

**Official Transcript of Proceedings**  
**NUCLEAR REGULATORY**  
**COMMISSION**

Title: Advisory Committee on Nuclear Waste  
173rd Meeting

Docket Number: (not applicable)

Location: Rockville, Maryland

Date: Monday, September 18, 2006

Work Order No.: NRC-1254

Pages 1-53

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE (ACNW)

173rd MEETING

+ + + + +

MONDAY,

SEPTEMBER 18, 2006

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ROCKVILLE, MARYLAND

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The Advisory Committee met at the Nuclear  
Regulatory Commission, Two White Flint North,  
Room T2B3, 11545 Rockville Pike, at 10:00 a.m.,  
Michael T. Ryan, Chairman, presiding.

COMMITTEE MEMBERS:

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

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ACNW STAFF PRESENT:

JOHN T. LARKINS, Executive Director, ACRS/ACNW

ANTONIO DIAS

NEIL M. COLEMAN

DEREK WIDMAYER

ALSO PRESENT:

DR. THEODORE ROCKWELL, Radiation, Science &  
Health, Inc.

DR. DON COOL, NRC

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I-N-D-E-X

AGENDA ITEM

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

(10:02 a.m.)

CHAIRMAN RYAN: We will come to order, please. This is the first day of the 173rd meeting of the Advisory Committee on Nuclear Waste.

During today's meeting, the committee will consider the following: observations from ACNW members on staff and recent member activities, and discussion of draft ACNW letters. The first item will be this morning's activity, and the draft letter writing will be this afternoon.

The meeting is being conducted in accordance with the provision of the Federal Advisory Committee Act. Antonio Dias is the Designated Federal Official for today's session.

We have received a request by Dr. Theodore Rockwell from Radiation, Science & Health, Incorporated to make an oral statement during today's session. Should anyone else wish to address the committee, please make your wishes known to one of the committee staff.

It is requested that speakers use one of the microphones, identify themselves, and speak with sufficient clarity and volume, so they can be readily heard. It is also requested that if you have cell

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1 phones or pages that you kindly turn them off.

2 I will begin with some items of current  
3 interest. Dr. Richard Savio -- is Dr. Savio with us  
4 at the moment? Has been with the ACRS for more than  
5 30 years. He will be retiring on September 30, 2006.  
6 During his tenure with the ACRS and the ACNW staff he  
7 has provided outstanding technical support to the ACRS  
8 on numerous matters, including reviews and evaluation  
9 of safety research project and programs in support of  
10 ACNW safety research reports.

11 On behalf of the committee, I would like  
12 to thank Dr. Savio for his contributions, and I know  
13 I speak for all members and staff in wishing him good  
14 luck in his future endeavors, and thank him for his  
15 more than 30 years of service to this agency and to  
16 the country.

17 Mr. Noble S. Green, Jr., an administrative  
18 secretary to the Executive Director for ACRS/ACNW  
19 office for the past three years has accepted a  
20 position as an administrative support specialist in  
21 the Information Management Branch for Nuclear Reactor  
22 regulation. He started his new job on September 1st,  
23 and he has provided outstanding administrative support  
24 to both the ACRS staff and the committee members.

25 And on behalf of the committee, I again

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1 would like to thank Mr. Noble S. Green, Jr., for his  
2 support and wish him much success in his new position  
3 in the agency. Thank you very much.

4 Without further ado, I will turn to our  
5 agenda. And the first item is some observations of  
6 members, and we will start with the visit to the Crow  
7 Butte in situ leach facility in Nebraska. And I think  
8 Dr. Weiner will lead the discussion, supported by  
9 Latif Hamdan.

10 MEMBER WEINER: I have some slides. It's  
11 a Powerpoint slide. Just take a moment to get our  
12 slides up.

13 On August 15th, Dr. Hinze and Dr. Hamdan  
14 and I went to -- visited the Crow Butte facility, and  
15 we -- I want to get the slides up. The trip report  
16 that we put together -- and I really want to thank  
17 Latif Hamdan, who is really the expert on this, much  
18 more so than Bill and I are -- he did most of the work  
19 on the trip report. The committee members have the  
20 trip report. There it is.

21 And I made a few slides from the trip  
22 report and from a background document that we had.

23 Okay. Can I have the next slide?

24 These -- and I apologize, I made these  
25 fairly quickly and had some other things to do, and I

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1 ask that Latif and Bill interrupt and make comments  
2 whenever they have a comment to make. This is one in  
3 situ leach facility. It has been in operation since  
4 1991. The host rock for the uranium deposit is a  
5 sandstone aquifer in Chadron formation, and it goes  
6 from several hundred feet to 1,000 feet deep.

7 The near surface aquifers are the potable  
8 aquifers. The Chadron formation is underlain by about  
9 1,500 feet of an impermeable shale, and the  
10 groundwater below the shale is not of usable quality.

11 Can I have the next slide?

12 We were very interested to see how the in  
13 situ leach mining is done, and I want to point out  
14 that what is done when they mine in situ is chemically  
15 basically the same process that was done on the rock  
16 when the uranium was mined as a hard rock and brought  
17 to the surface, crushed, and then they did the  
18 leaching at the surface.

19 For the in situ leach, there are three  
20 phases -- a mining phase, uranium processing phase,  
21 and the last is aquifer restoration. The mining is  
22 conducted in aquifers or aquifer units which are  
23 exempted by the EPA based on criteria and standards  
24 for the underground injection control program in  
25 40 CFR Part 146.

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1           There are repeated -- the mining involves  
2 repeated cycles of injecting native groundwater which  
3 contains carbonate ion, because the uranium uranyl  
4 carbonate is quite soluble, and heavily oxygenated  
5 water. What they inject is called the lixiviant, and  
6 it is injected into the host formation. The uranium  
7 is leached, and the dissolved uranium is then  
8 extracted.

9           The lixiviant which contains the uranyl  
10 carbonate is called the pregnant lixiviant, and when  
11 they take it out then it's called the barren  
12 lixiviant.

13           (Laughter.)

14           I think this is -- it's very interesting.  
15 And Latif may know the origin of these terms. I  
16 don't. The pregnant lixiviant is pumped to above  
17 ground facilities for recovery and processing, and we  
18 also had a tour not only of the mine -- and I'll show  
19 you some pictures of things that we had a tour of --  
20 but also of the surface reprocessing facility.

21           Next slide, please.

22           The uranyl carbonate is collected on an  
23 ion exchange column, and it is precipitated as U-308.  
24 The U-308 is crystallized, washed, and dried, and  
25 transported offsite to further processing. From Crow

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1 Butte, the offsite processing is done in Canada, and  
2 this is because the Crow Butte uranium contains quite  
3 a bit of vanadium contaminant. And the Canadian  
4 processor that they send it to can handle that  
5 vanadium contaminant better than a number of sites in  
6 the United States.

