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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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MEETING WITH ADVISORY COMMITTEE ON NUCLEAR WASTE  
(ACNW)

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ROCKVILLE, MARYLAND

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WEDNESDAY, MARCH 16, 2005

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The Commission met in open session at 9:30 a.m., at the Nuclear Regulatory Commission, One White Flint North, Rockville, Maryland, the Honorable Edward McGaffigan, Jr., Commissioner, presiding.

COMMISSIONERS PRESENT:

EDWARD MCGAFFIGAN, JR.	Member of the Commission
JEFFREY S. MERRIFIELD	Member of the Commission
GREGORY B. JACZKO	Member of the Commission
PETER B. LYONS	Member of the Commission

(This transcript was produced from electronic caption media and audio and video media provided by the Nuclear Regulatory Commission.)

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STAFF AND PRESENTERS:

DR. MICHAEL RYAN, Chairman, ACNW

DR. RUTH WEINER

ALLEN CROFF, Vice Chairman, ACNW

DR. WILLIAM HINZE

DR. JAMES CLARKE

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

1  
2 COMMISSIONER MC GAFFIGAN: Good morning, Dr. Ryan,  
3 members of the ACNW. Chairman Diaz regrets he is unable to be with us  
4 today. He is at a very important conference on control of radioactive sources  
5 that is taking place in London. He had to be there today.

6 The Chairman also asked me to extend his regards to the  
7 committee and looks forward to reading the transcript once he returns.

8 As you know, this is Commission's annual meeting with the  
9 Advisory Committee on Nuclear Waste. As I have stated previously, the  
10 Commission has been well served by ACNW over the years. And I'm  
11 interested in hearing and I'm sure my colleagues -- the committee's insights  
12 and reports on your most recent activities.

13 Based on the slides you have provided, I see we will focus  
14 today on various activities related to the ICRP draft recommendations, waste  
15 research, igneous activity in the future and planned activities.

16 I would like to take a moment to welcome the two newest  
17 members of the committee, Dr. Hinze and Dr. Clarke. I also would like to  
18 recognize Dr. Garrick and Dr. Hornberger, who are no longer on the  
19 committee, now serve on the Nuclear Waste Technical Review Board. They  
20 did an absolutely outstanding job.

21 When we last met with you, we didn't know that they would not  
22 be here to have kudos expressed by the Commission for their efforts that they  
23 have done a great job, and I'm sure will continue to do a great job on the  
24 Nuclear Waste Technical Review Board.

25 Before I turn the meeting over to you, Mr. Ryan, I would like to  
26 ask my fellow Commissioners if they have any opening remarks.

27 COMMISSIONER JACZKO: I just want to make a brief one.

28 I want to just raise one issue because there is moderate  
29 amount of Yucca Mountain related material in the presentation. I just want to  
30 preface the briefing with a reminder that I have agreed to recuse myself from  
31 voting or speaking publicly about this issue.

32 So, none of my questions or comments during the briefing  
33 should be interpreted as questions regarding Yucca Mountain.

34 COMMISSIONER MC GAFFIGAN: Thank you.

35 Dr. Ryan, please proceed.

36 DR. RYAN: Thank you very much Commissioner McGaffigan,  
37 and thank you, Commissioner Merrifield, Commissioner Lyons, and  
38 Commissioner Jaczko. It is a pleasure to meet you gentlemen for the first  
39 time, and we look forward to supporting your efforts through the efforts of the  
40 committee.

41 I second the comments you made about our departed, John  
42 Garrick and George Hornberger, both past chairs of this committee. They are  
43 big shoes to fill, and we hope to do a good job in continuing their example.

44 Thank you very much.

45 You have covered our agenda quite well, so I will not, if I may,  
46 repeat slides 2 and 3. Those are the topics that Commissioner McGaffigan  
47 listed.

1 I'll go to slide four, please.

2 We are well served by Professor Hinze. Professor Hinze is a  
3 returning member to the ACNW and served previously and brings a wealth of  
4 knowledge and ability in the geosciences area to the committee.

5 Professor Clarke comes to us from Vanderbilt. His area is in  
6 the area of expertise is in the area of environmental assessment both with  
7 experience in chemical and radiological assessment.

8 So there is a broader experience for us to draw on there. And  
9 we welcome both of these members to our committee.

10 Over the past 12 months, we have worked, I think, effectively  
11 and cooperatively with NMSS to help develop the agenda that you see before  
12 you and we reported to you in our action plan. We are pleased with those  
13 interactions and some of what we are reporting to you today on is a result of  
14 those interactions. So we look forward to that to continue.

15 We have met with staff and management and continue to view  
16 our role to be helpful in every way we can to the NMSS program, as well as  
17 our responsibilities and supporting your efforts in Yucca Mountain.

18 A couple of the successes are those interactions and also  
19 we're evolving in our role for the delayed Yucca Mountain license application.  
20 We have adjusted our agenda, I think again effectively. And I think as I said  
21 to Commissioner Merrifield at one point, we have a full plate and full agenda,  
22 and we are looking forward to supporting activities across that broad scope.

23 The High Level Waste Risk Insights Baseline Report is an  
24 example of one success in the high level waste area. We feel that we have  
25 added some value. And we look to add value in all the items of our action  
26 plan.

27 Let me turn now, if I may, to the working group session and  
28 report that we made on the International Commission on Radiological  
29 Protections 2005 draft recommendations.

30 At the outset, I would like to note this was cooperative effort.  
31 Dr. Powers from the ACRS joined our working group session. We felt that it  
32 was important to have that ACRS perspective, since many of the  
33 recommendations of the ICRP would flow naturally to licensees if they were  
34 adopted, and we wanted to make sure that the ACRS reactor area was  
35 covered as well. So he added quite a lot of value to our work in that area.

36 Our goals were to review the substance and technical bases of  
37 the draft International Commission on Radiological Protection  
38 recommendations and to assess the value of those recommendations to U.S.  
39 radiation protection practice.

40 The ICRP, the International Commission on Radiological  
41 Protection, characterized this current update as a simplification and  
42 elaboration of its previous recommendations.

43 We were hampered in the fact that the foundation documents,  
44 four technical foundation documents, that contained the scientific bases for  
45 the recommendations were not then and are not now available for evaluation.  
46 So it prevented us from having a complete review.

47 Nonetheless, the committee believes that the ICRP goal of

1 simplifying its terminology based on what was in the recommendations has  
2 not been achieved. There are still ambiguity throughout the document and  
3 the terminology is confusing and conflicting in parts.

4 The schedule for update to that report and the schedule for the  
5 release of the foundation documents has been revised. And the anticipated  
6 revised guidance is expected late in 2005. And hopefully, the foundation  
7 documents will come along sometime during this year so they can be  
8 evaluated as well.

9 Our observations from our working group session were,  
10 specifically regarding and questioning whether the ICRP recommendations for  
11 optimization, their term for what we call as low as reasonably achievable or  
12 ALARA, were really improvements. And in fact, Dr. Powell is having extensive  
13 knowledge of the use of that principle in the reactor area offered that, in fact,  
14 it was confusing and confounded the use of our ALARA principles, and we  
15 didn't find it very useful at all because of those confusions in terminology.

