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UNITED STATES NUCLEAR REGULATORY COMMISSION'S
ADVISORY COMMITTEE ON NUCLEAR WASTE

July 19, 2005

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE (ACNW)

161st MEETING

+ + + + +

TUESDAY

JULY 19, 2005

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ROCKVILLE, MARYLAND

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The Advisory Committee met at 3:30 p.m. in Room T-2B3 of the Nuclear Regulatory Commission, Two White Flint North, 11545 Rockville Pike, Dr. Michael T. Ryan, Chairman, presiding.

COMMITTEE MEMBERS PRESENT:

- | | |
|------------------|---------------|
| MICHAEL T. RYAN | Chairman |
| ALLEN G. CROFF | Vice Chairman |
| JAMES H. CLARKE | Member |
| WILLIAM J. HINZE | Member |
| RUTH F. WEINER | Member |

1 ACNW STAFF PRESENT:

2 Neil M. Coleman

3 Latif Hamdan

4 Michele Kelton

5 Michael Lee

6 Richard K. Major

7 Sharon A. Steele

8 Ashok Thadani

9

10 ALSO PRESENT:

11 Heather Astwood, OCM

12 Dennis Damon, NMSS/SFPO

13 Dave Diodato, USNWTRB

14 Allen Fetter, NMSS/HLWRS

15 B. John Garrick, Invited Expert

16 Norm Henderson, Bechtel SAIC Company

17 Robert Johnson, NMSS/DWMEP

18 John Kirkwood, BAHOCRUM

19 Jocelyn Mitchell, RES/DSARE

20 John Russell, CNWRA

21 Duane Schmidt, NMSS/DWMEP

22 Wilkins Smith, NMSS/FCSS

23 Roxanne Summers

24 Engelbrecht Von Tiesenhausen, Clark County,

25 Nevada

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

(3:38 p.m.)

CHAIRMAN RYAN: On May the 14th to the 21st, three of us, Allen Croff, Jim Clarke, and myself visited Japan. We had a number, I think, of good meetings, the first of which was the NSC, the Nuclear Safety Committee of Japan.

And it was interesting, I think as we took away some major issues that the NSC is wrestling with, the same kind of integrating definitions of waste as the ICRP actually talked about, very low activity wastes, low activity wastes, which is probably equivalent to what's LAW in the National Academy Report, low level waste, high low-level waste, which might actually be intermediate waste, and then on up to high-level waste.

So they are struggling with, and at this point are relatively qualitative about where these boundaries are. And then they're tending to look at them in a different way than we are. They're not looking at them so much from the origin definitions. They're looking at them in terms of what is the right disposal concept for these various levels.

Do you guys agree?

VICE CHAIRMAN CROFF: Pretty much with the

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1 exception of high-level waste where --

2 CHAIRMAN RYAN: Yes, that's clearly at the
3 top end.

4 VICE CHAIRMAN CROFF: Yes, at the top end,
5 that's a source-based definition. So they could work
6 themselves into the waste incidental to reprocessing
7 problem if, you know, they ever got there. Now they
8 reprocess their waste and don't have much stored in
9 tanks and stuff so that may not be an issue. But they
10 could.

11 'But the others were using those terms.
12 And I guess I'd phrase it is they're tending for the
13 other waste types to go more like a DOE system.
14 Instead of defining classifications per se, they're
15 just basically developing a site and developing an
16 acceptance criteria for that site and what goes into
17 it is that class of waste.

18 CHAIRMAN RYAN: I think it is based on the
19 performance assessment --

20 VICE CHAIRMAN CROFF: Yes.

21 CHAIRMAN RYAN: -- and the risk-informed
22 assessment --

23 VICE CHAIRMAN CROFF: Right.

24 CHAIRMAN RYAN: -- for that site. It's
25 not --

1 VICE CHAIRMAN CROFF: It seems to make
2 sense.

3 CHAIRMAN RYAN: It seems to. Some other
4 observations, obviously Japan has a closed fuel cycle.
5 They have a high-level waste study area in Honorobe,
6 which is on Hokkaido, the northernmost island. And
7 the study area is guaranteed by written agreement not
8 to be a high-level waste site for Japan. That's the
9 only way the study area could be started.

10 It's got to be a multiple shaft, you know
11 deep geologic investigation program in hard rock.
12 There's a similar site on the western side of Japan in
13 unconsolidated sediments. I mean the idea there is
14 the science teams will be experimenting -- I've got it
15 reversed. Excuse me. I'm sorry.

16 Thank you. The hard rock is in the
17 western side and Honorobe is the unconsolidated
18 sediment.

19 But the interesting part is they have had
20 a candidate effort where 3,239 information packets
21 went out to communities and community leadership
22 groups seeking a volunteer. And they have received
23 zero responses. They have had no success stories come
24 out of the process so far. And so that's an issue
25 there they are struggling with.

1 These two study areas are underway but
2 we'll see how that proceeds.

3 MEMBER HINZE: No success stories or no
4 applicants.

5 CHAIRMAN RYAN: They had one that they
6 worked with for a while but failed. But there is
7 nobody on the horizon that is raising their hand
8 saying please make it mine. So that was an
9 interesting development.

10 MEMBER HINZE: Any Indian traps there?

11 CHAIRMAN RYAN: The Tokai -- I'm sorry,
12 the Rokkasho area is where they have quite a lot of
13 development, both nuclear and non-nuclear. They have
14 30 days to refine petroleum products to cover the
15 nation's need. So they have quite a large oil storage
16 tank field up there to store this reserve. And I
17 believe they're continuing to increase it as time goes
18 on.

19 VICE CHAIRMAN CROFF: They have no
20 refineries.

21 CHAIRMAN RYAN: What?

22 VICE CHAIRMAN CROFF: They have no
23 refineries.

24 CHAIRMAN RYAN: They have no refineries.
25 It's all imported, finished products. They have 22

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1 two-megawatt windmills. Tokai Power is operating 11
2 and Kansai Power is operating the other 11. They are
3 in some sort of a performance kind of competition to
4 operate these windmills.

5 MEMBER WEINER: What kind of area do these
6 windmills cover -- windmill farms cover?

7 CHAIRMAN RYAN: I'm going to guess a
8 couple hundred of acres or so. They tend to be strung
9 out on mountain ridges and places where they will
10 catch the most wind. They weren't in an array. They
11 were, you know --

12 MEMBER WEINER: Strung out?

13 CHAIRMAN RYAN: -- strung out a bit. And
14 I guess that's really, you know, kind of a high-end
15 experimental facility. But I imagine it generates
16 power for the region to some extent.