7 The barren lixiviant from which the  
8 uranium has been removed is recycled by reinjection  
9 into the ore body. A small amount is sent to an  
10 evaporation pond, and this keeps the gradient, the  
11 lixiviant gradient, moving toward the production well.  
12 There are really three kinds of wells, and you'll see  
13 them. There are the production -- there are the  
14 injection wells that inject the lixiviant, the  
15 production well where the pregnant lixiviant comes  
16 out, and then there are monitoring wells that monitor  
17 the aquifers.

18 Can I have the next slide, please?

19 They mine until it is no longer  
20 profitable, and that is usually -- we asked that  
21 question, and that is usually when the pregnant  
22 lixiviant is down to about 10 parts per million. They  
23 do continue to extract uranium from the lixiviant, but  
24 that is -- they extract down to three to four parts  
25 per million, and that is for restoration. But it

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1 doesn't produce an economic product.

2           There are three options for groundwater  
3 reclamation that you can reclaim to baseline or  
4 background conditions, or to the class of use --  
5 drinking water or whatever -- or to an alternate  
6 concentration limit. And Latif can speak much more  
7 knowledgeably than I to the ACL, the alternate  
8 concentration limit.

9           This amounts really to a change in the  
10 point of compliance. Instead of requiring compliance  
11 with one of the first two standards at the well, the  
12 point of compliance is moved to a further point,  
13 usually no further than the site boundary.

14           Latif, do you want to make any further  
15 comment on that?

16           MEMBER HAMDAN: Yes, I think just instead  
17 of complying with the standard at a point of  
18 compliance, they elected instead that they move the  
19 compliance point from the original point of compliance  
20 to what they call the point of exposure, which is the  
21 point where somebody could be exposed. And by doing  
22 that, essentially you are exceeding the standard at  
23 the original point of compliance, but meeting it at  
24 the point of exposure.

25           MEMBER WEINER: This is the area that is

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1 to be addressed. It's groundwater reclamation. It's  
2 the area that is to be addressed in the draft rule.  
3 At the present time, the standard -- there is no rule  
4 that gives you a standard for compliance. It is done  
5 -- this was from conversations with the project  
6 manager, Steve Cohen. It is done either in the  
7 license conditions or the -- in some combination with  
8 state standards. The state can set standards for  
9 offsite concentrations, and so on.

10 There are other mines other than Crow  
11 Butte where there is actually very little water in the  
12 monitoring -- they have difficulty monitoring the  
13 groundwater because there is so little of it. There  
14 is a site -- a mine in Wyoming -- Wyoming mines are  
15 basically in deserts, and they frequently have too  
16 little water, even to get good measurements for  
17 monitoring.

18 But this is one of the areas where I  
19 believe -- or it was our impression that some kind of  
20 a baseline regulation is needed. This is really the  
21 impetus for having a rule.

22 Can I have the next slide, please?

23 This is just further details about how  
24 they mine. At Crow Butte, they are completing  
25 restoration at one mine section that had a seven-year

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1 lifetime. And reclamation -- the reclamation usually  
2 takes about two years.

3 The contaminated water is disposed by  
4 discharging into an onsite deep injection well or into  
5 onsite evaporation ponds. Both of them have physical  
6 limitations. The ponds have a limited area, and  
7 injection -- a deep well injection is very deep. It  
8 is below the pure shale.

9 Can I have the next slide, please?

10 Okay. These are some slides that I took  
11 from Steve Cohen's very excellent background document.  
12 This is just -- shows you where the Chadron mine is.  
13 And I apologize a little bit, I copied these as  
14 images, as graphics, not as text. Can I have the next  
15 one?

16 This is a -- the little compass in the  
17 lower right is very difficult to see, but the top of  
18 the graph is north. And this is a picture --

19 CHAIRMAN RYAN: Do you mean the top on the  
20 screen or the top on the --

21 MEMBER WEINER: The top on the screen --

22 CHAIRMAN RYAN: Okay.

23 MEMBER WEINER: -- is north. I blew that  
24 up as much as I could, and I still couldn't tell --  
25 barely tell what the letters are. This is just a map

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1 of the ore body itself, and -- oh, wow.

2 MEMBER HAMDAN: Right here.

3 MEMBER WEINER: Right here. Okay. North  
4 is up here. This is a map of the ore body at Chadron.

5 Can I have the next slide, please?

6 CHAIRMAN RYAN: What do the colors mean?

7 MEMBER WEINER: I can't read what the  
8 colors mean.

9 CHAIRMAN RYAN: Are they different  
10 concentration zones?

11 MEMBER WEINER: Yes, they're different  
12 concentration zones.

13 MEMBER HAMDAN: These are different. I  
14 mean, it's --

15 CHAIRMAN RYAN: Okay. All right.

16 MEMBER WEINER: Yes.

17 CHAIRMAN RYAN: Fair enough.

18 MEMBER WEINER: This is a general picture  
19 of all of the wells that are on the site, and on this  
20 particular diagram you can't tell which well is which.

21 CHAIRMAN RYAN: You can't even tell what  
22 a well is.

23 MEMBER WEINER: These little thingies.

24 CHAIRMAN RYAN: This might get the "bad  
25 graphic of the week."

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1 (Laughter.)

2 MEMBER WEINER: It does, I think. Every  
3 one of these little things that look like specks on  
4 the picture.

5 CHAIRMAN RYAN: So there's a thousand  
6 wells?

7 MEMBER WEINER: There are thousands of  
8 wells. When you see the -- Latif took some pictures,  
9 but they didn't come out.

10 CHAIRMAN RYAN: Just so I'm clear, every  
11 one of these little tick marks all over the place --

12 MEMBER WEINER: Yes.

13 CHAIRMAN RYAN: -- are wells.

14 MEMBER WEINER: Are wells, that's correct.

15 CHAIRMAN RYAN: Wow. It's Swiss cheese.

16 MEMBER WEINER: It depends on what kind of  
17 well they are. When you see the site, what you see is  
18 a relatively undisturbed grassland with all these  
19 little white barrels on it. And I'm just sorry  
20 Latif's pictures didn't come out, but he had good  
21 pictures.

22 The next slide gives you -- okay. This is  
23 a diagram of a single section of -- a single well  
24 section. Each production well -- the yellow ones are  
25 production wells, and each production well is

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1 surrounded by a network of injection wells, so that  
2 you have this grid of production and injection wells.  
3 And typically 300 feet away from the mining area, if  
4 you will, are the monitoring wells, and they surround  
5 -- and I think it is 300 or 400 feet maximum between  
6 monitoring wells, 400 feet.

7 There is a central pump house which I have  
8 -- there are central pump houses that control the flow  
9 in the injection and production wells. The flow of  
10 the monitoring wells is done at the well head.

11 Can I have the next slide, please?

12 Okay. This is --

13 MEMBER HINZE: It might be well to point  
14 out that those are monitoring wells that go to the  
15 upper aquifer.

16 MEMBER WEINER: Yes, thank you.

17 MEMBER HINZE: It's the one that has  
18 potable water in it.

19 MEMBER WEINER: Yes. These monitor the  
20 potable water wells. This is -- unfortunately, this  
21 picture is dark, but this gives you an idea of what  
22 the site looks like on the surface.

