 to go first. I like that. Usually, I am just waiting
6 around.

7 (Laughter.)

8 This is a great body to appear before, a
9 very auspicious group. I am glad to see Dr. Ryan. It
10 has been a long time since I have seen him. Whenever
11 I think of him, I always think of what somebody said
12 in a meeting one time: the world's largest
13 leprechaun, Dr. Ryan.

14 (Laughter.)

15 CHAIRMAN HORNBERGER: We'll remember that
16 one, Joe.

17 MEMBER GARRICK: We'll make a note of
18 that.

19 (Laughter.)

20 MR. KLINGER: It's great though.

21 But today what I will be talking about, I
22 am wearing two hats really. I am with the State of
23 Illinois to talk about control of sources and how we,
24 as one of many agreement states, how we do our job.
25 You will see that it is really not that different than

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1 what NRC does, which is no surprise.

2 Then the other thing, the other hat I will
3 be hearing is the Conference of Radiation Control
4 Program Directors' hat. This is a group that has been
5 in existence since the early sixties. It is
6 headquartered in Frankfurt, Kentucky, home of the
7 first agreement state. By no coincidence, that is why
8 the Conference is headquartered there.

9 It is involved in all aspects of radiation
10 safety throughout the United States. As you will see
11 by the end of the presentation, we have been very,
12 very active for quite a number of years on this very
13 subject of the control of radioactive materials and
14 security.

15 All right. Okay, how do we control
16 sources in Illinois? The same way the NRC does. We
17 regulate cradle to grave. We do it through licensing.
18 We have specific licensing, general licensing, exempt
19 from licensing; certain sources are exempt from
20 licensing. And nothing new, but there is a little bit
21 more attention to it now.

22 Some of the large sources that are in
23 storage, we are very concerned about those, as we
24 always have been in the past, but even a little bit
25 more so now because of the terrorist concerns.

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1 Control of radioactive sources in the
2 United States, roughly 157,000 byproduct material
3 licenses, 22,000 specific licenses, 135,000 general
4 licenses. Practically 2 million devices have been
5 distributed. These are rough numbers. We don't
6 really know how many. It is hard to have a good
7 number.

8 There are estimates of upwards of 25
9 percent of these devices are maybe unwanted and in
10 storage. Some people take that number and they go,
11 "Oh, my gosh, you've got all these orphan sources."
12 But they are not orphan sources. They are properly
13 regulated. They are controlled.

14 But people want to get rid of it, or they
15 will eventually. So that is pretty much what that
16 number is. Doug Broadus I think can go into more
17 details with that particular number.

18 All right, next. Control in Illinois, it
19 is done by the Illinois Department of Nuclear Safety.
20 We became an agreement state in 1987. We regulated
21 NARM, Natural and Accelerator-Produced Radioactive
22 Materials, for many years as part of the Health
23 Department. But in response to the Three Mile Island
24 accident, the Governor at the time, Governor Thompson,
25 wanted to make sure that we had a very good emergency

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1 response system. So they set up the Illinois
2 Department of Nuclear Safety, which our Director is a
3 Cabinet position on the Governor's staff. There is
4 one other state like that, and it is Arizona, I
5 believe.

6 We have about 750 specific radioactive
7 material licensees. One of those is an 11e(2)
8 byproduct material one. We had our agreement amended
9 in 1990. So we took over the control of the Kerr-
10 McGee facility. I have spoken to you all a couple of
11 times here in the past, and it was about that
12 facility.

13 Thousands of general licensees, I know
14 Doug and others will be talking about general
15 licensees. They are a concern as well. For many
16 years we have had a registration program. We track by
17 serial number, which is real important. We also have
18 an annual self-inspection, where we have the
19 requirements. We send it to our general licensees
20 which are those of concern, the ones above the working
21 group study that was done several years back. So we
22 have a pretty good program. We also have fees in
23 place, about \$350 per year per installation or per
24 general licensee.

25 Just to give you a feel to it, NRC

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1 controls all the nuclear power plants and all that,
2 but as far as byproduct material licensees throughout
3 the United States, 77 percent of materials licensees
4 are in agreement states. So it is the majority by
5 far. Maybe by 2003, about 35 agreement states; right
6 now there's 32. That is where they are. You will see
7 most of the populated states are agreement states.
8 Wisconsin is working on it, Michigan, and a couple of
9 other states are working on their agreements.

10 Back to the Illinois Department of Nuclear
11 Safety, we are headquartered in Springfield, Illinois,
12 home of Abraham Lincoln. If you've never been there,
13 it is pretty nice. There's about 200-plus employees
14 in our Department. We have field offices in west
15 Chicago and Mazon.

16 Next. Other things that we do, just one
17 slide: emergency response for our nuclear power
18 plants. We have, I think, more nuclear power plants,
19 power reactors, commercial ones, than other state. We
20 register and inspect radiation-producing machines. We
21 have a technologist accreditation program, industrial
22 radiography certification, a radon concerns program,
23 licensing program, and we have a website, too.

24 So what do we actually regulate? We
25 regulate basically the same thing that the NRC does,

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1 a wide variety of industrial uses. Most of you are
2 probably involved in nuclear power reactors. You will
3 see, as I go through some slides, we are involved in
4 industrial radiography, well logging, fixed gauges,
5 portable gauges, x-ray fluorescence analyzers. We are
6 also involved in medical use, diagnostic, and
7 something unique to agreement states, we've got
8 positron emission tomography; short-lived
9 radionuclides, very important; chemical cyclotrons
10 that are used in great imaging techniques that are out
11 there, therapy, brachytherapy. We are concerned with
12 brachytherapy sources, as is NRC.

13 Research facilities, the University of
14 Chicago, the University of Illinois, all kinds of
15 broad licenses, again, major universities, just like
16 NRC and all the other agreement states regulate.

17 Then we have an inspection program. I've
18 got 23 people in my Division. I'm the Chief of the
19 Division of Radioactive Materials.

20 After we license, after we issue a
21 contract with people that want to use radioactive
22 materials, we have inspectors that go out and enforce
23 the provisions and the license and the rules and the
24 statutes. We have six inspectors up in west Chicago
25 that cover the north part of the State, and we've got

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1 one downstate. He is on the road all the time. He is
2 indispensable. He is great.

3 How do we do it? We enforce. We make
4 sure they are complying through notices of violation,
5 management conferences, orders, and civil penalties.
6 We don't hesitate to use our civil penalty provisions,
7 and have been doing so for quite some time.

8 I thought this would help some of those
9 that aren't in the regular specific licensing arena
10 all the time. Industrial radiography, I think you all
11 have heard about industrial radiography. You know
12 about it.

13 The source is inside a shielded container.
14 It is cranked out. You've got the crank-out cable
15 there. Then you put film on the back side of the well
16 and you expose it. You take film radiographs, using
17 100 curies of iridium 192, larger sources and fixed
18 facilities using cobalt 60.

19 There have been problems. There is a
20 pigtail assembly. The source is right there.
21 Obviously, that is not a live source.

22 (Laughter.)

23 Next picture. Because if it were, you
24 would have a little problem. These are serious. They
25 can kill you. That is what happens if you put a

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1 source in your back pocket. It is not pretty.

2 So they are very dangerous sources. They
3 have to be controlled very carefully. They are very
4 serious.

5 Teletherapy units, we will talk about some
6 of the incidents worldwide briefly, but they are large
7 sources, 1,000 curies of cobalt, have been responsible
8 for many problems throughout the country and the
9 world.

10 Next. Large pool-type irradiators;
11 several million curies you're looking at right there,
12 about 20,000 curies in a little pencil, these little
13 pencils that are in these holders, very, very large
14 sources.

15 Security now is a very big concern. We
16 have issued advisories to our licensees that use these
17 types of sources. They are the same advisories that
18 NRC has been putting out. We have just been endorsing
19 those and sending those out. So we share NRC's
20 concerns over these facilities, as well as all the
21 facilities.

22 Portable gauges, moisture density gauges,
23 are all over the place. You go down a highway that is
24 under construction; you will probably see one sitting
25 there. Hopefully, somebody is nearby. It is not

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1 always the case. We have had them run over by
2 steamrollers. Amazingly, they look terrible,
3 flattened out, but the source has always been intact.
4 So they are very durable, but we get very upset. We
5 had this happen on a Friday evening in downtown
6 Chicago and lock up the highway system there, and it
7 was a real mess.

8 The RSO who is there onsite, he goes,
9 "Hey, I've got to go. I've got a heart problem."
10 Yes, well, we did, too; our inspector did, too, when
11 that was going on. So, anyway, we finally took care
12 of it and billed them for our time, full-cost
13 recovery.

14 Fixed gauges, thousands of these all over
15 the country, all over the world. Any large
16 manufacturing facility, refinery, things like that,
17 there will be fixed gauges, these radioactive devices
18 which have the source on one side, a detector on the
19 other. Whenever the amount of radiation detected is
20 being reduced means the fluid level in a vessel, for
21 example, has gotten in the way, it activates certain
22 controls. All these things happen.

23 They are very important to industry.
24 There is really no alternative in most cases. So they
25 are all over the place. Oftentimes, they forget about

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1 them, and the environment, it causes negative effects
2 on the labels. People don't know that they have
3 radioactive material. So sources end up at scrap
4 recyclers and other places, and that is a major
5 concern I will be talking about here shortly.

6 All right. Again, that is just another
7 gauge on the outside of a vessel that is kind of
8 typical of an environment that we find them in.

9 We have all these uses, but if we did know
10 where all the devices are -- we really don't, because
11 if we did, we wouldn't have to be doing this. This is
12 my lead inspector up in the Chicago area, Andy
13 Gulczynksi. He is highly educated, but he spends a
14 lot of his time doing this kind of stuff.

15 It is very important that we do this at
16 least once a week. We have several monitor trips a
17 week, and we spend a lot of time doing this. We wish
18 we didn't have to, and most of the time it is medical
19 waste. It is I-131, but we never know for sure that
20 it is I-131 until we go out there. So it takes up a
21 lot of our time, but it is very important. We do find
22 sources every once in a while. Now the last one I can
23 recall was a cesium source out of a moisture density
24 gauge that we are trying to dispose of through the
25 Conference program that I will be going into just

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1 shortly.

2 CHAIRMAN HORNBERGER: Who alerts you to
3 this? How do you know to go there to inspect it?

4 MR. KLINGER: Oh, they have monitors.
5 There's monitors all over the place at these
6 facilities. I will show you in just a second.

7 Again, there's some inspectors. There is
8 an inspector here going through mountains of trash
9 because there will be a source that sets off a
10 monitor, it went off a bell, and so we've got to go
11 find the source. Oftentimes, it is like looking for
12 a needle in a haystack. It is dangerous conditions
13 oftentimes. You've got biological concerns for the
14 inspectors, and it is just no fun.

15 A lot of landfills, a lot of transfer
16 stations, the scrap recyclers all likely have these
17 now, these monitors. The trucks will go through.
18 They are trying to protect themselves. They are not
19 happy about this, but they have to because, if a small
20 source, just a little 10-millicurie source, gets
21 through them and goes to scrap to a still facility,
22 and they melt it, it is an average of \$10 million for
23 that facility and potential public health concerns as
24 well. So they have to do it, and they are just not
25 very happy about it.

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1 So we go out there and occasionally find
2 some orphan sources that way. There's orphan sources.
3 I will get into that in more detail shortly, but that
4 is the most frequent clear orphan source. You go out
5 there; you find a source. We find them shredded
6 sometimes that are not leaking, but you can't get any
7 information from the source. You don't know whose
8 source it is. So you are stuck.

9 The scrap people are tired of that. They
10 have to go out and buy these monitors. They have to
11 shut down their facility oftentimes. They have to
12 spend \$10 million, and, plus, they get stuck with the
13 source. In the past, that is adding insult to injury.
14 So I thought that was a main -- it was pretty pathetic
15 the government couldn't do something about it. So, in
16 1998, funded by EPA, the Conference did something
17 about that. That is what I will be going into later.

18 So we have these meltings, 33 meltings
19 reported in the U.S. since 1983, average \$10 million.
20 We had one up to \$23 million. That was in Illinois,
21 Keystone Wireline.

22 Most recent -- we thought, ah, we've got
23 this under control -- well, we had one in July of last
24 year, Ameristeel in Florida, about \$10 million again.
25 Again, they have to buy expensive monitoring systems

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1 and they get stuck with the sources.

2 About 500 radioactive orphans found by
3 monitors at U.S. scrap metal facilities. Industry is
4 not happy. There's about 375 lost, stolen, or
5 abandoned sources devices reported by licensees each
6 year, the tip of the iceberg, and I am afraid that
7 iceberg is pretty big.

8 Why? Why do we think it is that?
9 Because, first of all, you need to know you have a
10 source. Some of these general licensees, we go out
11 and they didn't even know they had a source. "Why are
12 you bothering me? I don't have anything radioactive."
13 "Oh, yes, you do." Hopefully, it is out there on a
14 tower or something.

15 So they need to know it is missing. They
16 need to periodically go out there and find their
17 source. They need to know to make a report. They
18 need to make the actual report. Those are just some
19 of the reasons why this is probably an underreporting.

20 Next. Since 1955, 266 individuals
21 overexposed, 39 fatalities. That is worldwide. The
22 Ukraine, some of these concerns about orphan sources
23 now, many radioactive sources unaccounted for. I have
24 heard all kinds of estimates. I don't want to come up
25 with a number because I don't know it, but I know that

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1 there's a lot of sources that are not properly
2 accounted for.

3 International incidents, I think everybody
4 is familiar with the Brazilian incident where a little
5 girl thought it was amazing and she put the cesium on
6 her body and ended up dying. The members of the
7 family did, too, four dead.

8 In Spain they had a cesium source melt in
9 1998. They detected the plume, the cloud, in Italy
10 and France and Switzerland. So they thought, oh, my
11 God, here's another Chernobyl. It created all kinds
12 of concerns.

13 Thailand, cobalt 60 teletherapy, again, a
14 large source in storage. It was junked, and somebody
15 was messing with it, and it ended up three deaths and
16 seven others severely exposed.

17 In Egypt, a real sad case where the little
18 radiography source was picked up by a little boy, a
19 father and his son. The father and son died and five
20 others severely exposed.

21 Juarez, I think everybody is familiar with
22 that and significant exposures at the scrap yard
23 there. Bob will probably talk about that.

24 So you say, well, that's international; it
25 couldn't happen here, right? Well, we have been

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1 lucky, and I think it could happen here. In a sense,
2 it has. In Pennsylvania we had the situation where a
3 source was essentially lost inside a patient, a woman
4 that later died. They ignored their monitoring at the
5 hospital. It ended up going out with the bandages and
6 stuff, and that caused a lot of concern. So there's
7 one example. Again, Bob will talk about this
8 probably.

9 The stolen radiography device that had
10 some associated overexposures or some exposures
11 associated with that. The brachytherapy sources
12 stolen in North Carolina, I don't know that those were
13 ever recovered. So we do have some incidents here,
14 nothing as sensational as the international, and we
15 hope it stays that way, but there is potential.

16 One of the problems that we have is we
17 were so good at responding. We would know about --
18 people would call us if they have a monitor trip; we
19 would hear about it. We would send people out there,
20 and we were great at that. Just as soon as possible,
21 we would identify it and say, God, that's great.
22 Okay, we've got it secured; leave it with a scrap yard
23 or somebody that's not even licensed and say, "Okay,
24 well, it's not a problem, but you've got to get rid of
25 this thing. It's not us." In a lot of states,

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1 including us, we would say, "Okay, make sure it's safe
2 and secure, but you've got a liability." So we wanted
3 to do something about that.

4 We, a lot of people, U.S. EPA, the
5 Conference, all the states, we said, let's try to fix
6 this problem. So, in 1998, U.S. EPA put a couple
7 hundred thousand dollars up and established the Orphan
8 Source Committee. That is E-34. I am the Chair of
9 that. I have been since the initial organization.

10 We have two agreement state
11 representatives, Bob Free and myself. Cheryl Rogers
12 was with Nebraska. That is an agreement state. Now
13 she is with Wisconsin, which is a non-agreement;
14 hopefully, will be an agreement pretty soon. And
15 we've got Jim Yusko. I think most of you know Jim and
16 Bob were very active in this area for a long and have
17 served on other working groups that all of us have
18 benefited from.

19 So we meet a couple of times a year. We
20 have kind of met this situation head-on, tried to do
21 something about it. Our goal is to develop and
22 facilitate implementation of a dynamic nationwide
23 system that will effectively manage orphan sources, try
24 to fix that problem where we've got these orphan
25 sources and these people get stuck with them, trying

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1 to come up with a better way to help people when they
2 find orphan sources.

3 The information was scattered. Who do you
4 call? All these different things.

5 So the first thing we did was create a web
6 page on the CRCPD website that provides all available
7 information for orphan source dispositioning. We
8 tried to make it real easy. Because it was scattered,
9 we put it all in one place.

10 Dr. Terry Devine, he is the one person to
11 call. He knows contacts all over the world that can
12 help properly disposition the source, come up with the
13 best option in the most economical fashion.

14 We put out a brochure, and I think I got
15 a copy for each of you. You will see the brochure.
16 We provided this, I don't know, 20,000 of these or so,
17 all over the United States, to scrap facilities. When
18 we go out and find, respond to monitor trips, we make
19 these available, again, to try to help those
20 facilities that have found, or may find, an orphan
21 source and help them get through and find a way to
22 properly disposition the source.

23 Again, it is not just to help them to save
24 money. It is to make sure those sources are properly
25 controlled, so that they don't fall into the hands of

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1 a terrorist or fall into the wrong hands or go to the
2 bottom of a creek, or something like that. So, again,
3 we just want to make sure they are handled properly.

4 Other things we have done: We did a pilot
5 program in Colorado. We dispositioned 30 cesium-137
6 sources. It cost about \$29,000. That is a pretty
7 good bargain. We paid, I know some states have paid
8 as much as \$20,000 just to get rid of one source. So
9 to get rid of 30 at \$29,000 is pretty impressive.

10 That is what we could do on a national
11 level if there is one clearinghouse or one point, one
12 place to go, and that is what we have with our
13 national program, getting in touch with Dr. Terry
14 Devine, and his number is in that brochure.

15 Based on the Colorado pilot's success, and
16 it wasn't easy. Jake Jacobi and the State of Colorado
17 really worked hard on that program to make it happen.
18 So it is a lot of lessons learned there.

19 Based on NRC, NRC saved us there. Really
20 the most satisfying thing about this Committee has
21 been working with other non-agreement states and
22 agreement states, but probably the most satisfying
23 thing is the work with other federal agencies. Few
24 people can say that because most of the time there is
25 this in-fighting, but my experience has been U.S. EPA,

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1 the NRC, and DOE all see this need. This was long
2 before 9-11. They all see that there is a real
3 injustice, a real problem out there, so let's work
4 together; how can we do this? It has been very, very
5 refreshing from my perspective.

6 So, anyway, as evidence of that, EPA
7 funded our efforts. NRC has funded, it was roughly
8 \$225,000 per year for two years, and we are in the
9 second year now. And DOE had an extra \$100,000 and
10 they called us up, and they said, "Joe, can you use
11 \$100,000 because I know you guys are doing great work,
12 and is there any way you can use \$100,000 to take care
13 of some of these orphan sources?" "You bet." "You
14 bet." And we have used it. So that has been really
15 satisfying.

16 But at the time we were just developing
17 our program. So, based on the funding, because that
18 has always been the biggest limitation, is, well,
19 great, you can provide us information; you can tell me
20 what to do; you can do that, but some scrap yard is
21 stuck with the source because you're not helping me
22 unless you give me some money, because funding has
23 always been the problem.

24 So now we have a source of funds for
25 orphans. So there should be no excuse for some states

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1 and for anybody out there that finds an orphan source
2 to say, "Well, I threw it in the river," "I gave it to
3 terrorists," or something, "because I didn't have any
4 money." Work through your state program because the
5 funding has been there. We hope it continues.

6 So because of this, on October 24th last
7 year -- and I've got a copy of the announcement that
8 I provided you. That is the announcement that we sent
9 out to all the states and federal agencies saying that
10 we have a National Orphan Radioactive Disposition
11 Program. I say, "disposition" because a lot of people
12 say, "Disposal?" No, we try not to dispose of it,
13 bury it in the ground. It is more expensive for one
14 thing, and, plus, most of the time somebody else can
15 use that material.

16 So in all the cases so far we have been
17 able to provide it to a manufacturer that has recycled
18 those sources. So that is fine with me. It is less
19 expensive, and it is really the best way to do it.

20 Next slide. Our goal is to reduce the
21 number of discrete radioactive sources and devices
22 that are abandoned or improperly disposed of and,
23 thereby, reduce risk of unnecessary radiation exposure
24 to the public and/or contamination of the environment,
25 potential terrorist concerns, as well as inadvertent

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1 actions.

2 So I think it is a real laudable goal. I
3 don't see how anybody could be against it. So I am
4 proud to be a part of it.

5 What do we do, CRCPD. The Conference of
6 Radiation Control Program Directors is a mouthful, so
7 it is CRCPD. Provides the technical assistance to the
8 states, and they act as a third-party provider.

9 We have agreements so far -- we just
10 started this program now that we are funded, and we've
11 got agreements with the State of Maine, West Virginia,
12 and Illinois. West Virginia was the case that NRC
13 came across a device in working with the West Virginia
14 program. It was a generally-licensed device. It was
15 a true orphan. They didn't know whose it was, but
16 they know it needed to be taken care of.

17 So the State of West Virginia worked with
18 the Conference, worked out an agreement, and they
19 finally dispositioned that source. They got it where
20 it should be, and they used this program.

21 Illinois, I can speak for Illinois because
22 I am excited about this program because I am using it.
23 I've got, right now, as I speak, I've got a 10-curie
24 cesium 137 source, an orphan, that is being
25 dispositioned right now, using these funds. This is

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1 a 10-curie source. I mean, it is a large cesium 137
2 source that we've had some concerns about. We need to
3 get it properly dispositioned, and I am thrilled about
4 that. It is happening because of the funding
5 available through this program.

6 We are awaiting agreements with Rhode
7 Island, Massachusetts, North Carolina, Arizona,
8 Pennsylvania, Maryland, some others that have
9 expressed an interest and they are at varying stages
10 of agreements right now.

11 Our goal now is we need all the states
12 that need funding -- not all the states need funding.
13 There are some states that go out and collect any
14 source, and they come up with the funds to disposition
15 it. That's great, if you can do it. But most states
16 don't have that luxury.

17 The main stumbling block has been the
18 limitation of liability. CRCPD makes, as a third-
19 party provider of the funds that it gets from whatever
20 sources, but CRCPD can't assume any liability. So
21 there's these clauses that they have to work out at
22 first.

23 The Chief Legal Counsel in Illinois says,
24 "There's no way. This just isn't going to work." I
25 said, "Let's talk to the Conference." After they

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1 spoke to their attorney, they worked all the details
2 out.

3 So it just that the Conference has to
4 protect itself because they don't have any assets
5 really to cover any liability. So that is the main
6 stumbling block, that as states, more states, enter
7 into agreements, they realize that it is not a show-
8 stopper. You can get there. We did it.

9 So far, we dispositioned the 9-millicurie
10 cesium source in West Virginia. I've got a 10-curie
11 source, I've got a 10-millicurie source, two orphans
12 discovered at a scrap facility in Rockford, Illinois.
13 I want to use the funds to take care of that. That is
14 my next goal.

15 Maine is about to disposition all of its
16 orphans, again radium and cobalt, not just byproduct
17 material, but radium. A lot of these orphans are
18 radium sources. So that is the beauty of this
19 program, too. Getting funds from DOE was nice because
20 they said they are not limited to just byproduct
21 material; use the funds. I said, great, now we've got
22 some funds for radium, for non-byproduct material.

23 MEMBER RYAN: Joe, are they mainly medical
24 radium sources?

25 MR. KLINGER: Yes, uh-huh.

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1 In the works, North Carolina has come
2 across seven 1-curie vials of strontium-90 chloride.

3 Arizona has a licensee that has about 87
4 orphan gauges they picked up for some of the states,
5 doing some altruistic activities, saying, well, you
6 know, these sources were going to get in the wrong
7 hands and stuff if we didn't do something about it.
8 So they took these devices in for many years. Now
9 when they heard about this program, they said, "Can
10 you help us?"

11 They are sharing a lot of the expenses and
12 everything, but it is only right; I mean, these people
13 did do this. They kept these sources from getting
14 into wrong hands, showing up at scrap places and
15 stuff. So we are working with Arizona. Hopefully, we
16 will be able to take care of those devices.

17 Our main thing right now is we need to
18 continued funding. I think we have demonstrated that
19 we can do what we have set out to do. It is working.
20 What I want to do, as soon as I get the 10-curie
21 source taken care of, I want to go tell the other
22 states and really push the program and say, "Look,
23 we've worked it out in Illinois. You can work it out
24 in your state, too."

25 We requested and obtained approval from

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1 NRC to fund NMED changes. These are some of the other
2 things we did. This was really important. Everybody
3 said, "Well, how do you keep track of orphan sources?
4 If you find something with a serial number, how are
5 you going to find out whose it was and stuff?"

6 So we started coming up with databases,
7 and we said, well, wait a second, NMED, NRC's always
8 pushing NMED. Some states go, "I hate that NMED and
9 stuff," and Illinois was one of them.

10 But when we looked at it, we said, "Well,
11 why not embrace this thing? If they will amend that,
12 if they will change that NMED to accommodate all
13 byproduct, all radioactive material, and put some
14 special features in there where we could search for
15 serial numbers and that, then we would like that; and
16 if they would let us put non-byproduct material
17 sources in the NMED database, and provide that NMED
18 software to non-agreement states." They did. We
19 asked NRC, and they did it. That is really nice.

20 So NRC is doing that. We are working with
21 Sam Pettijohn, who runs the NMED program. We have
22 gone across the country and provided training. We
23 talk about our efforts of the E-34, and then he goes
24 into the NMED-specific training, shows them how to use
25 it, all its benefits and all that. So we have had

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1 them in Pennsylvania, Georgia, Colorado, Illinois, and
2 Oregon so far. New Mexico is next. So we are working
3 in harmony with NRC on this as well.

4 That is our goal. It is for the same
5 reasons why I just mentioned. It is just a win/win
6 situation.

7 We wrote letters to Secretary Pena at the
8 time to support the Orphan Source Recovery Program,
9 the Offsite Recovery Program. So there is no one here
10 from DOE today on that? Rob Campbell? Okay.

11 They have done great work. So I've got to
12 brag on them a little bit because they really have
13 been doing great work. I have the numbers, but I
14 didn't put it in my presentation because I thought
15 they were going to be here.

16 They have literally gone out and picked up
17 thousands of sources throughout the country, sources
18 that could get in the wrong hands, sources where
19 there's no disposal option at this point, greater than
20 Class C.

21 We just had them clean out about seven or
22 eight of our licensees who had GTCC sources in
23 Illinois where they couldn't get rid of it. They came
24 in, helped them package it, and took care of these for
25 us. They are doing a great job.

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1 So anything you can do, because I know
2 they've got budget concerns, anything this body can do
3 or anybody can do to make sure they have adequate
4 funding, we are in favor of, because they are doing
5 great work.

6 Our program, getting back to the E-34
7 activities -- there's a lot of other things; I won't
8 bore you with the details on it. But it was
9 recognized by the international community. There was
10 an International Radioactive Source Management
11 Steering Committee. We met at the State Department a
12 few times. It was really positive.

13 We had IAEA come over and we shared
14 information. Because they had certain information,
15 brochures and stuff, that they were starting, we said,
16 "We've already done some of that." So we shared
17 information, and that worked out pretty nice.