17 The reprocessing plant is well along.
18 They were getting ready for, I guess, cold uranium
19 testing.

20 VICE CHAIRMAN CROFF: I believe they were
21 in cold uranium testing --

22 CHAIRMAN RYAN: They were in cold uranium
23 testing.

24 VICE CHAIRMAN CROFF: -- while we were
25 there.

1 'CHAIRMAN RYAN: And doing shakedowns of
2 systems and all that. So they are well along. And
3 they have fuel on site ready for reprocessing. They
4 had probably what -- one and a half -- well, let's say
5 25 percent of their fuel capacity in storage was
6 already there or fuel elements, something like that.
7 We got a glimpse of the fuel pool.

8 So they're up and running. Of course,
9 they have the fuel fabrication plant up and running.
10 And there is a MOX plant planned which will start
11 construction about three years down the line.

12 Their low-level waste site has been up and
13 running for more than a decade. All the low level
14 waste is handled remotely from the time it arrives on
15 the truck to the time it goes into disposal position,
16 it's all remote handled. It's all one waste form.

17 DR. LARKINS: Is there MOX facility going
18 to be similar to the French Cogema design?

19 CHAIRMAN RYAN: The French are involved in
20 the design. Yes, the French are partner in the
21 design. So whether it is a newer design or similar to
22 what is existing, they weren't real -- we didn't get
23 a lot of detail. But it's three years down the line.

24 DR. LARKINS: It may be very similar to
25 what we're going to build here.

1 CHAIRMAN RYAN: I imagine it will be
2 bigger.

3 DR. GARRICK: Allen, what's the
4 reprocessing technology based on? Is it a purex
5 process?

6 VICE CHAIRMAN CROFF: Purex plant, yes.

7 DR. GARRICK: Purex plant.

8 VICE CHAIRMAN CROFF: I think they had a
9 lot of help from France there, too.

10 MEMBER WEINER: Is it like the Cogema
11 process or like --

12 VICE CHAIRMAN CROFF: Yes. Cogema.

13 CHAIRMAN RYAN: The low-level waste site,
14 they're in Phase 2 of the site. And they're now
15 designing Phase 3. Also at the Rokkasho site is an
16 intermediate depth disposal study boring tunnel. It's
17 actually quite a huge excavation. I mean I think Bill
18 you were taking note of the fact it was a very large
19 opening. And they're looking to study the placement
20 of intermediate depth waste.

21 For the purpose -- I think it was fairly
22 clear that they were really just trying to get the
23 intruder scenario out of play by going down several
24 tens of meters instead of just, you know, a few
25 meters. So that intrusion -- the high-low level or

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1 the intermediate or the low-high level. I'm not sure
2 exactly where the line would be drawn for waste that
3 had higher activity concentrations yet were not
4 persistent out into the tens of thousands of years
5 time frame.

6 And that seemed to be -- the study tunnel
7 is nearing completion in terms of construction. And
8 then shortly thereafter, I think they were going to
9 start, you know, testing and placement experiments of
10 one sort or another. So that was up and running.

11 The visitors center, which was a fabulous
12 facility, with, you know, great audio/visual and other
13 kinds of presentation materials puts 100,000 citizens
14 per year through the facility. There is a very clear
15 outreach program where busloads of people, school
16 children, senior citizens groups, all sorts of groups
17 are buzzing through the facility every day.

18 DR. GARRICK: Now where is that?

19 CHAIRMAN RYAN: It's right at the Rokkasho
20 area. And you can stand in a panoramic observation
21 tower and actually through telescopes and whatnot,
22 view every one of the facilities around the complex:
23 the windmills, the oil tanks, the reprocessing plant.

24 By the way, all of the shipment of fuel,
25 spent and new, is by ship to the reactors, which are

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1 all on the coast.

2 VICE CHAIRMAN CROFF: And low-level waste.

3 CHAIRMAN RYAN: And low-level waste. So
4 it's similar to Sweden in that regard. And they have
5 a rather extensive seaport area, the Takahiko Seaport
6 that takes in the oil for the oil repository, takes
7 out fuel, takes in spent fuel, and does all the
8 shipping. It's a rather well established seaport.
9 And there is a sole-use road to bring everything in
10 and out of the Rokkasho complex.

11 MEMBER CLARKE: They have a virtual
12 repository, too, that's incredible.

13 CHAIRMAN RYAN: Yes, it would rival a
14 Disney ride actually. You are taken inside a --

15 MEMBER CLARKE: It takes you right down
16 into --

17 CHAIRMAN RYAN: -- in a waste package.
18 And you follow -- you actually become a cesium atom
19 bouncing, you know, back and forth.

20 MR. HAMDAN: So what kind of organization
21 do they have government-wise? They have an executing
22 agency, a greeting agency, or it is one in the same.

23 CHAIRMAN RYAN: It's a single-phase
24 program.

25 MR. HAMDAN: That's why they can do all of

1 this.

2 CHAIRMAN RYAN: How many permits does a
3 reactor get in Japan to start up and run? One. So
4 it's -- and the low-level waste site, there is the
5 NSC. And they're the advising agency to the
6 government on yes or no.

7 MEMBER WEINER: What's been their accident
8 experience with their reprocessing facility?

9 CHAIRMAN RYAN: Well, they haven't
10 operated it yet so --

11 VICE CHAIRMAN CROFF: Not the big one.

12 MEMBER WEINER: Oh. Okay.

13 CHAIRMAN RYAN: Let's see, so that's
14 really the stops we made. We then went down to the
15 Tokai research facility and saw the pilot plant
16 operations of the various components. And saw a
17 little bit more of the details there.

18 We visited the really formidable
19 geosciences laboratories that were -- you know they
20 did some interesting tests, for example. They used
21 big bentonite rings around every waste package. And,
22 of course, there is a seismic question there. In a
23 seismic event, what happens is the waste packages
24 twist in the bentonite and the bentonite takes the hit
25 whereas the waste package remains intact.

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1 So they put it into a medium that will
2 undergo a defamation and preserve the waste package,
3 which is a pretty slick idea. And they've actually
4 done scale testing of that.