16 Our recommendations were that the Commission should  
17 continue to defer action on the ICRP recommendations until the Biological  
18 Effects of Ionizing Radiation Committee of the National Academy Report VII  
19 becomes available. I think that is anticipated relatively soon.

20 That also has some of the same foundation that the ICRP  
21 recommendations would have. And NRC staff should stay cognizant of ICRP  
22 activities until more details are forthcoming about the technical bases for the  
23 International Commission's recommendation.

24 There were some technical points, particularly with regard to  
25 calculation efforts, and on I'm on slide 11.

26 When the recommendations become final and not at this point  
27 in time, I want to make that clarification, those specific words are not in the  
28 slide, that there are some technical improvements regarding radiation  
29 weighting factors for neutrons and protons, new tissue-weighting factors and  
30 recent methods and models to assess internal radiation dosimetry that would  
31 be of value and how best to incorporate those. We can probably reevaluate  
32 as the draft recommendations move to some final step, perhaps in 2006.

33 But I didn't want to confuse that that should be done now. We  
34 should stand by and wait and see if those stay in the same form and fashion  
35 that they are in now.

36 At our working group panel, we had members of the working  
37 group panel from the ACRS, as I mentioned, from the Advisory Committee on  
38 Medical Uses of Isotopes, members from the Environmental Protection  
39 Agency, from the NRC staff, and we had members of the ICRP Committee on  
40 Internal Dose Committee II, and ICRP Committee IV, Committee on the  
41 Environment.

42 And across that entire span of folks I asked this question:  
43 would adopting these recommendations improve the public health and safety  
44 and radiation protection practice? The answer was no.

45 COMMISSIONER MC GAFFIGAN: Just a clarifying matter.  
46 Not the three issues that you had on slide 11, where taking them out, sort of  
47 picking them out, your belief is that those would be constructive?

1 DR. RYAN: Yes, I think they would be constructive. And in  
2 fact, they are kind of in practice now.

3 For example, I believe there's guidance to licensees that if they  
4 have an internal exposure, they are advised to use the best available models  
5 in their analysis. So this would just be formalizing some of those  
6 improvements that are already in practice now. I think those would be  
7 technical improvements and not broad sweeping policy changes.

8 With that, that concludes my presentation on the ICRP report.  
9 And I would now like to turn the meeting to Dr. Weiner, who is going to talk  
10 about the committee's waste research activity.

11 DR. WEINER: If I could have the next slide, please, on waste  
12 research activities.

13 Thank you.

14 The waste research activities includes both Research and the  
15 technical assistance that the Center for Nuclear Waste Regulatory Analysis  
16 offers to NMSS.

17 If I could have the next slide, please.

18 As a committee, we perform an annual review of Research  
19 which is broader-based and has a wider scope than the technical assistance  
20 aspect.

21 We also annually review the work of the Center for Nuclear  
22 Waste Regulatory Analysis. And the focus of these reviews is that the  
23 research that they do supports NMSS and has a goal.

24 As far as the broader value of research values is concerned, I  
25 would like to present a cutting edge example that was presented to us this  
26 year.

27 Could I have the next slide, please.

28 Research is undertaking a study of model uncertainty. For the  
29 most part, when we deal with complex models of physical systems and  
30 particularly of environmental modeling, we look at parameter uncertainty, the  
31 uncertainty in the input parameters that we have. This particular area of  
32 research looks at uncertainties in the model itself.

33 And some statistical techniques have been developed.

34 If I could have the next slide, please.

35 Some statistics -- I'm sorry, go back one.

36 Statistical techniques have been developed to assess the  
37 uncertainty among competing conceptual models. This has so far been  
38 applied to geohydrological models, but it addresses the uncertainty that you  
39 have when you get different results from using different models. You always  
40 get that.

41 So we very badly need a way to correlate the results of  
42 different models, particularly when we are using predictive models that predict  
43 over long periods of time.

44 The method is rigorous and it's far-reaching cutting-edge  
45 research. The work does provide some benefits now and it may become  
46 much more useful in the future.

47 The rigorous details of this method may limit its actual use by

1 NRC staff. But we believe that staff will gain very important insights and  
2 particularly into risk-informing the models from this research. It looks as if it  
3 has limited application now.

4 But, I myself, applied the method to other models and I believe  
5 it has far-reaching implications.

6 As the analysis that NMSS does become more risk-informed,  
7 we believe this will have much more applications, in particular to  
8 environmental models.

9 Could I have the next slide, please.

10 Each year, the committee sends a small group to visit the  
11 Center for Nuclear Waste Regulatory Analysis so that we may discuss with  
12 them, in depth, their research work on some of the problems that they are  
13 addressing.

14 And this year, this coming year, our visit will focus on the  
15 igneous activity, and Dr. Hinze will address this later in this presentation.

16 We will also be focusing on their ongoing research on  
17 container life and source term and radionuclide mobility.

18 The Center has done extensive laboratory research, as well as  
19 modeling, in the area of container life and corrosion. And what we would like  
20 to do is look at the results of their research, where it is leading, what  
21 conclusions they may have come to regarding corrosion rates and stability of  
22 the waste package, and how this applies to the near field environment in the  
23 repository.

24 They are also doing research in areas that are not related to  
25 Yucca Mountain, particularly in looking at models for complex  
26 decommissioning sites. The total system performance assessment, which the  
27 Center has developed, has both Yucca Mountain and non-Yucca Mountain  
28 applications, as does their work in radionuclide retardation and radionuclide  
29 mobility.

30 We will address all of these in our visit and hope to report  
31 some results at our next meeting.

32 Thank you very much. And I would like to turn it over now to  
33 Mr. Croff.

34 MR. CROFF: Thank you.

35 By way of introduction the committee approaches its working  
36 group planning trying to accomplish three objectives: Providing insight to the  
37 committee as a basis for its letters, providing information to the NRC staff to  
38 aid in their regulatory activities, and providing a mechanism for outreach to  
39 the local public when opportunities present.

40 The working group meeting framework facilitates these  
41 objectives by allowing and in-depth review and expanded participation to  
42 delve into these technical aspects and doing so in a public venue.

43 Next slide, please.

44 With that, I would like to turn to the planned working groups  
45 about this coming year. We plan to convene five high priority working group  
46 meetings.

47 First, a health physics working group meeting that will focus on

1 there interrelated topics.

2 One is the next draft of the proposed revision to International  
3 Council on Radiological Protection recommendations and the foundation  
4 documents associated with them.

5 Secondly, the forthcoming Academy update on biological  
6 effects of ionizing radiation.

7 And third, recent scientific advances concerning radiation  
8 protection, such as fundamental radiation biology, radiation dosimetry,  
9 radiation effects on humans, and environmental fate and transport of  
10 radionuclides.

11 The timing of this meeting is somewhat uncertain because as  
12 has been described, we don't know when we are going to get some of these  
13 documents. We would expect later in the year rather than earlier.