23 CHAIRMAN RYAN: All the things that look  
24 like tree stumps are actually the well heads?

25 MEMBER WEINER: Yes. These are the well

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1 heads. Here are the wells. Here is a little -- this  
2 little house houses the control of the injection and  
3 production wells. And it is an enormous site that --  
4 as you can see. But the thing that --

5 CHAIRMAN RYAN: Well, just so -- I mean,  
6 "enormous" is what, a thousands acres, 1,500 acres,  
7 or --

8 MEMBER WEINER: How big is the site? Do  
9 you remember, Latif? It's --

10 MEMBER HINZE: Square miles.

11 MEMBER WEINER: Yes, it's square miles.  
12 The thing that impressed me is that there is so little  
13 surface disturbance, really, in a mine like this.

14 Can I have the next slide? This may be  
15 the last. Okay. This is the interior of the -- of  
16 one of the pump houses, and I have forgotten which  
17 side is injection and which side is production. But  
18 one side in injection wells, and the other side is  
19 production wells. And also, there is -- one pump  
20 house handles a number of wells.

21 Do you all remember --

22 MEMBER HINZE: Mine unit.

23 MEMBER WEINER: A single mine unit.

24 MEMBER HINZE: That's different colors.

25 MEMBER WEINER: Yes.

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1 CHAIRMAN RYAN: Okay.

2 MEMBER WEINER: Okay. Next slide? This  
3 is a flow diagram of the process itself, which I  
4 described. And it is centrally -- the injection and  
5 production wells are centrally controlled from a  
6 control room in the processing facility. And  
7 basically, this shows the extraction of uranium, the  
8 ion exchange columns, and then the recovery, the  
9 crystallization and recovery of yellowcake. And the  
10 yellowcake is what is shipped offsite.

11 I don't -- I'm not sure that's -- is there  
12 another slide? I'm not sure. Yes.

13 This is a picture of one of the ion  
14 exchange resins. I just thought it was interesting to  
15 look at.

16 CHAIRMAN RYAN: Not much uranium on it.

17 MEMBER WEINER: Not -- just a little bit.

18 CHAIRMAN RYAN: Not much.

19 MEMBER WEINER: Okay. Finally, the  
20 Commission voted to promulgate a rule, either Part 41  
21 or a section of Part 40. And the -- if you read the  
22 Commission -- and each of the Commissioners put a  
23 little bit of text with his vote, and essentially the  
24 reason for promulgating a rule is to eliminate  
25 overlapping and dual -- where they exist, dual

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1 regulatory schemes, EPA regulation, state regulation,  
2 what's in the license, and so on.

3 Now, I might point out at this point that  
4 if the state wants to pass a regulation that is more  
5 stringent than any rule EPA -- NRC rule, they are free  
6 to do so. We talked this over -- Latif and Bill and  
7 I talked this over on the way back, and we thought, as  
8 I pointed out in the P&P, that the committee needs to  
9 hear from a spectrum of stakeholders in addition to  
10 NRC staff. And our proposal is that we have one or  
11 two state representatives, since the states do  
12 regulate this, that we have some representative from  
13 industry and we have a hydrologist to talk about the  
14 reclamation and the groundwater considerations.

15 Latif and I attended the National Mining  
16 Association conference, and we did not observe that  
17 there was a lot of miscommunication among the various  
18 stakeholders. In fact, they seemed to community very  
19 well.

20 Do you want to add any more about that  
21 conference?

22 MEMBER HAMDAN: The only thing that was  
23 notable about that meeting was that it was --  
24 everybody that was there was industry, and so the  
25 stakeholders were not -- I think the reason there was

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1 no miscommunication, everybody agreed --

2 MEMBER WEINER: There weren't many --

3 MEMBER HAMDAN: -- they were all industry  
4 people, you know. And although it was a public  
5 meeting, and it was open to the public, but just  
6 having that there was --

7 MEMBER WEINER: There were very few  
8 members, if any, members of the public there.

9 MEMBER HAMDAN: That's correct.

10 MEMBER WEINER: I went the day before the  
11 meeting and attended the meetings that the NRC project  
12 manager has with the various states and mining  
13 industry people. And part of my question -- part of  
14 my own observation was that when you had a small group  
15 discussing a single mine, and you always had the state  
16 there and the industry there and NRC, the  
17 communication seemed to be very good. In other words,  
18 there was no withholding of information. They seemed  
19 to understand each other's problems quite well.

20 My last thing is we proposed -- and I have  
21 -- not really a working group session, but we would  
22 like to propose a session for the committee on in situ  
23 leach mining for February or March that includes all  
24 of -- representatives of all of the stakeholders, so  
25 that we can hear what their problems are, what their

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1 views are, of the draft rule. There will be a draft  
2 rule at that time.

3 I believe that's all the slides I had.  
4 Thank you.

5 CHAIRMAN RYAN: Just one friendly  
6 amendment to that list of stakeholders. If there are  
7 other stakeholders, of course, that wanted to express  
8 their views to the committee --

9 MEMBER WEINER: Oh, yes.

10 CHAIRMAN RYAN: -- to us, we'd certainly  
11 welcome that.

12 MEMBER WEINER: Yes, we certainly would.

13 CHAIRMAN RYAN: So that is just the  
14 starting point.

15 VICE CHAIRMAN CROFF: I'm not clear at  
16 this point. What are the technical issues that need  
17 to be addressed here?

18 MEMBER WEINER: I believe the issue that  
19 is of concern to the Commission is groundwater  
20 reclamation, and the only technical hook is to what  
21 extent, when you -- when you resolve the problems of  
22 overlapping regulations, are you ensuring a better,  
23 more consistent reclamation of groundwater?

24 Bill or Latif, do you want to add anything  
25 to that?

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1                   MEMBER HAMDAN:  Actually, there is the  
2                   main problem, restoring the aquifer to either the  
3                   background -- water conditions that existed before  
4                   mining or to some acceptable standard, you know, like  
5                   class reviews or even ACL, but at least there is a  
6                   standard that you agree to restore the aquifer to,  
7                   because you can't just go to the licensee and then  
8                   they will just mine and leave.  So you need a  
9                   standard.

10                   And at this time, frankly, there is no  
11                   consistent or uniform standard in the regulation.  So  
12                   each -- you know, they have it, but it's not codified  
13                   in any code.

14                   VICE CHAIRMAN CROFF:  Is the expectation  
15                   that the NRC's proposed rule will include groundwater  
16                   issues within NRC jurisdiction?