5 They've done fracture flow modeling that's
6 unbelievable. They put fractured rock chunks, I mean
7 big chunks under pressure and actually modeled flow
8 through them under pressure. You know they decided
9 they wanted to actually get pictures -- x-ray
10 photographs of fractures under pressure so they bought
11 their own CAT scanner, which, you know, is not a
12 trivial purchase. It's about a five million dollar
13 piece of equipment.

14 So on they go. It's a pretty impressive
15 scientific staff in terms of their knowledge and their
16 experimental program. And they are really designing
17 to get at every phase of everything from, you know,
18 package performance right on through the various
19 components of what they anticipate as their system.
20 And they're measuring things as they go along.

21 Pretty impressive.

22 DR. GARRICK: How much was the bentonite
23 decision based on chemistry? And how much was based
24 on it being plastic bed for the --

25 CHAIRMAN RYAN: I don't know if they

1 actually made a distinction. They just recognized it
2 had both elements of value and they have modeled both
3 in the total system. They've treated it as a system.

4 They didn't decide on bentonite because it
5 was plastic or because it would have good radionuclide
6 retention properties. They said boy, it does both.
7 That's a good idea. So I think it was both rather
8 than one or the other or, you know, a choice of one
9 and good luck, we got the other one, too. They really
10 seem to be pretty systematic in their thinking about
11 it.

12 Their modeling that they demonstrated on
13 the screen to us, for every radionuclide, they've
14 actually modeled time to either decay or time to break
15 through from the bentonite so that that's how they
16 developed their source term for longer-term modeling.

17 DR. LARKINS: So what's the waste package?

18 CHAIRMAN RYAN: The waste package is --
19 they've got a couple of different versions. They've
20 got, I think, a copper liner inside a stainless steel
21 alloy container. And I don't recall the alloy off the
22 top of my head.

23 VICE CHAIRMAN CROFF: I think it is a
24 fairly standard one. It's a glass cylinder, oh, 18
25 inches or so in diameter and about a meter tall, I

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1 guess. They're a lot shorter than ours. But, of
2 course, destined to go into basically a reducing
3 environment so they followed the rest of the countries
4 in the world and it's relatively cool so they're
5 putting bentonite around it.

6 PARTICIPANT: They're the same size?

7 CHAIRMAN RYAN: Yes, they're all the same
8 size.

9 VICE CHAIRMAN CROFF: Yes, everything is
10 standardized.

11 MR. HAMDAN: So what will happen after the
12 bentonite deforms the first time? Then what? Do they
13 have to do anything? Or it just continues to perform?

14 CHAIRMAN RYAN: It seems so. I mean we
15 didn't get into, you know, a really thorough detailed
16 conversation. But, I mean, that seemed to be the
17 conclusion that they reached that the bentonite, you
18 know, would deform but would continue to do its job.

19 VICE CHAIRMAN CROFF: An expected
20 condition is the repositories, these are saturated.
21 And when the water hits the bentonite, it swells and
22 seals. And so as long as it remains saturated, it
23 will sit there unless certain bad chemicals get in
24 there.

25 CHAIRMAN RYAN: And it will self seal once

1 deformed again. I mean it will do that.

2 VICE CHAIRMAN CROFF: Yes.

3 MEMBER WEINER: How do they guarantee a
4 reducing environment other than just the bentonite?

5 VICE CHAIRMAN CROFF: No, it's the geology
6 which is the reducing environment.

7 MEMBER WEINER: Oh, okay.

8 CHAIRMAN RYAN: Subsurface. It's beneath
9 the water.

10 MEMBER WEINER: The subsurface.

11 CHAIRMAN RYAN: Yes.

12 MEMBER WEINER: So they figure they have
13 a saturated --

14 CHAIRMAN RYAN: They don't figure it, they
15 know it.

16 VICE CHAIRMAN CROFF: They know.

17 MEMBER WEINER: And saturated is a
18 reducing environment.

19 VICE CHAIRMAN CROFF: To get to what Mike
20 was saying, the variability is they are looking at
21 clads over this stainless steel, between it and the
22 bentonite. One is copper and one was titanium. I
23 think it was titanium.

24 CHAIRMAN RYAN: Yes, they're looking at
25 different options.

1 The other thing to mention, too, of
2 course, is that they're not going to be burying spent
3 fuel. Just to, you know, make sure we cover the base.
4 They're going to be burying glass, reprocessed glass
5 high-level waste.

6 By the way, they already have an inventory
7 of several hundred glass canisters delivered back to
8 them, I believe mainly from France, that they've
9 gotten back as part of a reprocessing contract with
10 Cogema.

11 VICE CHAIRMAN CROFF: And others made by
12 Tokai.

13 MEMBER HINZE: And what are they doing
14 with it? Where is it?

15 CHAIRMAN RYAN: They have a high-level
16 waste well storage facility.

17 MEMBER HINZE: Well storage?

18 CHAIRMAN RYAN: Yes, it's basically a very
19 deep concrete structure with, you know, lifting
20 capability and all that. Of the -- I don't know, I'm
21 going to guess, Allen, of the hundred or so, Jim,
22 canisters, they said about a third of them were full -
23 - or a quarter, something like that.

24 VICE CHAIRMAN CROFF: Yes, of the wells,
25 they --

1 CHAIRMAN RYAN: And the wells had, I don't
2 know what was it -- eight, or nine, or ten canisters
3 each?

4 DR. GARRICK: Do they recover anything
5 more than uranium and plutonium?

6 CHAIRMAN RYAN: As far as I know, no.

7 VICE CHAIRMAN CROFF: I don't believe so.
8 They haven't gone beyond that -- in that study but
9 they haven't gone beyond it in application. Well, I
10 don't know which one they're using but Tokhai's were
11 processed. Remember they said they were processed
12 like -- was it a hundred tons of fuel?

13 CHAIRMAN RYAN: And, again, all that is
14 sort of pilot study. And I think the Tokhai glass
15 rods were the ones that ended up in the storage
16 facility.

17 You know they were very interested in the
18 role of the ACNW. We provided them with a CD with all
19 of our letters going back and the organization of
20 those materials.

21 DR. LARKINS: Is that a gift or
22 punishment?

23 (Laughter.)