14 Second --

15 COMMISSIONER MERRIFIELD: If I may ask a clarifying  
16 question.

17 You have got the five planned working groups here. Was it  
18 your intention to put those in priority order? Or is there any method to the  
19 order that you have here on the list?

20 MR. CROFF: No, they are not in priority order, and there's not  
21 a method.

22 We hope to have all of these working groups, however as will  
23 you see, some of them are subject to document availability or other events.  
24 So we may or may not. But it is our hope to have all of these.

25 Second, the decommissioning working group meeting will  
26 inform development of guidance documents concerning implementation of the  
27 license termination rule. Topics to be addressed at this working group  
28 meeting include institutional controls, on-site waste disposal, realistic dose  
29 scenarios, intentional mixing of soils and preventing future legacy sites.

30 Additionally, we were recently visited by Commissioners  
31 Merrifield and Lyons. This was during our February meeting. And  
32 Commissioner Merrifield suggested a need for increased emphasis on  
33 capturing and integrating lessons learned obtained from many ongoing  
34 decommissioning activities. And in response to this, we plan on including that  
35 topic as part of the working group meeting.

36 This working group is scheduled for June of this year.

37 Third, the working group meeting on waste incidental to  
38 reprocessing will focus on the technical aspects of the new provisions for  
39 NRC's consultation and monitoring concerning the Department of Energy's  
40 waste incidental to reprocessing determinations. And that will be directed at  
41 supporting the development of a risk-informed standard review plan.

42 In response to your direction, we have assigned this activity a  
43 higher priority. And this working group meeting is scheduled for July of this  
44 year.

45 The working group meeting on controlling the disposition of  
46 solid materials will provide the committee information required to advise the  
47 Commission on the technical aspects of an anticipated rule on this subject.

1           The timing of that meeting is uncertain pending release of the  
2 draft rule.

3           The fifth working group is on the West Valley Demonstration  
4 Project. It will focus on the decommissioning plan and draft environmental  
5 impact statement. The meeting will address integrated elements of  
6 decommissioning a complex site, including the license termination rule, waste  
7 incidental to reprocessing and controlling the disposition of solid materials.

8           In support of our outreach objectives, the working group  
9 meeting is planned to occur near the West Valley site when the relevant  
10 documents are available, which is currently projected to be October of this  
11 year.

12           As time and resources permit, the committee will also consider  
13 some lower priority working group meetings on risk significant pre-licensing  
14 issues concerning the proposed repository and issues associated with the  
15 disposal of low-level waste.

16           We tried to develop the agendas for these working group  
17 meetings in consultation with NMSS staff with the hope that the information  
18 obtained in the meetings can simultaneously inform the committee's  
19 deliberations and staff's regulatory activities.

20           With that, I will turn it over to Dr. Hinze to talk about igneous  
21 activity.

22           DR. HINZE: Thank you, Allen.

23           Gentlemen, briefly, I will look at the igneous activity issue with  
24 you. Then we will move on to looking at the conclusions, both general and  
25 specific, from a working group meeting on igneous activity that the committee  
26 held last September. And then finally, we will look at where the committee  
27 plans to move ahead with this issue.

28           If we can go to the next slide, please.

29           Igneous activity has been problematic area issue at Yucca  
30 Mountain for the past quarter century as characterization has initiated and  
31 been conducted. And it remains a problematic area today. And I have listed  
32 here on this slide, slide 20, some of the those reasons for the problematic  
33 nature.

34           We have several small volcanos that have occurred over the  
35 past several million years that have been accompanied by ash falls. We  
36 know that there are at least five or there are five volcanic events in the  
37 adjacent crater flat that occurred a million years ago. And then we have the  
38 obvious Lathrop Wells feature which we all see as we drive to the proposed  
39 site. That is only 80,000 years ago, only 80,000 years old.

40           Evaluation of the volcanism is required. It does not screen out  
41 as a very unlikely event in the standards and the regulations. And therefore, it  
42 must be evaluated.

43           The good news or the bad news is that performance  
44 assessment, both the DOE and the NRC, show that the igneous activity is a  
45 major contributor to the probability weighted dose. But the good news of that  
46 is that there is a minuscule, approximately, a one millirem probability weighted  
47 dose that we see in the first few thousand years.

1 We also have a problem associated with the fact that there's  
2 limitations to our knowledge of the physics of the volcanic and igneous  
3 process. And that certainly does make it more difficult to look at the  
4 probability and the effect issues, the consequence issues.

5 If we may go to the next slide.

6 As a result of the concerns regarding the igneous activity, the  
7 Advisory Committee on Nuclear Waste has looked at this issue with various  
8 experts for the past decade or more.

9 And if one looks at the four letter reports that have been sent to  
10 the Commission on this issue, there appear to be some recurring themes.

11 And I just want to briefly remind you of those.

12 First of all, great strides have been made in the understanding  
13 of igneous processes and events over this past decade. The NRC and the  
14 DOE -- and I especially congratulate the NRC on the improvements that they  
15 have made in that regard. But there are many uncertainties remaining.

16 There is also a need for the integrated approach to probability  
17 and consequences. And I'm not a reincarnated John Garrick, but we do need  
18 to consider consequences and probability at the same time. The probability  
19 puts the consequences in the proper frame -- proper context.

20 And we must rely more on evidence-based models and data.  
21 They must have more realism.

22 Next slide.

23 We look at some of the general conclusions regarding the  
24 NRC studies that we derived from the working group last September. And  
25 many of these really parallel the recurring themes.

26 First of all, we believe that increased emphasis is needed on  
27 risk-informed studies using performance probability analysis.

28 Secondly, the degree of conservatism in some of the  
29 assumptions appears to be unwarranted.

30 And finally --

31 COMMISSIONER MERRIFIELD: Conservatism instead of  
32 conservation.

33 DR. HINZE: I'm sorry.

34 Some of the assumptions that are involved in the NRC work  
35 the committee has found to be appear to be unwarrantedly conservative. And  
36 that is a significant conclusion.

37 The third conclusion is that improved risk insights regarding  
38 consequences of the igneous event are warranted and attainable. They can  
39 be done.

40 Moving on to more specific conclusions from that working  
41 group. The first bullet here is on probability on page 23.

42 We have challenges here in the probability area, because we  
43 have the regulatory precision on one side and we have the natural uncertainty  
44 on the other side.

45 The challenges here are much like those that we may be more  
46 familiar with in terms of earthquake prediction. There is no clear definitive  
47 long-term predictors to volcanism in the Yucca Mountain site, these small

1 basaltic volcanic features.

2 There is no universally established methodology or the criteria  
3 for selecting the parameters. There is no universally accepted approach to  
4 that.

5 And as I mentioned before, there's limitations in our process  
6 knowledge.

7 Now, this leads to what I call rear view mirror approach to  
8 things, because we must go to an extrapolation of past igneous events. This  
9 oftentimes has a statistical and mathematical rigor which is very impressive,  
10 but to be very honest about it, this is still a subjective process, depending  
11 upon the parameters that one puts into the modeling.