18 But it was coordinated through the U.S.
19 Department of State, and the people there, there has
20 been a change in personnel, and it just kind of
21 dropped. I would love to see that come back because
22 I think it is a great opportunity to share information
23 and to work together, so we are doing the same thing
24 internationally as well as nationally.

25 NRC, again, they funded cost-free expert.

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1 Jim Yusko of my Committee was a cost-free expert, was
2 over in Vienna for about a year working on this very
3 issue of orphan sources. Now he is back. He is back
4 working with us. He works out of Pennsylvania.

5 Next. So we strongly encourage all
6 regulatory agencies to improve their control over
7 radioactive materials, primarily generally licensed
8 devices. I mentioned our program. It is very similar
9 to what NRC has just done. We applied NRC's efforts
10 in that arena.

11 Other states, I know Texas is beefing up
12 theirs. There are some states that really don't have
13 a general licensing program. They get notified that
14 people have generally-licensed devices, and that's it.
15 We encourage all the states to find some way to fund
16 a generally-licensed program, so they can get better
17 control over their generally-licensed devices in their
18 state. It is very important. These efforts were
19 ongoing long before 9-11. We have been doing this
20 since 1998 and even before then.

21 We need to obtain funding to continue the
22 national program and to assist nationally and
23 internationally. Over time we can gain greater
24 control over sources of significance in this country
25 and abroad.

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1 EPA, Ms. Deborah Kopsick, who is our
2 advisor, they've got a real neat interactive CD
3 training program. It is a CD. We are testing it
4 right now. It is really great. It is going to be
5 provided to scrap facilities throughout the country
6 and transfer stations that handle waste. So you sit
7 it down -- it is interactive. It can be six hours
8 long. It shows you the right way and the wrong way;
9 if you come across a radioactive source, what do you
10 do? It shows you. If you make the wrong decision, it
11 shows the consequences and all that. It is really
12 neat. So that is being funded by EPA. So that should
13 be available shortly.

14 One problem that Dr. Devine asked me to
15 bring up, he is having a little problem with plutonium
16 239 sources. He's got quite a number of those
17 throughout the United States where it is about 5
18 curies, and he is having trouble getting those
19 dispositioned. I was hoping that DOE was here, so
20 they could address this issue.

21 Radium sources greater than 100
22 milligrams, we have a number of those, too. Because
23 of the waste site restrictions, we don't really have
24 a disposal option for those right now. So if anybody
25 has any ideas or any suggestions on how to help in

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1 those two areas, we would sure appreciate it.

2 MEMBER RYAN: Is this just the commercial
3 sites, Joe, or all sites?

4 MR. KLINGER: Right. Yes, just
5 commercial.

6 Then our dream is that one of these days
7 maybe we could go over one year without having to
8 respond to monitor trip. I don't know. There's a lot
9 of devices out there. I mentioned there's like 2
10 million devices that have been distributed that is
11 guessed, about roughly that 1.8, 2 million. So
12 there's a lot of them that are out there that are
13 going to show up at scrap facilities. They are going
14 to show up. But as long as we exercise greater
15 control right now, over time we will have a better
16 handle around those.

17 So we are doing our best. We have been
18 doing it for quite some time, and I am just trying to
19 get more information out about our program. If
20 anybody has any questions about it, just look at our
21 brochures. We've got the website. It's got videos.
22 We've got a couple of videos that we have put together
23 that have been received pretty enthusiastically and
24 stuff.

25 So I think that is all I've got. Does

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1 anybody have any questions?

2 VICE CHAIRMAN WYMER: You say that's all
3 you've got; it seemed like an awful lot to me, Joe.

4 MR. KLINGER: There was. There was.

5 MEMBER RYAN: Joe, if you could expand a
6 little bit on detection, on two points? One is the
7 sensitivity of detectors and how they work a little
8 bit, and then maybe your assessment of sophistication.
9 Are people at steel mills and landfills and other
10 areas, how is their knowledge base and ability to deal
11 with this coming along? It might be helpful to have
12 your national perspective on that.

13 MR. KLINGER: Okay. Let me start off with
14 the Illinois perspective. I am more familiar with
15 that.

16 These detectors, the one you saw in the
17 picture, the old Bicron, whatever they are now, they
18 are very sensitive. Oftentimes, we will go out, and
19 I mean they are just barely above background. That is
20 the way they like it because they don't want to take
21 any chances, being a scrap recycler, because it
22 impacts their business. If they screen all this stuff
23 and they say it is good and it goes to a steel plant
24 and they have a \$10 million problem, that scrap
25 recycler is out of business. He gets his business cut

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1 off. So they are very, very sensitive about that, and
2 those monitors are very, very sensitive.

3 Now if you had a source, and I have heard
4 that they have tried this, where they chilled it in
5 some chains and stuff -- I heard about that; I don't
6 know how true that is -- to try to shield it, and
7 somebody found it and stuff. But that is the only one
8 I have heard of where somebody intentionally tried to
9 sneak it through a detector.

10 The sophistication on the part of the
11 people at these sites, it is just "go/no go." If it
12 is above background, if it is a monitor trip, they
13 don't take any chances; they put the truck beside --
14 most of them know enough now to check to see if the
15 driver has undergone any medical treatments using
16 radioactive materials. They know that, and they will
17 run it back through the monitor system again just to
18 make sure. Once they do that, they set that truck
19 aside, and they call us. We will send somebody out.
20 I think that is pretty typical throughout the country.
21 Bob and Doug can address that in more detail.

22 So the knowledge of the people using the
23 instruments is very poor, but this interactive CD that
24 we've got that is going to be going out to all of
25 these people, that is going to help a lot. Really it

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1 is aimed at that: Give them more of a background as
2 to what it means when a monitor goes off, at what
3 level. Don't panic. Who you should call, what you
4 should do to disposition your sources and stuff.

5 One thing that we are looking at doing is
6 we've got like five facilities that we spend most of
7 our time at. We are thinking about providing hand-
8 held instruments and working with these people and
9 training them, so we won't have to send our people out
10 all the time. It takes us away from these other
11 things. So if are comfortable with the people --
12 there's several that we've got a good relationship
13 with -- we think we can train them to screen.

14 If it is I-131 that pops up. They've got
15 these little sands and stuff where you just point at
16 it and it says, oh, it's I-131. You know it is short-
17 lived. Go ahead and let it be disposed of without
18 regard to its radioactivity. Just let it be mixed.
19 It happens all the time.

20 So once you know what it is, then you know
21 how to deal with it. So we are pretty comfortable
22 with that, and that is what we are working toward
23 right now.

24 So the bottom line is they are very
25 sophisticated as far as detection but, beyond that,

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1 they leave it to the state to figure out what it is
2 and help me with getting rid of it.

3 CHAIRMAN HORNBERGER: I can see how
4 recyclers, steel recyclers, this would be very
5 important to them, why they would want to do this.
6 What prompts landfills to do this? Are there laws and
7 regulations that they have to do this? How do they
8 screen? It looked to me from some of your pictures
9 that you were poking around in waste, which means they
10 didn't find it on the truck, or if they did, they did
11 something they shouldn't have done.

12 MR. KLINGER: Yes. Not all of them have
13 it. A lot of them don't have it. But the word is
14 getting out that you should do this. So they're doing
15 it --

16 CHAIRMAN HORNBERGER: They do it for the
17 good of humankind?

18 MR. KLINGER: Liability reasons, I think.

19 CHAIRMAN HORNBERGER: Oh, okay.

20 MR. KLINGER: Yes, but I think most of
21 them, at least in the big cities, are doing it now at
22 the landfills. In fact, we just had one where NRC was
23 involved because it turned out to be a VA facility.
24 We found out -- when we go out there, we find out what
25 this waste is, and you see the labels, and it says,

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1 "dah, dah, dah." Well, that is not our licensing. If
2 we can trace it back to -- even if it is medical
3 waste, it shouldn't be there if they do the proper
4 surveys.

5 Oftentimes, it will be diapers and stuff
6 from somebody that was sent home. Those we have to
7 live with. But if it is coming from a facility that
8 should have done proper surveys and we can identify
9 that facility, we go back and issue an NOV. We can
10 bill them for our time that we spend out there.

11 But these facilities, more and more of
12 them are getting monitors out there.

13 CHAIRMAN HORNBERGER: And they monitor the
14 trucks?

15 MR. KLINGER: They monitor trucks, uh-huh.

16 CHAIRMAN HORNBERGER: So they, then,
17 shouldn't let the trucks dump if they find a --

18 MR. KLINGER: Right. Sometimes what we
19 will have to do, we will have to have them dump out on
20 a tarp or something, and then we go through it. If we
21 go out there and identify it as I-131, then we know
22 pretty much. But if we are not sure, if it is
23 shielded, we are just not sure, we will have them dump
24 the load and we will sort through it.

25 MEMBER RYAN: Joe, isn't it true that most

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1 landfills, whether it is industrial or it is municipal
2 or hazardous, have permanent restrictions on
3 radioactive material?

4 MR. KLINGER: Right.

5 MEMBER RYAN: So there is a big reason
6 that their permits are restricted, cannot receive
7 radioactive material. So it is a violation of their
8 permit if they receive it.

9 MR. KLINGER: Uh-hum.

10 CHAIRMAN HORNBERGER: Yes, but, I mean, I
11 guess what is curious to me is, how would anyone ever
12 know if they didn't check? I mean, people don'[t go
13 around with meters walking across landfills, do they?
14 Do they have inspections? Do they face inspection?

15 MEMBER RYAN: Well, no, I think they are
16 interested -- that it has become a national issue and
17 they are smarter than they used to be, and they don't
18 want to expose anybody. They just want to follow
19 their permits, sure.

20 MR. KLINGER: Yes, especially with the
21 potential exposures to the workers and stuff, I think
22 there is a big driver.

23 Bob, do you have any comments on that?

24 MR. FREE: The comment was just made that
25 the permit restriction, we deal with that quite a bit

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1 in Texas, and they have a lot of, I say a lot of hits.
2 Most of the ones that are reported to us are events
3 where hospital waste gets away from them, and that
4 winds up at a landfill.

5 In our experience, the landfills have a
6 good idea of where that truck picked up the waste, and
7 they are able to backtrack to the facility that
8 released it. Usually, those facilities are very
9 responsive. They get someone out there immediately.
10 They will recover whatever waste they can.

11 Then our inspectors will evaluate the
12 event, and we will issue a Notice of Violation as well
13 and handle it from that angle. But all of the parties
14 have been very responsive in our experience.

15 VICE CHAIRMAN WYMER: John, do you have a
16 question?

17 MEMBER GARRICK: Yes. Most of what you
18 described in the way of problem-solving has been with
19 respect to accountability, dispositioning, tracking,
20 generally management of the waste. I would be very
21 curious if there was anything in the area of technical
22 contribution that could be made that would make this
23 whole issue much less of an issue.

24 We talked a little bit about detection,
25 but there is also the matter of back-end processing

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1 that would convert these sources into an acceptable
2 waste form, rather than a waste form which you don't
3 know where to put it and there's nobody to accept it.

4 Can you comment a little bit about what
5 science can contribute to this whole problem? What
6 technical contributions could be made that would make
7 life much easier for you?

8 MR. KLINGER: Well, I know there is a
9 Health Physics Society, HPS, Position Paper that Joe
10 Lubeneau and Jim Yusko are pushing. That is looking
11 up alternatives to using radioactive materials. Like
12 I said earlier, you've got these fixed gauges and they
13 really don't have any alternatives. Well, maybe there
14 are alternatives, and they are looking for technology
15 to help them out there. If you can come up with
16 alternatives, then you don't have to use radioactive
17 materials as much.

18 Then they also push this justification
19 provision. Make sure that licensees don't come in and
20 say, "Well, I need this and so I want it." Well, they
21 have justify why there is no other alternatives to the
22 regulatory agency. So technology could help there.

23 As far as waste form, all the dispositions
24 we have had thus far have just gone back to the
25 manufacturer for recycling. So they reuse that

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1 radioactive material. We haven't focused too much on
2 waste form. I know where you are going with that,
3 and, sure, if you can vitrify it in, I think that
4 certainly would be the best thing. But we really
5 haven't focused on it, and I don't know that that
6 would help that much.

7 I think our efforts really right now are
8 making sure that those programs that don't have real
9 good control over radioactive materials, anything that
10 they can do to enhance their control, establishing
11 their general licensing program, register, inspect,
12 issue fees, have them check and make sure they know
13 where their radioactive material is every once in a
14 while. To try and make sure everybody knows where
15 their radioactive material is like the first step.

16 MEMBER GARRICK: I guess part of what I
17 was thinking of, an analogy in the reactor field would
18 be to think in terms of not just the nuclear reactor,
19 but the total nuclear energy system, including its
20 entire fuel cycle as the design challenge, rather than
21 just the reactor.

22 Is there anything that could be done here
23 with respect to the source terms and their ability to
24 manage them that could be implemented, say, at the
25 design stage that would make this much less of a

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1 problem? Is this really looked at from a cradle-to-
2 cradle point of view when they design a source or when
3 they manufacture these things?

4 I guess what I am really getting at is,
5 what technical problems exist? If we took all of the
6 intelligence that we had and we asked them, "Okay,
7 we're technical people. We want to help solve the
8 problem. Give us your top 10 technical issues that we
9 can work on that will give you the best bang for your
10 buck," how would you do that?

11 MR. KLINGER: Well, we have --

12 MEMBER GARRICK: I mean, all I hear is
13 process.

14 MR. KLINGER: Yes.

15 MEMBER GARRICK: And I don't hear anything
16 about fundamentals.

17 MR. KLINGER: There has been that. We
18 have had situations where cesium chloride, for
19 example, has been used, was used in certain sources,
20 and because of the solubility concerns and stuff,
21 every state and the NRC, not every state but a lot of
22 states, actually review the sealed source and device.
23 They evaluate the manufacturer of the sealed sources
24 in their state. So they have to do a critical
25 technical evaluation of those sources to make sure

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1 that they can withstand all these different
2 parameters, that they use the best material and the
3 best form.

4 So a lot of that has been done for many,
5 many years, and a lot of that, most of it is to just
6 prevent the dispersibility of that radioactive
7 material, should the encapsulation be compromised.

8 So there has been a lot, just from its
9 inception of the SS&D Review Program, we have been
10 doing that, and there have been improvements. I
11 remember the WESF capsule, the Waste Encapsulation
12 Storage Facility, the problems in Atlanta, things like
13 that.

14 We have had some devices where people have
15 proposed to us, "We would like to use this particular
16 radionuclide," and one that always comes to mind is
17 cesium chloride, "in this harsh environment." And we
18 looked at it and we were not comfortable with it, so
19 we denied them their request, again, just because it
20 wasn't a good form, using our technical evaluation,
21 and we are glad that we did that.

22 But as far as most sources are very
23 durable. It is like the moisture density gauge that
24 I mentioned; I mean, getting run over on a hard
25 surface with a steamroller, and the sources are

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1 actually intact, that is pretty impressive.

2 So I imagine there are some technical
3 things, but they are not jumping out at me right now.
4 But I will give that some thought and see if I can
5 challenge our E-34 Committee to take a look at that
6 very issue.

7 MEMBER GARRICK: Okay.

8 MR. KLINGER: I appreciate it.

9 VICE CHAIRMAN WYMER: Milt?

10 MEMBER LEVENSON: Yes, a couple of
11 questions. One, are all agreement states participants
12 in this conference?

13 MR. KLINGER: Yes. Yes.

14 MEMBER LEVENSON: How about the non-
15 agreement states?

16 MR. KLINGER: Non-agreement states are,
17 too. I think there's representatives from every
18 state, from all 50 states, in the Conference of
19 Radiation Control Program Directors, yes.

20 MEMBER LEVENSON: The next question: I am
21 not going to ask you to identify any state by name,
22 but what would be your estimate as to what fraction of
23 the states really have good, viable programs? You
24 mentioned a number of things. Various states are
25 thinking about signing up. How many, what fraction of

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1 the states have as complete a program as Illinois
2 does, for instance?

3 MR. KLINGER: Okay, in terms of their
4 radiation control program or --

5 MEMBER LEVENSON: Yes.

6 MR. KLINGER: I think all the agreement
7 states, just by the fact that they have been approved
8 and they are agreement states, we would have to say
9 that all 32 agreement states have passed that muster.

10 MEMBER LEVENSON: That is the monitoring,
11 but how about for this issue of retrieval of orphan
12 sources, et cetera?

13 MR. KLINGER: Okay, as far as
14 participating in the program, some states, I think
15 like California and Florida, and some others, they
16 have already found their source of funding. So they
17 know where their sources are. So, periodically, like
18 once every five years, they have a roundup within
19 their state. So they have been it on their own.

20 What we wanted to do here was do it on a
21 national basis because this way you've got the
22 economies of scale. We could find Terry Devine there
23 in Frankfort knows all the players here. If we know
24 where all the sources are, we can handle those in a
25 rational, comprehensive fashion.

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1 Right now is a little fragmented. What I
2 am going to do is encourage those states that have
3 been doing it on their own to participate on a
4 national basis, so they can save money and just be a
5 more efficient system.

6 Now as far as control of radioactive
7 material, I think all the agreement states, they do
8 fine, and the non-agreement states, in the area that
9 they are responsible for. The only exception would be
10 the generally-licensed devices. States are all
11 different in their programs.

12 Probably Doug can address that. He will
13 probably be addressing that in his presentation, as to
14 which states can give you a better feel. I know the
15 Texas program. I know the Illinois program, and I
16 know the Illinois program is almost identical to what
17 NRC has just done. We have been doing it for some
18 time. We have to tweak it just a little bit as far as
19 reporting from the manufacturers in our State, but
20 that's about it. Going any further than that, I don't
21 think we can.

22 We have been doing the best we can, and we
23 are pretty comfortable with it. But there are some
24 states that just simply don't have the funds to do it.
25 What is going to happen in those states I don't know.

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1 MEMBER LEVENSON: One other question. It
2 is fairly clear how derivative sources -- by that, I
3 mean things like diapers or medical waste, et cetera
4 -- you can be pretty sure you have enough sensitivity
5 your monitors will catch them. But sealed sources per
6 se in many cases were originally in shielding. Has
7 there been any problem in the scrap route channel with
8 shielded sources and the possibility that they get
9 through the monitor because, in fact, they are
10 shielded?

11 MR. KLINGER: Well, we are able to find --
12 just the one in Rockford that we had recently, that
13 was a little 9-millicurie cesium source, and that was
14 in a pile of scrap.

15 MEMBER LEVENSON: Yes, but I am thinking
16 of in the original shield, as opposed to incidental --

17 MR. KLINGER: Well, it was still in its
18 double encapsulated source. It is still in its
19 shielded source. It is not in the device, but it is
20 a bare source --

21 MEMBER LEVENSON: Yes, yes, but I am
22 thinking of the device part where the shielding is.
23 Or like that example you showed of an industrial
24 radiography source, has there been any problem with
25 those getting into scrap channels with the shielding

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1 intact?

2 MEMBER RYAN: It is my experience, Joe, is
3 they tend to separate the lead out because they don't
4 want the lead in the recycle. They tend to separate
5 the lead shielding away from the steel for that
6 reason. So you end up with bare sources rather than
7 lead-shielded sources.

8 MR. KLINGER: Even so, on the outside of
9 the shield the dose rate is still there.

10 MEMBER LEVENSON: I think the one you
11 showed, if I remember the markings on the label, that
12 probably had a depleted uranium shield rather than
13 lead.

14 MR. KLINGER: It does. It is that DU
15 shield inside, yes.

16 MEMBER LEVENSON: I was just curious
17 whether experience has indicated any problems with
18 this.

19 MR. KLINGER: I don't know of any. Bob,
20 do you know of any.

21 MR. FREE: Most of the events that are
22 reported to us were devices detected at a scrap
23 facility or a steel mill itself, they are actually
24 still in the device and shielded. The large plastic
25 detectors that they are using are very sensitive and,

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1 like you say, are set just a small fraction above
2 background, and they are very effective.

3 Now there have been a few events where
4 they have gotten through and into the process, and
5 then in the process of handling the scrap, a dealer or
6 their workers don't necessarily recognize the device
7 itself as something that contains another type of
8 metal. So they are not actively trying to separate
9 those.

10 Does that address what you are trying to
11 get to?

12 MEMBER LEVENSON: Yes, it raised an
13 interesting question in that we normally think of
14 specifying a minimum amount of shielding for sources.
15 It sounds like maybe we ought to specify a maximum
16 amount, so you have two times background or something
17 as leakage to assure your ability to monitor the
18 thing.

19 (Laughter.)

20 MR. BROADDUS: This is Doug Broaddus. I
21 can tell you, just because of my own experience in
22 reviewing sealed source and device, doing sealed
23 source and device evaluation, that generally every
24 device that has any type of gamma component associated
25 with it, and even those with beta components, will

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1 have some external radiation levels. I mean it is
2 going to be above background.

3 From the monitor trips, things of that
4 sort, most of the devices will be detected. The low-
5 level ones, the ones that have very small sources,
6 generally those are the ones that would not be
7 detected. They are not the ones that would cause a
8 \$10 million --

9 MEMBER LEVENSON: They are not the big
10 risk items either.

11 MR. BROADDUS: Right.

12 MEMBER LEVENSON: Yes, okay.

13 VICE CHAIRMAN WYMER: Any other questions?

14 MEMBER RYAN: Yes, one last question. You
15 gave some examples of the horrific injuries from close
16 contact with these higher, stronger sources. Do you
17 have any sense of the general dose consequences from
18 these more routine events at steel mills or landfills?
19 Is it zero or is just slightly above zero? Or is
20 there any kind of --

21 MR. KLINGER: In this country, I don't
22 know of any significant exposures. The stolen one
23 maybe, but that is a little bit different though. You
24 had some exposures there.

25 MR. FREE: Well, the event Joe is

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1 referring to is an event where cobalt 60 radiography
2 sources were stolen from a bankrupt facility. This
3 facility was under Superfund action for hazardous
4 materials, but part of the process involved use of
5 these radiography sources. These were stolen and then
6 defaced, so that the warning labels had been removed,
7 and they were put in the scrap process.

8 In the process of that movement, one
9 individual picked up a bare source, because the
10 lockbox had been broken off, and he got a burn to his
11 finger, but that was the most serious exposure to
12 anyone from that event. As far as I know, his wound
13 has healed and he is back at work.

14 VICE CHAIRMAN WYMER: I have just a couple
15 of observations.

16 MR. KLINGER: Sure.

17 VICE CHAIRMAN WYMER: One is it looks like
18 a huge problem. The second is that it is gratifying
19 to see the amount of effort going into track down
20 these orphan sources and do something about them. It
21 is a little disconcerting that it is a fairly recent
22 occurrence, and the sources have been out there a long
23 time, some of them. Finally, it looks like so far it
24 has been a catch-up program, that you are trying to
25 take care of problems of the past and catch up to it.

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1 I think our next presenters will probably
2 say steps that are being taken now to make sure we
3 don't have a lot of orphan sources out there anymore,
4 and we are tracking them better and increasing the
5 requirements. This does increase the cost of the
6 program, and somebody has to ante up the money
7 somewhere somehow.

8 So thank you very much. It has been a
9 very illuminating discussion.

10 MR. LEE: Just one question: The \$10
11 million quote, is that the cost of the production run
12 of the steel plant as well as decontamination of the
13 plant?

14 MR. KLINGER: Yes. Yes, the one that I am
15 familiar with is where it gets in the back-house dust
16 and then you've got a mixed waste, a KO-61 waste. So
17 then I remember seeing all the containers out there
18 and disposal cots, and then they have to shut down
19 that run for a while.

20 The one I am familiar with, Keystone Wire,
21 is a huge operation, and to shut that thing down for
22 a day or two alone costs millions of dollars.

23 MR. LEE: Okay.

24 MR. KLINGER: So all those were factors in
25 it. As I understand the most recent one, Ray Turner

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1 from industry works with us, and he went down
2 personally on the Florida one and he said, "Yes, it
3 was roughly \$10 million." I asked that question. I
4 said, "Does that include shutting down the operation
5 for that thing?" He said, "Yes, all those costs are
6 considered."

7 MR. LEE: Thank you.

8 MEMBER LEVENSON: One more question:
9 Maybe you don't know. Would you be willing to make a
10 guess as to, of the 2 million source number you have
11 up there, that includes all of them. Some significant
12 fraction are either relatively short half-lives or
13 very small sources. What percentage of them -- we
14 would like to have them all under control, but what
15 percentage of them might really represent a public
16 health and safety risk?

17 I don't mean -- I understand that, even at
18 low levels, the steel mill has to shut down, and it
19 costs them a lot of money. But that is not a public
20 health and safety issue per se. What fraction of them
21 do you think are potentially public health and safety
22 issues because they are big enough sources?

23 MR. KLINGER: Yes, that roughly 2 million,
24 1.8 million, I think I got that from the NRC. They
25 probably can justify it better. But those are devices

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1 that have been distributed. I mean, they could be
2 back, decayed out, and stuff. So it is anybody's
3 guess.

4 But a question I get asked a lot, which is
5 along the same lines, is: How many orphan sources of
6 concern are there out there?

7 MEMBER LEVENSON: How many of them are big
8 enough to really be health and safety risks?

9 MR. KLINGER: To cause a problem.

10 MEMBER LEVENSON: Yes.

11 MR. KLINGER: And that's a tough question,
12 but I know of several in my State, and I know probably
13 every state knows about several of them. So right
14 there you are looking at probably, you know, a couple
15 of hundred, 150-200 sources of concern, from a
16 radiological health and safety concern, that are
17 orphans that need proper disposition.

18 MEMBER LEVENSON: But in trying to get a
19 perspective of how serious the problem is, a few
20 hundred, even a thousand, is a little different number
21 than a couple of million.

22 MR. KLINGER: Right, and that's why that
23 2 million, that just means that that's how many have
24 been distributed. They have been safely controlled.
25 I am very confident that most of those -- the question

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1 is, what's "most"? Well, let's say -- that is why I
2 am real comfortable with several, two or three in each
3 state, a few hundred of concern, that I would be
4 concerned about.

5 MEMBER LEVENSON: Yes, okay.

6 MR. KLINGER: It is kind of a guess.

7 MEMBER LEVENSON: That is what I asked
8 for, is your guess.

9 MR. KLINGER: At least it is a feel.
10 Right, it is a feel. There's certainly not 2 million
11 of them out there that we are all concerned about,
12 because that number gets in the news media and they
13 go, "Oh, my God, you've got 2 million." It is not
14 even that. Even the 25 percent that are unwanted,
15 that doesn't mean that they are recklessly just thrown
16 out there.

17 Because I had one reporter who said, "If
18 that were true, then we would be tripping over these
19 devices on the sidewalk," you know. Well, that is not
20 the case, obviously. But these things do show up on
21 occasion. We all know that. So we've got to take
22 care of them.

23 How many more are out there? Hopefully,
24 I wish, I like to think that there's none, but that is
25 pretty naive. They are going to show up.

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1 MEMBER RYAN: One last point that might
2 help address Milt's question, and that's, hasn't Joel
3 Lubeneau and Jim Yusko published some analysis of
4 these kinds of numbers, how many, and all that?

5 MR. KLINGER: Right.

6 MEMBER RYAN: We could maybe get a copy of
7 those publications, a summary.

8 MEMBER LEVENSON: My question was,
9 basically, of the 2 million, is 20 percent of them big
10 enough to be public health and safety risks or is it
11 really a small percentage?

12 MEMBER RYAN: I think Joel and Jim Yusko
13 have done some analysis. We can get you the
14 publications on it to help answer the question.