24 CHAIRMAN RYAN: I think for the staff
25 folks that needed to go through them, probably a

1 little bit of a task. A richly rewarding one.

2 And, you know, of course we invited them
3 to come and visit us. And visit here.

4 DR. LARKINS: I was just mentioning to
5 Sharon, you know, we are having this technical
6 exchange next year with the French, Germans, and
7 Japanese for the ACRS. It may be, from all that you
8 mentioned, worthwhile inviting the Japanese, French,
9 and maybe the Swedes for a technical exchange with the
10 ACNW next year or the year after.

11 CHAIRMAN RYAN: Yes, that sounds like a
12 great idea actually. I think we were warmly welcomed.
13 I think they were genuinely interested in our, you
14 know, what is happening in the United States' program
15 and where we are and how the ACNW works. And we were
16 genuinely interested in learning how they were doing
17 things so we could bring it back. But it is
18 fascinating to see, you know, and I would welcome the
19 opportunity. I mean we can maybe have the meeting in
20 Nevada and give everybody a tour of Yucca Mountain for
21 example.

22 VICE CHAIRMAN CROFF: Sure.

23 MR. THADANI: And that would include the
24 French certainly?

25 DR. LARKINS: Yes, well I was thinking the

1 Japanese, French, and Swedes.

2 MR. COLEMAN: I'd like to just add the
3 Japanese were very interested in the risk-informed
4 approach. And I've sent them several of Dr. Garrick's
5 papers. They were interested in any substantive,
6 large studies involving risk assessments outside the
7 reactor area. And I sent them the staff's latest
8 sensitivity study with the TPA code for Yucca Mountain
9 which they were very interested in.

10 DR. LARKINS: Well, we met with the
11 Japanese, French, and Germans in Berlin in, I guess,
12 two or three years ago. They were doing performance
13 assessments at that time. So both for high level and
14 low level. So they are using performance assessment
15 methodologies now.

16 CHAIRMAN RYAN: I think that's a good
17 idea, John. That would be very timely with what they
18 are interested in. And I say let's do it.

19 MEMBER HINZE: May I ask in terms of
20 publications of their research, are any significant
21 numbers of these available? And are they in English?
22 And do you have a list?

23 CHAIRMAN RYAN: I think we have a list of
24 many of their publications. Some, of course, are in
25 Japanese and they provided some materials in English.

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1 And we would be happy to --

2 DR. LARKINS: Our library gets a lot of
3 the publications, foreign publications. And
4 periodically we get a list of things. They are
5 typically a year or further behind.

6 MEMBER HINZE: Well, I noticed in the list
7 of things that were brought back are largely
8 pamphlets. And don't seem to be documents. And it
9 would be interesting to see the research that's going
10 on, particularly in these two underground sites. And
11 if you can give me any clues to where I can access
12 that.

13 DR. LARKINS: Yes, well maybe we can get
14 Neil to check with our library. If we don't have it,
15 a lot of times they'll go out and get it for us.

16 CHAIRMAN RYAN: One other thing we could
17 do is we do have contacts with two of the NSC senior
18 staff people. And if we had a specific area where we
19 said, you know, could you give us your top ten high-
20 level waste geohydro, you know, study publications for
21 the last year or so, I'm sure they'd help us track
22 them down.

23 MEMBER HINZE: So I'll work with --

24 CHAIRMAN RYAN: Sure.

25 MEMBER CLARKE: I think the major research

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1 programs have their own websites as well. I don't
2 know how much of that is in English.

3 CHAIRMAN RYAN: You know that's a problem.

4 They are very sensitive to the fact that
5 part of the international community, of course the web
6 -- a lot of it is in English and many of their
7 websites have both. So I would start with that.

8 MR. COLEMAN: I would mention that a lot
9 of the materials in the two-page list at the end of
10 the trip report, a number are pamphlets, as you
11 mentioned, but the others are the overhead
12 presentations that we saw at each of the organizations
13 that we visited that are just filled with technical
14 material. And there are also a number of policy
15 papers, detailed policy papers in English there.
16 There is much more, of course.

17 CHAIRMAN RYAN: Yes, that packet that we
18 brought back would be a good packet to start with.
19 But it was a very productive trip. And it's clear
20 they are on the edge of a lot of interesting technical
21 issues.

22 MR. THADANI: Did you visit Toboksu -- I
23 think that's correct -- the seismic --

24 CHAIRMAN RYAN: No, we did not.

25 MR. THADANI: It's incredible.

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1 MEMBER HINZE: Along the same line but I
2 was wondering about the volcanic studies, the igneous
3 activity. Certainly they have to be more than
4 interested. And I've seen some work on that but I'd
5 like to see a little more in depth of what they're
6 doing.

7 MEMBER CLARKE: Bill, the candidate sites,
8 they don't have any candidate sites but the geologic
9 area that we're characterizing in study sites, the one
10 we went to was, you know, selected to be sedimentary
11 rock that was really highly fractured.

12 MEMBER HINZE: Yes, but that doesn't mean
13 that a volcano was going to come along.

14 MEMBER CLARKE: No, but they have a
15 requirement --

16 CHAIRMAN RYAN: The low-level waste site
17 is in the Takahiko formation, which is an old volcanic
18 formation. I mean vulcanism and seismicity is not
19 something they shied away from. They've had to deal
20 with it for hundreds of years.

21 MR. THADANI: They are world leaders in
22 that.

23 CHAIRMAN RYAN: So they figured it out in
24 a way. But it would be interesting to pursue it.

25 MR. COLEMAN: Before we close on this, I

1 wanted to mention on the record an appreciation for
2 the work by Dr. Yoshio Murao and also Dr. Ando of the
3 Nuclear Safety Commission of Japan. They coordinated
4 our visit among many nuclear organizations in the
5 country. That made it possible to visit so many
6 facilities in a very short time with no hold ups at
7 any point. I just wanted to recognize their special
8 efforts on our behalf.

9 CHAIRMAN RYAN: And we'd be remiss, Neil,
10 if we didn't also recognize your contribution and your
11 help in getting us around. Because without you
12 communicating with our two hosts, we would have been
13 standing by the airport wondering where to go next.
14 So thank you very much as well.

15 DR. GARRICK: Neil, were you the staff
16 person that arranged that? Would you object to me
17 having our staff person who is arranging our trip to
18 Japan contact you so that, you know, we maximize what
19 we get out of this?