12 In terms of the results, published frequencies of dike  
13 intersection range from ten to the minus tenth to ten to the minus six per year  
14 over the 10,000 year time of compliance.

15 The DOE and NRC and most scientifically acceptable  
16 predictions fall in this range of ten to the minus eight to ten to the minus  
17 seven per year.

18 There is work being done at the present time to --

19 COMMISSIONER MERRIFIELD: I'm sorry. For the purposes  
20 of our audience, who is not as familiar with scientific nomenclature, could you  
21 explain in plainer English what a means?

22 DR. HINZE: Well, it means that there's one part -- if we have  
23 ten to the minus eight, for example, what that means is that there is one  
24 chance in 10,000 that that will occur over a 10,000 year period of time.

25 In other words, it's 10,000 chances, one part in 10,000  
26 chances or ten to the minus fourth times ten to the minus fourth for the years  
27 to get the yearly period. That's what it means.

28 COMMISSIONER MC GAFFIGAN: Or one in a hundred million  
29 to one in ten million per year.

30 DR. HINZE: I worked it out one time. I think if one --

31 COMMISSIONER MERRIFIELD: It's really, really small --

32 DR. HINZE: It's very small. In fact, what I like --

33 COMMISSIONER MERRIFIELD: This is an important issue  
34 here and that is -- and this is not just to ACNW. But I think this is something  
35 that the Commission has repeatedly said.

36 When we have slides like this, typically, we have people inside  
37 this room who understand what's going on. We web stream this information,  
38 and it is important for us to recognize the members of the public who may be  
39 looking to this to try to help inform them as to the views of the committee and  
40 of the Commission, are not going to necessarily have the level of  
41 understanding that the folks in this room necessarily have.

42 So that's why I think it is important for you to clarify it in a way  
43 that is understandable if we pick somebody off the street on Rockville Pike so  
44 that they would understand what you mean by that language.

45 DR. HINZE: You are absolutely correct. I made a calculation  
46 one time. And if I can recall it properly, I was thinking about ten to the minus  
47 seven, where the NRC would like to -- is currently having as their bounding

1 condition.

2 And I believe that if one takes a railroad track and visited that  
3 railroad track for 76 years, that a train would only occur during four minutes of  
4 that period of time, if there is one part in ten to the minus seven.

5 In other words, you would not really have to put stop signs  
6 there, because over your life time, there would be very little chance, very, very  
7 little chance that there would be a train passing that four minutes in 76 years.

8

9 COMMISSIONER MERRIFIELD: Thank you.

10 DR. HINZE: As a result of the fact that we anticipate little  
11 change in the frequency range, what we do suggest is that there be an  
12 increased emphasis on the consequences.

13 In going to the next slide, we also note that the Department of  
14 Energy as a result of new data that has become available and particularly, the  
15 aerial geophysical survey conducted by DOE in the past year, and drilling and  
16 dating of igneous rocks that are encountered in the drilling will be initiated  
17 within the next couple of months.

18 And there's a need for the NRC to monitor and evaluate this  
19 probabilistic volcanic hazard analysis, what the DOE calls its update. And this  
20 is an update of the 1996 expert elicitation.

21 If we move on to the next slide, and we see the consequences,  
22 there are several conclusions here.

23 We believe that in terms of the magma repository interaction,  
24 that there is a need for improved realism in the models for evaluating the  
25 potential interaction between the magma and the waste packages. And in  
26 particular, the behavior of magma in the drifts, the interaction of the high  
27 temperature and magma and its mechanical effects upon the waste packages  
28 and the waste magma interactions, the fragmentation of the waste and  
29 incorporation of the waste into the ash, the tephra -- into the ash that is blown  
30 out by a volcanic event.

31 Obviously, uncertainties remain.

32 COMMISSIONER MERRIFIELD: Can I get another  
33 clarification, if I may? In this slide, you talk about the need for improved  
34 realism. Earlier on slide 22, you spoke of the degree of conservatism in some  
35 assumptions being unwarranted. When you say an improved realism in  
36 model, are you saying that the models are overly conservative?

37 DR. HINZE: Yes, I am.

38 COMMISSIONER MERRIFIELD: Because that is not clear  
39 from this slide.

40 DR. HINZE: Okay. Well, by --

41 COMMISSIONER MERRIFIELD: But if that is the case, I will  
42 leave that. But I just want to have that clarification.

43 COMMISSIONER MC GAFFIGAN: While you're thinking,  
44 again a clarifying question. Dr. Ryan, I think you are the old hand now, this is  
45 more Garrick/Hornberger stuff. But my recollection in one of my previous  
46 discussions, when you talk about these models that for the drift interaction  
47 with the magma, that there was some nice model that was put together. And

1 my reaction -- it basically had things bouncing off the ends of the drift and  
2 oscillating and some harmonic. As a former physics student, it all sounded  
3 very familiar what physicists do with complex problems.

4 But, it's stuff like that you are talking about. The models at the  
5 moment are very simple. That they don't necessarily reflect physical reality.

6 DR. HINZE: To give credit to the NRC in this, they did start  
7 really looking carefully at modeling the magma in the repository drifts. Their  
8 initial study had assumptions that were very simplistic. And it is our  
9 understanding that they moved away from those. And they are now in the  
10 process of trying to makes those much more realistic.

11 And, we certainly support that and urge that there be this  
12 realism put into those models and into the parameters as well.

13 COMMISSIONER MERRIFIELD: Right. But when you say  
14 they were overly -- just so there is no misunderstanding, when you say they  
15 are overly simple, in order to accommodate the over simplicity, the staff went  
16 very conservatively as we do in other things. And you are saying with a more  
17 realistic model, some of that over conservatism is being backed out?

18 DR. HINZE: That's right. If I didn't make that point clear, I  
19 should have.

20 Going on to the exposure scenario, and I see my time is  
21 fleeting here, the realism again, Commissioner Merrifield, there we are with  
22 the realism again -- is needed to assess the following, the dispersal and the  
23 redistribution of the ejected contaminated ash. The contaminated ash particle  
24 size, there's needs to be more realism there into what is really inhaled rather  
25 than the spectrum that is now being used.

26 COMMISSIONER MC GAFFIGAN: Dr. Hinze, don't worry  
27 about the lights. This is an important subject. Continue, you only have a  
28 couple of more slides.

29 DR. HINZE: My colleagues have given me a few moments  
30 from their presentations.

31 COMMISSIONER MC GAFFIGAN: They exceeded the plan.

32 DR. HINZE: There is also need for more realism, particularly in  
33 the resuspension period. We think it is excessively long based upon the  
34 evidence that we have, the wind direction and velocity. And I'm referring to  
35 the work that we heard at the working group meeting in September; needs to  
36 have more realism as well as the whole dosimetry issue.

37 There is some fixed value assumptions there that appear to be  
38 overly conservative. We urge a probabilistic risk assessment approach to  
39 this. That will serve us better in terms of understanding the processes and  
40 removing the uncertainties.

41 The steps that we look forward to in the future in the final slide,  
42 28, is, as you heard from Dr. Weiner, we will be visiting the Center for Nuclear  
43 Waste Regulatory Analysis regarding consequence research activities. And  
44 we will be particularly concerned there about igneous activity.