15 MR. CAMPBELL: One more question.

16 VICE CHAIRMAN WYMER: There's always one
17 more.

18 (Laughter.)

19 MR. CAMPBELL: Joe, to what extent is
20 theft an issue on these? I know moisture density
21 gauges have a value and they walk away from the backs
22 of pickup trucks, which is the frequent scenario.
23 Even though it is maybe not a big health and safety
24 risk, do you have a scale for what fraction of these
25 things are stolen and then later abandoned versus

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1 things that are just lost track of?

2 MR. KLINGER: Our experience has been they
3 are just lost track of. A factory will shut down, and
4 then we will hit them up, "Well, what about your
5 radioactive materials?" "Oh, my God, do you mean we
6 have radioactive material out there?" So we have to
7 go hunt it down, not that it was stolen.

8 M/D gauges, of course, have been stolen.
9 It is an attractive thing. It's got this big yellow
10 case. "Hey, this thing's got to be worth some money."
11 And then they take it out and they see labels, and
12 they go, "Oh, God, I guess it's really not worth
13 anything." Very few of those.

14 But then the larger sources of concern, a
15 teletherapy source, we still have a couple of those in
16 storage in Illinois. I know every state probably has
17 some. Those we are very, very concerned about, not so
18 much theft, although it could be because that is what
19 has happened in other countries. Those very sources
20 are stolen because it takes a lot of shielding and
21 they say, "Hey, look at all this. I can get a lot of
22 money for it", with no idea what is inside. That has
23 been the sad, tragic events associated with it.

24 But in our country, because we do control
25 those very carefully, we have additional requirements.

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1 We make them go out there and make sure it is in that
2 locked room, it is still there, and report to us.
3 Don't just keep a record of it, and then a year from
4 now, when we go out and inspect, they show it. No,
5 you have to report that to us, and if we don't get
6 that report, we are very concerned. We follow up and
7 say, "Where's your report?"

8 So it doesn't happen very much, but,
9 again, we are very sensitive about it, especially in
10 light of 9-11, too. So our experience has been, with
11 the exception of M/D gauges, we really haven't had
12 thefts, but we are very sensitive about it.

13 MR. CAMPBELL: Okay.

14 VICE CHAIRMAN WYMER: Well, we had better
15 saw it off here. Thank you, Joe, for a very, very
16 illuminating discussion.

17 MR. KLINGER: All right, thank you. Thank
18 you very much.

19 VICE CHAIRMAN WYMER: Next, if I am not
20 mistaken, we will have Bob Free from Texas. Bob Free
21 is the Deputy Director of the Emergency Response and
22 Investigation Program for Texas. The title is his
23 presentation is, "Radioactive Source Security: Border
24 State Issues."

25 MR. FREE: I am afraid I won't be able to

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1 speak as long as Joe did.

2 CHAIRMAN HORNBERGER: Do you have copies
3 of your slides there?

4 MR. FREE: I handed those out earlier.

5 CHAIRMAN HORNBERGER: Okay, thanks.

6 MR. FREE: I was really looking forward to
7 getting up here to Washington, D.C. It is a lot
8 further north than where I live, and I was looking
9 forward to this cool weather you are all are
10 experiencing here.

11 (Laughter.)

12 I checked the weather forecast before I
13 came up. It was the same one we had in Austin, Texas.

14 (Laughter.)

15 CHAIRMAN HORNBERGER: It's cooler today.

16 MR. FREE: I was asked to put together a
17 presentation relative to -- I called it, "Radioactive
18 Source Security." To me, it goes a little beyond
19 that, to the point of response and recovery operations
20 as well, emergency preparedness. I hope to address
21 that today.

22 Some of the general information regarding
23 border state issues: There are about 2,000 miles of
24 land border with Mexico and the United States:
25 Arizona, New Mexico, California, and Texas.

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1 In Texas we have about 140 licensees --
2 next slide, please, and then the next one, sorry --
3 along the Texas border. This is a breakdown. Forty-
4 eight of those are medical facilities; 35 are portable
5 gauges, and then we have three large irradiator
6 facilities in El Paso.

7 What I tried to do is concentrate, for
8 these numbers, concentrate on the counties along the
9 border, but I mentioned earlier about the theft of
10 sources. I would maybe add a note to that. We get
11 about 12 reports a year of stolen moisture density
12 gauges, and that tends to be the only type of
13 radioactive material that is reported as stolen. I
14 mentioned earlier the radiography sources from the
15 event at the Superfund site. But for active
16 licensees, it is almost always moisture density
17 gauges.

18 I think Florida reports much larger
19 numbers. I am thinking maybe 50 a year. That may be
20 a little bit high, but it is a much larger number than
21 we experience.

22 In our contacts with -- Troxler is the
23 primary one, our primary distributor. They have
24 stated that they feel that there's an aftermarket for
25 these south of the border, and that extends into South

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1 America as well.

2 When we began to get increased reports on
3 these moisture density gauge thefts, we reported that
4 to the FBI, but they weren't interested in that at
5 that time because the individual units are less than
6 \$50,000, and they don't really want to get involved in
7 an expensive investigation for events involving that
8 small a dollar figure. Anyway, since 9-11, they have
9 taken a little more active position, but they still
10 realize, or they are beginning to realize I think,
11 that those are individual events, are relatively small
12 public health hazards.

13 In November last year, I attended a
14 conference in Carlsbad, New Mexico of the National
15 Border Technology Partnership Program. That is a DOE-
16 sponsored event. The idea was to bring federal
17 agencies, border communities on both sides of the
18 border, and regulators from Mexico and the United
19 States together to discuss issues of orphan sources,
20 sealed sources, along the border.

21 Actually, we didn't uncover very many
22 bodies in terms of sources that have been orphaned or
23 events after approximately 1990. The incident that
24 Joe made reference to occurred in 1984, where the
25 teletherapy source was exported across the border into

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1 Juarez and stored for several years before it was
2 finally, I guess you could call it, mutilated, taken
3 to a scrap yard.

4 I don't know, but I think most of you may
5 be familiar with some of that event. If you have any
6 questions about it, I would be glad to address them.

7 The Conference focused on that subject.
8 Unfortunately, there were no Mexican regulators
9 present. They couldn't attend, for whatever reason.
10 Some representatives of Juarez were there for that
11 Conference, and they expressed concerns about
12 primarily environmental issues.

13 The participants on the U.S. side
14 identified several issues that were of concern, and
15 those were not knowing what the traffic is, legitimate
16 or otherwise, of radioactive sealed sources back and
17 forth across the border, and not having an idea of
18 what may exist out there that could become orphaned.
19 So those were issues that were discussed in that
20 Conference, and there was a publication or a
21 proceedings document from the Conference that is
22 available. I brought a copy of it, if anyone wants to
23 take a look at that.

24 In Texas, our office, the Bureau of
25 Radiation Control, is under the Texas Department of

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1 Health. They have an Office of Border Health. That
2 office focuses primarily on strictly health issues for
3 organisms and chemical hazards.

4 The Texas Natural Resource Conservation
5 Commission has an Office of Border Affairs also that
6 works on environmental issues with Mexico or Mexican
7 officials. I wasn't able to contact that office. I
8 don't have a really good report on their activities or
9 whether any of those activities include discussions of
10 radioactive material use or transport.

11 Next slide. In Texas, we have about 250
12 radioactive material events reported each year. There
13 have been only 12 events along that border, that area
14 of the border I mentioned earlier, the counties, over
15 the past five years. Most of them were moisture
16 density gauges. Some of those have been parts of
17 gauges that have shown up at scrap yards or steel
18 mills or they were involved in some accident that
19 occurred during the construction operation. There was
20 one industrial radiography device that was lost, but
21 subsequently recovered.

22 Go ahead (referring to slide). I
23 contacted the other border states just to get a feel
24 for the number of licensees that they have in their
25 adjacent counties: 224 licensees in California, 17 in

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1 New Mexico, and Arizona has 61.

2 I asked them also about any issues that
3 they may have -- next slide -- or events. None of
4 them had any significant events to report in recent
5 years. California had one event where a -- I believe
6 this was a brachytherapy source that was exported to
7 Tijuana and, for whatever reason, either they couldn't
8 return it or couldn't dispose of it, it showed up in
9 a parking lot in a shopping mall in San Diego.

10 VICE CHAIRMAN WYMER: How do you define a
11 border state event?

12 MR. FREE: Events are incidents that are
13 reported to us relative to loss of control of our high
14 exposures from use of radioactive sources.

15 VICE CHAIRMAN WYMER: Well, what makes it
16 a border state event?

17 MR. FREE: They occurred in a border
18 state.

19 VICE CHAIRMAN WYMER: Did something cross
20 the border? Is that what makes them a border state
21 event or --

22 MR. FREE: No, that was an arbitrary title
23 I gave this because --

24 VICE CHAIRMAN WYMER: Oh, okay.

25 MR. FREE: -- these events occurred in

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1 border states, and they were adjacent to the border.

2 VICE CHAIRMAN WYMER: Okay.

3 MR. FREE: That was just to give a --

4 VICE CHAIRMAN WYMER: But maybe 25 or 50
5 miles at a border or something like that?

6 MR. FREE: I would say roughly we are
7 talking on average 100 miles.

8 VICE CHAIRMAN WYMER: Okay.

9 MEMBER LEVENSON: It is a border state,
10 not a border event.

11 MR. FREE: Correct.

12 CHAIRMAN HORNBERGER: It is written
13 correctly. There's no hyphen.

14 MR. CAMPBELL: So the bottom line is there
15 does not appear to be a large, if you will, traffic
16 back and forth across the border of licensed --

17 MR. FREE: That's correct.

18 MR. CAMPBELL: Okay.

19 MR. FREE: Let's go to the next slide.
20 Some of the border state issues that were expressed to
21 me in my telephone conversations were concern for
22 receiving advanced notice of potential threats.
23 Initially, after 9-11, we used to receive a lot of
24 reports of potential threats that were coming, that
25 could be coming across a border, "we" being

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1 California, New Mexico, Arizona, and Texas.

2 There has been no formal meeting among our
3 states to discuss this subject. This is just
4 anecdotal information I gathered in preparation for
5 this.

6 There are a lot fewer of those now. In
7 fact, no one, until July 4th, has any reports of
8 anything. The July 4th notice was pretty much
9 nationwide.

10 Other issues involve our ability to
11 coordinate with federal responders. Most of us have
12 experience with our nuclear power plant exercises,
13 where we understand how to coordinate with DOE, the
14 Federal Emergency Management Agency, and the NRC, but
15 we haven't had an opportunity to work together to plan
16 or plan for coordination of any events along the
17 border. I am speaking primarily to a potential
18 terrorist act.

19 Then emergency preparedness: We have a
20 lot of other concerns besides our own ability to
21 respond to an event. Local governments have concerns
22 that they have expressed to us. They need training,
23 equipment, or they perceive that they do. They need
24 technical support.

25 Next slide. But some of the things that

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1 we are trying to do for source security, let's see, I
2 think it was in -- I don't recall the exact timeframe
3 -- the February timeframe, NRC sent a letter out to
4 their licensees advising them to enhance their
5 security for sealed sources. A copy of that letter
6 went to the agreement states. We have issued in Texas
7 that letter. Actually, we modified that letter to be
8 ours, sent it to our licensees, essentially, telling
9 them to be more alert and take better vigilance during
10 their mobile operations.

11 I found out also that I can't write an
12 acronym.

13 (Laughter.)

14 That is supposed to be D-O-T. The
15 Department of Transportation has inspectors doing
16 interviews with licensees about transport of
17 radioactive materials. I was able to get a copy of
18 one where one of our licensees went through one of
19 these interview sessions, and they are asking
20 questions about source security, vehicle security,
21 vigilance, training for operators, familiarity with
22 radioactive material detection capabilities, and
23 ability to coordinate with local officials.

24 I thought that was interesting. I wasn't
25 aware that DOT was doing that. They actually went to

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1 our licensee's facility to conduct that interview.

2 Next slide. We have a group within our
3 Bureau working with large-quantity users, the large
4 irradiator facilities, hospitals and clinics that use
5 teletherapy sources, and waste processors with large
6 inventories of radioactive material.

7 These facilities also have to work with
8 local communities. They have to be able to work
9 especially with local fire departments, law
10 enforcement, and they in some cases have to have an
11 emergency plan in place that is shared with those
12 groups. We have waste processors that we are
13 concerned about regarding their ability to secure some
14 of the sources that they have in possession.

15 Go ahead, next slide. Some of the local
16 government concerns that are expressed to us are
17 concerns about possibilities for bringing radioactive
18 materials into their jurisdictions. This is, again,
19 along the border. Training for their first-responders
20 and local officials. There's some Department of
21 Justice funding that is available. Some communities
22 have decided to use that funding to purchase radiation
23 detection equipment, not necessarily the training that
24 goes with it.

25 They want contact information for support

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1 from the Bureau of Radiation Control and other State
2 agencies that could help them if there were an event
3 involving radioactive material and contamination.

4 Next slide. So some of the things that we
5 are trying to do are update emergency plans, provide
6 training for response organizations, conduct drills
7 and exercises, and at least give advice on equipment
8 maintenance for these communities that have purchased
9 radiation detection equipment.

10 Go ahead. Right now we have modified our
11 emergency plan to include potential terrorist acts.
12 As far as our response goes, I don't think that really
13 changes a lot from what we were already prepared for
14 or planning for. I think that might need some
15 adjustments, depending on what happens with the new
16 Homeland Security Department.

17 Go ahead (referring to slides). We
18 currently provide training for first-responders. We
19 have a group that is, I guess you can call it, a
20 remnant of the old Civil Defense operation that still
21 maintains some of those instruments that are
22 distributed around Texas. They conduct training,
23 routine training, of local fire departments, law
24 enforcement, and that includes some other State
25 agencies as well, to respond to an event involving

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1 release of radioactive materials.

2 Next slide. We conduct drills and
3 exercises. Recently, we participated in one that was
4 kind of a large one, actually. It was a terrorist
5 event. The scenario involved a terrorist event
6 exploding a "dirty" bomb, a "dirty" weapon, in the
7 Houston Ship Channel. That event involved the Federal
8 Emergency Management Agency, the Governor's Office,
9 EPS, several State agencies, and local jurisdictions.

10 We also conduct the State-sponsored
11 drills. We conduct small drills with local
12 communities, participate with them, so that they get
13 an idea of what we bring to the table, if they have an
14 event in their jurisdiction. And we conduct the
15 nuclear power plant exercises for offsite response.

16 Next slide. I mentioned earlier we
17 provide the equipment for some of these jurisdictions.
18 The equipment is the Civil Defense instruments that
19 were distributed years ago. We keep those maintained.
20 As they become inoperable, we either repair or
21 cannibalize parts from other units to try to make
22 those work.

23 For equipment that jurisdictions purchase
24 with the Department of Justice funds, we provide
25 advice on what sort of maintenance and calibrations

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1 they should use. We even offer to train them on the
2 use of the instruments, if the jurisdiction desires,
3 and then discuss the maintenance issues as far as
4 abuse of the equipment, the storage, and just general
5 upkeep of the equipment.

6 Like I said, my presentation was going to
7 be short. That pretty much concludes it. I tried to
8 hit on points that I thought the border states all
9 need to address in order to respond to a potential
10 event involving radioactive materials, whether it be
11 terrorist-driven or any other accident.

12 VICE CHAIRMAN WYMER: Bob, how many people
13 do you have -- we heard that there are about 200 in
14 Illinois -- for the whole nuclear area?

15 MR. FREE: For the whole State, we have 32
16 radioactive materials inspectors. They are spread out
17 through regional offices. There are 10 regional
18 offices -- 11, excuse me. We have three radioactive
19 material inspectors to cover the border. They also
20 have other counties that they cover for inspections.
21 One of the inspectors is located in Corpus Cristi, one
22 in San Antonio, and then one in Midland. They are
23 pretty much central to the licensee density, not the
24 geographic center.

25 VICE CHAIRMAN WYMER: Questions? Mike?

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1 MEMBER RYAN: I was curious, you know,
2 when I think of Texas and gauges, for example, I think
3 about the oil industry.

4 MR. FREE: Okay.

5 MEMBER RYAN: Have you had positive
6 experiences with industry segments like the oil
7 industry in terms of getting on board with managing
8 their sources? How does that work?

9 MR. FREE: Well, presently, we don't have
10 -- we are not actively interviewing licensees in our
11 inspections to ask those types of questions. We are
12 headed in that direction, and that has to do, in part,
13 with coordinating with the NRC. That is also true of
14 our other licensees as well, the waste processors.

15 We have a group in-house that keeps a
16 watch list of licensees. Originally, it was set up
17 for troublesome licensees. Now they are adding the
18 large licensees because of the concern for security.

19 VICE CHAIRMAN WYMER: You indicated that
20 you are getting Department of Justice funds. Is that
21 just since September the 11th?

22 MR. FREE: We are not; the local
23 communities are. The Department of Justice is
24 distributing funds to local communities in Texas
25 through the Texas A&M Extension Service.

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1 VICE CHAIRMAN WYMER: This is just since
2 September the 11th, I suppose?

3 MR. FREE: Yes, that is correct. It is
4 geared strictly toward terrorist acts.

5 A lot of the communities are actually
6 purchasing equipment that they really can't use for
7 chemical response and trying to get training on
8 biological response as well, but they know that there
9 is also this radiological possibility out there, and
10 they want to try to address that. Some of them don't
11 have confidence in the Civil Defense instruments that
12 we distribute. They think that by purchasing more
13 updated equipment that they will be able to respond
14 better to those events.

15 VICE CHAIRMAN WYMER: Have there been any
16 sort of international incidents between Mexico and the
17 border states of any consequence?

18 MR. FREE: That is a point I needed to
19 make. There's no participation that I am aware of
20 from Mexico, from their regulators. We used to have
21 -- currently, and I guess the only events that we are
22 doing this are for the moisture density gauges because
23 those are mostly the ones that we have thefts
24 reported.

25 We fax to Mexico's regulatory authority --

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1 I can never hope to pronounce it correctly, so I will
2 just say "authority" -- the reports that we get, so
3 that they know that there is something that has
4 happened and that there is a potential for it coming
5 across the border.

6 I guess the names have changed recently.
7 The names that we used to have that we were in contact
8 with have moved on to other areas within their
9 environmental agency. So we have new names now that
10 we contact, but we haven't had face-to-face or verbal
11 communications with them.

12 VICE CHAIRMAN WYMER: Joe Klinger
13 mentioned the Mexican incident with the source. Was
14 that a U.S. origin?

15 MR. FREE: Yes, it was. It was a
16 teletherapy -- are we talking about the Juarez steel
17 incident? Okay, I refer to that as the Juarez steel
18 incident because it was first detected in the steel.
19 It was a hospital in Lubbock that I guess transferred
20 the source to an installer in Texas who exported it to
21 Juarez.

22 VICE CHAIRMAN WYMER: That's kind of an
23 orphan source. Is it a U.S. concern orphan source?

24 MR. FREE: Well, it can be. In that case
25 it was because it originated in the U.S. I guess a

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1 lot of the concern, of course, initially was that
2 there may be contamination in El Paso. When we
3 contacted the Department of Energy, they jumped on the
4 wagon very quickly and arranged to do helicopter
5 flyovers to detect sources in El Paso. Once they
6 completed those surveys, they offered the assistance
7 to Mexico, and my recollection is it took two to three
8 weeks to get all of that in place so that they could
9 fly Juarez and the highway between there and
10 Chihuahua.

11 VICE CHAIRMAN WYMER: U.S.-origin
12 radioactive sources in other countries is kind of a
13 new dimension to the tracking of orphan sources, isn't
14 that, though?

15 MR. FREE: Yes. Well, I focused on --

16 VICE CHAIRMAN WYMER: I know you did.

17 MR. FREE: -- Mexico and the U.S.
18 Actually, there's a lot larger concern, and that has
19 to do with the import of radioactive materials,
20 intentionally or accidentally, in either steel
21 products or other areas.

22 Recently, most recently, we were involved
23 in a situation where we surveyed an apartment in
24 Dallas, and this apartment contained contamination
25 from strontium-90. This is a very strange report, but

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1 originally this was imported or purchased from
2 Thailand or Laos. Both countries are involved
3 somehow.

4 It came through Miami, went to Tennessee,
5 and the person it was shipped to is a gambler.
6 Somehow or other, he decided that there was some value
7 to using this strontium-90 on dice that is used in a
8 gambling game.

9 (Laughter.)

10 There is a paste that is mixed with the
11 strontium-90 material. It is put in one of the
12 dimples on the six side of the dice, painted over with
13 fingernail polish to fix it, and the game is to gamble
14 on what number comes up, I think. Anyway, somehow or
15 other, this is supposed to influence or help him in
16 his gambling effort.

17 So there was a home in Murfreesboro,
18 Tennessee and an apartment in Dallas that became
19 contaminated. There's also one more recently in
20 Florida.

21 The FBI is investigating this. I probably
22 told you more than I should, but that was a very
23 interesting import-export story.

24 VICE CHAIRMAN WYMER: Yes.

25 MR. FREE: But, also, the larger issue is

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1 all of the traffic through the shipping channels. We
2 get calls frequently from Customs or Coast Guard in
3 Houston asking us to check out this or that ship that
4 has brought this material, some material in. In some
5 cases it is legitimate; in other cases -- well, I take
6 that back. In every case we have looked at so far,
7 there is a legitimate shipment involved and not any
8 real concern.

9 I think most recently there was a huge
10 piece of equipment that was used at Chernobyl that was
11 brought over by some company that purchased it here,
12 but they had made all the arrangements they needed to
13 make to survey. There was some contamination in the
14 treads that hadn't been cleaned up before it was
15 shipped.

16 VICE CHAIRMAN WYMER: Is Joe Klinger still
17 here?

18 MR. FREE: He's out of sight.

19 VICE CHAIRMAN WYMER: I wonder, this
20 business of foreign imports becoming orphan sources,
21 has your E-34 Committee concerned itself with those?

22 CHAIRMAN HORNBERGER: Joe, can you go to
23 a mike?

24 MR. KLINGER: Yes, we have worked with
25 Customs. In fact, our last meeting was downtown over

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1 by Customs, and we had some of the big shots from
2 Customs there. We asked them what kind of services we
3 could help them with. What we are interested in is
4 training to help their people identify some of these
5 things that they are encountering because Customs,
6 they are wearing these pagers; it is a "go/no go"
7 situation. They are finding things out there. Now
8 they are going to some portable gamma specs and
9 neutron detectors, so they will be able to readily
10 identify these things.

11 What we thought we would do is work with
12 them and then be able to help them disposition those
13 sources when they do encounter those. Right now, this
14 is kind of a new area that is evolving. Customs is
15 typically in the mode of having to disposition
16 sources, but they will be doing much more of this as
17 they continue to use these devices.

18 So we are very concerned about that. We
19 are coordinating with Customs, but anything more than
20 that right now is still kind of developmental.

21 MR. FREE: We have had quite a bit of
22 experience with Customs agents calling us, asking
23 about this or that hit. In almost every case, well,
24 in every case so far, they are legitimate shipments.

25 These little pager devices are apparently

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1 very sensitive, and they will detect any radiation
2 level. I think they use a number scheme, and I don't
3 know the relationship to whatever the radiation
4 reading is, but I think they set it on number "5" out
5 of 9.

6 MEMBER RYAN: Ray, there's a couple of
7 other issues besides sealed discrete sources that are
8 orphaned. One is NORM, naturally-occurring
9 radioactive material, that is in commerce. I think
10 there's a lot of positives with that.

11 The second is ubiquitously-contaminated
12 materials coming from Europe. Under the European
13 Union Rule, Safety Directive 6, they have standards
14 for solid contamination limits in material.

15 VICE CHAIRMAN WYMER: Yes, it is 1
16 millirem per year.

17 MEMBER RYAN: Right, so it is based on a
18 millirem per year, but with cobalt and some others it
19 is actually easily-detectable level.

20 So there's actually three discrete
21 problems here. One is sealed discrete sources. The
22 other is NORM, and the other is dilute ubiquitously-
23 contaminated materials. I think sometimes they get
24 sort of all put under the same umbrella, but they are
25 really three different things.

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1 MR. FREE: Right, and the charge to our
2 Committee from CRCPD is to just deal with sealed
3 sources.

4 MEMBER RYAN: Right.

5 MR. FREE: So we have to push the
6 contamination issues aside and try to -- but we would
7 still work with people and try to help them find the
8 resources they need to recover.

9 MEMBER LEVENSON: I have a question for --
10 I'm not sure whether it is for Joe or for you. Does
11 the Conference of Radiation Control Program Directors,
12 or maybe individual states, but the Conference of
13 Radiation Control, have a liaison with the NEST group,
14 in case you really get a problem with a big source?

15 MR. KLINGER: I think it is Terry Devine.
16 They would contact, you know, by our outreach program
17 with the brochures and going to meetings and stuff.
18 Any questions, when people call me, I just say, "Talk
19 to Terry Devine" and give them the number, and he is
20 responsive. I mean, he is getting some funding from
21 our efforts and stuff. So he will provide information
22 as soon as possible.

23 MR. FREE: I don't know if it is NEST that
24 we would deal with directly.

25 MEMBER LEVENSON: What?

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1 MR. FREE: I'm not sure it would be NEST,
2 unless they have reorganized.

3 MEMBER LEVENSON: Well, the question is,
4 if there is a loss, big source, would you utilize the
5 NEST facilities to find it, which is really the best
6 in the world?

7 MR. FREE: That has been done on several
8 occasions.

9 MEMBER LEVENSON: Yes, I know.

10 MR. FREE: In fact, I mentioned at that
11 time they were called the ARMs flights when we had the
12 source in Juarez. It has been done more recently in
13 Louisiana, I think even more recently in Maryland.

14 MEMBER LEVENSON: Because a few years back
15 they were so classified you really couldn't use them
16 for -- at the time of TMI, we couldn't use them, et
17 cetera. So I wondered if that had been cleared up and
18 that resource is now available to you people.

19 MR. FREE: When we were involved with the
20 ARMs, the ARMs Branch was strictly for peacetime use,
21 and they were easily contacted and available.

22 MR. BROADDUS: This is Doug Broaddus. The
23 ARMs or Ops Center has an incident threat assessment
24 team, and they coordinate through the FBI. Anytime we
25 have stolen material and potentially lost material

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1 that could be, as you said, high-activity potential
2 threat, they will coordinate with the FBI and then
3 decide whether that -- the FBI, in coordination with
4 them, will decide whether their sets of resources are
5 needed.

6 So we have the capability, and that
7 includes agreement state reports as well as NRC
8 reports, because we receive all the reports here at
9 the Ops Center.

10 MEMBER LEVENSON: And, also, I guess I am
11 not sure I understand. If we perceive that there is
12 a threat to health and safety and it is a technical
13 issue, do you need to go through the FBI to get
14 resources?

15 MR. BROADDUS: If it is potential
16 malicious activities --

17 MEMBER LEVENSON: No, no, just a lost
18 source.

19 MR. BROADDUS: No, if it is just
20 potentially a lost source, then it would be handled
21 through the Health and Safety Programs with the states
22 or with NRC's Radiation Protection Programs.

23 MEMBER RYAN: How does the DOE RAP
24 response fit in? That is the first-response group?

25 MR. BROADDUS: They can be requested, each

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1 individual state can make a request to the DOE RAP
2 team.

3 I was going to talk also about some other
4 agreements we have with DOE for responding to these
5 types of sources as well.