20 MR. COLEMAN: Please have them get in
21 touch. It would be my pleasure.

22 DR. GARRICK: Her name is Paula Alpher --
23 Paula Alpher. And I'll have her call you. Thank you.

24 CHAIRMAN RYAN: Yes, and, John, we'd be
25 happy to give you any of our reports or, you know,

1 pamphlets, or anything we have to help you prepare for
2 your trip.

3 DR. GARRICK: Yes, thank you.

4 CHAIRMAN RYAN: All right. Let's see.
5 Where are we?

6 PARTICIPANT: We're at a break.

7 CHAIRMAN RYAN: We're at a break?

8 (Laughter.)

9 CHAIRMAN RYAN: What is this break
10 business? Dr. Garrick, you started this bad trend of
11 allowing breaks.

12 (Laughter.)

13 CHAIRMAN RYAN: Oh, I'm sorry. Okay. So
14 we're on break until 4:15 and we will reconvene on the
15 record.

16 (Whereupon, the foregoing
17 matter went off the record at
18 4:02 p.m. and went back on the
19 record at 4:18 p.m.)

20 CHAIRMAN RYAN: Okay. If we could take up
21 our agenda please at the Occupational Safety and
22 Health Administration's Request for Additional
23 Information on Ionizing Radiation?

24 As members have discussed, we have
25 actually gathered information and studied the question

1 related to what OSHA is looking for. And OSHA
2 basically is asking for a request for information that
3 asks about workers being exposed and perhaps not being
4 properly monitored or cared for but in a very vague
5 way. And they ask a bunch of other questions that are
6 not really focused on any particular point.

7 What they said was interesting. But what
8 I think was not said was more interesting to me. And
9 that was that there wasn't any particular focused
10 problem they were addressing. It was kind of a net
11 they were casting to see if anybody would respond to
12 identify a problem.

13 And, you know, as we took this question
14 up, the Committee has thought about well, what does
15 the infrastructure look like? The Atomic Energy Act
16 authority to the NRC controls the main body of
17 radioactive material in the United States, reactors
18 and nuclear materials across a broad spectrum of uses,
19 agreement states, 33 are authorized to carry that out
20 at the state level.

21 As the Committee reported a couple of
22 months ago, the IMPEP Program is successful and vital
23 at bringing the states' performance in those programs
24 to the attention of the Commission. The same
25 organizations in states regulate non-AEA radioactive

1 material and also regulate permitted electronic
2 product radiation sources, x-ray machines and medical
3 devices of various kinds and so forth. Also
4 accelerators that are in NAP, natural accelerated
5 produced, again, non-AEA, are regulated by the same
6 staff and the same technical infrastructure at the
7 state level as the AEA material.

8 So the reason I say all that is if we have
9 confidence they're doing their job on the AEA side,
10 there is no reason to assume they're not doing the
11 same job on the non-AEA side of the state's house.

12 There is also, apart from the strict
13 regulatory delivery end of radiation protection
14 practice, we all use and apply generally applicable
15 radiation standards that come to us from the EPA,
16 which address emissions and address, you know,
17 performance of facilities at the boundary and things
18 of that sort. And that relationship is well
19 established and governed by MOU and other kinds of
20 well-established relationships with the NRC.

21 Apart from the regulatory structure, there
22 is a robust infrastructure that supports agreement
23 states. The Conference of Radiation Control Program
24 Directors has had for many decades suggest state
25 regulations which have been updated and are compatible

1 with NRC and the states use on a regular basis.

2 There is implementation guidance for all
3 of those parts of the suggested state regulations,
4 again, to support the state programs in a wide variety
5 of areas.

6 The organization of agreement states is an
7 organization that actually was put forth out of the
8 NRC on its own because it had matured and was taking
9 on its own identify and being very effective in that
10 effort.

11 There are advisory bodies, which include
12 the National Council of Radiation Protection and
13 Measurements and even emerging issues as the use of
14 backscatter x-ray units for inspection of containers
15 and things of that sort relative to post 9/11
16 questions, there's current guidance on the street on
17 those issues for states and others to use and
18 implement.

19 You know, there's lots of other
20 professional organizations that offer guidance in
21 radiation protection matters of one form or another.

22 So just in summary, when you look at this
23 landscape of radiation protection regulators,
24 professional organizations, and guidance organizations
25 that are available to any radiation protection program

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1 in the United States, I ask the question, "What's
2 broken? What problem is this OSHA information-
3 gathering effort aimed at solving?"

4 And I've come up dry. I don't have an
5 answer that there is any solution that needs their
6 attention at this moment. You know we do recognize
7 that OSHA is the principle occupational inhalation
8 protection source. We use OSHA respiratory protection
9 guidance and that is integrated into NRC in agreement
10 state regulations. And that, again, is well
11 established and up to date and not anything that needs
12 a crisis.

13 There was a hint in the request for
14 information that there was some segment that was
15 unattended. You know I thought about states that have
16 NORM and T-NORM questions.

17 But, you know, from my own firsthand
18 knowledge, those state programs address those issues
19 in Florida or Texas or Louisiana. I mean there are
20 suggested state regulations for CRCPD on NORM and T-
21 NORM. And there is an implementation guide. And
22 states have their own regulations and have adopted
23 those as appropriate. Some states don't deal with
24 NORM so they don't necessarily have to address it.

25 So I just wonder what the net is being

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1 cast to try and capture. And I guess I come up with
2 the answer not much.

3 I'd be happy to have anybody else's view
4 on what it might be. Or if I'm off base or on target.

5 MEMBER HINZE: In view of John's
6 statements earlier about consistency between
7 regulatory agencies, what about units, this type of
8 thing? Is there any area here which can be improved
9 upon?

10 CHAIRMAN RYAN: Well, frankly, I mean OSHA
11 doesn't really deal much with radiation units. And,
12 in fact, they're out of step with the fundamental
13 bases for their regulations in their ICRP-2, which is
14 guidance developed in 1955 and published in '59. So,
15 you know, they'd have a lot of catching up to do if
16 they wanted to do something.

17 But that's sort of a secondary question to
18 me of what problem are they trying to solve? What is
19 the untended problem that needs their attention as
20 opposed to the infrastructure that is out there for
21 radiation protection now?