45 We want to be brought up-to-date on what they are doing. And  
46 we will be reporting back to you on that.

47 We also will continue to review staff as well as DOE progress

1 in the risk informing consequence. We are particularly interested in that.

2 We will continue to monitor the progress of the probabilistic  
3 volcanic hazard analysis update expert elicitation. And we have heard about  
4 working groups here. We are also considering an additional working group in  
5 this area. My vote on that would be particularly focused on exposure  
6 scenario.

7 And with that, I will try to answer any questions that you have.

8 DR. RYAN: Thank you, Professor Hinze.

9 I would like to turn our attention now to our action plan.

10 COMMISSIONER MERRIFIELD: If may ask a clarifying  
11 question, just so it is all sort of in the context of this presentation.

12 You have talked about the challenges and complications of  
13 dealing with igneous activity as it relates to Yucca Mountain. And you have  
14 spoken in some detail here about the degree of conservatism that the staff  
15 has previously undertaken by injecting more realism into these activities. It  
16 would allow a closer understanding of the actual consequences. And that is  
17 sort of my take on what you said.

18 At the very beginning of your presentation, you said the  
19 igneous activity is a problematic issue at Yucca Mountain. Taken out of  
20 context, one might say that you are saying it is a problem.

21 Were you really intending to say that it is a challenge and a  
22 complex one, but that the focus you had in your presentation today is that the  
23 agency and the staff, in terms of attempting to put more realism into its  
24 efforts, is working back from some of those issues?

25 Is that what you were intending to say by your reference to  
26 problematic or am I getting it wrong?

27 DR. HINZE: Well, I was trying to put it in the context that this is  
28 a difficult problem.

29 COMMISSIONER MERRIFIELD: It's a challenge.

30 DR. HINZE: It is a real challenge. So maybe the

31 nomenclature --

32 COMMISSIONER MERRIFIELD: -- so problem is not the right  
33 word to use?

34 DR. HINZE: Well, it's a challenge, and I believe that the NMSS  
35 staff, the Nuclear Regulatory Commission has made excellent strides. But we  
36 believe that what we need to see is more probabilistic risk analysis, we need  
37 more realism, we need less conservatism in some of the assumptions.

38 We need to approach this not from the standpoint of single  
39 point -- values in the parameters, but a range of parameters that capture the  
40 uncertainties.

41 And I think we are moving towards the solution. The  
42 probability --

43 COMMISSIONER MERRIFIELD: Did you mean to leave the  
44 conclusion that the staff is on track or off track in its activities?

45 DR. HINZE: I think that the staff needs to be bumped more  
46 into a PRA area as well as greater realism.

47 COMMISSIONER MERRIFIELD: Okay. But your concern is

1 that they are too overly conservative at this point?

2 DR. HINZE: That's right. That's what I said.

3 COMMISSIONER MERRIFIELD: I just want to make that  
4 clear.

5 COMMISSIONER MC GAFFIGAN: Dr. Ryan.

6 DR. RYAN: Thank you. I would add, Commissioner Merrifield,  
7 that I think the committee as whole believes the staff is on the right road but  
8 they are not at the end of the road with regard to the igneous activity. And  
9 our efforts are aimed at addressing and exploring the technical issues with  
10 them as we move forward.

11 So thank you.

12 I would like to turn our attention now to slide 30 on the ACNW's  
13 action plan.

14 We reported a draft of our action plan to you. We received  
15 your comments and direction, which we have incorporated into the plan. And  
16 we have identified priority topics in Tier I and II.

17 I would like to turn to slide 31, and go through those Tier I  
18 activities, the activities of highest priorities.

19 The area of decommissioning and the working group that Mr.  
20 Croff described is on our agenda, as well as routine communications and  
21 briefings by staff in this area. Waste incidental to reprocessing is an area  
22 where we are gearing up for activity. The disposition of solid materials, health  
23 physics and risk-informing regulatory activity.

24 I will talk for a minute about each one.

25 On slide 32, the key issues for us in decommissioning will be  
26 the institutional controls, questions, realistic scenarios, intentional mixing, and  
27 on-site disposal. And we have taken up these issues again in consultation  
28 with NMSS staff.

29 The applications will be the West Valley Demonstration Project,  
30 which is unique. It's a complex site. And other complex sites may come to  
31 our radar screen as decommissioning issues.

32 The waste incidental to reprocessing, we will focus on the  
33 reclassification criteria. We will use risk-informed approaches, performance  
34 assessments in that area, and we will support the development of a  
35 risk-informed standard review plan for waste incidental to reprocessing  
36 determinations.

37 And the disposition of solid material, we will focus on the  
38 rulemaking concerning disposition of materials that have very small amounts  
39 of radioactivity and the draft potential rule which is expected relatively shortly.  
40 We will focus on that documentation as it becomes available to us.

41 The committee will advise on technical and risk-informing  
42 issues in the area of deposition of solid materials.

43 Again, the health physics area, Mr. Croff discussed will be  
44 mindful of the International Commission on Radiological Protection as they  
45 issue their documents and revised guidance, biological effects of iodizing  
46 radiation update to its basic radiation risk reports.

47 Report number VII should be forthcoming. And emerging

1 radiobiological issues they are developing over time we will also keep on our  
2 radar screen.

3 As with all of our activities, we look to continue in the model of  
4 Garrick and Hornberger on risk-informing regulatory activities, and we focus  
5 on instilling realism, transparency, consistency and the identification of  
6 uncertainties in all of our efforts and activities, and that is a standard that we  
7 think about for every one of our letters.

8 We will assess strengths and weaknesses of risk assessments  
9 for decision making and point those out where both exist.

10 At the top of slide 37 on our Tier II activities is the radioactive  
11 material transportation, in particular the review approach to package  
12 performance study. We have internally decided that we will generate a white  
13 paper on transportation. Dr. Weiner will lead that effort. And we will better  
14 formulate how we are going to address this important issue that's important to  
15 the public, this will be an ongoing question so we can better serve you and  
16 advise you on this topic.

17 So we are going to think about that seriously and develop a  
18 more formal white paper on how to proceed forward.

19 Also on Tier II are waste management research program  
20 reviews for the NRC Office of Research and the Center for Nuclear Waste  
21 Regulatory Analysis. I think you have heard us talk about our visit to the  
22 center upcoming soon. We are going to focus on the work at the center  
23 directly related to the igneous activity. That is our number one issue as we  
24 visit there so we can better understand what work has been updated and what  
25 answers are out there to many of questions that Professor Hinze mentioned  
26 to you this morning.

27 Moving to slide 38.

28 We are staying cognizant of the proposed Private Fuel Storage  
29 Facility updates. Though, we have no specific agenda there at moment, we  
30 remain informed of all technical issues there.

31 In the fuel cycle facilities, we will be reviewing technical and  
32 safety and licensing related issues. And, in fact, we are scheduled for a  
33 briefing from the Piketon, Ohio uranium enrichment plant activity and licensing  
34 process this afternoon. So we will be hearing more about that.