17                   MEMBER HAMDAN:  The rule is all about  
18                   groundwater protection.

19                   MEMBER WEINER:  Yes.

20                   VICE CHAIRMAN CROFF:  Okay.

21                   MEMBER HAMDAN:  And it will include that.  
22                   But by UMTRACA, which by -- the in situ leach is  
23                   mentioned only briefly, there is no standard there for  
24                   in situ leach.  And by UMTRACA, EPA is supposed to  
25                   promulgate the standard, NRC is supposed to take the

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1 promulgated relations based on the standards, so you  
2 can see the role of the EPA in this -- the EPA has to  
3 agree to understand that it is going to be, and NRC  
4 takes it from there and --

5 VICE CHAIRMAN CROFF: Okay.

6 MEMBER HAMDAN: -- that's why the EPA is  
7 so -- the role of the EPA is so important to this.

8 VICE CHAIRMAN CROFF: Okay. Thanks.

9 MEMBER CLARKE: Latif, I was going to say  
10 when you say "the standard," are you talking about the  
11 alternate concentration limit, that there would be a  
12 federal limit and then the states could revise that  
13 downward if they wanted to? Is that --

14 MEMBER HAMDAN: You see, the guide for  
15 this is actually the primary standards which are in  
16 Appendix A to 10 CFR Part 40. And these are  
17 background MCLs, maximum concentration limits, or  
18 alternate concentration limits.

19 MEMBER CLARKE: Right, I understand.

20 MEMBER HAMDAN: And yet these are the  
21 standards -- the primary standards, you know, and  
22 there are -- the thinking has been until recently of  
23 the last two, three years, that standards --  
24 background, MCLs, ACLs -- are also applicable to in  
25 situ leach.

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1           Two or three years ago the industry  
2 complained about that, and they ended up with the  
3 standards that are in a NUREG document -- I think it's  
4 1573 -- which indicates the standard for in situ leach  
5 is background, class reviews, and ACLs. But this is  
6 not codified in, you know, in NRC regulations. Unless  
7 we need some consistency, you know, make sure that  
8 your regulation, which Ruth mentioned, they need some  
9 consistent source so they can know what they are  
10 dealing with.

11           And the idea now is either to add  
12 something to Part 40, you know, amend it with  
13 something that's applicable to in situ leach, which I  
14 think was going to happen, and initially they thought  
15 about having a Part 41, which I don't think is going  
16 to happen.

17           MEMBER CLARKE: Thank you.

18           MEMBER WEINER: I would say that most, if  
19 not all, of the mining that is now done, uranium  
20 mining that is done in the United States, is in situ  
21 leach mining. They have gone pretty much away from  
22 hard rock mining. And given the status of the uranium  
23 market -- we didn't talk about this too much -- the in  
24 situ mining will increase. And I think one of the --  
25 another impetus for a rule is that there really is no

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1 rule presently that addresses in situ leach mining.  
2 They are using the mill tailings rule.

3 MEMBER HINZE: We have a rule for oranges  
4 that is being applied to apples.

5 MEMBER WEINER: Thank you.

6 MEMBER HINZE: And that really is the  
7 problem, in addition to the overlap problem. And so  
8 what one should try to do is build in some  
9 consistency, and that's the word you've heard here ad  
10 nauseam. And as far as technical problems, you know,  
11 we discussed this quite a bit after visiting, and the  
12 technical problems are not severe. They're really  
13 doing a very good job with the present regulations in  
14 terms of monitoring everything where we're able to  
15 scratch at in terms of monitoring, in terms of  
16 baselining, it's a great job.

17 CHAIRMAN RYAN: These regulatory changes,  
18 then, in my -- from what I've heard you guys report is  
19 that we'll be focused on consistency and clarity more  
20 than anything else.

21 MEMBER WEINER: Yes.

22 CHAIRMAN RYAN: Okay. John had a  
23 question.

24 MEMBER HAMDAN: And the new regulation  
25 issue.

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1 MEMBER WEINER: Yes, right.

2 MEMBER HAMDAN: Review it.

3 MR. LARKINS: For Ruth and Latif. Do we  
4 have an idea what the correct standard should be? I  
5 mean, should it truly be focusing on the EPA  
6 groundwater standard, or should we be looking at a  
7 more risk-informed approach which allows some  
8 flexibility for those sites where you don't -- aren't  
9 using -- you know, this is not potable water, and the  
10 -- it is somewhat isolated from the groundwater table  
11 or any usable aquifer.

12 MEMBER WEINER: I think you've made a very  
13 good point. The usage seems to be that practice is  
14 that you set the standard in accordance with the  
15 conditions of the mine that you have, which is in fact  
16 a risk-informed approach. And the staff has simply  
17 said -- I actually asked staff people why you want a  
18 regulation. And they said because right now there is  
19 simply no consistency. It's in the license -- much of  
20 it is in the licensing conditions, and that depends on  
21 what you're doing.

22 CHAIRMAN RYAN: So the idea would be to  
23 have this one-day session of meetings from various  
24 stakeholders and staff, and then maybe offer a view on  
25 what the risk-informed approach is forward. That is

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1 kind of our path on this.

2 MEMBER WEINER: I would say half a day  
3 probably, but --

4 CHAIRMAN RYAN: Half a day.

5 MEMBER WEINER: Yes.

6 CHAIRMAN RYAN: I mean, the idea is we're  
7 looking to advise on what's the risk-informed  
8 approach.

9 MEMBER WEINER: Yes.

10 CHAIRMAN RYAN: All right. With that, we  
11 probably ought to press on to our next two segments.

12 VICE CHAIRMAN CROFF: Can I ask one more  
13 question?

14 CHAIRMAN RYAN: Sure.

15 VICE CHAIRMAN CROFF: Is there anybody  
16 during your little session that could come in and  
17 address sites, ISL sites that have been previously  
18 closed?

19 MEMBER WEINER: Oh, yes.

20 VICE CHAIRMAN CROFF: You know, they were  
21 remediated and what happened there. Have things gone  
22 well? Have things gone bad? And it's gone bad. How  
23 did it go bad?

24 MEMBER WEINER: Yes, there is. Latif  
25 will --

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1                   MEMBER HAMDAN: I think we can invite DOE.  
2                   There have been mill tailing sites, and we can give  
3                   the committee very good insights as to what the  
4                   reference is, and so forth, and we have a lot of  
5                   experience with --

6                   CHAIRMAN RYAN: Be careful, though. Mill  
7                   tailing sites are not the same as in situ leach mining  
8                   sites, by a long shot.

9                   MEMBER HAMDAN: They're not the same, but  
10                  they are --

11                  CHAIRMAN RYAN: They're not even close.

12                  MEMBER HAMDAN: I'm not so sure.

13                  VICE CHAIRMAN CROFF: Has DOE reclaimed,  
14                  or are they watching over any ISL sites?

15                  MEMBER WEINER: Oh, yes. Yes, they are.  
16                  The ones in Wyoming they --

17                  CHAIRMAN RYAN: If they're doing ISL  
18                  sites, that's the direct comparative of -- the surface  
19                  mill tailing site is a whole different ball of wax.

20                  MEMBER WEINER: And, actually, Crow Butte  
21                  has reclaimed one mine section, and they can give us  
22                  a --

23                  CHAIRMAN RYAN: Okay.

24                  MEMBER WEINER: Yes. The answer to Allen  
25                  is yes.

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1 CHAIRMAN RYAN: Okay.