22 MR. HAMDAN: Can't we ask them?

23 CHAIRMAN RYAN: Well, I mean we certainly
24 could as individuals. But I guess I'm working in the
25 context that, you know, we've studied this question

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1 and we'll report our findings to the Commission.

2 And, you know, leave them with this answer
3 that we see a very robust radiation protection
4 infrastructure in the United States and, you know, go
5 through some of the details that I've highlighted to
6 you with a little bit more, you know, referencing and
7 so forth.

8 And say we don't see that there is problem
9 that needs their solution at this point. We don't
10 understand what they're actually reaching for because
11 they have not identified a specific problem they're
12 trying to address.

13 There is a very generic thing about well,
14 you know, radiation exposure is increasing. Well, it
15 isn't in workforces. NRC data shows it has been
16 decreasing steadily for the last decade or more in
17 reactor and non-reactor areas. So what do we do with
18 that? I mean you know the facts are that there
19 doesn't seem to be an increase in there.

20 Now in the popular media, we've heard
21 about self-referral CT scans and, you know,
22 specialized kinds of CT scans, spiral CT scans and so
23 forth, that the patient dose per exam are higher.
24 But, you know, that's specifically exempted in NRC
25 regulation. No exposure in this part shall be

1 interpreted as limiting the intentional exposure for
2 a patient for the purpose of diagnosis or therapy.

3 And, you know, the machines are regulated.
4 And that's a whole other area. The Center for Devices
5 and Radiological Health under the FDA has a very, you
6 know, robust program for, you know, performance
7 testing and acceptance testing and, you know, all of
8 that. The NEX Program for mammography quality and,
9 you know, all those kinds of quality programs exist to
10 address the quality of the exposure of a patient.

11 But the actual dose part of that is not on
12 the radar screen. That is a, you know, medical
13 practice area. So that's off the radar screen.

14 Yes?

15 DR. GARRICK: Mike, I would think that one
16 document that might be an excellent overview for them
17 on this whole issue would be about the first 50 pages
18 of BER-7 report --

19 CHAIRMAN RYAN: Yes.

20 DR. GARRICK: -- because it has a very
21 nice public statement together with the executive
22 summary. And taking those two sections together is a
23 very nice compact review of all of these issues,
24 including the CT scan business.

25 CHAIRMAN RYAN: All of that, yes, that's

1 a good point, John. In addition, I think they raised
2 the specter that, you know, there's a risk of
3 radiation. They're very vague about it in the write-
4 up and the BER-7, in spite of some of the popular
5 press reports, has really affirmed the same risk
6 estimators. And, in fact, a few of them have gone
7 down.

8 DR. GARRICK: Right.

9 CHAIRMAN RYAN: So that from a policy
10 standpoint, the use of a linear no-threshold approach
11 in policy setting is affirmed. And we're basically at
12 the same square where we were the day before BER-7
13 came out.

14 So, you know, I think all of this comes
15 together to say, again, what problem is OSHA trying to
16 solve with this information gathering exercise. Until
17 that's clear, you know, what's being missed, you know?
18 I personally don't see why it should proceed.

19 Have I missed anything? Does anybody else
20 have any comments or agree? Disagree?

21 MEMBER HINZE: Are we going to hear from
22 anyone in the NMSS? Are they approaching this problem
23 at all?

24 CHAIRMAN RYAN: Well, you know, based on
25 the schedule, you know, we kind of took on our own

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1 information gathering, which you've seen, you know, a
2 bit of. And if the Committee is disposed to do so,
3 I'll draft a letter and we'll read it out this week
4 and get it -- again, I'm not going to go into a broad,
5 you know, detailed view. I'm just going to cite some
6 of these components of the programs federally and
7 states that we've talked about. And give a little bit
8 more detail and so forth.

9 And make the conclusion that we just --
10 you know we would recommend to the Commission that
11 they advise OSHA that they don't understand what
12 problem it is that is being solved.

13 MR. THADANI: Mike, I might just note that
14 OSHA was looking for comments by August 1st. And to
15 get to the Commission probably would have to be this
16 week.

17 CHAIRMAN RYAN: Well, we will be done this
18 week.

19 MR. THADANI: Okay.

20 CHAIRMAN RYAN: I will have a draft of it
21 tomorrow hopefully if I'm excused early from dinner.

22 MEMBER HINZE: Has the NMSS staff or some
23 staff done anything for the Commission on this?

24 CHAIRMAN RYAN: Well, actually Dan Cool is
25 on travel in France and was unable to be with us.

1 MEMBER HINZE: Right.

2 CHAIRMAN RYAN: But he is, you know,
3 briefing on this as well. But, you know, and I did
4 have an occasion to actually just tell him that we
5 were taking up our own consideration of it. And he
6 was at the health physics meetings briefly. And I
7 simply told him we were looking at it. And he said
8 well, you know, he'll advise on his own and so will
9 we.

10 MEMBER HINZE: So we're not going over to
11 France to check with Don is that what you're saying?

12 (Laughter.)

13 CHAIRMAN RYAN: If you want to put in a
14 travel request, Bill, have at it.

15 (Laughter.)

16 MR. HAMDAN: See, they went to Japan.

17 CHAIRMAN RYAN: In any event, so any other
18 comments? Or are we ready to proceed?

19 MEMBER WEINER: I have a question.

20 CHAIRMAN RYAN: Okay.

21 MEMBER WEINER: They made the point in
22 their Federal Register notice that there is increased
23 exposure from all the x-ray machines in airports in
24 the security screening. And you successfully answered
25 that for me and said that no, there isn't.

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1 I think that's a point that since they
2 made the point in their Federal Register notice, that
3 we might address.

4 CHAIRMAN RYAN: Yes, and again, there's
5 three components here that are very important. One is
6 people are not x-rayed in airports. Baggage is x-
7 rayed. Workers who x-ray the baggage are monitored
8 radiation workers just like any other have been for a
9 very long time. X-ray machines in airports are not
10 new. They're not 9/11. They were there before.

11 There may not have been as many. But it
12 certainly was a, you know, radiation worker segment
13 that was well monitored. And I'm sure all of you
14 observe the dosimeters on folks as you travel through
15 airports. They are there. And they use them.

16 For more of the, you know, homeland
17 security area, there's two -- there's actually three
18 documents from the NCRP that address backscatter x-ray
19 units which have been used in, you know, theft control
20 in diamond mines, for example and other examples.