35 And also we had a collaboration on the mixed-oxide fuel  
36 fabrication facility, recognizing that the ACRS, Advisory Committee on  
37 Reactor Safeguards, had the lead on that activity. We supported their  
38 expertise with questions regarding waste management questions for the MOX  
39 facility. And that was, again, a successful collaboration between the ACRS  
40 and the ACNW, which we will look for other opportunities like that in the future  
41 to collaborate with them and they with us.

42 On slide 39, low-level radioactive waste is on our radar screen  
43 as a Tier II item for risk-informing 10 CFR Part 61. There's lots of interesting  
44 questions there. It is not a stand-alone question. Some of the definitions of  
45 low-level waste are involved with WIR and other overlapping areas. So we  
46 are thinking about how it in terms of how it flows across other issues and  
47 areas as well, decommissioning and others. And we are formulating our

1 thinking there.

2 We have also decided to develop a white paper again that  
3 would more rigorously develop a written plan and agenda for how we would  
4 approach those questions. And in that, of course, there would be low-level  
5 waste storage processing and disposal issues as well.

6 I would like to turn our attention to slide 41, if I may.

7 We have some action planned items regarding Yucca  
8 Mountain. We are continuing our pre-license application activities. We  
9 continue to apply the risk insights process to focus on the most important  
10 areas.

11 The igneous activity is recognized as a high significance issue.  
12 And it is in that context that we are continuing the activities we have just  
13 reported to you.

14 We will also turn our attention to the above ground surface  
15 facilities, performance assessment modeling. And as the issue of time of  
16 compliance develops, we will be mindful and cognizant of how we can further  
17 support the Commission in that area.

18 We have and will continue to develop our familiarization plan  
19 so that we will become familiar with the license application when it comes in.  
20 And support the Commission after a license application consistent with your  
21 previous guidance to us in that area.

22 My final slide, please, is the summary slide. I would like to just  
23 take a minute and recognize the staff, the technical staff and the support staff  
24 that helped the committee do its work. And without them, we would not be  
25 nearly as successful as we are in providing you the guidance that you asked  
26 us to provide. And we feel they do an excellent and professional job, every  
27 single person. And we just felt we wanted to make that comment to you.

28 COMMISSIONER MC GAFFIGAN: Thank you very much, Dr.  
29 Ryan.

30 I think we -- without the Chairman here, we have had to  
31 stumble as to who's turn it is. We have decided it's Commissioner Merrifield  
32 to go first.

33 COMMISSIONER MERRIFIELD: Thank you very much.

34 I'm going to turn first to Dr. Ryan. You spoke about health  
35 physics and also, ICRP. I would like to briefly touch on both of those.

36 In the analogy you used earlier about having a full plate, one of  
37 the things that anyone knows when you have a full plate is some things are  
38 things you need to eat first and some things are things you need to eat later.

39 I guess the Commission did opine in a Staff Requirements  
40 Memorandum to the committee as to its expectation. You talked about the re-  
41 prioritization that the Commission used.

42 I was reflecting this morning that on the issue of health  
43 physics, the Commission didn't really go very much into that particular one.  
44 And I understand and I think some of the things that are you thinking about  
45 doing in terms of taking a look at what ICRP is up to, BEIR and otherwise, is  
46 of help. But it struck me this morning that the issue of having a committee or  
47 a subcommittee look into some of the health physics issues could get rather

1 octopus-like in its reach.

2 I'm wondering how you are going to try to discipline yourselves  
3 to remain focused on that which is going to be helpful in terms of advising the  
4 Commission versus a whole lot of real interesting things that one might get  
5 into in health physics, but nonetheless might not necessarily be of value in  
6 terms of helping us make decisions?

7 DR. RYAN: That is a fair question. I think our focus is going to  
8 be the principal recommendation documents as they come along, as we need  
9 to better understand what those recommendations are. We will certainly  
10 educate ourselves with the foundation documents.

11 But in no way did I want to contend that we are starting new  
12 research or new radiobiological workshops or technical meetings of that sort.  
13 We are really focused on the fact that as new information or new  
14 recommendations come along, you are obligated to evaluate that with regard  
15 to our radiation protection standards in the Code of Federal Regulations Part  
16 20, for example, and everywhere else in the regulation.

17 We are focused on supplying you with analysis and  
18 assessment with regard to that specific objective. We are not making a  
19 science project out of this.

20 So I want to you know that we are very much focused on doing  
21 the reviews that are important.

22 Now, there are staff folks that participate and study the depth  
23 of the questions. And we certainly are advised and informed by them. So we  
24 are in no way going to duplicate that effort. But again, we are focused on that  
25 which serves your needs.

26 COMMISSIONER MERRIFIELD: I think the committee would  
27 be well disposed to keep actively engaged with the Commission to make sure  
28 that we are on the same wavelength in terms of the areas where we want you  
29 to focus in that particular regard.

30 Staying on ICRP for a moment. One of the issues that you  
31 didn't really get into particular depth -- and I appreciate the comments on  
32 ICRP, and I think those are reflective of what we have received from our of  
33 staff and perhaps intuitively where the Commission is coming from. But I  
34 would like to focus for a moment on the issues associated with the initiative  
35 they are taking on of the environment and having a separate set of standards  
36 for fauna and flora. And I'm wondering if you had any sort of separate  
37 observations on this particular effort?

38 DR. RYAN: Yes. Thank you.

39 We did have presentations by the current president of the  
40 International Commission and the soon-to-be president of the International  
41 Commission, perhaps now president. And the second presentation was about  
42 that.

43 As I understood the presentation at this point, they have  
44 created what they described as a logical framework for the concept of an  
45 environmental standard.

46 COMMISSIONER MERRIFIELD: That's their description.

47 DR. RYAN: That's their description. And at this point, and with

1 no foundation document, I have nothing to say about it, because there is no  
2 substance to the details of what they are actually proposing or what they  
3 would do.

4 On inquiry during that session, we asked about, well, are you  
5 recommending dosimetry, are you recommending limits. And again, that was  
6 all very vague. There was no specificity of how they would approach that in a  
7 technical, detailed level.

8 So until their recommendation is more mature, it does not  
9 seem to me to be something that we can address fully.

10 COMMISSIONER MERRIFIELD: Well, there is an issue that  
11 the Commission previously had, I think, a bit of doubt about, to put it mildly.

12 DR. RYAN. If I may, Commissioner. One technical question  
13 that sticks in my mind is that -- and I asked this very specifically of Dr. Lars-  
14 Erik Holm -- for more than 50 years, we have used the principle that if we  
15 protect man, we protect the environment.

16 And I said, show me the radiobiological evidence that counters  
17 that principle that we have used. And I have yet to see any evidence to that  
18 effect.

19 So when there is a body of evidence that addresses that  
20 specific principle that we do base our regulations on, I will be informed  
21 differently. But so far, I have not seen that evidence.

22 COMMISSIONER MC GAFFIGAN: Commissioner Merrifield, I  
23 think, for our two new colleagues, that has been the view of the three  
24 enduring Commissioners for quite sometime, that last statement that we don't  
25 know why we are doing this. And there is no evidence that I'm aware of  
26 either.