6 VICE CHAIRMAN WYMER: John, you had a
7 question?

8 MEMBER GARRICK: Well, I have this bad
9 habit of, after I hear a briefing, trying to figure
10 out what the problem is, and that comes from probably
11 being on this Committee too long.

12 (Laughter.)

13 VICE CHAIRMAN WYMER: There there's no
14 problem.

15 (Laughter.)

16 MEMBER GARRICK: But you had two exhibits,
17 one called "Border State Issues" and another called
18 "Local Government Concerns" that come kind of close to
19 answering that. But I am also reading between the
20 lines that maybe the most significant problem is not
21 on the list, and that has to do with the participation
22 of the Mexican authorities. Is that an
23 overinterpretation?

24 MR. FREE: In my view, no. I am leaning
25 on Doug's presentation to address that somewhat. I

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1 know that NRC, Mexico, and Canada had a meeting in
2 February. It was a closed session. I am not familiar
3 with the proceedings.

4 But even more, I guess, to the point,
5 though, is that we don't have the communication with
6 Mexican regulatory authorities as a state that we had
7 after the Juarez steel incident. Even though that was
8 a terrible event, but it built some bridges between us
9 and Mexico, and those are not there now.

10 I guess even as far back as 10 years ago
11 we had attempted to contact those authorities and get
12 them involved in some discussions, and they were eager
13 to do that when we talked to the individuals, but
14 their administrations or management didn't see the
15 benefit.

16 They did participate in one conference
17 that we had in El Paso -- I think it was around the
18 1990 timeframe -- where we discussed this issue. At
19 that time Customs was maintaining -- they weren't
20 maintaining; they were using these portable monitors
21 at crossings, border crossings. Customs had decided
22 that they weren't going to keep those anymore.

23 There were a lot of issues with that. One
24 of them had to do with the turnover in agents at the
25 border crossings because training was a very large

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1 issue. As soon as someone was trained, they moved on
2 to some other location, and someone else came in; they
3 needed training. They also had hand-held instruments
4 that they were trying to use. It is the same
5 situation that we experienced with the Civil Defense
6 training, was keeping people up-to-speed on the use of
7 the equipment.

8 VICE CHAIRMAN WYMER: I guess I would
9 observe that we have two borders. I suppose we don't
10 have a lot of trouble with Canada.

11 MR. FREE: Well, I didn't contact Canada,
12 but I am told there are some similarities in issues
13 there. Hopefully, Doug will be able to address some
14 of that.

15 MEMBER LEVENSON: I would suggest maybe we
16 have three borders, and that the ones with the oceans
17 might be the worst ones because of shipping.

18 VICE CHAIRMAN WYMER: That is a little bit
19 different sense of the word "border" I guess.

20 MEMBER LEVENSON: Risk-wise it could be
21 the major one.

22 VICE CHAIRMAN WYMER: Certainly.

23 MR. CAMPBELL: How extensive are your
24 interactions with Region 4 in terms of coordination
25 on, for example, these international issues? Do they,

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1 for example, send the PNs to Mexico?

2 MR. FREE: I don't know if they do that.
3 That is a good question. I haven't asked them. For
4 all events, we are in touch with them quite a bit.
5 But as far as their communication with Mexico or
6 Canada, for that matter, I don't know. I think Doug
7 is going to address that.

8 MR. CAMPBELL: Okay.

9 VICE CHAIRMAN WYMER: Okay. Any other
10 questions?

11 (No response.)

12 Okay, if not, I think, with the agreement
13 of our Chairman, I will try to break for 15 minutes.
14 Thank you very much.

15 (Whereupon, the foregoing matter went off
16 the record at 10:26 a.m. and went back on the record
17 at 10:42 a.m.)

18 VICE CHAIRMAN WYMER: On the record.
19 We're trying to finish by 12:00 noon which means we
20 need to get started right away. Our next speaker is
21 Dough Broaddus who works with the Division of
22 Industrial and Medical Nuclear Safety of the NRC. His
23 title is NRC Activities for Enhanced Control Sources.
24 I told Doug I was going to introduce him as the
25 speaker who is going to tell us how to get this

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1 problem at hand so there won't be anymore orphan
2 sources in the future.

3 MR. BROADDUS: I'll try to address that as
4 best as possible in this presentation. What I'd like
5 to do is just start with a background of some
6 historical perspective and then talk specifically
7 about the types of initiatives we have done here at
8 the NRC. Also I'm going to address some international
9 activities both that the NRC is doing that we are
10 aware that are on-going and then talk as well about
11 some stray enhancements that have been put in place.
12 I'll talk as much as I can on these but a lot of it I
13 can't give specifics on but post-9/11 enhancements.
14 I'd also like to say that basically Bob and Joe have
15 done a great job that they've basically covered a lot
16 of what I have on here but hopefully that will give us
17 some more time to concentrate on the areas that you
18 had some questions on before that I can answer.

19 This is just showing you a similar picture
20 my picture that I intended to use. There's a cesium
21 gauge right there in the middle of that and I'll show
22 you in the next slide the more specific, closer up of
23 that. Basically this was a facility that had
24 decommissioned not from the standpoint of radiation
25 decommissioning but basically they just went out of

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1 business. They were tearing it down for the scrap
2 metal. It was getting ready to be carted off to the
3 scrap metal recycler. The gauge was detected, so one
4 curie cesium 137 source. (Indicating.)

5 Next one. This is a closer up picture of
6 it still attached to the pipe. Basically the piper
7 just cut it down and the whole thing was being
8 removed. You can see the labelling there. That's how
9 they identified it as to the labelling. Also through
10 that labelling we were able to trace it back to the
11 original owner and get it taken care of.

12 Next. That's what we're trying to
13 prevent. As Joe indicated we have about 200,000
14 licensees. About 90 percent of those are general
15 licensees. About 10 percent are a specific licensee
16 and that's across the United States. It's not just
17 NRC. NRC has about a quarter of these total
18 licensees.

19 Those licensees have about 2 million
20 devices total as Joe indicated. Each device can have
21 anywhere from one to four sources. Joe also talked
22 about some of the different types of uses so I won't
23 go over those as well. What I do want to highlight
24 though is that there are also millions of consumer
25 products such as smoke detectors, gun sights, watches

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1 that have small amounts of radioactive materials in
2 there that are exempt from licensing.

3 Next. I wanted to give some data that we
4 have in our Nuclear Material Events Database (NMED).
5 This database contains information on all types of
6 reportable events but this information is specific to
7 lost and stolen radioactive material events that have
8 been reported.

9 Again this also includes agreement state
10 data as well as NRC's data. Since NMED was in place,
11 there have been about 2,000 reports of lost or stolen
12 radioactive materials, amounting to about 2700 sources
13 total. As I indicated there are some devices that
14 have two sources or more per device.

15 I also wanted to highlight that since
16 October of last year the NMED has been modified
17 slightly to increase our ability to track lost,
18 stolen, recovered and even unwanted radioactive
19 materials for several reasons partly because of the
20 request from the CRCPD to enhance the NMED so it would
21 be an orphan sources extracting database but also to
22 respond to inquiries we've been receiving about lost
23 and stolen radioactive materials.

24 These are the numbers we have received
25 since October of last year and what you can see as

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1 well is that the numbers of the actual recovery
2 refound radioactive materials over the last year has
3 been really more like 51 percent. The reason this is
4 lower -- It could be several reasons, partly that we
5 didn't have as much data from the very beginning but
6 this is about the numbers that are being recovered
7 right now. About 20 percent of the reports are
8 portable gauges and the majority of those are stolen
9 portable gauges not lost. But 40 percent of the
10 sources and 20 percent of the reports actually is
11 where that comes out.

12 There are few risk sources that have been
13 reported. I can give you an example. For radiography
14 over the past five years there have only been about
15 six radiography reports of the license or sources. Of
16 those four to five I believe it is five have actually
17 been recovered. So only one of them was not recovered
18 and that was relatively recently. As Joe indicated
19 there have been a number of different melts at the
20 U.S. steel mills. The average cost is \$10 million.

21 MEMBER GARRICK: Over what time period are
22 those steel mill events?

23 MR. BROADDUS: That's for all --

24 MEMBER GARRICK: All time?

25 MR. BROADDUS: Yes. Since the data has

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1 being collected which is probably I believe in the
2 1950s for that. Now what I'd like to talk to you
3 about is what causes people to lose control of their
4 radioactive material. Primarily it's loss of
5 accountability as indicated previously. People change
6 their jobs. Companies change. They are taken over by
7 other companies. The person who was responsible for
8 controlling the gauge or material may be assigned a
9 new title or new job without being replaced.

10 Just people over time tend to forget.
11 They're not really playing close attention. Financial
12 constraint. Bankruptcy. Again being bought out by
13 another company can cause people to lose
14 accountability of the material. There could be a lack
15 of understanding of the regulations. That they even
16 have material that has radioactive material in it.
17 That could be caused by either the original
18 information that they got on the gauge if that was
19 provided to them by the distributor or because again
20 for personnel changes and other information.

21 Also a lack of understanding can lead to
22 people not following the regulations or the authorized
23 procedures. But also sometimes people get complacent
24 and they just don't follow the procedures as well.
25 That can cause loss of accountability, loss of

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1 control. Then to a lesser extent theft and
2 abandonment result in this. As I indicated a majority
3 of theft reportable gauges and Joe talked about why
4 they seem to be more stolen than others. They seem to
5 be very attractive to people thinking that they are
6 some type of very expensive equipment. In many cases
7 they have actually been stolen with the truck where it
8 is tending that item. But there are very few
9 abandonment cases which we have actually received.

10 MEMBER GARRICK: So is 90 percent of it
11 the first category?

12 MR. BROADDUS: I'm not sure if I can say
13 90 percent but I'd say more than the 50 percent but I
14 don't know the exact breakdown for each of those. I
15 can say that abandonment is probably less than one
16 percent. Thefts are -- I can get you those numbers or
17 more specifics on that but I'd hate to guess. I know
18 it's more than 50 percent.

19 Let me give some information about
20 generally licensed (GL) devices. This has been one of
21 our areas where the lack of accountability and control
22 has been of highest concern primarily because they are
23 the ones that possess the most number of devices. A
24 little bit of background on the actual devices
25 themselves. They are designed to minimize potential

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1 for exposure to the users. The use and the devices
2 themselves are designed to require a minimal amount of
3 knowledge and understanding of the radiation
4 protection to protect themselves from exposure.

5 There has been in the past minimal
6 regulatory oversight of these gauges for these
7 reasons. I'll talk more about that has changed
8 recently. In the past they have also been tracked
9 primarily through the vendor NGL reporting to the NRC
10 or the agreement states of transfer that have
11 occurred. That has changed also recently.

12 Specifically licensed devices and sources
13 are a little bit different. They can be anywhere from
14 minimal to high risk materials and uses. However
15 there are specific requirements with the specific
16 licensees that to the licensing process increased the
17 oversight and protection requirements based upon the
18 hazard. Security and control are spelled out, the
19 requirements, in Part 20 requiring there to be a
20 constant surveillance and control over the materials
21 that either in storage or out in unrestricted areas.

22 Licensees are responsible for the source
23 of accountability. They have to have their own
24 programs in place. We would verify that through the
25 inspection process. Specific licensees are tracked

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1 but the devices currently are not tracked. We have a
2 licensing tracking system where we have specific
3 licensees and we also have information about their
4 authorized uses and their authorized materials. Again
5 that might be something else that could changing soon.

6 Also I wanted to give an historical
7 perspective on the orphan sources. I think Joe gave
8 a really good understanding of this. It's basically
9 material that is not under regulatory control for one
10 reason or another. The sources that we've dealt with
11 in the past have been both generally and specifically
12 licensed. We've also had imported materials, legacy
13 materials from the former Atomic Energy Agency, from
14 DOD that have been around since the '50s and before.
15 We have dealt with some cases of that.

16 In the past as Joe indicated the response
17 has been either minimal or inconsistent. In some
18 cases this is a change as he indicated in his
19 presentation that things are getting better. We have
20 some more programs in place now to increase the
21 consistency and the ability to respond to orphan
22 source incident.

23 Now I would like to go through what NRC
24 has done. What I would like to say as well is that
25 NRC's initiatives in many cases have been in

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1 conjunction with the agreement states. As I'll show
2 you in some cases that the general licensee program
3 for example would work closely with the agreement
4 states and have changed some of their requirements for
5 compatibility to insure that there are consistent
6 programs across the board.

7 What I'd like to talk about is there have
8 been a number of different studies done for general
9 licensee accountability. The first one started back
10 in 1984. The last one ended around 1996. Bob Free
11 was part of that last working group. That was a joint
12 NRC and agreement state working group that came up.
13 That's what the basis of our new Generally Licensed
14 Enhanced Oversight Program was based upon, that last
15 report in 1996.

16 Joe also talked a little bit about the
17 Orphan Source Recovery Program. I'll talk as well
18 about NRC's role in that and some other parts of that
19 that are outside of the CRCPD program. I'll talk
20 about some changes we've made recently to the
21 enforcement policy to try to provide an incentive to
22 increase control and accountability and again some
23 more enhancements that we've done since 9/11.

24 In February of last year, we implemented
25 some new requirements for general licensees. Those

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1 requirements are applied to general licensees, the use
2 of the device, the distribution of the device which
3 would be the vendors who are distributing those
4 products, to the devices themselves and there are some
5 changes in the compatibility requirements for the
6 agreement states.

7 Basically what was done is that all those
8 requirements are now one of the highest compatibility
9 requirements which means that it essentially has to be
10 identical to what we have. As I indicated we have
11 also employed some changes to our enforcement policy
12 and we've developed a new general licensee tracking
13 system to track all NRC general licensed devices.

14 The basic requirements or changes were
15 first of all to allow increased contact with general
16 licensees to insure that we have better interface with
17 them so that they understand that they have material
18 that is being regulated. If you contact them on a
19 regular basis, it increases their awareness of the
20 fact that they have regulatory requirements as well as
21 that they have radioactive material in their
22 possession.

23 We have an annual registration program for
24 the higher risk devices where we send out a listing of
25 all the devices that they have in their possession.

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1 They are required to go through and review those
2 devices, tell us if they've received any new ones, if
3 they've gotten rid of the old ones and to verify if
4 our information is correct. Also they must designate
5 a person now that is responsible for both compliance
6 with the use as well as the control over the material,
7 responding to registration requests and any other
8 requests that the licensee might receive from the NRC.

9 This was previously just a contact person.
10 Now this person actually has some defined
11 requirements. They have to for example for the
12 registration when they sign the registration it says
13 I understand the requirements, that I have reviewed
14 all the devices and I confirm that the information I'm
15 providing is true and correct. So it's a little bit
16 greater responsibility and we can hold them
17 accountable for providing inaccurate information to us
18 which we actually had a recent enforcement case where
19 that came into play.

20 VICE CHAIRMAN WYMER: Is there a
21 succession provision too if I leave and somebody else
22 comes in?

23 MR. BROADDUS: Part of the requirement and
24 this goes with the vendors actually is that every time
25 the vendors distribute a new device to the general

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1 licensees that they have to also request information
2 about the responsible individual and tell us that
3 information as well as the general licensees being
4 required to tell us that information.

5 VICE CHAIRMAN WYMER: That's at the
6 outset. How about downstream?

7 MR. BROADDUS: If they receive a new
8 device, then that information will be updated. The
9 only other time that that would be updated at this
10 point that we would ask for updated information would
11 be when we send the registration out or we contact
12 them for some other reason whether we're doing a
13 mailed inspection. They are required at all times to
14 have a responsible individual but the way we would
15 find out about it would be through the reporting
16 requirements.

17 VICE CHAIRMAN WYMER: But there's no
18 formal requirement for succession.

19 MR. BROADDUS: It's not like a specific
20 licensee where they have an RSO and they have come in
21 and get that approved by us.

22 VICE CHAIRMAN WYMER: Okay.

23 MR. BROADDUS: So no, there isn't. We
24 also in these changes clarified some of the
25 requirements. We enhanced the area that talked about

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1 what types of transfers are authorized by general
2 licensees. General licensees as I indicated
3 previously were confused to some extent about what is
4 an authorized transfer and not. We clarified that we
5 need information on both the mailing address and the
6 location of use whereas before it was just one
7 address.

8 For example we could have a general
9 licensee that is actually located in an agreement
10 state but we had a mailing address in an NRC
11 jurisdiction. So we would be assuming that they were
12 using it at that location but they actually would be
13 using it in the agreement state and the agreement
14 state wouldn't know it and visa versa. So now we have
15 requirements for both so that we know where we can
16 send correspondence to them as well as where we can
17 inspect them.

18 We clarified some of the reporting
19 requirements. I talked a little bit about some of
20 those. One of the changes was reporting of transfers.
21 They are required to report all transfers to us
22 whereas before there was some provisions that would
23 allow them not to report certain changes to the
24 devices and in transfers that occurred. Now they are
25 required to do all. We had a provision put into the

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1 regulations for portable devices so if their location
2 of use may be multiple places but we need a storage
3 location where they are going to be routinely stored
4 so that we have that information as well.

5 For the vendors, we also have device
6 requirements as well as requirements for the vendors
7 themselves. Primarily these were changes to the
8 reporting requirements for the vendors. They are
9 required to report to us all distributions that they
10 do and now also all returns that they get back whereas
11 previously they would not report to us returns. They
12 would only report to us that they have a return for a
13 replacement. Now we've changed that provision in the
14 requirement that there is no such thing as a
15 replacement anymore. Anytime that they distribute a
16 device or they receive one back they report it to us.

17 This would catch any time that the general
18 licensees would fail to report back to us so we would
19 find out in fact that if they had returned a device.
20 Then we would follow up with the general licensee and
21 find out what their records show again.

22 Anytime there are modifications made to
23 the devices, if you go out and put a new source in
24 there with a new isotope and activity they would have
25 to report that to us. We would then know what exactly

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1 they had in-house. They are required to report to us
2 the serial numbers for the devices and again the
3 agreement state compatibility was increased. But in
4 this case we asked that the agreement states become
5 compatible with these new reporting requirements
6 within six months because that way even the vendors
7 that are located in agreement states would be
8 reporting to us all the new information. Otherwise we
9 wouldn't have that information. We have recently
10 received information from the state programs that they
11 all have met the requirement for that to become
12 compatible for the reporting requirements.

13 Also we had what I term a disclosure
14 provision which indicates that vendors must provide
15 information to potential purchasers before they
16 transfer the device to them so that they can
17 understand fully what they are getting into. So that
18 they know they are going to be receiving a device that
19 has certain requirements associated with it.

20 For the devices we've required some
21 additional labelling which is labelling on devices
22 where they may be separated. The housing from the
23 actual gauge could be separated. Also that the
24 labelling must be more rigorous and must be able to
25 withstand the harsh conditions of use that they could

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1 be subjected to but basically this has resulted in
2 primarily mostly labels being made out of metal
3 whereas before they may have been paper.

4 As part of getting ready for the
5 registration with the new requirements coming into
6 place, we have developed a new general licensee
7 tracking system. We had an old system that was just
8 a database. But this is an actual tracking system
9 where we can track devices cradle to grave that are in
10 the possession of general licensees. The actual
11 deployment of this occurred in late 2000. In 2001 at
12 the time that the new requirements came into place, we
13 actually started implementing the registration
14 program.

15 The database maintains information about
16 all the general licensees, the vendors and the devices
17 that are possessed by them. I can tell you where any
18 device is at any time based upon the reporting that we
19 have received. It has an automated system for
20 registration form creation and then input coming back
21 in when we receive the registration forms back.

22 We have enhanced our ability to create
23 reports, do searches and do data input and validation.
24 What we found is that because we didn't have this
25 validation, the data info was rather cumbersome. We

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1 were getting lots of errors in the old database and so
2 we now have a lot of validation in there. We couldn't
3 do many searches at all. It was very difficult to do
4 searches in the old database. Now we have better
5 ability to do that.

6 This has actually been used a number of
7 times since it was developed. We have had several
8 instances where devices have been lost or found
9 somewhere. They became an orphan source and by doing
10 searches we were able to track it back to the previous
11 owner and actually go out and find that owner and get
12 them to take the material back.

13 Any information that we receive either
14 through a registration or through any other type of
15 reporting from general licensees on lost devices, we
16 can create a report that would be downloaded to the
17 NMED so that we can make sure that we capture all
18 those reports as well. Then that would be checked
19 against NMED to see if they have already received the
20 report or if it's a new report.

21 We've developed a system so they could be
22 expandable to a national system so that it can include
23 all agreement state information as well. At the
24 current time there aren't plans to make this a
25 national database but that really will depend upon

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1 whether the agreement states want to do it or not.
2 They've indicated a desire to do that but there are a
3 number of different logistical issues that would have
4 to be worked out from that. At this current time like
5 I said we're not planning on doing that. The
6 registration program as I indicated was begun back in
7 March of last year as well.

8 Coincident with the GL program, we have
9 also implemented an interim enforcement policy. It
10 became effective back in 1999 through at least the end
11 of this fiscal year because we have essentially
12 completed our first round of registrations and this
13 policy was only intended to go through the first round
14 of registration. Basically the policy is that if a
15 general licensee identifies a violation to us and then
16 reported to us and then take appropriate corrective
17 actions to prevent that from occurring again we will
18 use discretion to not cite these violations. The
19 intent here is to remove a potential disincentive for
20 general licensees to report to us lost devices that
21 they have had in the past. If they are afraid that if
22 they report it to us that they are just going to get
23 hammered through our enforcement policy, a number of
24 them we believe would not report those. It's also
25 important to encourage general licensees to identify

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1 and locate the devices and come into compliance with
2 the new requirements.

3 It's a process by which we will also if we
4 find the general licensee is not aware of their
5 requirements is to make sure that they are fully aware
6 of their requirements and give them an opportunity to
7 have them come back into compliance. It's not
8 applicable if the NRC identifies the violation or if
9 there's a willful violation of the requirements.

10 We also have another enforcement policy
11 that became effective at the same time the new rules
12 went into place back in February 2001. It's called
13 the Lost Source Policy. The interim policy was only
14 applicable to general licensees. This is applicable
15 to all licensees whether they be specific or general
16 licensees. This is I guess the opposite of the
17 previous policy which is it's an incentive to insure
18 that they have proper control in transfer and disposal
19 of sources by the fact that if they don't they could
20 be subject to much harsher civil penalties than
21 previously.

22 What we've done is we've now established
23 three levels of civil penalties. Each one of these
24 levels corresponds to approximately three times the
25 cost of authorized disposal for a certain class of

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1 sources. This would be lower activity sources. The
2 15,000 in the middle is really the sources that are
3 subject to registration. They have the same criteria
4 as those that would be subject to registration for
5 general licensees and the 45,000 would be the highest
6 activity sources, generally sources that are greater
7 than one curie of activity. What we've also done now
8 is to the policy, this policy we would use discretion
9 to cite or to impose a civil penalty when in the past
10 we may not have imposed a civil penalty or at least a
11 civil penalty may have been lesser than what the base
12 level penalty might be.

13 From an orphan source standpoint, we've
14 been working with DOE on orphan sources since the
15 early 1990s or since 1990 actually. This was
16 originally set up through some letters of agreement
17 with DOE and the basic premise was that any time the
18 NRC identified a emergency situation where there was
19 an orphan source that could pose a threat to the
20 public, DOE would provide us assistance to recover
21 those materials. That has basically transformed
22 itself into the DOE Offsite Source Recovery Program
23 (OSRP).

24 Since DOE is not here, I can give you a
25 little bit of background in that. That's a program

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1 down at Los Alamos that is responsible for registering
2 and putting together a program to recover Greater Than
3 Class C sources that are unwanted by licensees. They
4 are also the same group that would respond to any
5 emergency requests that we may make to them. We have
6 used that on a number of cases.

7 I believe there has been 20 to 22
8 different recovery requests in the past. Some of
9 those have been pilot programs where the offsite
10 source recovery program was ramping up their program
11 to try to allow for the on-going recovery of Greater
12 Than Class C sources on a more routine basis not just
13 emergencies. Those occurred over the last couple of
14 years. At this point they have an on-going, more
15 routine recovery program. As Joe indicated though
16 there have been some concerns with the funding. In
17 fact their funding was cut several times. My
18 understanding is that now their funding may be coming
19 back to them. I can't tell anymore because I don't
20 know the specifics. I just have heard that they are
21 going to be getting more funding back soon.

22 We put together the agreement with the DOE
23 back in 1999 where we put together a memorandum of
24 understanding where it spelled out clearly what the
25 DOE's responsibilities would be and NRC's

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1 responsibilities would be for responding to an orphan
2 source incident that may require DOE assistance. Also
3 we have responded to several instances where the
4 Commission direction has indicated we should increase
5 our efforts in the orphan source area. We've provided
6 a couple of Commission papers and I'll talk about
7 those in a minute.

8 We've participated and supported the
9 CRCPD's E034 Committee on Unwanted Radioactive
10 Materials as Joe indicated. We had a staff member and
11 myself actually that have been participating in that
12 program as advisors. We have had participation and
13 cooperation with several international efforts and
14 I'll talk about that in more detail in a minute.

15 The first instance of Commission direction
16 was in an April 13, 1998 Staff Requirements Memorandum
17 where they lined out a guiding principle for us to
18 follow which is that non-licensees who find themselves
19 in possession of radioactive sources that they did not
20 seek to possess should not be expected or asked to
21 assume responsibility and cost for exercising control
22 or arranging for their disposal. Basically as Joe
23 indicated, don't just walk away from the scrap dealer
24 and say now you have to dispose of it. So that was
25 their guiding principle in that memorandum.

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1 The staff responded to that in the
2 Commission paper of February 1999 and made a
3 recommendation that we work with CRCPD to develop and
4 fund a national orphan source program. The Commission
5 came back and said go forth and do that so that's what
6 we did. Joe talked about that as well what we did
7 with that.

8 We worked with the CRCPD as I indicated.
9 The funding once CRCPD completed their program, we
10 evaluated it and determined that it did meet most of
11 our needs for developing a national orphan source
12 program. We have funded it as of September 2001.
13 It's worked through a cooperative agreement managed by
14 the FDA.

15 As Joe indicated, it's approximately
16 \$225,000 per year for the first two years. Then we
17 will consider additional funding after the first two
18 years depending upon the needs in the program at that
19 time. However because it is being funded by NRC, the
20 funds can only be used for responding to events
21 involving AEA material. But as Joe indicated, there
22 are other sources of funding such as DOE that could be
23 used for NARM material as well.

24 A couple other recent activities that
25 we've had. Noting that theft of portable gauges was

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1 a problem, we actually put out a number of information
2 notices in the past. This was a more recent one, July
3 of last year, where we made some recommendations on
4 how portable gauge users could increase their security
5 over their materials.

6 One of the provisions was a recommendation
7 to insure that the gauges are not in sight when they
8 are being stored in a truck. Or if they have the
9 ability to bring it inside and store it inside of
10 facility to do that rather than leave it in the
11 truck. The more you can see it the more chance there
12 is it's going to be stolen.

13 Also Bob referred to the fact that we had
14 a trilateral meeting between the U.S., Canada and
15 Mexico back in February. The purpose of this was to
16 get agreement with Canada and Mexico that we would
17 establish a process for notification when sources are
18 either lost or stolen near our common borders. We
19 have since then developed an interim program or
20 process by which we are now making these
21 notifications.

22 I think the question was asked are these
23 notifications made. We use the event notifications
24 that we receive either from the agreement states or
25 from NRC licensees as well as the preliminary

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1 notifications. We provide those notifications to
2 Canada or Mexico when they occur. We have contacts
3 both in Mexico and Canada to do that. We've also
4 received a few reports from at least Canada about
5 incidents that could have had some implications here
6 in the U.S. as well whether a material may have
7 possibly come across. I don't believe we've received
8 any Mexico yet.