21 And the doses there are microrem per exam.
22 And, you know, the NCRP has developed, you know,
23 guidance to provide for those uses. They are not so
24 widespread. But, again, I see that as a problem
25 solved, not a problem unaddressed because the NRCP was

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1 explicitly solicited for how that was going to be
2 done.

3 And again, taking into account current
4 thinking on exposure of members of the public and, you
5 know, the value of the exam versus, you know, security
6 and radiation exposure questions and all that. So
7 there is guidance out there. It's not something that
8 is oops, we forgot about it. It has been addressed in
9 detail.

10 So, yes, Ruth, I think we could certainly
11 address it and point out what these documents are.
12 But there's guidance out there on those topics.

13 DR. LARKINS: Sounds reasonable.

14 CHAIRMAN RYAN: Proceed with the letter?

15 MEMBER WEINER: Yes.

16 CHAIRMAN RYAN: Okay. I have my homework
17 assignment.

18 Well, thank you very much. And on we go.

19 I think it's time to call Alan Pasternak
20 back.

21 DR. PASTERNAK: Hello, Alan Pasternak.

22 CHAIRMAN RYAN: Alan, Mike Ryan, how are
23 you?

24 DR. PASTERNAK: I'm okay. Thanks for
25 calling.

1 CHAIRMAN RYAN: Good. We have you on a
2 speakerphone and you are on the microphone and we're
3 on the record.

4 DR. PASTERNAK: We're on the record,
5 great.

6 CHAIRMAN RYAN: Alan, I wanted to take
7 just a few minutes and discuss with the Committee and
8 other individuals present that the ACNW is now kind of
9 on its Draft 2 of low-level radioactive waste white
10 paper or management paper.

11 And where we are -- and I'll just outline
12 for you, you know, what the content is. We've really
13 tried to put in one place the history of low-level
14 waste regulation, starting, believe it or not, with
15 the Atomic Energy Act of 1946.

16 And kind of working ourselves through its
17 current status with the current operating sites and
18 those under license development and the history of
19 compacts and all of that with the idea of really just
20 educating ourselves and thinking about its regulatory
21 structure and with the idea of, you know, what is risk
22 informed, what is not, and what do we think about
23 that.

24 So we really haven't gotten to what are
25 our conclusions or observations phase. We're really

1 at the information-gathering phase.

2 I anticipate that we'll finish up a draft
3 of that probably at this meeting. And then we'll take
4 it to think about between now and our next meeting.
5 So that's kind of where we are.

6 And I understood from our staff that you
7 wanted to offer us some comments and insights as we
8 complete this first step.

9 DR. PASTERNAK: Yes, I would appreciate a
10 chance to do that.

11 CHAIRMAN RYAN: Okay. Well, we're at that
12 point. So please let us know your thoughts.

13 DR. PASTERNAK: Okay. Thank you very
14 much.

15 First of all, let me say I appreciate the
16 phone hookup. I'm sorry I'm not there. But I do look
17 forward to attending a future meeting of the ACNW.

18 Cal Rad Forum, short for California
19 Radioactive Materials Management Forum is an
20 association of organizations that use radioactive
21 materials in the four state of the Southwestern
22 Compact. So our members include universities,
23 utilities with nuclear power plants, biotech firms,
24 industries, medical centers, and a number of
25 professional societies in radiation safety and

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1 medicine.

2 Let me ask you at this point if you can
3 hear me all right?

4 CHAIRMAN RYAN: We can hear you just fine.

5 DR. PASTERNAK: Good.

6 CHAIRMAN RYAN: Is everything okay with
7 the recorder? Yes, we're fine.

8 DR. PASTERNAK: Okay. The statement I
9 want to make on behalf of Cal Rad Forum is that we
10 would like to urge the ACNW to expand the scope of the
11 white paper to include a discussion of the failure and
12 unwillingness of the states to implement the Low-Level
13 Radioactive Waste Policy Act and the Amendments Act of
14 1985. And the consequences of that failure, the lack
15 of assured access to disposal facilities for
16 organizations that use radioactive materials.

17 As you are aware, on July 1st, 2008, the
18 disposal facility at Barnwell, South Carolina will be
19 restricted to the member states of the Atlantic
20 Compact. And at that time, organizations that use
21 radioactive materials in 36 states will have no place
22 to send the more radioactive categories, Class B and
23 Class C, of their low-level waste. No place to send
24 it for disposal.

25 In addition, they will have only one place

1 to send a subset of their Class A waste, and that will
2 be the Envirocare Facility at Clive, Utah, which will
3 then have monopoly control over disposal of most of
4 Class A waste, not including sealed sources and not
5 including biological tissue, at least under current
6 license restrictions.

7 Should the Texas effort be successful, and
8 we hope it will be, that would reduce the number from
9 36 to 34, I believe. But it's significant that today,
10 25 years after passage of the Policy Act of 1980,
11 Texas is the only state with a program to develop a
12 new disposal facility.

13 Other states, including the host state of
14 the Southwest Compact, California, have lacked the
15 political will to move ahead on that process and
16 develop new facilities as needed.

17 And our thoughts on this are explained in
18 more detail in our testimony to the Senate Energy and
19 Environment Committee on September 30th, our written
20 testimony.

21 With respect to the regulations, in 10 CFR
22 61, we believe those regulations are good. In fact,
23 as one looks at the disposal system in the country
24 today, perhaps it's the only stable and reliable part
25 of the disposal system. While regulations can always

1 be improved, doing so at this time does not focus on
2 the real problem which, as users of radioactive
3 materials and generators of low-level waste, we
4 believe to be the lack of access, assured access to
5 disposal facilities in the years ahead.

6 That July 1, 2008 deadline is only three
7 years away. The California effort, the only one to
8 ever issue a license under the Act, took 13 years.
9 Ten years from enactment of legislation to issuance of
10 the license, 1983 to '93. Another three years for
11 litigation. The license was challenged but it was
12 upheld along with the EIR, both of them were upheld by
13 the California courts.

14 And unfortunately, the transfer of land
15 for the Ward Valley site was opposed by the Clinton
16 administration. And in 2002, at the urging of ex-
17 governor Gray Davis, the Legislature passed a law
18 cancelling the Ward Valley Project and putting in
19 place some requirements that we think are probably
20 incompatible with NRC requirements for development of
21 any future facilities.