2 MR. DIAS: But would DOE be willing to say  
3 what went wrong with their mining, in situ mining  
4 experience?

5 MEMBER HAMDAN: They will say what DOE  
6 will say.

7 MR. DIAS: Okay.

8 MEMBER WEINER: We'll ask them.

9 CHAIRMAN RYAN: Okay. Any other  
10 questions? Once? Twice?

11 I will go ahead and take up the next  
12 topic, which is the attendance that we had at the U.S.  
13 Department of Energy workshop on low dose radiation  
14 research. Neil Coleman from the staff and I attended.  
15 There were other NRC staff members present as well.

16 We will probably write a letter later on  
17 this afternoon on this topic, but I will kind of  
18 summarize the meeting. It was interesting on a number  
19 of points. There is an awful lot of what I will term  
20 phenomenological research where people are trying to  
21 develop understandings of what happens at "low dose,"  
22 and I use that term in quotes for the moment, of  
23 radiation exposure. And that's acute exposures in the  
24 upwards of 100 rad and above kind of range.

25 While not an absolute observation in terms

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1 of, you know, a clear cutoff, a lot of the experiments  
2 involve doses that from a regulatory standpoint that  
3 is worker protection standards or members of the  
4 public standards where high doses -- and they are  
5 looking at some interesting biology and radiobiology  
6 phenomena. And they talked a lot about things that  
7 people are familiar with, like bystander effects and  
8 other kinds of effects that -- their phenomenology  
9 kinds of things that people were observing and  
10 providing reports on.

11 I think -- you know, so many of these  
12 experiments are at doses that are even up to orders of  
13 magnitude above what you expect to be exposures from  
14 a workplace or public exposure standpoint. And that  
15 includes even medical exposure and some of those  
16 things.

17 MEMBER HINZE: Could I interrupt you to  
18 ask --

19 CHAIRMAN RYAN: Yes, sir.

20 MEMBER HINZE: -- why that is true?

21 CHAIRMAN RYAN: Well, I think it's because  
22 they're working kind of at levels where they can  
23 demonstrate some of these phenomenology.

24 MEMBER HINZE: In a fairly short --

25 CHAIRMAN RYAN: In a fairly -- and they

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1 are working with the constraints of --

2 MEMBER HINZE: Right.

3 CHAIRMAN RYAN: -- you know, the typical  
4 experimental design constraints.

5 MEMBER HINZE: Right.

6 CHAIRMAN RYAN: So extrapolations of lower  
7 doses and further reconciliation with existing  
8 epidemiologic studies have so far not really been  
9 performed at a level of detail that would be terribly  
10 useful in informing policymaking in any new way at  
11 this point, or in revising, at least in my own view,  
12 and I think from the developing -- you know, for  
13 revising current or developing new radiation  
14 protection standards at the moment. It just --  
15 there's nothing overpowering.

16 In fact, one speaker at the end of the  
17 last day commented on the fact that the research  
18 community in low dose work has not really done a very  
19 good job of communicating their results in a way that  
20 is relevant to the thought process of policymakers.

21 Dr. -- Dr. -- I'll call his name out in a  
22 little bit, check it out. But that -- it was  
23 interesting that there's a lot going on.

24 The other interesting reports were from  
25 folks outside the United States. The European Union

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1 has a study that's ongoing between 2006 and 2010  
2 involving a number of EU countries that are interested  
3 in this topic. And they are launching a specific  
4 project on non-targeted bystander effects of ionizing  
5 radiation, and when we do report in a letter we'll  
6 have the website information so others can certainly  
7 track this process.

8 Additional work is also being performed by  
9 the European integrated project, which is examining  
10 the radiosensitivity of individuals and susceptibility  
11 to cancer induced by ionizing radiation. And, again,  
12 they have a website with more information. We can  
13 certainly track that.

14 I guess the one word --

15 DR. COLEMAN: Oh, the name you were  
16 looking for, Dr. William Morgan of the --

17 CHAIRMAN RYAN: William Morgan, thank you.

18 DR. COLEMAN: -- Radiation Oncology  
19 Research Lab, University of Maryland. And he offered  
20 the challenge to other researchers that the research  
21 results of these low dose studies could be much better  
22 communicated -- to the public, policymakers,  
23 stakeholders, to everyone.

24 CHAIRMAN RYAN: Right. Thank you.

25 MR. LARKINS: How large is this European

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1 Union study, do you know?

2 CHAIRMAN RYAN: It's a five-year study,  
3 and it's in -- I don't recall the exact number amount,  
4 but it's a substantial effort on the part of the EU.  
5 I'm recalling something in the multi-millions of  
6 dollars, tens of millions -- you know, \$10 million,  
7 something in that -- up to that range. I'd have to  
8 look in our notes and see specifically, but, yes, it's  
9 very much an EU-wide system. There are member  
10 countries participating. France was one, Finland was  
11 I think the speaker, and there were other participants  
12 attending the DOE workshop.

13 The other point that I didn't say earlier,  
14 John, is that they're working hard to coordinate with  
15 the DOE effort, so they're not spending the same  
16 dollars on the same projects. They're actually  
17 looking at things that will be complementary rather  
18 than overlapping. So that's a positive effort that  
19 they're putting forward.

20 I think it's -- I believe the work is  
21 useful and helpful to the basic science of radiation  
22 biology myself. I think it should continue, because  
23 I think some of the phenomenology they're exploring  
24 needs to continue. Whether it will be helpful or  
25 change in any way how we view radiation protection

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1 standards at this moment I'm not sure anybody is  
2 willing to -- you know, to say that as clearly or not  
3 clearly, some may be -- I don't know -- but it seems  
4 that at least from the work that was reported that  
5 it's interesting. There are clear results that need  
6 further study, and they have good plans to do that.

7 As far as our tracking this work, I think  
8 we might think of somewhere in the year and a half, or  
9 maybe even two years out, an update where we bring a  
10 working group of some of the -- you know, the senior  
11 folks in this area to the ACNW and to this forum, so  
12 we can hear directly.

13 And maybe if they take Dr. Morgan's advice  
14 from this meeting and start thinking about, well, what  
15 does this mean in a policymaking arena, or how do you  
16 translate the science into radiation protection  
17 standards one way or another, whatever their way might  
18 be, that that might be a focus for a working group  
19 that we might want to hold.

20 I think the other part, of course, in  
21 November we'll be hearing from the French Academy of  
22 Sciences Report Committee on their recent report,  
23 where they see a very clear threshold at 10 Gray in  
24 their work. So we'll have certainly the benefit of  
25 both of those to further advise the Commission.

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1           So that's really a short summary of the  
2 meeting. Many of the papers were on very specific  
3 projects, some at the molecular level, some at the  
4 cellular level, some at the organism level. With  
5 zebra fish they had an interesting experiment or two  
6 there. And even some with patients where they were  
7 doing some specific studies to look at reactions in  
8 other tissues related to tissues nearby radiation  
9 therapy sites and others.

10           So there was a whole host of experiments.  
11 We even heard from some folks that on the one hand  
12 said the epidemiology is not really complete at these  
13 very low doses that you'd expect from public  
14 exposures, and others that felt that there are very  
15 clear thresholds that show up for certain analyses.