9 In addition during that meeting it was
10 also discussed that we could have an exchange of
11 personnel to talk about how we could increase the
12 tracking that are coming across the border. In fact
13 as a follow-up to that, some Canadian representatives
14 are planning to come down either August or September
15 to meet with us to talk about their development of a
16 tracking system similar to what we are doing with the
17 general licensee tracking system and how we can
18 develop programs that can be compatible to be able to
19 track materials that are coming across the border. As
20 of yet, we have not received any requests from Mexico
21 but they did express interest during the meeting as
22 well in getting together with us and talking about
23 that as well.

24 From an international standpoint, I just
25 wanted to put up some of the bullets of what are some

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1 of the concerns internationally: obviously illicit
2 trafficking of materials coming from the former Soviet
3 Union; the competing priorities in developing
4 countries. If they have a certain amount of money to
5 spend on cleaning up their water or controlling
6 radioactive material, they're probably going to spend
7 it on cleaning up their water rather than controlling
8 radioactive materials.

9 Another concern which was discussed
10 earlier as well is radioactive material coming in in
11 recycled products whether that be already part of the
12 material, the metal, or whether it's an entire source
13 or device that comes across as part of a shipment.
14 There has been some discussion about the use of
15 obsolete equipment and devices, whether they are in
16 poor condition and maintenance. That's been the case
17 quite a bit more so from the former Soviet Union as
18 well but also within developing countries,
19 transferring them from one country to the other. But
20 as indicated in the Juarez (Mexico) and the Golania
21 (Brazil) incidents in both those cases the teletherapy
22 unit came from the United States. It was older
23 equipment that had been sold to some user down in
24 those countries and they didn't maintain it. They
25 didn't control it within the country. It eventually

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1 became significant in an event. That's also the
2 unauthorized transfers as well as unauthorized uses
3 which could be malevolent as well as just using it for
4 other types that unfortunately it wasn't intended.

5 We and I mean NRC have been involved in
6 addressing a number of these issues through
7 interacting with the IAEA on its action plan for the
8 control of radioactive sources. Along with that
9 action plan part of the result of that was a code of
10 conduct that is being developed by IAEA also which
11 talks about certain requirements that countries should
12 adhere to for transferring materials between
13 countries, tracking materials.

14 We recently put up a Commission paper to
15 discuss that as well and made some recommendations as
16 to where we should go with that. We've also been
17 involved in working groups for security of radioactive
18 materials. We're also on another working group for
19 categorization of radiation sources for developing
20 that's going to be used to categorize the sources into
21 high level, medium level and low level categories that
22 would then be used for developing different levels of
23 tracking, different levels of control of requirements.
24 So those are some of the examples in addition to the
25 interfaces that we are having with Canada and Mexico

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1 now as well.

2 We've also as everybody I'm sure is aware
3 have taken a number of different actions after
4 September 11 to try to increase security of
5 radioactive materials. We did some initial actions
6 which were, of course, staffing of the outcenter, 24
7 hour staffing of that, getting information out to the
8 licensees immediately as to, the higher risk
9 licensees, about the potential threats. We issued
10 three materials safeguard advisories. They were to
11 all materials users which was one of them. One was to
12 the manufacturers and large quantity users. The third
13 one was for licensees that may be transporting large
14 quantities of radioactive materials what is termed the
15 highway route control quantities which amounts to
16 about 27,000 curies (PH) of materials in a shipment.

17 We also sent a request to DOE requesting
18 them to accelerate recovery of sources that they
19 registered with their offsite source recovery program.
20 We've been working with them to develop priority
21 ranking for that request and we've recently received
22 a positive response on that in that we're in the
23 process of trying to work with them to get these
24 recovered. I was hoping that the DOE would be here so
25 that they could talk more about that, their response.

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1 But that's the information that we've gotten back so
2 far.

3 We are in the process of developing and
4 implementing interim compensatory measures as well.
5 Again these go along the same lines as the safeguard
6 advisories, transportation of large quantity
7 shipments. So additional requirements for those would
8 be implemented orders. I can't get into details as to
9 what they are. Some of them are still in the process
10 of being developed. Most of them are not releasable
11 information at this time.

12 But there are two main areas where we are
13 dealing. One is the transportation of shipments and
14 all other materials licensees and there would be
15 various different ICMS for classes of materials
16 licensees. The basic premise of these ICMS is to
17 increase the security over the materials, to increase
18 awareness of the potential threats that are out there
19 and to prevent a terrorist attack either by using the
20 materials or attacking the facility.

21 In addition, my understanding is that
22 there has been a proposal by the Chairman to the
23 Budget Committee to request \$10 million and ten FTE
24 for the development of a source tracking system that
25 would be nationwide tracking system. My understanding

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1 is it would be for sources that are of higher risk
2 that could be used possibly as a "dirty" bomb and for
3 tracking real time throughout the U.S.

4 That's basically what I wanted to talk
5 about. I know you had some other questions before.
6 If you still have those specific questions and if I
7 haven't address them throughout this, feel free to ask
8 again.

9 VICE CHAIRMAN WYMER: You've pretty well
10 covered everything. What questions do we have of
11 Doug? John.

12 MEMBER GARRICK: It's an impressive amount
13 of new initiatives and attempts to improve the
14 accountability and the licensing process. Have you
15 had enough experience with some of these changes to
16 see any kind of impact on the problem?

17 MR. BROADDUS: For general licensees, yes.
18 We definitely have. We've seen a much greater
19 awareness of the general licensees. We've had a
20 number of general licensees who have gotten either --
21 One of the things that I didn't put up there is the
22 fact that we also send out letters to all general
23 licensees indicating that the new rules will be put
24 into place.

25 We have received a number of different

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1 calls from general licensees saying why did I receive
2 this. I don't even know that I have radioactive
3 material. So there have been a number of cases where
4 we've gotten those calls where we have helped them to
5 understand why they are receiving this information and
6 directed them to where they can go to find out
7 additional information about exactly what they have
8 and what their requirements are either by providing
9 them copies of the regulations or giving them
10 information about the vendor who sent the device to
11 them originally.

12 We've had a number of different
13 inspections. There's been an inspection program that
14 has gone along with this to go out and find general
15 licensees that we have lost track of ourselves
16 through we've done mailing out and we've received the
17 mail back as undeliverable so we've gone out and done
18 inspections to try to find those general licensees.
19 They may have just changed their address. They may
20 have moved down the street and that's happened in a
21 couple of cases. So we have increased the awareness
22 in that way. We have also increased the awareness
23 across the regulatory community both within the
24 headquarters as well as regions that we've increased
25 the awareness of these problems that we've seen as

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1 well.

2 MEMBER GARRICK: Have you lost any sources
3 in the meantime?

4 MR. BROADDUS: We've found a number of
5 instances where sources have been lost. Whether
6 they've been lost subsequent to the rules going in
7 place, we've actually did have an enforcement case
8 recently where a source was lost, was found detected
9 at a scrap facility. It was a general licensee
10 facility where we had sent a registration to. What we
11 found out in that case is that the general licensee
12 had thought that they had done an adequate review and
13 they realized that they hadn't done an adequate
14 review. Basically that resulted in a lost device.
15 That's probably the only one that I can think that has
16 been specifically related to this particular program.
17 But what we have as I indicated found a number of them
18 that had been either lost or improperly transferred or
19 either prior to this rule going into place or during
20 the rule being implemented when we have been able to
21 track it back to the licensee.

22 MEMBER GARRICK: One thing that I was very
23 interested in is the note about developing a tracking
24 system. How do you see that? Do you see that
25 primarily as a procedure or new technology or a

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1 combination of those?

2 MR. BROADDUS: Are you talking about the
3 Chairman's proposal?

4 MEMBER GARRICK: Yes.

5 MR. BROADDUS: My understanding is that
6 it's an evolving issue. As I said the information
7 that I have is that the Chairman has put up a proposal
8 to develop a system. I don't know whether it would
9 specifically address new technologies but it would
10 discuss the means by which we could track the
11 materials that the licensees would have. It may
12 include additional technologies from that standpoint.

13 MEMBER GARRICK: One piece of advice there
14 an oversight or innovative that I was involved in
15 looking at the WIPP transportation system and DOE's
16 attempt to build a rather elaborate tracking system
17 for --

18 MR. BROADDUS: (Inaudible.)

19 MEMBER GARRICK: -- and the further
20 examination of that revealed that there were a number
21 of commercial systems which had superior performance
22 specifications and at much less cost. The thought
23 here is that if you are going to develop a tracking
24 system, you really ought to take a hard look at what's
25 in the commercial field.

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1 MR. BROADDUS: In fact I indicated that
2 the licensee tracking system that we currently have is
3 one system that we are looking to replace. It's an
4 older system. We are looking to update that and
5 replace it with a client server-based system. We have
6 in going out and looking at off-the-shelf systems that
7 can be used for that purpose found that some of those
8 if they had been available at the time when we did the
9 general licensee tracking system would have been good
10 systems to use as well for that. We did an analysis
11 at the time and were not able to identify anything at
12 that time that was available. So that's why we
13 developed that in-house.

14 MEMBER GARRICK: I would think with the
15 GPS technology that now exists there ought to be some
16 alternatives.

17 VICE CHAIRMAN WYMER: Milt.

18 MEMBER LEVENSON: I have a couple of
19 questions. The first one is just to follow up on a
20 comment on John's system. You can now buy a new car
21 that comes with a tracking system in it. I'm not sure
22 why we should need to develop anything since it's
23 cheap enough to put into a new car.

24 MR. BROADDUS: Well, the GPS system has
25 some limitations to it first of all. There is a

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1 limitation of how the radiation would interfere with
2 the tracking of it. Also the reason it works well on
3 a car is because it's always outside exposed to the
4 satellite whereas the radioactive materials may be
5 underneath in a cover somewhere so it would not have
6 a signal to be able to track it in that case. Also in
7 the very harsh conditions that these devices would be
8 used in they could also destroy a GPS system
9 relatively quickly.

10 MEMBER LEVENSON: Yes. The question is do
11 you attach it to the outside of the shield or the
12 inside but that's a whole separate issue.

13 MR. BROADDUS: Actually that has been
14 brought up and I believe some people are looking at
15 the feasibility of that. They've indicated that they
16 want to try to but how far they've gone I haven't
17 heard recently.

18 MEMBER LEVENSON: I have one question
19 which is the matter of clarification. You indicated
20 that there are reports that need to be made on losses
21 of sources and on transfers of sources. Does the
22 report require if they relocate a source previously
23 reported lost?

24 MR. BROADDUS: Anybody who has a generally
25 licensed device or general licensee who has a device

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1 would have to report anytime that they would either
2 transfer or lost a device or if they move from one
3 location to another, yes, would have to report that to
4 us. Now if they don't realize that they have it
5 because it had been lost previously or they --

6 MEMBER LEVENSON: They just find. It was
7 just reported lost but it really wasn't. Does that
8 get recorded?

9 MR. BROADDUS: Well, they should update
10 the NMED to our reporting requirements that they now
11 have it. Now the specific licensee they would have to
12 have it tracked in the accounting system where they
13 would go back to their inventory and update their
14 inventory obviously.

15 MEMBER LEVENSON: The other question I
16 have is who has access to the database.

17 MR. BROADDUS: Right now, it's only a few
18 people within NRC. Basically the database we have now
19 is only limited for the GLTS NRC employees and
20 primarily people here in the headquarters. We're
21 working on a module that would allow the inspectors to
22 have that access as well so they can have the
23 information more readily available to them when they
24 want to do an inspection of a general licensee. For
25 right now, the headquarters program office provides

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1 that information to the inspectors.

2 MEMBER LEVENSON: I would suggest that in
3 today's world you might want to consider further
4 restrictions on who has access to that database rather
5 than expanding access.

6 MR. BROADDUS: It's still going to be
7 limited to just NRC users. It contains propriety
8 information as well. So we have to protect it from
9 that standpoint from the public and not allowing
10 public access.

11 MEMBER LEVENSON: I think from a security
12 standpoint.

13 MR. BROADDUS: Yes. There is no intent to
14 provide general access to the public or to a large
15 audience of users. It is intended to be restricted
16 and we do have some security built into it now and we
17 are enhancing the security of it as well at this
18 point.

19 CHAIRMAN HORNBERGER: Doug, I'd like to
20 make a connection back to the question that Ray asked
21 Joe in the first presentation. That is your
22 perception of how the various states are functioning
23 more with regard to orphan and lost source. I
24 understand since February 21 they all have to be
25 essentially identical for a general license.

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1 MR. BROADDUS: For the general license
2 program?

3 CHAIRMAN HORNBERGER: Yes. But prior to
4 that they didn't have to be essentially identical.

5 MR. BROADDUS: No, and as Joe indicated,
6 their programs could be quite different from one state
7 to another. Each state handled their general licensee
8 program based upon what they perceived as the need for
9 that program. For example, one state indicated that
10 they would not allow generally licensed devices. They
11 would require a specific license for all devices.

12 There are some states that have
13 implemented registration programs even before NRC's
14 was in place. There are other states that have done
15 the minimum necessary was to collect the reports that
16 were made to them to insure that the vendors are
17 making their reports. So it varied from one state to
18 another. But in general they have all tried to have
19 a program that has done basically what is necessary
20 for the general license program.

21 Since we implemented these requirements,
22 we have identified a few problems. We are working to
23 try to work out those problems where states may not
24 have had all the information available to them or may
25 have not fully understood exactly what all the

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1 requirements were or in implementing them. But that's
2 been rare. There have been a couple states that we
3 are working with to try to work that out. I can tell
4 you that it's my understanding that it's only a few
5 instances.

6 CHAIRMAN HORNBERGER: That has to do with
7 how they handled the general licenses. Now if we look
8 at where we are today and we consider that there are
9 a certain number of lost, orphan sources and we would
10 like to locate them and recover them right the ones we
11 can obviously.

12 MR. BROADDUS: Yes.

13 CHAIRMAN HORNBERGER: If you had to grade
14 the states first of all the non-agreement states, is
15 NRC giving them a grade of A in all of those states?

16 MR. BROADDUS: Well, it depends upon
17 whether you are grading them on a bell curve. I would
18 say all the regulatory agencies have had problems in
19 the past in both tracking and in finding and dealing
20 with orphan sources, in tracking lost materials across
21 the board. I think that we're all trying to work to
22 improve those programs. Some states have a higher
23 level of funding to be able to do more intensive
24 programs than others.

25 But I don't know of any specific problems

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1 right now in any of the states on dealing on orphan
2 sources beyond the funding issue of being able to
3 dispose of it. That's why one of the reasons we have
4 the CRCPD program and we're providing funding for that
5 is to insure that the funding is available if an
6 orphan source is found and needs to be dispositioned.

7 CHAIRMAN HORNBERGER: So that the 50 to 60
8 percent of the ones that are reported lost and have
9 not been found these are either not a concern or if
10 they are a concern you are convinced that everything
11 possible is being done.

12 MR. BROADDUS: What I can tell just to
13 give you some data on what types of sources are out
14 there and I may have missed this in my presentation
15 but I intended to tell you is basically 90 percent of
16 the devices and sources that are out there are tritium
17 exit signs and static eliminators. So you have
18 basically the 10 percent left that don't fall into
19 that category.

20 Probably one percent of the total are
21 really the highest risk sources that you are talking
22 about. These are the ones that could really cause
23 some type of exposure to someone who is a member of
24 the public, an overexposure or even possibly some type
25 of acute problem, health effects. As I indicated with

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1 the radiography example, there are very few reports
2 that we actually receive where those are either lost
3 or stolen. There are almost no reports where they are
4 stolen and it's rare to actually have one where it is
5 lost as well. Does that answer your question?

6 MEMBER RYAN: I was going to follow up
7 with a similar question that I asked earlier about
8 those consequences. Obviously the security issues are
9 clearly in front of us. But as you marched through
10 this and picked sources, have you (1) done any dose
11 evaluations from folks that handle it or perhaps
12 mishandle it and (2) what do those numbers look like?
13 Again I separate out the obviously injury exposures
14 that have occurred and there are half a dozen of those
15 cases that we know about.

16 MR. BROADDUS: In almost every case when
17 a state or the NRC responds to a loss or a found
18 radioactive material we do some sort of assessment as
19 to the potential dose consequences. If it's been
20 found, we'll try to trace it back through its path to
21 find out where it went to and who could have received
22 exposures in those cases. If it's lost, we look for
23 the potential pathways it could have go as well and
24 look for the potential for exposure in those cases.

25 I don't have specific data on the actual

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1 doses. I can only tell you from my own experience in
2 most cases the minimal there have been some cases
3 where they have actually exceeded the regulatory limit
4 for members of the public. In other cases, where
5 there is a potential that it could have exceeded
6 exposures for occupational exposures as well but
7 that's not often that that occurs.

8 MEMBER RYAN: So most of them are just
9 nominal or trivial and some of them might have been at
10 a 100 milligram a year level or up to five REM a year.

11 MR. BROADDUS: Based on my experience,
12 that's what I would have to say, most of them, but
13 there have been some that have been above that.

14 MEMBER RYAN: Yes.

15 MR. BROADDUS: I can get you some more
16 specifics.

17 MEMBER RYAN: No, that's fine. I was just
18 curious what is the general breakdown is but would you
19 say that the majority are in that pretty low end
20 category.

21 MR. BROADDUS: Yes.

22 MEMBER RYAN: Okay. Thanks.

23 VICE CHAIRMAN WYMER: Any other questions?

24 MEMBER GARRICK: Just one. Of the orphan
25 sources knowing what they are, are you tracking what

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1 would be the curie risk with time of the loss sources?
2 In other words, the good news about radioactive
3 sources that they have is that they have a half-life.
4 So when you heard the numbers in the context of
5 hundreds or thousands that have been lost that sounds
6 horrible. But if you heard a number that said here's
7 what the curie content of those was from the beginning
8 but at the level of which it is expected to be now, it
9 might not be a big deal. Do you do those kind of
10 analyses?

11 MR. BROADDUS: We looked at that in
12 general as to how many of the materials that are out
13 there are long-lived isotopes and the higher activity
14 isotopes that could possibly be long-lived and could
15 be a problem for the long time.

16 MEMBER GARRICK: Right.

17 MR. BROADDUS: The majority of them are
18 the shorter. I mean there is a lot of medical uses as
19 Joe indicated that have very short half-lives where
20 they have found material. You have breaking therapy
21 source using iodine. You have the diaper sources.

22 MEMBER GARRICK: But you see to me it's a
23 very important point because the press will only pick
24 up the number of sources and that they are lost. If
25 it turns out that the radiation levels are pretty much

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1 trivial, then that information would seem to me to be
2 critically important.

3 MR. BROADDUS: I don't have the specifics
4 on it but again from my own experience in seeing the
5 events, the majority of them are shorter half-lives.

6 MEMBER GARRICK: Yes.

7 MR. BROADDUS: And within six months or
8 less, they will decay down pretty much to nothing.

9 MEMBER GARRICK: Yes, if you have 2,000 or
10 3,000 out there and it turns out that only 35 have any
11 significant source left in them, that's a reassuring
12 observation that I would the regulators ought to be
13 prepared to answer.

14 MR. BROADDUS: It is also the activity
15 itself in the level of hazard of the device. For
16 example, even if you broke a tritium exit sign open
17 and we've actually had a couple of instances where
18 people broke open tritium exit sign, the analysis that
19 we've done, even though they may have 10 to 20 curies
20 of tritium in them, has determined that they received
21 less than 100 milligram for those exposures.

22 MEMBER GARRICK: Yes.

23 MR. BROADDUS: From a health and safety
24 standpoint --

25 MEMBER GARRICK: Maybe you've done this

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1 but it would seem to me a risk assessment of the loss
2 sources would be a valuable piece of information.

3 MR. BROADDUS: We do have a risk group
4 that has done a risk assessment of the potential
5 consequences for various different types of materials
6 and different types of uses. It's a rather thick
7 analysis that they have. I don't have the specifics
8 with me.

9 MEMBER GARRICK: I'm thinking it's
10 something that would be put on one page and would
11 really be revealing about the whole loss source issue.
12 I think there's a tendency for us to not think in
13 those terms and yet that's how the public thinks.

14 MEMBER LEVENSON: I was going to follow up
15 on John's comment. In fact as you move in toward
16 either expanding databases or tracking systems you are
17 going to have limited resources. Somebody ought to be
18 doing a risk assessment so that you only track or
19 worry about making sure you have in the database those
20 things that have a potential to be public health and
21 safety issues rather than tracking everything that
22 should be using risk assessment as a basis.

23 MR. BROADDUS: My understanding is that
24 the proposal that's been put forward which is the
25 Chairman's proposal was that it would be limited to

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1 those that could have the potential for risk. For
2 example, also in the general licensee tracking system,
3 we only do the annual registration for the higher risk
4 sources. We don't register the tritium exit signs and
5 the static eliminators because they are at very low
6 risk. So we have done a risk approach to these
7 tracking systems up to this point.

8 MEMBER RYAN: Did I understand that you
9 have actually written off the decayed sources or are
10 you still carrying those in there?

11 MR. BROADDUS: They are still in the
12 database. Yes, they are still listed as any event
13 that was reported. Any loss source that was reported
14 stays in the database forever so we have the
15 historical information if needed.

16 MEMBER RYAN: But I mean in terms of
17 tracking routinely and requiring for --

18 MR. BROADDUS: You mean for the generally
19 licensed devices?

20 MEMBER RYAN: Yes.

21 MR. BROADDUS: We have now built into the
22 system the ability to basically code what happened to
23 that device. If it gets lost, it stays in the system
24 but it is now indicated as being a loss device. It is
25 no longer indicated as being with that licensee but

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1 now we can track it back to find out if that licensee
2 had it. It will stay in the database forever as being
3 a device that was at one time --

4 MEMBER RYAN: Just on the basis of decay
5 though I guess is my point. I don't know the range of
6 devices and half-lives well enough to know but what
7 fraction of the total number of generally licensed
8 sources are actually inoperative at this point because
9 they have decayed away, tritium for example as some of
10 those light sources and other things.

11 MR. BROADDUS: They are replaced every
12 five years or so. Static eliminators are replaced
13 every year.

14 MEMBER RYAN: Right.

15 MR. BROADDUS: Those are your two biggest
16 numbers that are in there.

17 MEMBER RYAN: Static eliminators are at a
18 low risk and I agree with you for lots of reasons but
19 I think that it looks like a lot of sources but
20 there's probably a very small subset that's really at
21 risk.

22 MR. BROADDUS: Yes, the two million that
23 we have total or the 1.8 million that we have
24 approximately in the general license database I'm sure
25 that some of those are no longer actually out there.

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1 It's just that we didn't receive the report from the
2 general licensee that they got rid of it. So you are
3 right. There are probably some of them in the
4 database that are actually not there.

5 Through this process of registration,
6 we're getting updates on a lot of that information
7 although the static eliminators and the tritium exit
8 signs are not ones that are being registered. We do
9 include that list when we sent it out to the general
10 licensees for their own information. We are providing
11 a listing of information for all the devices that we
12 have but not asking them to register those devices.

13 MEMBER RYAN: Does it include anything to
14 do with radioactive material in consumer products?

15 MR. BROADDUS: No.

16 MEMBER RYAN: Thanks.

17 VICE CHAIRMAN WYMER: Any other questions?
18 Thank you very much, Doug.

19 MR. BROADDUS: All right.

20 VICE CHAIRMAN WYMER: It's good to see the
21 program in place. The agenda shows that we quit at
22 12:30 p.m. but these have come up which require us to
23 quit at 12:00 noon. I had indicated earlier to Paul
24 Lohaus that we would try to fit it him before lunch.
25 However in order to do him justice, we can't do that.

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1 I apologize, Paul, but that's the way it turned out.
2 I think I'll turn it back to our Chairman.

3 CHAIRMAN HORNBERGER: Thanks, Raymond.
4 We'll pick up with our regular schedule at 1:30 p.m.
5 I do want to break in just a few minutes. I thought
6 that we might take this opportunity. Raymond had
7 drafted a letter dealing with sealed sources that was
8 in our meeting book. Given the presentation this
9 morning, I think we should think about whether the
10 questions we had that led to that letter are now
11 answered or whether we think that a letter is still
12 called for.

13 VICE CHAIRMAN WYMER: It depends a little
14 bit on the purpose of the letter.

15 PARTICIPANT: (Off the microphone.) Where
16 is the letter in there?

17 CHAIRMAN HORNBERGER: Handwritten 66.

18 VICE CHAIRMAN WYMER: I personally think
19 the topic is timely enough that a letter report to the
20 Commission is probably still a good idea because of
21 the terrorist implication that has come up. So maybe
22 we consider including some of this new information
23 we've heard. We probably should do that and then try
24 to push the letter on out. That's my feeling.

25 MR. CAMPBELL: Just a point of

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1 information, most of what you heard about today is not
2 Greater Than Class C waste. The sealed source is.

3 VICE CHAIRMAN WYMER: We understand that.

4 MR. CAMPBELL: Virtually everything you've
5 heard about today with some exceptions is --

6 VICE CHAIRMAN WYMER: The draft letter we
7 have is specifically aimed at sealed sources so it's
8 not a Greater Than Class C.

9 CHAIRMAN HORNBERGER: The focus of the
10 letter I think Andy is right is on those sources that
11 happen to be Greater Than Class C. We recognize that
12 it's not the bulk of them. In fact, I think that was
13 one of the points that John was making just a minute
14 ago. The vast majority of them are not Greater Than
15 Class C but there are a few.

16 VICE CHAIRMAN WYMER: But the thrust of
17 the letter is not to address the issues associated
18 with Greater Than Class C waste.

19 CHAIRMAN HORNBERGER: Actually the letter
20 if you come down to the recommendation that it is
21 specifically to deal with sealed sources that are in
22 the GTCC category. Now I'm not suggesting the letter
23 has to retain that focus. I'm just saying that was
24 the focus of the letter that we prepared. So,
25 Raymond, your view is that the letter should be

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1 modified obviously but it's worth preparing a letter
2 to go to the Commission.

3 VICE CHAIRMAN WYMER: Yes.

4 CHAIRMAN HORNBERGER: Are there other
5 comments or views to be heard?

6 MEMBER GARRICK: The only other thought
7 would be if we heard something today that was not
8 necessarily a Greater Than Class C issue but a sealed
9 source issue that we felt was important and we wanted
10 to embrace that in the letter.

11 VICE CHAIRMAN WYMER: Yes, I think we
12 should, John. We should include that sort of thing.
13 There are some good things we can say.

14 CHAIRMAN HORNBERGER: Okay. So it strikes
15 me then that what we should do is charge Raymond with
16 revising the letter or rewriting however you want to
17 approach it.

18 MEMBER GARRICK: Maybe after some
19 discussions.

20 CHAIRMAN HORNBERGER: Possibly after some
21 discussion. Do you want to think about it or are
22 there main points that you want to put on the table
23 for Raymond right now while everything is fresh in our
24 minds?

25 VICE CHAIRMAN WYMER: That's a good point.

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1 MEMBER LEVENSON: If we're talking about
2 the bulk of the sealed sources that are not Greater
3 Than Class C, what's the message in our letter?

4 VICE CHAIRMAN WYMER: The message is I
5 think that there are procedures in place now for
6 tracking these sources that are substantially better
7 than heard of a year or a year and a half ago and that
8 we have reason to feel more comfortable about the
9 situation.