27 DR. RYAN: Anecdotally, that same question is being asked in  
28 other countries of the world that are also addressing the ICRP  
29 recommendation.

30 So, I remain open as a scientist to new evidence. But at this  
31 point, we have not been provided that new evidence. We stand open to read  
32 their foundation documents in that regard.

33 COMMISSIONER MERRIFIELD: Well, I'm glad you are asking  
34 tough questions. I agree with Commissioner McGaffigan, I think almost all  
35 the regulators I have met have questions similar to ours. And it muddies an  
36 area where we have had pretty good clarity so far.

37 A quick question on the center for Nuclear Waste Regulatory  
38 Analysis. I know you are going down. This is an institution, I think, this  
39 Commission has been committed to over the years. In general. I think we  
40 feel very highly about the quality of work that they could do. I know you are  
41 going down there soon.

42 One of the things I have been trying to challenge our staff with  
43 is, are there further -- outside of the work that they been doing and  
44 accomplishing for us relative to Yucca Mountain, is there more that they can  
45 do in areas that they are currently not involved?

46 We spend a lot of money on national labs, on other  
47 contractors, and the center, in my mind, comes as close as we have got to

1 our own national lab. I would be interested as you visit if you could potentially  
2 give us back some information in terms of if you think that there are additional  
3 capabilities that they may have in other areas of the agency's need that they  
4 might be an appropriate nexus there. But I don't know if you have any  
5 comments that you want to make.

6 DR. WEINER: We will certainly keep that in mind when we go  
7 down to the center. I think that's an excellent suggestion.

8 What we have been directed toward in our previous visit and  
9 our questions for this visit is how is the work that you have undertaken  
10 proceeding and do you see spin-offs or do you see an end to it or conclusion?

11 But I think you have raised an excellent point. We will certainly  
12 bring that up on our visit to look at the other capabilities of the center.

13 COMMISSIONER MERRIFIELD: This may also have some  
14 overlap on not just ACNW but ACRS as well.

15 DR. CROFF: If I might. I attended the research review last  
16 year. And my impression is that they too are very much interested in serving  
17 the NRC in a broader sense.

18 I think your question is very appropriate, that they will be  
19 interested as we investigate that further down there.

20 COMMISSIONER MERRIFIELD: The last one, since my time  
21 is up, I want to make a comment rather than a question.

22 You are following through in reviewing efforts associated with  
23 our development of proposed rule on the disposition of solid waste. The only  
24 thing I would want to say is I think it is very important -- and this goes not just  
25 to you, but our staff -- to make sure you are appropriately tailored with them  
26 so that there is not a long delay between your ability to review that and get  
27 some information back to the Commission, because I think for me, I think that  
28 is something I think we need to work on in a timely way.

29 DR. RYAN: Thank you, Commissioner. I appreciate your  
30 comments and your questions.

31 COMMISSIONER MC GAFFIGAN: Commissioner Jaczko.

32 COMMISSIONER JACZKO: I'm going to ask two questions.  
33 One deals with some of the work you are planning to do on waste incidental  
34 to reprocessing on this area.

35 One of the things that we have tasked the staff of the NRC to  
36 do is make sure that their meetings and interactions with DOE are public.  
37 And that is one of the areas you sent us in one of your letters, is one of your  
38 commitments is to regard the public as your ultimate stakeholder.

39 So one of you can talk about it. As you start to formulate your  
40 work in that area, what kinds of things will you be planning in terms of  
41 ensuring that public involvement in that process?

42 DR. RYAN: Thank you for your question.

43 I think all of our meetings are public meeting upstairs. So our  
44 working group sessions are open public meetings.

45 With regard to other activities, we have had some meetings  
46 here in Washington. We have had other meetings at sites. So I think.

47 COMMISSIONER JACZKO: In this area do you intend to

1 do sites in Idaho?

2 RYAN: Yes. In fact, we have got a visit that we are  
3 contemplating to the Savannah River site, which, of course, is a site where  
4 this will be dealt with. And we could certainly figure out how to have a public  
5 forum at that meeting, as well as a public forum here.

6 So, yes, we are very much in agreement with that full  
7 participation and will plan to do so on WIR.

8 COMMISSIONER JACZKO: The other question talk a little bit  
9 about, you mentioned as one of your Tier II issues -- I'm trying to find the slide  
10 now -- the low-level waste activities.

11 DR. RYAN: Slide 39.

12 COMMISSIONER JACZKO: Yes. I was wondering if you  
13 could talk to me a little bit about what you see as the technical issues and  
14 perhaps the issues that we are going to be dealing with in the low-level waste  
15 arena?

16 I guess my question is more I think that there might be some  
17 things there that will push that up to perhaps a Tier I issue rather than a Tier II  
18 issue. But could you talk to me about what is some of the technical work that  
19 you think needs to be done in that arena.

20 DR. RYAN: Sure. Let me describe to you our white paper that  
21 we are developing.

22 This is, as I mentioned, an area that contacts other areas. The  
23 definition of low-level waste, as you well know, is one of exclusion. And as a  
24 result, it overlaps with WIR, the classification of class C waste and greater  
25 than class C waste, again, transcends from one regulation to one regulated  
26 area to another.

27 So first of all, we want to systematically, educate ourselves on  
28 all of those details.

29 The second step is recognizing that the draft EIS was, I  
30 believe, 1979. The final environmental impact statement for that part of the  
31 regulation on low-level waste was in 1982. There was prior to a lot of the  
32 risk-informing kinds of thinking that we're doing now. So we would also  
33 include in our white paper an exploration of those types of issues.

34 If we risk informed it in some different way or thought about it  
35 in a different way, what might we see as a potential result.

36 One specific example is the intruder scenario. The probability  
37 of intrusion is one. The probability of intrusion into the highest concentration  
38 waste is one. That's likely to be conservative.

39 If you took a simple aerial projection, the more likely  
40 probabilities are down in the real tiny branch, very small, below one in ten  
41 million, perhaps. So, that is just one little facet of if we thought about it, what  
42 that exploration might look like. And I think our end goal or our work product  
43 here is this white paper to identify these issues, certainly not to say what  
44 should be done or how something should be handled. But at least to develop  
45 that in a systematic way so that we can all think about it from that point  
46 forward.

47 COMMISSIONER MC GAFFIGAN: I might just add, I think you

1 are going to find, and it has been a frustration of mine during my tenure here,  
2 that there are statutory impediments -- I mean a lot of these definitions and  
3 attempts to inform or to classify various waste streams didn't -- they were  
4 dominated by lawyers rather than physicists and they don't make a lot of  
5 sense.

6 So I think as part of that white paper, you are inevitably going  
7 to stumble upon statutory impediments to some of what you want to do. And I  
8 think that would be interesting.

9 Here is what we think is technically -- I don't at all discourage  
10 you from going in this direction. Here is what the current -- what we think is  
11 technically sound. Here might be, possibly, some statutory impediments to  
12 getting there.