16           One researcher from the Institute for  
17 Inhalation Toxicology in New Mexico, for example,  
18 spoke about that. So there's a broad range of views,  
19 interesting and ongoing research that I think we  
20 should follow and integrate in our thinking about how  
21 ICRP makes recommendations or how the other national  
22 and international bodies make recommendations. But  
23 that's a work in progress.

24           MR. LARKINS: The committee has over the  
25 years had several working group meetings, as Bill

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1 probably remembers, on the effects of low levels of  
2 ionizing radiation and written a couple of reports.  
3 And there always seems to be --

4 MEMBER HINZE: Just beyond the horizon.

5 MR. LARKINS: -- yes, more work, but it's  
6 not clearly -- and you raise it in terms of putting  
7 the information out there in a form that the  
8 decisionmaker can use. Do you see in two years you'll  
9 be able to make a recommendation as to what is --  
10 what's the ultimate experiments that are needed in  
11 order to impact the regulations? If it's LNT or other  
12 areas, worker exposure limits, or --

13 CHAIRMAN RYAN: I think some of the  
14 researchers who have been in that field for a long  
15 time, and particularly those that were involved in  
16 summarizing sessions in the rapporteur for the  
17 meeting, and so forth, brought together those kinds of  
18 questions. And, you know, I think that at least I  
19 took away the impression that the folks who are  
20 summarizing said we really need to kind of think about  
21 how we go from phenomenology to what this means for  
22 standard-setting.

23 And I think -- you know, and as work goes,  
24 it might very well be a year or two down the line  
25 before that matures a little bit. I would hope so,

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1 and I would hope that, you know, if we could invite  
2 folks and get them to come that we would have them or  
3 ask them to focus on the very question you have  
4 raised, John. I think it's time to ask that, you  
5 know, what's the impact on phenomenology? I mean, of  
6 the phenomenology on standard-setting.

7 MR. LARKINS: The standards and --

8 CHAIRMAN RYAN: Right.

9 MR. LARKINS: -- limits.

10 CHAIRMAN RYAN: Right.

11 MEMBER HINZE: Well, perhaps the lack of  
12 communication is appropriate, because we don't know  
13 how to deal with that lower dose area. And we -- it's  
14 difficult to communicate when we don't know how to  
15 deal with that down there. I don't understand how  
16 we're going to foster communication when we don't have  
17 the data to interpret down there.

18 And the only problem there is that their  
19 regulators may make decisions based upon their  
20 interpretation of these higher levels, and, therefore,  
21 be quite inappropriate as well.

22 CHAIRMAN RYAN: Well, and that's -- and if  
23 we heard that, you know, as the message that, you  
24 know, there isn't a clear change in path or direction,  
25 that's okay, too. I mean, I'm not trying to offer a

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1 view that -- you know, what theory or what approach is  
2 right. I'm just -- we're just -- I think we need to  
3 continue to stay up to date on what research findings  
4 are coming out of this area and react to them  
5 accordingly.

6 MEMBER HINZE: Well, was there any sense  
7 that there is hope of making investigations that will  
8 help us to get definitive answers with a lower degree  
9 of uncertainty down in those lower ranges?

10 CHAIRMAN RYAN: Well, you know, it's --  
11 yes, I think there's -- there certainly are productive  
12 lines of research that many of the researchers spoke  
13 of as here's where I am now, and here's where I think  
14 we can go forward in a productive way to learn more.  
15 It's kind of like geology. I've never met a geologist  
16 that doesn't want to drill one more hole.

17 (Laughter.)

18 And I don't mean that to belittle in any  
19 way the quality of the work that these folks are  
20 doing. They were all thinking ahead, but, you know,  
21 how it comes together at -- down the line a bit, it  
22 wasn't -- that wasn't as crystal clear to me.

23 DR. COLEMAN: If I may --

24 CHAIRMAN RYAN: Please.

25 DR. COLEMAN: -- offer just one example of

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1 an interesting research result that they're following  
2 up aggressively now is that there appear to be unique  
3 gene expression profiles for high dose versus low  
4 dose, which then could lead to an understanding of why  
5 the different responses at high dose versus low dose  
6 and when repair mechanisms kick in. So that was new  
7 to me, just one example.

8 MEMBER WEINER: Could I ask a question?  
9 When you say high dose or when they at the meeting  
10 said high dose and low dose, are they using low dose  
11 as a synonym for chronic as distinct from acute dose?

12 CHAIRMAN RYAN: That's a really good  
13 question, and it's one that I haven't resolved in my  
14 own mind. Most of these experiments are what I would  
15 characterize as acute doses in the high range. And my  
16 measure of that is that they are higher compared to  
17 background exposure rates from, you know, typical  
18 lifestyle in the United States, say, or the range of  
19 lifestyle for radon and all the things that vary.

20 And they tended to be in the, you know,  
21 upwards -- higher than 10 Gray acute over short  
22 periods of time. So you're right, that's a caution  
23 that's well taken, is it high or low, and acute and  
24 chronic, you know, are in the eye of the beholder  
25 sometimes. So in order to really develop a keen and

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1 detailed understanding, we'd have to sort through all  
2 that in some level of detail.

3 Before we get too far along here, we do  
4 have a request for time to speak to the committee from  
5 Dr. Rockwell, So I'd like to ask him at this moment  
6 to give us his presentation, and then we'll continue  
7 with the question and answers. If you wouldn't mind,  
8 Dr. Rockwell, if you would come up front, and we can  
9 -- that way everybody can see you and hear what you've  
10 got to say. Thank you for being with us today.

11 DR. ROCKWELL: Is this the hot mike?

12 CHAIRMAN RYAN: Yes.

13 DR. ROCKWELL: Okay. If you're  
14 comfortable, just have a seat there, and that'll be  
15 fine.

16 DR. ROCKWELL: Well, I'm Theodore Rockwell  
17 from the Radiation, Science & Health, Incorporated,  
18 which is an international nonprofit public interest  
19 group that has been concerned for many years now in  
20 trying to reconcile some pretty wild discrepancies  
21 between radiation practice and radiation science.

22 And what I've done is to make available  
23 two pieces of paper for you here. This is an article  
24 in Science, which talks about the worst realistic  
25 casualty that could happen to our reactor plant or its

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1 fuel, and this is a thing on some history on the  
2 review of NCRP-136, which was yet another review of  
3 the low dose radiation.

4 And as Mike just told us, there are a lot  
5 of people looking at the low dose radiation problem  
6 and at the casualty problem. On September 8th there  
7 was a meeting that the NRC internally looked at their  
8 program of trying to evaluate the casualty case where  
9 they are concerned not only with the low dose health  
10 effects question, but the question of the release and  
11 attenuation processes of fission products in an actual  
12 realistic situation.

13 If you assume, for example, that there is  
14 no water or steam present when these fission products  
15 are released in a casualty, you are sure going to get  
16 a different answer by several orders of magnitude than  
17 if you assume that there is in this colder structure  
18 steam condensing out, and so forth. There's about a  
19 factor of  $10^5$  difference in iodine that gets out of  
20 the containment under that situation.