10 DR. BAHADUR: I believe the issue came at
11 a time when the DOE came and talked to us specifically
12 about Greater Than Class C materials. Their
13 presentation was based on a request which had been
14 made on the budget is to be Greater Than Class C. Now
15 if the Committee believes that we are trying to move
16 away from Greater Than Class C then the subject is
17 going to be sealed sources which may or may not be
18 Greater Than Class C then my suggestion would be to
19 drastically change the letter because when you see the
20 presentations by the two states and you see the
21 presentation made by the NRC staff, the problem
22 doesn't seem to be as bad as it appeared at the time
23 when DOE came and did Greater Than Class C
24 presentations. So my suggestion would be rather than
25 making --

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1 VICE CHAIRMAN WYMER: Cosmetic changes.

2 DR. BAHADUR: -- bad changes in this
3 letter, the Committee should rethink about whether we
4 want to write a letter on sealed source and if yes,
5 what message are we trying to give.

6 CHAIRMAN HORNBERGER: I think that was
7 Milt's question. I think that was precisely Milt's
8 question. I think Raymond's answer was basically that
9 the letter would be to say that from what we've heard
10 today we are much reassured that the problem is really
11 not significant. Mike.

12 MEMBER RYAN: You know you could think
13 about it actually as two problems. I agree that a
14 letter reflecting all of the program work that has
15 gone on is important and helpful and it's very good.
16 There's a lot of coordination between the NRC and the
17 states. I think that's very good. CRCPD is involved
18 so there's a national commonality to the program.
19 There is access to resources. There are lots of very
20 positive things to talk about.

21 In this small context, Greater Than Class
22 C, it is really an artifact of the classification
23 system. These small sealed sources can be trivial in
24 activity yet can be Greater Than Class C based on a
25 volumetric calculation. So to try to put Greater Than

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1 Class C into this detailed discussion of very good
2 programmatic work I think dilutes your focus on this
3 programmatic activity to grab a hold of this.

4 So I agree with Sher very much. Then if
5 there are other than Greater Than Class C issues that
6 have their own merit which is really a question of
7 disposition of where a Greater Than Class C goes
8 ultimately for disposition, that's really a different
9 kind of issue. I would suggest that we think about
10 maybe splitting the two points and as you suggested,
11 Ray, focus on a letter that really gives some feedback
12 on what we've heard today.

13 VICE CHAIRMAN WYMER: I would like to
14 propose that I work with Mike on drafting the letter.

15 CHAIRMAN HORNBERGER: I figured that was
16 coming.

17 (Laughter.)

18 MEMBER GARRICK: One comment I would like
19 to make on this though is that I think that the
20 Committee is most effective when it deals with
21 problems. I wouldn't be in favor of writing a letter
22 if it's just an "atta boy" letter. If there are some
23 issues that need to be dealt with and that we can make
24 constructive recommendations on how to deal with them,
25 then I think a letter is warranted. Beyond that, I

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1 would rather go shake their hands and say you did a
2 hell of a good job and forget it but not write a
3 letter just to do that.

4 MEMBER RYAN: I think there are actually
5 some issues that you could think about. One is this
6 program is in its early stages. Two is there are
7 questions of how a landfill and how others are going
8 to use it.

9 MEMBER GARRICK: Right.

10 MEMBER RYAN: So I think there are some
11 technology questions and some other things that you
12 could put in but I think we have focused on it's nice
13 to --

14 MEMBER GARRICK: Well, the point is we
15 haven't written a letter.

16 MEMBER RYAN: Right.

17 MEMBER GARRICK: If we have written a
18 letter with a lot of negative stuff in it and now we
19 hear all this good stuff it would warrant us writing
20 a letter and say we like the progress that you have
21 done and so forth. But we haven't written a letter.
22 So right now, we have a clean sheet of paper and we
23 should try to address problems in a way that is
24 helpful.

25 CHAIRMAN HORNBERGER: So what I would

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1 suggest is that Ray and Mike be given the task of
2 coming up with three or four or whatever it is issues
3 such as landfill would be that the letter would focus
4 on. Then we can have a discussion to see if the
5 Committee agrees. Then the letter could go forward to
6 be drafted.

7 MEMBER GARRICK: I think one of the issues
8 should be this tracking business.

9 CHAIRMAN HORNBERGER: Yes.

10 MEMBER GARRICK: And being very
11 intelligent about how we do that.

12 MEMBER LEVENSON: I think it's worth
13 commenting because of all of the public numbers if we
14 write a letter including a comment putting in
15 perspective what a small fraction of those sources
16 represent any potential risk to the public. When we
17 do that then we can include a reference that says
18 while the group is apparently very well organized to
19 recover and identify, etc. sealed sources, there still
20 remains the issue of ultimate disposal of those that
21 are Greater Than Class C.

22 CHAIRMAN HORNBERGER: Which is a part of
23 this letter.

24 MEMBER LEVENSON: Yes. And consider that
25 issue.

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1 MEMBER GARRICK: And I'm glad you
2 mentioned the word "risk" before I did.

3 MEMBER LEVENSON: I always use four letter
4 words.

5 MEMBER GARRICK: But I think that it's
6 very important for the group that we heard from today
7 to take a risk-informed perspective on this issue and
8 I don't think that's been done.

9 CHAIRMAN HORNBERGER: I want to break
10 because we have a 12:15 p.m. appointment. I want the
11 Committee to grab lunch and meet in the subcommittee
12 room so bring your jacket. We are adjourned until
13 1:30 p.m. Off the record.

14 (Whereupon, the foregoing matter went off
15 the record at 12:02 p.m. and went back on
16 the record at 1:32 p.m.)

17 CHAIRMAN HORNBERGER: We are back on the
18 record. We are continuing this afternoon with a
19 presentation on the agreement states program and again
20 the cognizant member is Ray Wymer and I'll turn the
21 meeting over to Ray.

22 VICE CHAIRMAN WYMER: Thank you. We're
23 going to pick up where we left off this morning. This
24 afternoon our first presenter is Paul Lohaus who is
25 the Director of the Office of State and Tribal

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1 Programs. He's going to discuss with us the
2 implementation of the NRC Oversight Program Integrated
3 Materials Performance Evaluation Program. Paul.

4 MR. LOHAUS: Thank you very much. It's a
5 pleasure to be here. Let me start with two
6 introductions. I would like to recognize Josie
7 Piccone. She is Deputy Director for the Office. Also
8 Kathy Schneider who is a Senior Project Manager and
9 has responsibility for the acronym we use is our IMPEP
10 program, the Integrated Materials Performance
11 Evaluation Program.

12 I'm going to talk off a set of slides that
13 we put together and what I thought we'd do is maybe
14 cover a broad background in terms of the genesis of
15 the program and some aspects that I think are
16 important. There are some current issues that I think
17 are important for you all to have some information on.
18 Then maybe we can focus on our Integrated Materials
19 Performance Evaluation Program. But if we can move on
20 to the first slide. Some of these I'm going to go
21 through rather quickly so stop me at any time if there
22 are any questions or if you want me to amplify any of
23 the points further.

24 The background on the agreement state
25 program goes back really to the Manhattan Engineering

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1 District. As you are aware, that program was really
2 from a health and safety standpoint was reserved to
3 the Atomic Energy Commission. The states went to
4 Congress in 1959 and argued that they should have
5 their traditional health and safety role and
6 responsibility for regulating the bi-product, the
7 source and especially the nuclear materials.

8 Congress responded and passed legislation.
9 It's Section 274 and basically defined a cooperative
10 program. What that legislation also did is it
11 provided a mechanism for NRC to transfer to the states
12 certain of its regulatory authority. I want to
13 emphasize this point because the Agreement State
14 Program is a different legislative program than the
15 other Federal-state relations programs.

16 For example, you are probably familiar
17 some of the delegated programs. This is not a
18 delegated program. In this case NRC relinquishes and
19 the states assume under independent state statutes and
20 regulations responsibility for certain categories of
21 materials. So NRC is really giving up authority here
22 and that's an important distinction.

23 If you move on to the second slide. It
24 did reserve certain areas to NRC and I'll talk more
25 about these later. It was also modified in 1978 to

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1 direct NRC to periodically review the performance of
2 the agreement state programs and also was further
3 amended in 1980 to give an NRC authorization to
4 suspend all or part of an agreement in the event of an
5 emergency. Maybe the final point here is that there
6 has always been an oversight program that NRC has
7 exercised and this was made more formal in 1978 with
8 the change to the statute.

9 If we move on to the fourth slide I think
10 this information has been presented earlier and I
11 won't dwell on it. There are three states, Minnesota,
12 Wisconsin and Pennsylvania that are currently in
13 negotiating agreements. Connecticut has legislation
14 under consideration. There are other interests in
15 other states as well.

16 Move on to the fifth slide. I want to
17 talk a little bit about funding. With most of the
18 delegated programs, there is Federal funding that goes
19 with those programs, the clean water, the clean air
20 programs under EPA. In this case, although NRC does
21 have the ability to provide seed money for states to
22 negotiate agreements we have chosen by policy not to
23 provide seed money.

24 The legislation does not provide for
25 operating funds that would be provided to the states

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1 by NRC. They must provide their own budgets and
2 budget the programs. In the early stages of the
3 program, NRC used to fund all of the training and we
4 used to also pay the travel and per diem for state
5 staff to attend training.

6 The Commission wrestled with this issue
7 from a fee equity standpoint. In 1997 we stopped
8 funding state training and the travel and per diem
9 reimbursement for states to attend our courses or to
10 attend meetings. This has been an area of continuing
11 concern to the states. They believe there is at least
12 a continuing obligation that NRC has given the earlier
13 efforts to provide that.

14 But we ceased that. We do provide
15 training where the states pay tuition. Last year for
16 example there was about \$200,000 of tuition fees that
17 were recovered from the states, about a 250 state
18 staff that attended our training courses and they paid
19 their own travel and per diem.

20 Similarly when it comes to providing
21 direct licensing or technical assistance, that would
22 be done on a fee chargeable basis. We do provide
23 routine technical assistance to the states in terms of
24 answering questions on regulation, how would the NRC
25 license particular activities, how would we approach

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1 a particular inspection issue and things like that at
2 no cost. But if it's actually doing work for them,
3 it's done on a fee chargeable basis.

4 Let's move on to the sixth slide. What's
5 here and on the next slide are basically the
6 categories of agreements. The standard agreement
7 would cover the bi-product, the source and small
8 quantities of specialty nuclear material. It's all
9 categories of licensees except uranium recovery and
10 low level waste. The state does have the option to
11 select whether they would want to exercise
12 jurisdiction over the review in approval of sealed
13 sources and devices. What we call the device
14 evaluation, the registration authority.

15 If you move on to the next page, some
16 states maintain along with their standard agreement
17 uranium mill agreement authority. For example,
18 Washington has that authority. Texas does. Some
19 states also have low level waste authority. For
20 example, California and Texas are two that have that.
21 Obviously the full agreement would include the full
22 suite of those categories.

23 Let's move on to the next. What's shown
24 here are the areas of authority that are reserved to
25 the NRC. We have a set of implementing regulations in

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1 Part 150. I'll mention a few of these: protection of
2 common defense and security. This is one area that's
3 reserved to the Commission. Obviously this area is of
4 greater significance today given 9/11 and our response
5 to those activities. Federal agencies are retained by
6 NRC.

7 Reactors, exports, imports, high level
8 waste disposal, the transfer of products, the persons
9 exempt from licensing. Part of the thought here is
10 that you wanted to have a central control over the
11 distribution of consumer products that would be exempt
12 from further regulatory control, watches, smoke
13 detectors and things of that nature and that's
14 reserved to the NRC.

15 Let's move on to the next slide. One of
16 the things that we did in the program about seven
17 years ago I guess what I would call is a reengineering
18 or reinvention of the program. Out of that came two
19 new key policy statements. One of the statement of
20 principles and policies for the program which sets out
21 the overall framework, the concept of operation,
22 responsibilities of NRC and the states.

23 A second was to define adequacy and
24 compatibility. There is a second policy statement
25 that we use that provides guidance to the staff as

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1 well as the states on the adequacy and compatibility
2 part of this.

3 The third policy statement that's there,
4 the criteria for guidance to states, is a policy
5 statement that has been in effect since the beginnings
6 of the program. It was amended in 1981 but that
7 basically provides guidance on entering into
8 agreements.

9 We also have a rather extensive set of
10 implementing procedures. I have highlighted one of
11 those: SA-700, "Processing of a New Agreement." Also
12 highlighted is the Management Directive 5.6 which
13 covers our Integrated Materials Performance Evaluation
14 Program.

15 Let's move on to the next slide. Here it
16 shows the major components that a state interested in
17 entering into an agreement would need to include in
18 its request for an agreement. It's basic information.
19 They need to have a program that's essentially
20 comparable to NRC's program from the standpoint of
21 their statutes and regulations, the licensing program
22 and procedures they apply, inspection and enforcement.

23 I really want to dwell on the fourth item
24 which is adequate number of trained and qualified
25 staff. This is a key area as in any program. What we

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1 have found, and I want to talk about this a little bit
2 further, is that this is one of the key areas that we
3 really emphasize with a new agreement state.

4 We're finding that some of the existing
5 agreement states that some of the performance
6 difficulties that they are experiencing are
7 attributable to difficulties that they are
8 experiencing in retaining staff, getting staff
9 trained, providing competitive salaries. This is an
10 area that is a challenge for the states. We found
11 that it is affecting and has affected their
12 performance. Procedures for fair and impartial
13 administration. Finally a program that deals with
14 response to incidents and events and response to
15 allegations.

16 Let's move on to the next one. What does
17 NRC must do before a state becomes an agreement state?
18 There are basic requirements that are in the statutes.
19 You all may be familiar with these but basically we
20 have to find the program compatible. We also have to
21 find the program adequate to protect public health and
22 safety.

23 We do this using the earlier policy
24 statement and the procedures. There is a whole set of
25 criteria in there. We prepare a staff assessment.

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1 There are 26 some odd criteria that we use when we go
2 through and evaluate the program against those
3 criteria, prepare an assessment which is published and
4 made available for public review and comment and
5 following that we set up a process that would provide
6 for an orderly transition of authority to the state.
7 We have a signing of the agreement. Then there is
8 normally a 30 day timeframe between the signing of the
9 agreement and the agreement becoming effective.

10 Let's move on to the next slide. What do
11 we do after the agreement is effective? There is a
12 lot of post agreement interaction. We exchange a lot
13 of information. There's a lot of daily telephone and
14 e-mail exchange. We do provide opportunity for state
15 staff to attend NRC training courses. I talked about
16 technical assistance earlier.

17 I wanted to highlight the performance
18 goals and measures. We have a set of performance
19 goals and measures that are in our strategic plan.
20 These are really national goals and measures. These
21 measures apply not only to NRC program but also to the
22 agreement state programs. And the event data that we
23 develop and maintain in our Nuclear Materials Events
24 database, the information on events and instances, is
25 used as a basis to prepare the performance measures

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1 information that's included in our performance report
2 to Congress.

3 We also have a very active program of NRC
4 and state involvement in dealing with rulemaking and
5 guidance issues. I'm going to digress here a little
6 bit given some of the discussion here this morning and
7 talk a little bit more about this and maybe come back
8 and talk specifically about some things that were done
9 dealing with generally licensed devices and
10 specifically licensed devices.

11 But there has probably been in the
12 neighborhood of 30 plus working groups that have been
13 set. These are groups that have involved NRC and
14 state staff where there's a common problem that's
15 identified and that group will go off and address that
16 problem and then make recommendations to the
17 Commission. One of these groups going back to June
18 1995 in recognition of the increased difficulties and
19 problems in source control and accountability both for
20 GL and specifically licensed devices, the Commission
21 approved the formation of the NRC and agreement state
22 working group.

23 That group over about a year's time period
24 held a series of public meetings, workshops, made
25 presentations to a number of different organizations,

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1 sought feedback, looked at the various regulatory
2 programs. One of the questions that you had asked
3 this morning is whether that had been any risk-ranking
4 that had been done.

5 I brought a copy of the report and what we
6 do is get this information and get that out to the
7 Committee members. But they did do some risk-ranking
8 in here. There is a more detailed table in the
9 appendix. They did identify some specific
10 radionuclides and activity levels that should be
11 selected if you will for increased oversight. So
12 there was some information. This was a joint effort
13 by the states and NRC. Out of this effort came a lot
14 of the activities that were discussed this morning in
15 terms of the --

16 VICE CHAIRMAN WYMER: What's the number?

17 MR. LOHAUS: It's NUREG-1551. This was
18 published in July 1996 I believe. Yes. It's actually
19 completed in July and published in October 1996. But
20 I thought this is a good example of the kind of
21 cooperative interaction because what I've seen in the
22 program as it's evolved and I'm going to talk a little
23 bit more about this later is that there's a
24 cooperative program and effort on the part of the
25 states and NRC to identify issues and then to set up

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1 a group. That group will work the issue, develop
2 recommendations and then those recommendations come
3 back for implementation. It seems to be a good
4 process and is helping strengthen the program, to
5 bring state expertise in this as well as NRC
6 expertise.

7 Let's move on to the next slide. Current
8 issues. I want to talk about three of these.
9 National Materials Program which is one of the things
10 that Joe Klinger highlighted earlier this morning. If
11 you look at the break-up of licensees nationally the
12 agreement states have responsibility for about 75
13 percent of the licensees. If you add three more
14 states, that's going to continue to increase.

15 In recognition of that, the Commission
16 asked to have a working group formed to take a look at
17 the question of as NRC's licensee base continue to
18 shrink and as the licensee based within the agreement
19 states continue to rise, should we be looking at some
20 alternative program frameworks? The major focus of
21 this was on NRC's activities which are supported by
22 licensees to provide the infrastructure, all of the
23 regulations, the rules, the supporting guidance for
24 implementation of the program nationally. Part of the
25 argument was that NRC license fees were covering the

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1 cost to develop products where there was a benefit to
2 the state and the state licensees who were not equally
3 sharing if you will in the cost of that.

4 So you are going to hear the term
5 "National Materials Program." You are going to hear
6 the term "alliance." The working group that was
7 charged with this activity looked at a number of
8 options. The options ranged from NRC taking back all
9 of the responsibility to giving it all to the states
10 and a number in between.

11 Their recommendation was for what they
12 call "an alliance structure" which is similar to where
13 the program is today but a more evolved state if you
14 will. It relies very heavily on leveraging state
15 resources, in other words, use of cooperative NRC and
16 agreement state working groups. But a larger share of
17 that would be handled by the states.

18 So we are sort of an evolution here in
19 terms of where the program is heading. We do have
20 some pilot programs that we're starting to further
21 test some of the concepts in the alliance and to
22 really try to come out with a process whereby there is
23 more equal sharing in the responsibilities for
24 development of the supporting infrastructure for the
25 materials program.

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1 Response to terrorist activities. I think
2 Doug Broaddus covered a number of these activities but
3 this is changing our relationship with the states. We
4 are working cooperatively with them in these areas.
5 But this is going to be a factor we are going to have
6 to deal with across the board with the states as we
7 move forward on our various response activities.

8 I mentioned earlier a difficulty faced by
9 a number of states to hire, train and retain staff.
10 I think one of the questions you asked this morning is
11 how are the state programs doing. If you look at our
12 IMPEP program across the board, the states carry out
13 effective radiation control programs. In some cases
14 they actually do more than NRC does. For example,
15 they may do more frequent inspections for certain
16 categories of licensees.

17 Some of the programs have experienced and
18 are currently experiencing difficulties. The primary
19 areas where they are experiencing difficulties are in
20 what we call the "status of the inspection program."
21 They are not keeping their inspections up to date.
22 They may not have timely response based on the results
23 of those inspections and also keeping their
24 regulations up to date.

25 We have a program that's focused on this.

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1 You are going to hear the term "heightened oversight."
2 Maybe to give you a couple of examples, we have two
3 state programs today, New Hampshire and Nevada, which
4 are on what we call "heightened oversight."

5 What we do if we find areas in the program
6 that do not meet the IMPEP criteria we will make
7 recommendations and then put the program on heightened
8 oversight. It requires the program to prepare a
9 program improvement plan. We follow that plan. We
10 come back and do a follow-up review. I'm going to
11 come back and talk more about that later. The key
12 message here I think is that when you look at the root
13 cause, it's principally loss of staff, some to
14 retirement, some move on to jobs elsewhere for higher
15 salaries and difficulty that they face in hiring and
16 training staff. That's seems to be a difficult
17 situation.

18 Some states have a very simple formula to
19 address this. They have very effective programs. For
20 example the Alabama program charges fees that are 75
21 percent of NRC's fees. Those fees are earmarked
22 specifically for their radiation control program.
23 They use those fees to train staff. They have a very
24 good record of attendance for example at the five-week
25 health physics course and other courses that we give.

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1 They also use some of that money to cross
2 train staff in other program areas so that as they
3 lose folks they have a succession and a cadre of
4 trained staff that move in to that program. And our
5 recent IMPEP review for their program for example
6 found them satisfactory across the board. So they met
7 all the IMPEP criteria fully. Let's move on to the
8 next slide and --

9 MEMBER RYAN: Paul, before you leave that,
10 I guess I've always felt that it's important to
11 recognize the states struggle with dealing not only
12 with the materials program under the agreement states
13 but they also have their own obligations for
14 electronic product, radiation as well as X-ray and so
15 forth.

16 MR. LOHAUS: Yes.

17 MEMBER RYAN: So they really have a two-
18 edged program in many if not all agreement states.

19 MR. LOHAUS: But most of the programs as
20 Mike indicates have X-ray programs. They have
21 mammography, the MQSA program, non-nauseating
22 radiation, tanning booths, the accelerated produced
23 material, naturally occurring materials, the radon
24 programs and radium in water, things of that nature.
25 So it's a broader based comprehensive program if you

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1 will as opposed to the narrow slice that we look at it
2 in the agreement materials program area.

3 Our Integrated Materials Performance
4 Evaluation Program as I mentioned earlier the Act was
5 amended and we do conduct these reviews under a
6 specific section of the Act. The second bullet talks
7 about a common process. In the past before we
8 reinvented the program, NRC had one process that it
9 applied for reviewing its materials programs within
10 the regional offices. We had a separate process that
11 we applied to the state programs.

12 What came out of a look at this was that
13 we really needed to have a common process. The
14 process that I'm going to talk to you about today is
15 a common process. The indicators, the performance
16 measures that we apply, are common to both NRC's
17 regional materials programs and the agreement state
18 programs. The same kinds of reviews, the same teams
19 that do the review, you will find at NRC regional
20 office during a review as well as each of the
21 agreement states.

22 The reviews are normally conducted on a
23 four year frequency. However if we find problems, we
24 will go back sooner. So we may go back in two years
25 or we may go back in a year. But on the average,

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1 reviews are conducted generally about every three or
2 four years.

3 The reviews are also scaled to the size of
4 the program. For a program like California, you will
5 have maybe a five member review team, sometimes a six
6 member review team. A state like Rhode Island, it may
7 only be a three member team.

8 VICE CHAIRMAN WYMER: When you make those
9 reviews, Paul, do you just go to the state office and
10 check their records or do you go out in the field and
11 look all over?

12 MR. LOHAUS: We do both. What we do prior
13 to the review is we ask the state to basically give us
14 a database of information on the program. We have a
15 standardized questionnaire we've developed and they
16 respond to that. That's used by the team to prepare.
17 We have, and we'll get into this, a series of
18 indicators that we go through.

19 But we also go out with their inspectors
20 which we think it's very important part of this and if
21 the review is done in a regional office, we go out
22 with the regional inspectors. If it's a state
23 program, we go out with the state inspectors to see
24 performance in the field. That's an important part of
25 the technical quality of the inspection indicators to

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1 have that data point in terms of how they are actually
2 performing in the field in making sure that what they
3 are doing is adequate to assess health and safety
4 issues, determine for clients and cover the areas that
5 you should cover during that part of the program.

6 I think I really touched on the last
7 bullet there that it's a team review. This team
8 includes staff from my group, staff from our regional
9 offices, staff from the materials program office here,
10 Nuclear Material Safety and Safeguards, and I think
11 very important, agreement states staff.

12 If you look at our program in the past, it
13 was done by a single individual normally, no agreement
14 state involvement. What we have today I think is a
15 much better process and not only is it I think
16 effective in terms of assessing performance but what
17 it's done is it's created a tremendous exchange of
18 information between the NRC staff and the agreement
19 state staff.

20 Good practices are identified and shared.
21 Josie and I go out for each of the exit briefings. In
22 other words at the end of the week, there's an exit
23 briefing and we go out and meet with the team. To me
24 a part of the beauty of the process is we're not there
25 as a member of the team but we're there representing

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1 management. The team is independent. They have a set
2 of criteria that they are using and they're expected
3 to make the hard calls on applying those criteria to
4 their program.

5 We're there to serve as a sounding board
6 and to help interact with the state management during
7 the review and also to help provide support for the
8 program. But one of the common messages and feedback
9 items that I get, and I always ask can we make the
10 process better and are there areas that you see we can
11 do things differently, is that I learned something,
12 I'm going to take something back to my program or the
13 program being reviewed says we had this problem here
14 and we found that the regional staff had a solution to
15 this and they are going to give me that and that's
16 going to help make my program better or visa versa.
17 It's a common theme and it really has helped bring out
18 the best practices and to share those practices among
19 the programs.

20 VICE CHAIRMAN WYMER: I'm just doing a
21 little simple arithmetic. You go out about once a
22 month.

23 MR. LOHAUS: We do. The answer is yes.
24 We do about 10 or so reviews a year. There may be a
25 couple of follow-up reviews too. But yes, on the

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1 average that's correct.

2 If we move on to the next slide. This
3 shows the indicators. What we did by necessity is we
4 broke these into two areas what we call common
5 indicators which apply to all programs, NRC's regional
6 programs and the states and basically it's the basic
7 essence or components of the program. How they are
8 doing on their inspection program? Are they up to
9 date? Are they getting their reports out on time?
10 Are they taking appropriate enforcement action? Is it
11 timely? Are they following up with licensing
12 corrective action? Things of that nature.

13 The team will go through and look at that
14 and look at that in the program. There is a set of
15 criteria that we have for judging the performance on
16 that. We have basically three ratings that we use.
17 We have a satisfactory rating which is the highest
18 rating. Obviously performance can range within that
19 satisfactory rating. The second would be satisfactory
20 with recommendations for improvement. The third is
21 unsatisfactory. There are criteria for each of those
22 ratings that are applied.

23 VICE CHAIRMAN WYMER: What's an allegation
24 in your sense?

25 MR. LOHAUS: Any allegation is an

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1 expression of concern. It may be a safety issue, a
2 safety concern. It may be alleged wrongdoing. It may
3 be an issue relating to a performance on either
4 individual staff in the agreement state program. But
5 basically it's a concern that the state would take and
6 follow up on or we would take and follow up on.

7 Technical quality of inspections. We
8 talked about this earlier. We go out with our
9 inspectors. But what we also do is we pull selected
10 range of inspection reports. Obviously we can't look
11 at every report but we go into certain areas and pull
12 selected reports and then we check.

13 Do the reports adequately document the
14 scope of the inspection? Do they provide an adequate
15 basis for any findings? Do they support any NEI
16 compliance items that are issued? If there is
17 escalated enforcement action, was that properly
18 supported, properly taken?

19 Technical staffing and training. Again I
20 can't emphasize this area enough. In any program it's
21 a key item and we focus to make sure they have enough
22 staff, that they are trained. They have a training
23 and qualification program. Their staff are trained
24 and qualified against that program.

25 Comparable to what we do in inspections,

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1 technical quality of inspections, we do the same thing
2 in licensing. We look at selected licensing actions.
3 Was the application adequate? Was the review and
4 conclusions reached supportive of the information in
5 the application? Were the licensed conditions
6 appropriate? All the factors that go into licensing.