22 So the time is extremely short. It's
23 three years. And there isn't time to start
24 development of a new project. The Texas project may
25 make the deadline. But we'll see. I hope they do.

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1 Finally, I would like to reference the
2 comments of the Nuclear Regulatory Commission
3 incorporated in a report issued by the General
4 Accounting Office last June. And just briefly, a
5 portion of those comments are the following:

6 The future availability of disposal
7 capacity and the cost of disposal under the current
8 system remain highly uncertain. And low-level
9 radioactive waste generators need predictability and
10 stability in the national disposal system.

11 We believe it is in the national interest
12 to begin exploring the alternatives identified in
13 Appendix 2 that would potentially provide a better
14 legal and policy framework for new disposal options
15 for commercial generators of low-level radioactive
16 waste.

17 That's a portion of the NRC comments.
18 They also pointed out that no new facilities have been
19 developed in all of the years -- at that time, 24
20 years -- since passage of the Policy Act. And it
21 seems to me it is a pretty strong statement for a
22 regulatory agency, a strong statement in the policy
23 and legislative arenas.

24 So we hope that the white paper will
25 provide some focus on the problem on this crisis in

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1 proper disposal of low-level radioactive waste in the
2 Class A, B, and C categories. And you might also want
3 to comment on the greater than Class C, although I
4 understand the Department of Energy has started work
5 on their EIR for their responsibilities in that area.

6 This problem effects commercial generators
7 of low-level radioactive waste, institutional
8 generators such as universities and medical centers.
9 It effects government agencies at both the state,
10 federal, and local level, federal agencies such as
11 NASA, the Department of Defense, Veterans
12 Administration, hospitals all depend on access to the
13 commercial disposal facilities. And that's where the
14 problem lies.

15 So it effects users of radioactive
16 materials in 36 states along with the federal, state,
17 and local entities that use radioactive materials in
18 those same states. The Department of Energy has
19 facilities for its own radioactive waste but accesses
20 to those, at present, is restricted to waste owned or
21 generated by the Department of Energy. And I've
22 discussed this in a little more detail with your
23 staff.

24 So as you move ahead, we'll be happy to
25 work with you on this. And hope that you can focus

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1 some attention on this problem.

2 CHAIRMAN RYAN: All right. Thanks, Alan.
3 We appreciate your comments and your insights. And I
4 think we have -- you mentioned testimony you gave to
5 the Senate. I believe we have that for us to
6 consider. And we'll certainly read that as well as
7 review your comments that are in the record today as
8 we move forward. And we'll also keep you apprised of
9 our schedule as we take this topic up on future
10 agendas.

11 DR. PASTERNAK: I appreciate that very
12 much Mr. Ryan. May I continue to listen to the rest
13 of your discussion on this issue?

14 CHAIRMAN RYAN: Well, actually where we
15 are is we really have just -- we're finalizing our
16 first draft of the facts. I might mention to you that
17 we do cover the Low-Level Waste Policy Act and its
18 amendments and other milestones in the process. We do
19 mention the site development process and the batting
20 average and so forth.

21 So we're covering -- just documenting the
22 facts and figures at this point. And we have not
23 formulated any opinions or recommendations as of yet.
24 But as we do that and deliberate on them, you
25 certainly are invited to be with us and hear those

1 deliberations and participate even by phone or in
2 person if that works with your schedule.

3 So at this point, we really didn't have
4 anything else to report other than we're at kind of
5 getting to our second draft. And we'll be finishing
6 that up and reporting that back --

7 DR. PASTERNAK: I see.

8 CHAIRMAN RYAN: -- next time.

9 DR. PASTERNAK: I wonder if any members --
10 you or any members of the Committee have any comments
11 to make to me at this time?

12 CHAIRMAN RYAN: Well, again, no. I think
13 we're in kind of the information gathering phase. I
14 certainly don't. But what I'd like to do is kind of
15 study your comments and look at your other testimony
16 and consider that as we move forward.

17 DR. PASTERNAK: Fine. I appreciate it
18 very much.

19 CHAIRMAN RYAN: All right. Thank you very
20 much. We appreciate your being with us. We'll be
21 back in touch.

22 DR. PASTERNAK: Okay. Thank you, Mr.
23 Ryan.

24 CHAIRMAN RYAN: Thank you. Okay, bye-bye.

25 DR. PASTERNAK: Bye.

1 CHAIRMAN RYAN: Okay. That being said, I
2 think there is nothing further on the agenda. Is
3 there any other business to take up this afternoon?

4 (No response.)

5 CHAIRMAN RYAN: Dr. Garrick, again, I
6 appreciate your being with us today and sharing your
7 insights. And I look forward to your being with us
8 tomorrow.

9 DR. GARRICK: I'll be here part of the
10 time tomorrow.

11 CHAIRMAN RYAN: Thank you very much.

12 MS. KELTON: Dr. Garrick, it doesn't start
13 until nine-thirty, though.

14 DR. GARRICK: That's all right. I'll be
15 here at six-thirty.

16 MS. KELTON: Okay.

17 (Laughter.)

18 CHAIRMAN RYAN: And we look forward to
19 seeing you. If there are no other comments -- yes?

20 MS. KELTON: Remind them of the ethics
21 training at eight-thirty.

22 CHAIRMAN RYAN: Yes, we know that. Yes,
23 that's fine. Are there any other comments?

24 PARTICIPANT: I think the thing I miss
25 most at the TRB is that.

1 CHAIRMAN RYAN: You can have one if you
2 like.

3 PARTICIPANT: I might steal it.

4 CHAIRMAN RYAN: All right. We'll conclude
5 the record here and conclude the meeting as well.
6 Thank you very much. Have a good evening. We'll see
7 everybody at nine-thirty in the morning.

8 (Whereupon, the above-entitled meeting was
9 concluded at 4:46 p.m.)

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CERTIFICATE

This is to certify that the attached proceedings
before the United States Nuclear Regulatory Commission
in the matter of:

Name of Proceeding: Advisory Committee on

Nuclear Waste

161st Meeting

Docket Number: n/a

Location: Rockville, MD

were held as herein appears, and that this is the
original transcript thereof for the file of the United
States Nuclear Regulatory Commission taken by me and,
thereafter reduced to typewriting by me or under the
direction of the court reporting company, and that the
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William Click
Official Reporter
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