21 So what I did -- the purpose of putting  
22 these out at this time is to say that there are a lot  
23 of people again reviewing the LNT and the casualty  
24 case both. And the reason for this is that it has  
25 been so poorly done every time.

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1           And the main fault of the reviews in the  
2 past have been that they have just failed to look at  
3 all of the data that have been accumulated, literally  
4 thousands of technical reports, hundreds of which are  
5 quite good. We've been collecting them on our  
6 website. I've referred to that.

7           So this one here about NCRP, which is the  
8 one that was to look at NRC, that was the one that was  
9 done because BEIR-V was such a bad report. Everybody  
10 said you didn't look at the data. So they went  
11 through the whole thing again, and they didn't look at  
12 the data.

13           And this is a little bit of that history,  
14 and my urging to you is -- you, not only ACNW, but NRC  
15 in general -- that we don't leave another one of these  
16 reports as our legacy. This is really a disgrace,  
17 that the data that exists were not looked at. We've  
18 been told that epidemiologically you can't get  
19 sufficient data. You'd have to have a population of  
20 millions. That's true only if the LNT is true.

21           So what you're saying is if the LNT is  
22 true, you can't prove that the LNT is true, and,  
23 therefore, we should assume the LNT is true. I don't  
24 think that's a very good way to set policy.

25           So the other thing is that there has

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1 always been some discussion of what the public would  
2 buy. That is not our problem here as scientists and  
3 technologists. Our problem is to tell them what the  
4 science is. The policy people are going to have to  
5 decide how to deal with that, but we don't -- we don't  
6 help them by biasing our science in terms of what we  
7 think the public will buy. That's a circular process  
8 that never gets to the truth.

9           So these two things I have that I think  
10 will help you look at where we've been. The question  
11 that the DOE program doesn't seem to be giving  
12 information that effects the policy much is a  
13 deliberate result -- Greta Dicus made it very clear  
14 when that program was first started that she did not  
15 want to see -- she wanted to see fundamental research.  
16 She did not want to see anything that would  
17 necessarily affect policy, and that's been in effect  
18 for the 10 years of the program.

19           But I think the point that several people  
20 have made that the time has come now to look at this  
21 information, and when you say, "Oh, we've got a  
22 program that shows bystander effects," bystander  
23 effects don't necessarily have anything to do with  
24 health effects themselves. This is part of the  
25 process by which cells communicate to the immune

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1 system and protective mechanisms.

2 So I was not intending to give a speech  
3 here, but I did want to say that I've put these two  
4 things in the record. I think you'll find them  
5 useful. At the bottom of the one on NCRP you'll see  
6 our website, and you'll see the vast amount of data  
7 that exists there that shows over and over and over  
8 again that low dose radiation has a stimulatory  
9 effect.

10 The thing that's sort of ironic to me is  
11 that every one of these reports that recommends that  
12 we use the LNT as our basic tool, every one of those  
13 reports starts right out at the beginning and says  
14 that's not what we find. It says it is important to  
15 note -- this is quoting from NCRP-136 now.

16 It is important to note that most  
17 populations exposed to low dose radiation are not  
18 harmed, and most populations are in fact benefitted.  
19 It says that right in the report. And they say over  
20 and over again that there is no data that shows that  
21 low dose radiation is harmful. And yet they say --  
22 the ICRP's famous statement, since there is no harm in  
23 assuming that it -- it's harmful, let's assume that  
24 it's harmful.

25 And I think we've seen the kinds of

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1 problems that result from over -- from exaggerating a  
2 hazard. We do just as much disservice by claiming a  
3 hazard is worse than it is. That's not conservative,  
4 it's not prudent to say that one gamma ray can kill  
5 you.

6 We have situations in which brave firemen,  
7 policemen, and other emergency guys that are trained  
8 and ready to run into a burning building, a collapsing  
9 building, into a hail of gunfire, and those people we  
10 are told should never cross a radiation line because  
11 one gamma ray can kill you. And that's nonsense.  
12 It's just scientifically false, and it's time we  
13 repudiated that.

14 That's my message.

15 CHAIRMAN RYAN: Dr. Rockwell, thank you  
16 for your message. I want to make sure that staff has  
17 available the two handouts on the back --

18 DR. ROCKWELL: Yes. There were 50 copies  
19 that we were supposed to supply.

20 CHAIRMAN RYAN: Okay, great. Just --

21 DR. ROCKWELL: And it's on your --

22 CHAIRMAN RYAN: Right. We've got that,  
23 but I just want to make sure everybody knows that  
24 those items are available.

25 Any other questions or comments? Yes,

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1       Latif.

2                   MEMBER HAMDAN:   Yes.  Mike, I understand  
3       that we are talking about very low dose radiation.  So  
4       I understand that.  But in this workshop or in the  
5       database that was mentioned here, do we have any data  
6       from, say, rays at Chernobyl for example?  If you go  
7       50 miles or 20 miles or 10 miles, there must be a  
8       point at Chernobyl where the doses are low and -- or  
9       even very low.

10                   So in the database that was mentioned or  
11       the workshop, do you tap into this data source, or  
12       everybody is doing the --

13                   CHAIRMAN RYAN:  My view of that is that  
14       Dr. Shirley Frye from Oak Ridge talked about the  
15       epidemiologic studies to date.  I can't recall if she  
16       specifically mentioned Chernobyl, but she sure  
17       mentioned a number of them.  And to me she highlighted  
18       the fact that the current experimental work that's  
19       ongoing is really distant from the resolution with the  
20       epidemiology.

21                   They haven't brought those together yet,  
22       and I think that might be in part what Dr. Rockwell is  
23       addressing, is that there really is a separation from  
24       the epidemiology.  I mean, the biggest cohort, of  
25       course, is Hiroshima and Nagasaki, and that is where

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1 BEIR-VII has hung its hat for a long time.

2 DR. ROCKWELL: Well, it's really -- you  
3 talked about dose rate. I think it's really an  
4 embarrassment to the scientific community that we hold  
5 up today as our gold standard for looking at chronic  
6 low level radiation, we hold up the Hiroshima data.

7 CHAIRMAN RYAN: It's clearly a different  
8 situation. You know, and I sat through the  
9 presentations, as I think you did, and, you know, I  
10 mean, in my own mind I'm doing calculations of what is  
11 a low dose, what is a low dose rate. And these terms  
12 need a lot more clarity than the way different  
13 researchers use them, because they -- low dose and low  
14 dose rate mean different things to different folks.  
15 You know, to an interventional radiologist, 1 R per  
16 hour is a low dose rate.

17 DR. ROCKWELL: But the data that we have  
18 -- one of the things that's referred to here is the  
19 shipyard study, the nuclear shipyard studies, a  
20 population of 700,000, years of excellent dosimetry,  
21 or this is under the naval reactors program. Every  
22 worker had a film badge.

23 The comparisons were made not between the  
24 healthy worker and the average citizen, but were made  
25 between welders and welders in radiation and not the

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1 steamfitters and steamfitters. And they were done all  
2 with the same demographics, age, and sex, and so  
3 forth.