7 Then the final area is response to
8 instance and allegations. What I might indicate here
9 is given some of the discussion here this morning is
10 this current round of reviews that we are going
11 through, we are putting a lot of focus on this
12 particular indicator area from two standpoints. One
13 is in terms of the basic response that the state
14 takes. In other words, are they getting out promptly
15 if necessary onsite? Are they insuring that the
16 licensee takes proper action? Are they taking proper
17 action? Do they follow up? Do they close things out?
18 Do they take enforcement action if it's necessary?
19 All those aspects.

20 But the other part of it which is an area
21 that you all touched on this morning is what I would
22 call the "event reporting." We made this a mandatory
23 matter of compatability. Each state is expected to
24 provide event reports that they receive from their
25 licensees to the NRC for entry into our Nuclear

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1 Materials Events database.

2 There is a separate category of events
3 what we call the significant events. These are those
4 that require immediate or 24 hour notification. We
5 also ask that the states notify our operation center
6 for any of those events. What this does is it
7 provides an opportunity for us to get further early
8 information.

9 In many cases there may be areas where we
10 can provide assistance. For example we mentioned the
11 aerial radiological monitorings. One case that I
12 recall we had a discussion. We picked up DOE and
13 brought them in and got the aerial radiological
14 monitoring done. It's a very good process. It's
15 supportive of the states.

16 But I want to make it clear that NRC does
17 not have the jurisdiction or the responsibility for
18 response in these cases. It clearly rests with the
19 state. Our role is supportive, is monitoring, lend
20 assistance and bring the Federal resources in if they
21 are necessary and if the state requests them. But we
22 are putting a great deal of focus on this round, on
23 the event reporting, to make sure that we are getting
24 the information and to make sure also that let's say
25 for lost material or stolen material that if it's

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1 recovered that we get follow-up information from the
2 state to close that out. This way we have a record
3 that if it was lost or it was stolen and it was
4 recovered that that's been noted in the NMED database.
5 We would have a record that that's clearly closed and
6 no longer an active raw source.

7 The noncommon indicators are what they
8 are. They are indicators that are not necessarily
9 common to all programs. For example on the
10 legislation and program elements required for
11 compatibility that's a noncommon indicator that
12 applies to all state programs but does not apply to
13 the regional programs.

14 Sealed source and device evaluation
15 program. All states do not carry out sealed source
16 and device evaluation programs. Same with low level
17 waste, uranium recovery. And the last two are
18 programs that are unique to NRC and are not covered in
19 the states's reviews.

20 The last bullet, draft for input reports
21 sent to the state for regional review, that's a new
22 part that we added to the process that we did not have
23 in the past. I think it's good because what it does
24 is it provides an opportunity for the program being
25 reviewed whether it be a regional office or state to

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1 give the team some feedback.

2 The team has an obligation to prepare a
3 draft report within 30 days of the review. Then that
4 report is provided to the state for review and
5 comment. Then the team has an obligation to address
6 their comments. Then they prepare what we would call
7 a proposed final report.

8 Let's move on to the next slide, number
9 16. The management review board. Another new process
10 that we added to the IMPEP program that we did not
11 have in the past. In the past the determination of
12 adequacy and compatability of the reviews was
13 basically made the individual in my position. It was
14 a letter that went back to the state and they drew
15 their conclusion.

16 What we have in our IMPEP program is that
17 there is a senior management review board and this is
18 headed up by my boss, the Deputy Executive Director
19 for -- Research and State Programs. Karen Cyr is
20 General Counsel and is a member. Marty Virgilio as
21 Director of NMSS is a member and myself. We also have
22 a senior state manager, a program director who serves
23 as an agreement state liaison to this board.

24 Basically what occurs is that the team
25 presents its findings to the Management Review Board

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1 and the program director or the regional administrator
2 for the program being reviewed has an opportunity to
3 participate in that meeting. What that process does
4 is it provides independence, a determination by an
5 independent board but it also provides an opportunity
6 for factors other than the criteria that we have to be
7 considered by the board in making the final
8 determination.

9 Basically the team presents its findings
10 to the board and then the board makes the final
11 determination. For agreement states we do make an
12 adequacy and compatibility finding for each review.
13 For the regions we make an adequacy finding only.

14 The last bullet on this slide.
15 Particularly in those cases where there may be a four
16 year timeframe between reviews what we also do is go
17 back and visit the programs about every 18 months.
18 Part of the focus of this program is to check on the
19 status of response of the program to recommendations
20 that may have been made in the previous IMPEP and also
21 to get a sense on where the program is. If we see
22 that the program may be experiencing difficulties that
23 might result in moving up the next IMPEP review. If
24 the sense is that everything seems to be going okay
25 then we would continue with the current schedule.

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1 We're going to take another look at this
2 part of the program because we think there is more
3 that we do here in terms of these between IMPEP
4 interactions. In some cases when we have done IMPEP
5 reviews, we found problems and are saying why weren't
6 those problems identified earlier and addressed so
7 that they were not an issue at the time of the IMPEP
8 review. We are looking at how we can make that part
9 of our program more meaningful.

10 Let's move to the next slide. What do we
11 do in terms of effecting change in the program? As I
12 said each review results in a report and a finding and
13 a letter goes to the state. If there are
14 recommendations, we ask for a response from the state.
15 In many cases, the state will address the action that
16 they are taking in those recommendations during the
17 MRB process. In some cases there is no need for
18 additional action.

19 One of the alternatives and new approaches
20 that we have for effecting change in the programs is
21 heightened oversight. If we find a program where
22 there's significant issues in the program, normally
23 this is defined as one or more of the indicators are
24 found to be satisfactory with recommendations for
25 improvement, we'll place the program on heightened

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1 oversight. What that involves is the program needs to
2 prepare a program improvement plan. That's submitted
3 to us and then we have bi-monthly phone calls to
4 review progress and actions taken by the state to
5 carry out and implement that program improvement plan.

6 We found in Maine that this is a very
7 effective program. That there is senior management
8 attention that's brought within the state to the
9 issues in the program that need attention. They are
10 addressed and corrected generally within a one year
11 timeframe. What we do is we go back at the end of the
12 year and conduct a follow-up review to check on those
13 areas that are covered as part of the heightened
14 oversight program.

15 If that is not effective, then we would
16 move into what we call probation. There's a whole
17 series of tools that we have here including a letter
18 from the Chairman to the Governor, a public
19 announcement, letters to the Congressional committees
20 and state delegation. It brings in a different
21 process and a different level of attention.

22 To date in those cases where we have run
23 into heightened oversight, heightened oversight has
24 been effective and we've not had any states that have
25 gone on probation. But the tool is there and I think

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1 it's a very good tool from the standpoint that it
2 carries with it I don't want to use the term but
3 sanctions if you will that a state would not want to
4 see itself present with. There is generally senior
5 management attention during the heightened oversight
6 process to address any areas in the program that need
7 improvements.

8 So I think it's worked very well. We've
9 had two programs, three programs, four programs on
10 heightened oversight. I think in all cases with one
11 exception they have been very effective within a
12 year's timeframe or less of turning the program around
13 and bringing them to a point where they are fully
14 satisfactory if you will with the performance
15 indicators.

16 There are other tools here in terms of
17 emergency suspension or suspension and termination but
18 we've not applied those except in one case back in
19 early times when a state program basically ceased
20 funding the program and took all the staff out of the
21 program. We went in and basically took over the
22 program. They are there if we need them but very
23 seldomly used.

24 The next shows the agreement state map and
25 I think you have seen that already so we will move on.

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1 The next I wanted to highlight one of the things that
2 we've done which is developed a fairly effective
3 program of electronic communications and interactions
4 with the states. This is our website
5 (<http://www.hsrdr.orni.gov>). There's a host of
6 information on this site dealing with our program and
7 in dealing with the states. There are state
8 directories.

9 There are all of our letters and other
10 information that is there. All of the program
11 reviews. Copies of all of the reports and the letters
12 are there. There are related links to documents.
13 Sealed source and device registry. We maintain copies
14 of all the sealed source and device registry sheets
15 and so on. I wanted to just highlight this. It's a
16 good source of information on the program. That
17 covers the area that I wanted to cover here in terms
18 of maybe giving you a broad overview of the program.
19 I will be pleased to answer any questions.

20 VICE CHAIRMAN WYMER: Thank you very much,
21 Paul. That was a specific overview. Most of this has
22 been in effect since the early 1980s. Is that
23 approximately right?

24 MR. LOHAUS: The program went into place
25 in the early 1960s in terms of the agreement state

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1 program. Our IMPEP program has been effective since
2 1995 timeframe I believe. It started in 1995. Prior
3 to that time we had a different process. We had 30
4 very prescriptive indicators. What we tried to do was
5 make this program outcome and performance based. So
6 we're looking at the performance and if we find
7 problems in the performance we're going to go behind
8 that and look at why they are experiencing performance
9 problems.

10 VICE CHAIRMAN WYMER: I must say we have
11 a much better understanding now of this program is
12 then we had when we first drafted our letter. I'm
13 glad we have it. Are there any questions here?

14 MEMBER GARRICK: I just have a simple one
15 or two. Is that okay?

16 VICE CHAIRMAN WYMER: No, John. You can't
17 do that.

18 (Laughter.)

19 MEMBER GARRICK: I was very interested in
20 your discussion about the technical assistance and the
21 form that it takes. Can you give the Committee a
22 sense of the magnitude of the effort in some
23 parametric way such as the number of FTEs that are
24 pretty much consumed in providing technical assistance
25 to the states and then the other number that I would

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1 be very interested in is the total effort in terms of
2 FTEs in support of the state because a lot of it
3 probably procedural and meetings and conferences and
4 these working groups that you talked about and what
5 have you and not really as much technical?

6 MR. LOHAUS: What I can do is provide that
7 information to you. I can give you a sense today but
8 in terms of the actual let's say what we budget for
9 the program I don't have all that information here.
10 But I want to differentiate between what I might want
11 to term direct licensing or inspection technical
12 assistance and we've only had occasional cases where
13 we've done that.

14 So that's an area I just don't see it
15 because generally what the states will do is that they
16 will look at it from a standpoint of fee reimbursable
17 they have alternate mechanism to obtain that
18 assistance. They may contract for example themselves
19 or they may have expertise within other state
20 departments or areas where they will go and gain that
21 expertise. This may be for example dealing with
22 groundwater modeling or something like that where they
23 may need some expertise for a particular action and
24 they may not have that.

25 But if it deals with let's say regulatory

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1 interpretation, I'll put in this category review of
2 their regulations for example, addressing questions on
3 our guidance and things like that, my sense would be
4 as we're talking of about a total of several FTE per
5 year, in that area. NMS budgets some effort for that.
6 There are some within my program and it's all covered
7 within both the materials arena and the waste arena.
8 But you're talking about maybe three to five FTE range
9 but what I can do is I can get you the actual budgeted
10 figures for that.

11 MEMBER GARRICK: Several years ago this
12 Committee wrote a rather lengthy letter that if you
13 don't remember it I would understand that on what
14 constitutes an adequate low level waste program for
15 NRC. If you do remember that, I guess I'm very
16 curious as to your own opinion as to what fraction of
17 that program do you think is actually being
18 implemented. As I say if you don't recall the letter
19 I would understand that. I don't recall it very well
20 myself but I know it was pretty thorough and quite
21 detailed and one of our longer letters.

22 MR. LOHAUS: I have to apologize. I can't
23 really answer that question in that manner but I can
24 do is maybe give you a sense of how we deal with the
25 states low level waste programs and maybe start with

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1 regulations. They are required to have a rule that is
2 compatible with our Part 61 regulation. That includes
3 for example the performance objectives. Those have to
4 be essentially identical.

5 The waste classification system for
6 example has to be essentially identical so there
7 cannot be variation there. The uniform waste manifest
8 that we have that has to be essentially identical so
9 that's uniform across the nation. The technical
10 requirements, the citing design operations
11 requirements have to have the essential objectives of
12 those requirements. They could be more restrictive
13 and they could have different requirements provided
14 they don't go out of bounds. What we use as an out-
15 of-bounds factor in our policy is that the
16 requirements that they might adopt become so stringent
17 that they would preclude a practice that is in the
18 national policy. Let's say approve the citing of a
19 facility.

20 In terms of program implementation, they
21 are expected to have and follow procedures that are
22 similar to our procedures and what we would use as our
23 1199 and 1200 guidance as a basis for supporting the
24 envelop that you would expect to see in the state
25 program. When we do reviews of those programs what we

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1 do is we have a technical specialist from the waste
2 management program who is a member of the review team.
3 That's what we normally do for a review of a program
4 let's say like Texas for example that has a low level
5 waste program. We've had that individual as a member
6 and they would look at the state's program in a manner
7 consistent with how we would handle the program.

8 In some cases when you look at our reports
9 you'll find a state like Nevada and others that there
10 will be a section that says Nevada does not have a low
11 level waste program. They are not a host state. They
12 don't have the expertise, the license and facility but
13 there is no intent in that program to do that.
14 Therefore we would not look at that or overlay that
15 particular indicator on that program. As I mentioned
16 there are those noncommon indicators. In this case
17 that would be an area that we would not look at their
18 programs. They really don't have a program if you
19 will. But if they were to receive an application then
20 our expectation would be is they would have to adopt
21 regulations and a program that would be enveloped and
22 be compatible and provide the same level of adequacy
23 as our program here.

24 MEMBER GARRICK: And one final question.
25 Does the fact that the states have the ability to

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1 establish their own requirements in terms of how a
2 regulation is complied with it albeit consistent with
3 our own regulations but they can establish levels of
4 compliance. The rubblezation example comes to mind
5 when a northeast utility was considering the
6 rubblezation option for the handling of certain low
7 level waste but the state imposed such a severe
8 requirement that it didn't become a practical
9 alternative. Does that present problems to the
10 agency? That kind of thing?

11 MR. LOHAUS: The area of compatibility of
12 regulations is a challenge and will continue to be a
13 challenge. One of the things that we've tried to do
14 and I think this has helped but we still see this as
15 an issue on both sides, both with the NRC and within
16 the states if you look at our policy what we've tried
17 to do is to define a small area of regulation that has
18 to be essentially identical. Radiation standards.
19 Definitions and anything that have transboundary
20 implications. Transportation. Sealed source and
21 devices and things of that nature.

22 When you get into some areas such as
23 constraints that may be established from a dose level,
24 there may be ability for a state to set a more
25 restrictive limit or more restrictive standard.

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1 That's not precluded by the policy or implementing
2 procedures but at the same time, there is some bounds
3 that we try to set in there so that it would not
4 become sufficiently constraining that it would affect
5 our ability to review programs, collect data, preclude
6 practices in the national interest, practice being a
7 licensed activity or something of that nature.

8 But there is tension and there will always
9 continue to be tension there on the states side. They
10 want to have a greater role, a greater say in
11 establishing the requirements and what the degree of
12 compatibility is. Clearly by law, by policy and our
13 procedure, the Commission has the final determination.
14 They consider input from the states. On the NRC side,
15 we're constantly wrestling with how much flexibility
16 and latitude can we provide in this suite of
17 requirements. And we apply our policy. We apply the
18 procedures and they work well but yet there is still
19 judgement involved. We try and involve the states in
20 reaching those decisions.

21 But I agree with you. This is going to be
22 a constant area of tension. It's probably healthy
23 though because out of that process is going to
24 hopefully going to come the best approach or the best
25 answer if you will. I look at it as healthy but it's

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1 going to be there.

2 MEMBER GARRICK: But there is a level of
3 restriction below which the regulations themselves
4 don't make sense in some cases.

5 MR. LOHAUS: Yes.

6 MEMBER GARRICK: Okay. Thank you.

7 VICE CHAIRMAN WYMER: Anybody else?
8 You've made a specific point, Paul, of mentioning that
9 these agreement state program is not delegated. It's
10 relinquished. Yet in fact there are a lot of strings
11 that hang on to it.

12 MR. LOHAUS: Yes.

13 VICE CHAIRMAN WYMER: So it isn't totally
14 relinquished.

15 MR. LOHAUS: The responsibility and the
16 authority is relinquished but the assurance of let's
17 say a national level of consistency in adequate
18 protection of public health and safety across all the
19 programs does reside --

20 VICE CHAIRMAN WYMER: That cannot be
21 attached now so it still resides with the NRC.

22 MR. LOHAUS: Yes, that's right.

23 MEMBER RYAN: Ray, that's kind of an
24 artifact I think because you can't just change state
25 laws.

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1 MR. LOHAUS: That's correct.

2 MEMBER RYAN: You have two choices. Let
3 them have the program or take it back in essence when
4 it's all said and done. You can take the agreement
5 back.

6 MR. LOHAUS: That's correct.

7 MEMBER RYAN: So if it's a contract the
8 NRC can cancel it and take the authority back or leave
9 it with the states.

10 VICE CHAIRMAN WYMER: Well, it's a little
11 more than that. That they retain a little more
12 control it sounded like to me than --

13 MEMBER RYAN: Well, all their oversight
14 and requirements are based on the conditions of
15 keeping the agreement like compatibility and all that
16 that has to be met, the performance under the program
17 and all that.

18 MR. LOHAUS: Again I keep contrasting with
19 earlier. If you go back prior to 1995 we basically
20 had two levels of process. We had send a letter to
21 the state and say here's some things that we found.
22 We think you need to pay attention to these. Or
23 terminate or suspend the agreement. What we have
24 tried to add and that's what is shown on that one
25 slide is a series of additional mechanisms that we

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1 tried to make them cooperative to you in terms of
2 bringing focus within the program to address issues
3 short of suspension and termination.

4 VICE CHAIRMAN WYMER: That's really what
5 I was getting to. This goes a little bit beyond just
6 saying you either do it or we take it back.

7 MR. LOHAUS: Yes, there's that blend in
8 there of heightened oversight, probation and other
9 things before we would actually take them out.

10 MEMBER RYAN: It's really not a flip of
11 the switch.

12 VICE CHAIRMAN WYMER: That's right. It's
13 a dimmer. Anybody else have anything? Thank you.

14 MR. LOHAUS: Thank you very much.

15 CHAIRMAN HORNBERGER: Okay. We are going
16 to switch gears and we have a presentation on waste
17 issues related to advanced reactors. Milt Levenson is
18 the cognizant member so I will turn the meeting over
19 to Milt.

20 MEMBER LEVENSON: There he is. Let me
21 just say that my understanding that this is for
22 information only primarily and the program is really
23 at a very early stage. So we shouldn't expect to get
24 a lot of details or specific things. It's more your
25 concept of what you are planning.

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1 MR. FLACK: That's right. That's pretty
2 much of it in a nutshell. The presentation is really
3 to inform the Committee about our activities
4 specifically with respect to nuclear materials and
5 waste. This is part of the advanced reactor research
6 plan. That is really the purpose of this meeting here
7 today.

8 To my left is Don Carlson. Don is part of
9 the Advanced Reactor Group and works specifically in
10 that area of nuclear material safety and waste
11 material safety. There is also Bill Ott I believe
12 somewhere here. He is the branch chief of a branch
13 within the office of research that deals with
14 radiation detection and environmental risk. That's
15 part of the division of Regulatory Effectiveness which
16 I am a branch in itself. I am the branch chief of
17 regulatory effectiveness in the human factor's branch.
18 But within that branch there is the Advanced Reactor
19 Group of which Don is part of.

20 What I'll do today is briefly talk about
21 the plan. I guess we have about an hour on the
22 agenda. Is that right? Give you some background as
23 to what the purpose is and then some of the objectives
24 of the plan and then specifically look at issues at
25 least we can see are being generated as part of the

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1 Advanced Reactor activities in the areas of nuclear
2 materials and waste. Some examples of some research
3 or activities that we have anticipate it and then some
4 follow-up on some future actions.

5 So with that in mind, just to mention a
6 few things in the form of a background to the plan,
7 the plan itself is about 110 pages long. I guess
8 everyone has a copy of it. There are many authors to
9 the plan. Specifically it follows the structure of
10 the different arenas, the reactor arena, the waste
11 arena and so on.

12 But the primary focus of the plan is on
13 non-light water reactor activities because that's
14 where we see our largest infrastructure need. There
15 is a lot of infrastructure in place now for light-
16 water reactors which we capitalize on. There are some
17 as you'll see that we touch upon but most of it
18 centers on non-light water reactor infrastructure
19 needs.

20 There are some additional designs that we
21 are now considering which will be put into the plan
22 which are now coming out of preapplication review. So
23 we will be adding those and I'll mention those as I go
24 along. There is a great deal of discussion at the
25 beginning of the plan as to what research's role is in

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1 all of this and what's the applicant's role in all of
2 it.

3 Basically we see ourselves as a
4 organization that pretty much pokes and probes the
5 outer limits of the safety margin. To large extent
6 licensee applicants responsible for demonstrating that
7 their plant meets the licensing basis and so on with
8 some margin and basically we go beyond that as an
9 office exploring the outer reaches and so on looking
10 at the issues and in a sense providing confidence in
11 the decisions that will ultimately need to be made.

12 A large part of the plan and an important
13 part of the plan is the collaborations that we are
14 establishing throughout the world in the advanced
15 reactor arena. Our budget doesn't allow us to do
16 everything so it's very important that we reach out
17 and find out what's going on in the world. So as you
18 go through the plan in different areas you will find
19 that there are discussions of collaborations primarily
20 internationally where we see a lot of this activity
21 going on.

22 Finally the plan itself does not
23 prioritize the work. The prioritization basically
24 takes place using two processes. One is called the
25 PIRT where we bring together where we identify and

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1 rank the phenomena and then decide for example in the
2 fuels what are the important issues to deal with
3 first, second and so on. Then there is the other part
4 of the prioritization process which deals with our
5 strategic plan. That's an officewide prioritization
6 process that takes place every year.

7 So with that as a background let me move
8 ahead and discuss the objectives of the plan. Again
9 basically it's to institute an advanced reactor
10 research infrastructure, to basically document the
11 areas where we need to do more developments in the
12 form of expertise, tools, methods and so on.

13 It is not necessarily issue driven. It is
14 more expertise driven. What is the expertise that we
15 need to ask the right questions basically? What the
16 methods, codes and data that we are going to need to
17 do the analysis that will provide us answers to those
18 questions?

19 However when you start to do that kind of
20 building looking to see where you need this
21 infrastructure you do identify issues. So in fact
22 part of the plan does bring out those issues that we
23 see as we go along and in that context identify the
24 gaps and the methods and the tools that will be needed
25 to address those issues.

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1 The plan is also intended to identify the
2 research projects and links to the regulatory process.
3 Basically the structure that was laid out in trying to
4 answer three questions: why, what and how. Why do we
5 need to do this work? What it is we need to do? And
6 how do we plan to use these results? So if you look
7 at each of the sections in the plan under each of the
8 different research areas it follows that format.

9 With respect to products, I would say the
10 most important product that gets generated by the
11 office is the first one which is really in the sense
12 contributing to and identifying the technical basis
13 for decision making and how much confidence you'll end
14 up in that decision is going to based on the technical
15 basis on which it is built. So much of the work that
16 we do in the office is the first one to a large
17 extent.

18 The office also does independent current
19 confirmations of applicants, calculations and so on.
20 We identify safety issues as we go along in reviewing
21 the applicant's submittal over whichever area that
22 might be in and pathways to resolutions of those
23 areas.

24 Policy issues is another thing that we
25 bring out. There is a policy issue paper. We went

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1 before the Commission letting them know that there is
2 going to be policy issues coming at the end of the
3 year. But we planned to submit to the Commission a
4 policy issue paper and options for resolutions of
5 those policy issues that we see coming out of the
6 advanced reactor program, things like the containment
7 question, source term and so on.

8 Another product of course is the technical
9 reports that come out to support safety evaluations
10 and generally regulatory guidance, methods and tools
11 for regulatory use. So that in a nutshell is pretty
12 much the kinds of products that we expect to generate.

13 The scope of the plan, the revision that
14 you see today really covers four types of designs.
15 The pebble bed of course was a real hot topic for a
16 while as they had come under preapplication review
17 Exelon but is subsequently pulled that preapplication
18 out. So a lot of the infrastructure has been
19 generated around our review and understanding of what
20 the preapplication was really after.

21 We do have in now a gas turbine-modular
22 helium reactor (GT-MHR) which basically uses the same
23 fuel. I'll go through that at least at the
24 microsphere level. I'll go through that in a few
25 minutes. The other plans covered by the scope are

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1 water reactors, the IRIS, the International Reactor
2 Innovative and Secure. They have just submitted a
3 letter requesting a preapplication review and, of
4 course, the Westinghouse AP-1000. But again a lot of
5 the infrastructure discussion centers around the first
6 two items.

7 The more recent plans that have come in
8 are under the preapplication review or are planning to
9 come in is CANDU design, the AECL ACR-700, advanced
10 CANDU reactor, the ESBWR and the SBWR and we will have
11 a separate section on Generation IV as we know those
12 plans they are starting focus on. So that's pretty
13 much the scope of the plan.

14 The next viewgraph is busy and I really
15 didn't want to spend much time on it. Although when
16 I had presented this to the Advisory Committee I never
17 got past this viewgraph because there were so many
18 questions. But basically it's how we laid out the
19 plan, the research that we intended to do. As you can
20 see on the top the ultimate objective is to have an
21 effective and efficient regulatory process of which a
22 framework that would be risk informed that may be
23 different than the one we see today. In fact it would
24 be for these types of plans is one of the major
25 activities in the advanced reactor research which we

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1 plan to do.

2 From there down, we started with the
3 arenas. Here we have the reactor safety arena and
4 that's basically centered around the four cornerstones
5 of safety that the NRR staff uses in a reactor
6 oversight process. Over here is where we will be
7 talking about today is this side of the plan which
8 involved the nuclear material safety and nuclear waste
9 safety. Basically there we are looking at the
10 cornerstones as being a ALARA and accident protection
11 and covering the full cycle from beginning,
12 operational and end of fuel cycle.

13 The safety and safeguards part of the plan
14 is pretty much a place holder at this point. We'll
15 see what we will need to do there to support the
16 Office of Homeland Security.

17 MEMBER GARRICK: John, what are you
18 assuming about the fuel cycle?

19 MR. FLACK: In what respect?

20 MEMBER GARRICK: Well, in terms of the
21 type of fuel cycle that would associated with each of
22 these reactor types. Are you assuming current
23 conditions based on current laws or are you looking at
24 the differences?

25 MR. FLACK: Differences, right. The plan

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1 basically focuses on the delta, the difference between
2 where we are now and where we would want to be years
3 from now.

4 MEMBER GARRICK: Yes and that would
5 include perhaps moving it toward closed fuel cycles.

6 MR. FLACK: Yes, it could even though
7 that's not part of the plan at this point but it very
8 well could be at some future date.

9 MEMBER GARRICK: It certainly is in
10 Generation IV.

11 MR. FLACK: Yes.

12 MEMBER LEVENSON: On the reactor side the
13 only place you have material is as part of the
14 barrier. Is that the only place it's included because
15 different materials like graphite play a significantly
16 different role many places than in the barrier?

17 MR. FLACK: Underneath material analysis,
18 there are really two key areas. One is the graphites
19 as you pointed out. The other is high temperature
20 materials as the research areas that are in the plan
21 explicitly.

22 MEMBER LEVENSON: But what I'm saying is
23 that they have impact more than as a subset to
24 barrier.

25 MR. FLACK: In the role I guess as we

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1 envisioned it here the way it's being laid out is
2 considered the barrier in the sense of the primary
3 system as a barrier to release. Also the containment
4 as a barrier to release. And structure will be a part
5 that as well.