4 And then, after 10 years of that where we  
5 had a very clear showing that the cancer rate is  
6 lower, that the death from all causes is lower, they  
7 try to brush it off as if it were healthy worker  
8 effect. But the whole purpose of this multi-million  
9 dollar 10-year study was to eliminate that. And they  
10 have the technical advisory panel on that study with  
11 Arthur Upton, the author of NCRP-136, and that data is  
12 not used when they come in and Ethel Gilbert gives her  
13 study of workers, and this one isn't used. It's just  
14 varied.

15 MEMBER WEINER: Could I ask a question?

16 DR. ROCKWELL: Yes.

17 MEMBER WEINER: Is there such a thing as  
18 a healthy worker effect?

19 DR. ROCKWELL: Oh, of course. Yes. I  
20 mean, if you take a guy in a factory and get the data  
21 from the factory and then compare that with the  
22 population as a whole, the population as a whole has  
23 old people and sick people and lazy people and all  
24 kinds of people that wouldn't be at a workshop.

25 (Laughter.)

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1 CHAIRMAN RYAN: Thank you. We'll have to  
2 move to our next topic, but, again, Dr. Rockwell,  
3 thank you for your time and your comments.

4 DR. ROCKWELL: Mike, I appreciate it.

5 CHAIRMAN RYAN: Sure. The final item on  
6 this morning's discussion points that were -- was  
7 attendance at the International Commission on  
8 Radiological Protections Workshop held right across  
9 the street in the Marriott. And it was one of several  
10 meetings around the world actually where the ICRP was  
11 soliciting comments on its draft 2006 guidance  
12 document.

13 And if you recall, and of course in our  
14 record there's the letters that we provided to the  
15 Commission on the 2005 draft, we prior to the meeting  
16 provided the Commission with a draft -- or with a  
17 letter on the 2006 draft. And then, this was an  
18 opportunity to hear other stakeholders raise questions  
19 and issues on the 2006 draft.

20 Many of the points that we covered in our  
21 letter were brought up by various speakers and  
22 participants on panels and from the audience in the  
23 sessions that were held during the day.

24 I think just to summarize briefly what the  
25 comments were about, a lot were about terminology.

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1 The ICRP tends to use terminology in a way that  
2 doesn't cross the borders well from one country to  
3 another. They use the word "constraint" in the way we  
4 use the word "limit." They use the word "limit" in  
5 the way we use the word "guidance" or "goal." And so  
6 there's a lot of confusion in terminology, and much of  
7 the discussion centered on those kinds of things.

8 I participated on a panel with several  
9 folks, and, you know, offered comments on the  
10 implications for, you know, waste management  
11 questions, and so forth, and, you know, just enjoyed  
12 the presentation. I think it was -- Commissioner  
13 Lyons, of course, gave the keynote address, and, you  
14 know, I think what will happen from that meeting is  
15 the ICRP will certainly take the comments it received  
16 here in Washington. They had a meeting in Canada.  
17 They had a meeting in Tokyo. And I think they were  
18 going to have a meeting in Prague or Brussels, one or  
19 the other, I forget which.

20 I'm sorry? It was Prague, thank you. Oh,  
21 there's Dr. Cool. Thank you. Dr. Jones, we  
22 appreciate it.

23 And there were going to be, you know,  
24 additional meetings, and I think the summation of all  
25 of that information gathering is that hopefully they

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1 will take that into consideration as they further  
2 revise the 2006 draft. And maybe we'll get a 2007  
3 draft to look at. Dr. Cool?

4 DR. COOL: Quick synopsis having just been  
5 in ICRP Committee 4's meeting last week. In fact,  
6 even as the comments have been coming in, the ICRP has  
7 been looking at and starting to revise the draft based  
8 on all the comments they have been receiving thus far.  
9 What they were saying was that the meeting in Prague,  
10 which will be the last week of October, will in fact  
11 be an opportunity to discuss some of the things that  
12 they are doing in terms of reorganizing and  
13 structuring the draft and responding to some of the  
14 comments.

15 So that third conference they are actually  
16 being sponsored by the Nuclear Energy Agency of the  
17 OECD. That conference will be different in character  
18 than the conference that was here in Washington or  
19 that in Tokyo in that it will be representing an  
20 evolution based on the first two conferences and all  
21 the input and additional discussion.

22 I understand from Lars-Erik Holm, who is  
23 the Chairman of ICRP, that that material will be  
24 considered by the ICRP's Main Commission in their  
25 meeting in Morocco the first week of November. And

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1 that there will likely be another draft for a short --  
2 emphasis on short at least at this time -- public  
3 consultation towards the end of the year or very early  
4 in 2007 before the ICRP would actually complete its  
5 work and send the draft recommendations to the printer  
6 for publication.

7 CHAIRMAN RYAN: Okay.

8 DR. COOL: We shall see.

9 CHAIRMAN RYAN: I might also note that,  
10 again, the committee had written a letter on the 2006  
11 draft, and the staff also offered its comments to the  
12 Commission on the 2006 draft and also, in turn, to the  
13 ICRP. So that is the summary of where that activity  
14 is.

15 I guess I think the next step for the ACNW  
16 will be to take Dr. Cool's schedule and react to it as  
17 we have comment time available, but we'll have to be  
18 ready because with the short comment time everybody  
19 has to act quickly if any additional comments will be  
20 made and delivered in a way that they can be accepted  
21 and considered. So --

22 DR. COOL: I would note at this point  
23 there is no formal schedule in terms of specifically  
24 when something would come out. What Dr. Holm was  
25 talking about was something that might be available

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1 for a month.

2 So we will have a very short window of  
3 opportunity if, in fact, that kind of scheduling  
4 continues to take place. But there may be further  
5 reactions and schedules, so I -- I don't want to try  
6 and pin any particular timeframe on this yet.

7 If you look at the ICRP's website, you can  
8 actually see all of the comments that are being posted  
9 by organizations. There is a huge amount of comment  
10 that has been put on in the past week. The NRC  
11 comments were officially put on last week, a number of  
12 other countries, so they have a lot of material to be  
13 posted and looked at.

14 I would also note that the things that the  
15 committee said, and the things which the NRC staff  
16 said, were echoed, repeated in various ways by many  
17 other commenters from a variety of countries and  
18 positions.

19 CHAIRMAN RYAN: Thank you, Don.  
20 Appreciate that update.

21 And with that, unless there are any other  
22 questions, that really is the substance of that  
23 meeting. So questions, comments? Any other questions  
24 or comments?

25 Hearing none, that will take care of our

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1 morning session. And to say on schedule we'll adjourn  
2 until 12:30, and then reconvene to consider letter  
3 writing activities this afternoon, and those are  
4 listed on the agenda.

5 I do not believe we will need the recorder  
6 for the rest of the day on letter writing, so we'll  
7 finish the record for today here. And we'll start the  
8 record tomorrow promptly at 8:30.

9 (Whereupon, at 11:08 a.m., the  
10 proceedings in the foregoing matter were  
11 adjourned.)

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