6 MEMBER LEVENSON: I understand it. But
7 what I'm saying with these different concepts,
8 material plays a significantly different role and
9 possibly accident prevention and mitigation with
10 different issues than just as an inert material or as
11 part of a barrier.

12 MR. FLACK: Yes, I thinks that's a good
13 point.

14 MR. CARLSON: I think he may be referring
15 to conducting the decay heat away through the graphite
16 and things of that nature.

17 MEMBER LEVENSON: No, just things like
18 graphite under stress erodes differently in helium
19 than it does when it's not under stress so it can
20 impact structurally and cause accidents. There's all
21 kinds of things which are different than part of a
22 barrier.

23 MR. FLACK: In fact, there's another
24 diagram in the --

25 MEMBER LEVENSON: I'm sorry. That's not

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1 part of this Committee. I'll take it back.

2 MR. FLACK: But now you can see why we
3 didn't get too far with the ACRS with this screen.
4 But in fact it's an integrative process as you are
5 pointing out because this could turn out to be a
6 barrier. Of course this could turn out to be a
7 initiating event. So there is a constant and there's
8 another figure which I don't have with me but it's in
9 the plan that draws lines between these and the
10 accident analysis. So we see that it's a feedback
11 kind of situation.

12 A lot of it centers around the reactor
13 analysis of course that predicts what temperatures and
14 so on that one would reach in the plant under the
15 various accident conditions but you are right we are
16 really here to focus on this piece over here. But
17 your point is well taken as being more than just a
18 barrier on materials. It could in fact be the
19 accident initiator.

20 MEMBER LEVENSON: Yes, and there's a lot
21 of things that change. I mean structural analysis for
22 a water type system is not necessarily directly
23 relevant either. I guess things in the research plan
24 that ignore some of those kinds of issues too. But
25 let's not get into that.

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1 MR. FLACK: Well maybe we can talk off-
2 line a little bit about it because it is an
3 interesting area to talk about. Again the plan is
4 trying to generate what changes and differences there
5 would be from where we see our regulations today as we
6 treat light water reactors today to where we would be
7 going for advanced designs. But in any case it did
8 offer a way of structuring our research in a sense of
9 looking to see what needed to be done. It resulted in
10 eight rather key areas.

11 These are the eight areas which are in the
12 plan and it's structured about. The one is being the
13 framework and that again is using some risk decision,
14 making decisions using risk information, performance
15 information in a different context or pushing the
16 envelope in a way we use it today. Then we have
17 accident analysis which is really the part of PRA, the
18 human factors and instrumentation control that is
19 addressed under that section, reactor plan analysis
20 which includes thermal hydraulics, nuclear analysis in
21 severe accidents. The fuel analysis which is very
22 important for these gas cooled designs as they use a
23 special kind of fuel.

24 Material analysis which includes the big
25 gaps that we find in the high temperature materials

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1 that are needed for these gas cooled designs and the
2 graphite as we were just pointing out. Structural
3 analysis including seismic events and concrete
4 performance. Consequence analysis and what changes
5 need to be made to those codes based on these new
6 plans. Here we are at nuclear materials and waste
7 safety and there is a part in the plan that is
8 intended to look at that as to what are the new issues
9 that we might see coming down the road there. Then
10 nine being the safeguard and security area.

11 Now I don't know how familiar the
12 Committee is with the Pebble bed and the new types of
13 fuels that are being put out so I thought what I would
14 do in the back of your handouts are all these
15 viewgraphs and I thought I'd just spend a minute going
16 through that to show the differences between the kind
17 of fuel that we are seeing with these high temperature
18 gas cooled designs and light water reactors. Please
19 fill in, Don, if you have --

20 MR. CARLSON: I forgot to bring my pebble
21 but they are the size of a cueball.

22 MR. FLACK: About the size of a cueball.
23 What's embedded in these graphite pebbles or cueballs
24 are these microspheres and it's about roughly 15,000
25 microspheres in one. Each of these microspheres if

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1 you cut them open you will find these different
2 layers. This is your TRISO fuel-coated particle. And
3 you have a silicon carbide layer which basically acts
4 as a barrier to releasing of the fission products
5 inside. Then there's these buffered layers to catch
6 fission products as they come off and gases and so on.

7 But the main thing that is this silicon
8 carbide layer that is really acting as the containment
9 function in retaining the fission product. The first
10 thing of notice is that these spheres actually in
11 volume would be resulted in about 10 times the waste
12 of light water reactors. So we are scaling up our
13 product there. Of course you have this other
14 additional materials, the graphite and the fuel and
15 then it's what that consists of as part of the fuel
16 cycle and ultimately -- You do have it.

17 MR. CARLSON: Alex Murray brought his
18 pebble in and we're also going to pass around --

19 MR. FLACK: A microsphere.

20 MR. CARLSON: A pellet for comparison.

21 MR. FLACK: So that's what the fuel looks
22 like that is different than light water reactors.
23 This next viewgraph just shows the pebble bed and how
24 those pebbles are fed through the reactor system. At
25 one point, and they've changed, in the middle they had

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1 envisioned graphite pebbles as being in the center and
2 then you had your fuel pebbles on the outside and then
3 this would be your inner reflector. The pebbles would
4 be come in at the top and exit at the bottom. A very
5 simple diagram of that is shown here. (Indicating.)

6 Here we see the solid fuel coming into the
7 pebble bed, graphite also coming in at the top making
8 up that center reflector. As they flow through the
9 damaged spheres would be taken aside, graphite would
10 go back in and the fuel would be checked at some point
11 to see how much of it had been burned up. it was
12 still within an acceptable range it would go back into
13 the reactor. If it wasn't then we would be adding
14 more fuel at the side and any spent fuel would come
15 down below.

16 So you see it's a rather sophisticated
17 fuel handling system that's envisioned. Each module
18 would have these as well. These are smaller modules
19 up around 100 to 120 Megawatt electrical. It would be
20 envisioned that there would be 10 of these at a site.
21 I think I do have a viewgraph on that.

22 The other HDTR (PH) is the pellet. It's
23 the gas turbine modular helium reactor. That's why GA
24 and that uses this pellet instead of a pebble. They
25 are embedded in a fuel element that looks like this.

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1 (Indicating.) Again you use the same microspheres as
2 we see in the pebble in the same structure with
3 different layers and so on. So there's a little
4 difference there with the fuel type.

5 MEMBER LEVENSON: There's a basic
6 difference in the form of the uranium, isn't it? The
7 other one showed as the core being uranium oxide and
8 this one is uranium carbide.

9 MR. CARLSON: Oxy carbide.

10 MR. FLACK: That's right. Although the
11 coatings would be similar in nature, the kernel would
12 be different. Right?

13 MR. CARLSON: The coating layers are
14 essentially identical.

15 MR. FLACK: Essentially identical. What
16 we have here is a three dimensional view of the pebble
17 bed reactor. You can see the fuel handling system on
18 the side and this is one module right here, a reactor
19 vessel. (Indicating.) So it gives you a scale. This
20 is roughly around 60 feet, right? The size of this
21 vessel so this is rather a lot of volume in a sense.

22 So that gives you a flavor for the types
23 of plans that are coming in. If we go back to where
24 I was before. So the three areas basically that are
25 in the plan under nuclear materials and waste cover

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1 the cycle. The front end's focus primarily is the
2 differences in the fabrication between the types of
3 fuels that we just looked at and light water reactors.
4 The operating cycle, of course, the fuel handling, the
5 storage and ALARA issues and then the back end of the
6 fuel cycle, the processing, the transportation and the
7 disposal.

8 In going through that, I've summarized on
9 the next two viewgraphs the kinds of technical issues
10 that seem to be evolving from the plan which is
11 documented in the plan but that we see as we are
12 looking at these advanced designs. The first is that
13 they are going to higher enrichments generally greater
14 than five percent and as high as 20 percent. This
15 leads to issues that would involve criticality in its
16 manufacturing and in its transportation, in fact
17 throughout the fuel cycle, these higher enrichments.
18 Radionuclide inventories that would be different that
19 could lead to different decay heats and different
20 radiation sources. And higher burn-ups going to for
21 example 80,000 Mwd/t and how much credit we would give
22 for burn-up at that point. So these are three of the
23 issues we are seeing coming up as being possibly
24 substantially different than the light water reactor
25 fuels that we are dealing with today.

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1 On the uranium enrichment and fuel
2 fabrication looking at new manufacturing facilities
3 and the hazards that are associated with those at
4 these kinds of enrichments. Transportation and
5 storage. Basically the physical size which we were
6 just mentioning and the differences radiologically
7 between the fuel types.

8 MEMBER LEVENSON: If your enrichment goes
9 up potentially as high as 20 percent, your burn-up
10 only goes to 80,000 Mwd/t. You're only burning about
11 one-third as big a fraction. That means that your
12 spent fuel is even going to be much higher enrichment
13 than present new water reactor fuels. Is that right?

14 MR. FLACK: That's a good point.

15 MR. CARLSON: The 80,000 Mwd/t burn-up
16 applies to the eight percent enriched fuel that would
17 be used in the PBMR. For GTMHR they are going to more
18 like 120 Mwd/t and that's a mixture of natural uranium
19 particles and 19.9 percent enriched particles.

20 MEMBER LEVENSON: One of the factors
21 that's important is after a couple of cycles you build
22 up a lot of uranium 236. That kind of kills you.

23 MR. FLACK: Yes. That is an extra too.
24 In the GTMHR, it ranges from I guess five to 20
25 percent enrichment.

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1 MEMBER LEVENSON: I think the point is it
2 isn't only on the front end that you have higher
3 enrichment problems. I think you're going to have
4 higher enrichment on the back end.

5 MR. CARLSON: Yes, for burn-up credit,
6 criticality safety analysis at the back end it
7 certainly carries over there.

8 MEMBER LEVENSON: It isn't a burn-up
9 credit. I mean if you don't take burn-up credit, the
10 actual enrichment is going to be higher.

11 MR. CARLSON: Sure.

12 MR. FLACK: Okay. Actually that's where
13 we went with this next one. The waste disposal and
14 what basically could be different there where you end
15 up with --

16 MEMBER GARRICK: Are you going to talk
17 about the waste form?

18 MR. FLACK: Well, I guess we could if
19 there are questions to it. I believe there are quite
20 a few from NMSS here and they could also answer the
21 questions. But I was raising this more in the context
22 of what were the technical issues that we are seeing
23 coming our way as differences in waste streams and
24 differences in the physical and chemical conditions of
25 the fuel as well as the source term and

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1 decommissioning and entombment I guess as part of that
2 as being things that were different. But, John, is
3 there something specific that you want to talk about?

4 MEMBER GARRICK: No, go ahead. We'll come
5 to it.

6 MR. FLACK: Okay. Then finally ALARA
7 we've seen at the moment for example silver as being
8 an issue that tends to migrate out of that fuel to the
9 coating. So that and of course graphite dust being
10 added to the mix. As we're reviewing these new plans
11 as they are coming in we can see that there are
12 similar issues that are coming up as well.

13 VICE CHAIRMAN WYMER: My understanding is
14 that it's not so much silver. It's what's called the
15 amoeba effect that chewed their way through the
16 silicon carbide layer. You see cross sections of
17 these microspheres and you see that the rarers are in
18 fact penetrating the silicon carbide coating rather
19 the silver did primarily.

20 MR. FLACK: That are getting through. I
21 guess there's not a good understanding or feel for why
22 that is the case at this point in time.

23 PARTICIPANT: (Off microphone.) Broken
24 particles.

25 MR. FLACK: Well, that will do it.

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1 MEMBER LEVENSON: Or microcracks in the
2 coating is a --

3 MR. FLACK: That can cause them to leak,
4 yes. Okay. So that's really a quick summary of
5 what's in the plan as far as the issues that we were
6 seeing. The next couple of viewgraphs talks about
7 research activities that are either on-going or could
8 be on-going to support the user office in addressing
9 some of these issues.

10 MEMBER LEVENSON: Let me just go back to
11 a follow-up to John's question.

12 MR. FLACK: Sure.

13 MEMBER LEVENSON: It has to do not with
14 the mechanics or the details but a perception. Is it
15 your perception that the waste form is the spent fuel
16 as it comes out of the reactor or that something will
17 have to be done to it to make it a stable enough
18 material to be considered a waste form? This is a
19 classic question of is graphite stable under the
20 definition of only stable materials are suitable for
21 waste form.

22 MR. CARLSON: The work that we've been
23 following to date considers the pebble as the waste
24 form or the graphite blocks from the --

25 MEMBER GARRICK: The cueball or the fuel

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1 block.

2 MR. CARLSON: There is this discussion of
3 a further development of the U.S. -- Green type fuel
4 technology of removing the fuel compacts from the
5 graphite block to reduce the volume of high level
6 waste.

7 MEMBER GARRICK: Yes.

8 VICE CHAIRMAN WYMER: It's easier said
9 than done. It hasn't been done to date for a good
10 reason. It's not easy.

11 MR. CARLSON: The Japanese version of HTGR
12 technology has pin and block design where you really
13 can move the compacts with a pin form from the block.

14 VICE CHAIRMAN WYMER: After radiation they
15 weld themselves.

16 MEMBER GARRICK: Yes, there's going to be
17 a little bit of fusion.

18 MR. CARLSON: But for the American they
19 certainly would weld themselves in.

20 MEMBER GARRICK: Yes.

21 MR. FLACK: And this viewgraph is just to
22 point out the different activities for infrastructure
23 that's in research today in the office that could be
24 applicable to the materials of the waste arena.
25 Certainly the work that's going on in the risk

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1 informed performance based methods area is nuclear
2 analysis, methods and libraries that apply to reactors
3 could equally apply to nuclear materials, out of core,
4 severe accident, source term activities and
5 information that we are generating as part of those
6 studies or those studies that will start to take
7 place, human factors, methods and expertise that we
8 have that could be applied to fuel fabrications,
9 facilities and so on.

10 The materials and structural work that's
11 going on in the office could equally be extended to
12 issues that deal with storage of nuclear waste and
13 international agreements and collaboration which is an
14 important part of the planning activity from which we
15 could capitalize on other work going on worldwide in
16 these areas.

17 Some examples and some of this is probably
18 redundant but the nuclear data libraries which is part
19 of the nuclear analysis work on cross sections for
20 reactors could be applied. Criticality models and
21 validation as some of the tools and methods that we
22 will be using and applications of these to burn-up
23 credit. Decay heat models and radiation sources
24 studies and characterization of spent fuel and waste
25 streams, the work you could possibly do in that area.

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1 And of course extending the framework to also include
2 beyond the reactors the nuclear materials waste
3 safety.

4 VICE CHAIRMAN WYMER: You're probably get
5 to it eventually but I would say again that when you
6 get to the burn-up credit uranium 236 plays an
7 important part.

8 MR. FLACK: Plays an important role.

9 VICE CHAIRMAN WYMER: Yes.

10 MR. CARLSON: But that's not one of the
11 burn-up credit players that's currently considered by
12 NMSS.

13 VICE CHAIRMAN WYMER: But it's real. It's
14 a neutron gobbler.

15 MR. FLACK: Is that right? Okay, well I
16 went through this rather rapidly on my final viewgraph
17 so I was just going to mention where we go from here
18 with the plan. What I think you received is this
19 first revision of the plan. It will be revised again
20 before it goes to the Commission which will be this
21 fall. We will also include these other reactors I've
22 mentioned including Generation IV as at this point
23 probably appendices to the report rather than going
24 back and changing the whole report to reflect those
25 new plans.

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1 We will be expecting additional
2 stakeholder interactions. We have working groups set
3 up. We have been working with NMSS. We have been
4 working with NRR in trying to understand the issues
5 and how we as an office can support resolution of
6 those issues. The plan will again be transmitted to
7 the Commission and then we will continue to keep the
8 plan as a living document and update it from time to
9 time. So that's pretty much it in a nutshell.

10 MEMBER LEVENSON: Let me ask a question.
11 The water reactors are obviously water reactors but
12 one slight question is the version of the CANDU that
13 is being considered or proposed --

14 MR. FLACK: In fact they are talking about
15 it right now upstairs.

16 MEMBER LEVENSON: -- is does that have
17 different materials, waste, fuel, etc. issues or
18 problems than the American light water reactor?

19 MR. FLACK: I think Don might be able to
20 answer that.

21 MR. CARLSON: It would tend to be similar
22 but we're aware of the differences. It uses slightly
23 enriched uranium. That would mean up to two percent
24 enrichment.

25 MEMBER LEVENSON: I was thinking more of

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1 materials and of fuels and of cladding and so forth.

2 MR. CARLSON: The cladding is quite
3 similar. It's a zircaloy type cladding. It's uranium
4 oxide fuel pellet. They are using dysprosium (PH) as
5 a fixed poison in the central fuel elements in the
6 channel.

7 MEMBER GARRICK: The stored energy is a
8 little different.

9 MR. CARLSON: Higher.

10 MEMBER GARRICK: Yes.

11 MR. CARLSON: Higher than in the old CANDU
12 design and I guess about more similar to what it is in
13 the current light water reactor.

14 MEMBER GARRICK: Right.

15 VICE CHAIRMAN WYMER: I don't know how
16 extensive you are going to go into the fuel cycle part
17 of this study but if you do go into that with the
18 CANDU reactors then you probably want to consider the
19 rather complicated fuel cycle that the Canadians are
20 considering with respect to their work with South
21 Korea. Are you familiar with this?

22 MR. CARLSON: Oh, yes. They are --
23 cycles.

24 VICE CHAIRMAN WYMER: Yes, because this
25 idea is just you take it CANDU reactor and put it in

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1 the light water reactor and you don't do any
2 reprocessing. You just simply heat it up and drive
3 off the volatile high cross section gases and then
4 stuff it back in the water reactor.

5 MR. CARLSON: Yes, take the light water
6 fuel and put it in the heavy water.

7 VICE CHAIRMAN WYMER: Okay, you are on
8 that.

9 MEMBER GARRICK: The current regulations
10 and the whole analysis infrastructure pretty much
11 revolves around thermal hydraulic kind of problems.
12 The reg guides and the regulations of course are
13 accordingly geared for those kinds of problems. Is
14 what you are trying to do here is to anticipate the
15 changes that are going to have to be made in the
16 regulations in order to accommodate a license
17 application for these advanced reactors? The non-LWR
18 reactors? What is the endpoint here?

19 MR. FLACK: Well, I think it could. I
20 think part of it is when we go through a series of
21 interactions with an applicant first being the
22 preapplication review and the question is can we
23 license this plant under the current regulations that
24 exist today. That's really the purpose of
25 preapplication review is to find out if we are looking

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1 for changes how are we going to go about first
2 identifying and then implementing whether they involve
3 policy issues with the Commission. So I think at this
4 point it's a pretty open question.

5 MEMBER GARRICK: Yes.

6 MR. FLACK: I mean when people come in
7 they could easily request --

8 MEMBER GARRICK: Well, the commonalities
9 are much more evident globally than they are in the
10 fine structure. I mean in the accident analysis of
11 the PBMR is going to be very different than an
12 accident analysis of any LWR.

13 MR. CARLSON: At this point.

14 MEMBER GARRICK: You're going to do PRA
15 and you're going to construct scenarios and you're
16 going to do evaluations but when you get down to the
17 point where the reg guides come into play, it's going
18 to be very different. And as part of this exercise to
19 try to ferret out what the NRC will have to do in
20 order to make the details of the regulations
21 applicable, the policies and the principles are one
22 thing. But the real understanding of the safety and
23 risk issues are going to involve entirely different
24 models and entirely different materials. Most of the
25 reg guides that I can think of just won't be

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1 applicable.

2 MR. FLACK: And in fact that piece of the
3 framework that we were talking about before.

4 MEMBER GARRICK: Right.

5 MR. FLACK: That is exactly the issues.
6 If there are going to be changes, how these changes
7 are going to be made in a risk informed performance
8 based arena? Then how do you go about implementing it
9 once you decide that these changes need to be made and
10 so on? It's not an easy process to change as you
11 know.

12 MEMBER GARRICK: Right, yes.

13 MR. FLACK: But that's really where the
14 framework is headed. I mean that's the initiative
15 there.

16 MEMBER GARRICK: Thank you.

17 MEMBER LEVENSON: Let me ask this. You
18 know neither the CANDU nor the pebble bed or the HTGR
19 is a brand new concept. In the mid '50s, each of
20 those had a rather major review as to what it would
21 take to get it licensed in the U.S. under what at that
22 time were the regulations. Do you have access to
23 those reports because they were very good and very
24 thorough?

25 MR. CARLSON: I was involved in the work

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1 during the early '90s on all of those designs when I
2 was previously in research in those days. So we have
3 NUREG-1338 which is the preliminary safety evaluation
4 report for the MHTGR. We have a number of major CANDU
5 research products from the early '90s that I was
6 involved in. We have tried to maintain our knowledge
7 base from the licensing Peach Bottom in Fort St.
8 Vrain.

9 MEMBER LEVENSON: I don't think any of
10 those identified some of the rather basic safety
11 issues in the study done in the mid '70s. It was
12 probably one of the highest powered review groups.
13 It's one of the things which probably led to the
14 cancellation of the 12 or 15 HGTRs in this country
15 that had already been purchased.

16 MEMBER GARRICK: And that was about the
17 same time, Milt, that they really were starting to do
18 some serious accident progression analysis as they
19 called it rather than PRA at the time although it was
20 PRA.

21 MEMBER LEVENSON: But it was basic
22 engineering issues that were covered in that study.

23 MR. FLACK: Now the fuel back then is
24 quite different than the TRISO fuel level.

25 MEMBER GARRICK: Right.

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1 MEMBER LEVENSON: But it was -- No, it was
2 TRISO fuel.

3 MR. FLACK: It was TRISO back then.

4 MEMBER LEVENSON: But it wasn't related to
5 the fuel.

6 MEMBER GARRICK: There were differences.

7 MEMBER LEVENSON: That's why I said the
8 idea that you can use the same codes for pressure
9 vessels for water that you could -- It has nothing to
10 do with temperature. You can adjust it for all of
11 that. I have to stop and think for a minute because
12 when I read the damned report it was under proprietary
13 conditions. I have to be careful about what I can say
14 and think for a second.

15 Basically something like a configuration
16 H where you have a reactor cylinder and you have a
17 cylinder with either power system and a connecting
18 pipe. Your study plan says the pipe is not going to
19 be treated as a pipe. It's going to be called a
20 vessel. You are going to analyze three independent
21 vessels. I think you would find in that original
22 report evidence that that doesn't work.

23 At that time, there was almost no known
24 way to design that properly because of the transition
25 point where in a conventional pressure vessel some

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1 things are in tension, they suddenly are in
2 compression and you have very peculiar -- All I'm
3 saying is that this is not relevant to this Committee
4 but there's some very serious differences in these
5 things that really need to be looked at very
6 carefully.

7 MR. CARLSON: We've talked about the issue
8 of a cross vessel versus a cross pipe or cross duct
9 but I'd be very interested in applying some of these
10 older reports that may have escaped my attention.

11 MEMBER LEVENSON: The one I'm referring to
12 was an international group which was put together
13 including people from the U.K. and France who were
14 very knowledgeable in gas cooled reactors. It was
15 really a high powered study.

16 MR. CARLSON: That's very interesting.
17 With NRC involvement?

18 MEMBER LEVENSON: No, it was proprietary.
19 It was private. It was done by Shell. The question
20 was whether they would put money or not into the HDGR
21 program.

22 MR. FLACK: Thank you for that tidbit of
23 information.

24 MEMBER LEVENSON: But I think that for the
25 small piece that is the responsibility for this

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1 Committee, I think we'd be very interested in seeing
2 how seriously are the concerns and looks at graphite.
3 I know there are some people that would argue that
4 graphite won't burn. I think both Windscale and
5 Chernobyl must not have read the documents because
6 they did burn.

7 The first method of analysis that was done
8 for Fermi's group in Westans (PH) they didn't have any
9 method of analyzing impurities in graphite at that
10 time so Johnny West took a full sized block of
11 graphite out of the reactor, put it into a big glass
12 pipe and burned it down to ashes and analyzed the
13 ashes. Lots of reason to believe graphite will burn
14 particularly highly radiated graphite probably ends up
15 with a reasonable amount of stored energy that can
16 change its properties. I think there's a lot of
17 questions that need to be asked about these systems.

18 MR. CARLSON: In some of the discussions
19 that we've been having with our NMSS counterparts
20 we've noted that for transportation accidents the fire
21 issue becomes different when you have graphite present
22 versus today's fuel materials. This is something we
23 will be keying on.

24 VICE CHAIRMAN WYMER: Let me add that it's
25 true that graphite burns but when you are trying to

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1 reprocess it and you are trying to burn it, it's very
2 hard.

3 MEMBER GARRICK: It burns erratically.
4 The back end of that fuel cycle for a closed fuel
5 cycle is really unresolved.

6 VICE CHAIRMAN WYMER: George? John?

7 MEMBER GARRICK: No, I'm fine.

8 VICE CHAIRMAN WYMER: Mike?

9 MEMBER RYAN: No.

10 VICE CHAIRMAN WYMER: Anyone else? Staff?
11 Questions?

12 MR. CAMPBELL: Has anybody done an
13 analysis of graphite materials in terms of source term
14 or a waste stream, the behavior of graphite in the
15 environment as opposed to the nice well controlled
16 environment? If we start looking at the pellets or
17 the cueballs of whatever you want to call them as a
18 waste stream in and of itself, then you have to look
19 at how does graphite behave over long periods of time
20 and the differences in the source term. I assume
21 there are significant differences. Is there any
22 information about that at this time?

23 MR. FLACK: Well, at this point actually
24 we have an individual who is now being brought up as
25 a graphite expert on the staff. He's not here today.

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1 He will be spending some time in England towards the
2 end of the year at the University of Manchester. Part
3 of his mission to England is to find out exactly as
4 much as he can about graphite, the experiences they
5 have with it and how they plan to dispose it and so
6 on. But at this point I don't have that information
7 unless, Don, do you have information on that?

8 MR. CARLSON: Well, we've been talking
9 with the European Commission about some of the
10 cooperative efforts that we could engage in. That
11 kind of work is being planned in that European
12 Commission effort and hopefully we will participate in
13 that.

14 VICE CHAIRMAN WYMER: Let me add one more
15 note here with respect to burning graphite and the
16 fuel cycle associated with it if there is a fuel
17 cycle. That is you have a carbon 14 problem. It's
18 from the nitrogen that's in the graphite. It's not
19 surprising if you know what the item of carbon 14 is.
20 But to most people it's surprising. Then carbon 14
21 can exceed permissible discharge limits.

22 MR. CAMPBELL: Well, Ray, that was part of
23 my issue with the source term. The CANDU reactors
24 have a carbon 14 issue. We know from our experience
25 at Yucca Mountain at the Technetium and the iodine

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1 because of the mobility become significant players in
2 the source term and in the CANDU reactors, carbon 14
3 is a significant player because of the nitrogen in the
4 derated water and actually the reactions that can
5 occur in there. They have been studying this for a
6 long time. It is an issue because of its mobility and
7 the ease of incorporation into biosystems. It's not
8 a trivial problem.

9 VICE CHAIRMAN WYMER: That's right. It is
10 an issue.

11 MEMBER LEVENSON: I guess I'll just turn
12 it back to you, Mr. Chair.

13 CHAIRMAN HORNBERGER: Thank you very much.
14 Okay. At this time we are going to take a break and
15 we will go off the record. We are finished with the
16 recorder for today and we will reconvene in 15 minutes
17 and then continue on with our preparation of AC and
18 other reports.

19 (Whereupon, the above-entitled matter
20 concluded at 3:16 p.m.)

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