13 Now, the chance of us fixing that, you know, everybody has  
14 their own opinion. But at least, there is a crisis coming in low-level waste,  
15 perhaps, depending on what happens in various states. And it's crisis that the  
16 Congress oftentimes responds to.

17 COMMISSIONER MERRIFIELD: One clarification of my  
18 colleague. There wasn't a problem with lawyers. It was a problem with the  
19 wrong lawyers.

20 (Laughter)

21 COMMISSIONER MC GAFFIGAN: Commissioner Jaczko, did  
22 you have further questions?

23 COMMISSIONER JACZKO: No. I just wanted to say that the  
24 reason I'm not going into the lawyer/scientist argument -- I mean, the reason I  
25 do bring that up and say that I think it is important to look -- and I don't know if  
26 I'm quite ready to say that there's a crisis -- but I think that there is definitely  
27 some challenges, perhaps, that we are going to be facing in the fairly short  
28 term on low-level waste.

29 And I would encourage you to take a look the some of those,  
30 and make sure that you are providing us with whatever information we could  
31 use as we may be forced to make policy decisions in that area in the fairly  
32 near term.

33 DR. RYAN: I appreciate the comments. And, Commissioner  
34 McGaffigan, I fully understand the impediment question. We are thinking  
35 about it, actually, in several tiers. There are things, for example, that you can  
36 do with an individual license and you can make a license condition. You can  
37 provide regulatory guidance that helps interpret it.

38 Again, I'm saying this not to respond but to help the broader  
39 audience. And we are actually thinking it through that system of license  
40 changes, regulatory guidance, regulation changes, and legislation, that tier of  
41 solutions certainly could be in play in an exploration like this. We will do our  
42 best to certainly not recommend policy, but to educate ourselves, and in turn,  
43 provide you with that white paper as we produce it.

44 COMMISSIONER MC GAFFIGAN: Commissioner Lyons.

45 COMMISSIONER LYONS: Just a comment on this low-level  
46 waste discussion.

47 I know you folks are well aware that there is a National

1 Academy study that should be coming out on this issue in the -- my  
2 understanding was October, September time frame, which at least may help  
3 to inform this discussion and probably should add to it. And I know you are  
4 well aware of that.

5 I have several questions on ICRP. To start a very basic one  
6 that probably everyone here except me knows, but what is the decision  
7 process on ICRP?

8 In other words, NRC, you have expressed significant concerns.  
9 And upon reading the ICRP recommendations, I very much share those  
10 concerns. What does ICRP do with such concerns and how does that  
11 influence the end product:

12 DR. RYAN: Well, I'm no expert on the internal processes at  
13 the International Commission on Radiological Protection, so I will speak from  
14 a practitioner/observer point of view, if I may.

15 Some of the NRC staff, Dr. Cool, for example, is a member of  
16 Committee IV of the ICRP. And I believe he would probably be able to  
17 provide to you a full explanation of their process.

18 But in general, they provide consultation documents, this draft  
19 issue was a consultation document offered to the public through their web site  
20 for public comment and for comment by government organizations that have  
21 in the past ascribed to or adopted or not adopted their previous  
22 recommendation.

23 And that process is underway now as a result of an initial  
24 comment, they are going to revise the guidance and issue the foundation  
25 documents, hopefully, as they become completed.

26 So it is very much an open process where they provide their  
27 recommendations and they get comment, they make a revision and then their  
28 recommendations are issued typically.

29 COMMISSIONER LYONS: At some point, is there a vote of  
30 whatever forms the commission?

31 DR. RYAN: I can't speak directly to that but I would assume  
32 so.

33 There is a main commission, there are committees that  
34 address various topical areas. And those committees report to the main  
35 commission. The main commission is the body that takes action.

36 And they are represented from members from various  
37 countries around the world.

38 COMMISSIONER MC GAFFIGAN: Can I follow-up, and  
39 perhaps Dr. Cool, if he wants, can come to the microphone. But does the  
40 commission make judgments by consensus? Are there dissenting views in  
41 the history of ICRP where a majority propounds a document and a minority of  
42 members feel compelled to write minority views? How does that process --

43 DR. RYAN: I defer to Dr. Cool.

44 DR. COOL: Good morning. Don Cool, NMSS.

45 I cannot give you, perhaps, as a complete an answer as you  
46 might wish. The main commission of ICRP does generally operate by  
47 consensus. It is not a fewer vote, X number of majority wins. They usually

1 attempt to have a consensus across the members of the main commission.  
2 There are 13 members of the main commission.

3 I do not recall a time where there has been a significant  
4 minority view that has come out in sort of a public forum or further discussion.

5 There are -- because I know most of the main commission  
6 members -- some very strong and divergent views within the main  
7 commission. And I expect that they are having some very lively discussions  
8 around the direction to proceed on some of the topics.

9 To specifically try to give a bit more information, Commissioner  
10 Lyons, to you, they are -- the ICRP is, in fact, sort of a new territory for  
11 themselves because they have attempted to make this particular process a  
12 much more open process. This is really the first time they have attempted  
13 this sort of public consultation, and they got a huge number of comments over  
14 the past half year.

15 The main commission is, in fact, meeting this week in Paris.  
16 One of the items on their agenda was to look over an initial summary of those  
17 comments and topics that had been prepared by the ICRP scientific  
18 secretary. I would guess that they would be providing some initial thoughts  
19 for the drafters to try and look at starting to prepare the next draft.

20 They will also be looking in detail at revised drafts of the  
21 foundation documents. Their hope being that those foundations documents  
22 would be published for public consultation and comment later this spring. We  
23 shall just have to see.

24 That was also their hope in the Beijing meeting in October.  
25 And, of course, none of them actually made it to the point where they felt that  
26 they were ready for public consultation.

27 So I can't give a specific opinion on that point.

28 Those foundation documents will go through public  
29 consultation. There be some discussions this summer, if that schedule holds.

30 There will be consideration, perhaps, of a revised draft in the  
31 meeting that the main commission of ICRP intends to hold in Geneva in  
32 September. Depending on those discussions, there is then an expectation  
33 that there might be a draft again of the draft recommendations that would be  
34 made available for public consultation late in 2005.

35 So, then there would be further consideration of the comments  
36 received. So I believe that they are into 2006 before they are in a position  
37 where they are trying to come to consensus on what the final version of that  
38 document would actually look like.

39 COMMISSIONER LYONS: Thank you.

40 COMMISSIONER MC GAFFIGAN: I might comment. Again,  
41 I'm pretty sure I'm speaking for all Commissioners, that we very much  
42 appreciate ICRP's willingness to have an open process and to -- as you said,  
43 this is an experiment -- in the past it was a pretty closed process.

44 And I think they are being served well by the openness with  
45 which they are going about this complex task.

46 COMMISSIONER LYONS: I would be very interested to see  
47 the BEIR VII report. And you used the word it is coming soon. I'm just

1 curious if you have any idea how soon? I have been watching for it for quite a  
2 while.

3 DR. RYAN: As we all have. I do not have a firm schedule in  
4 my mind.

5 I certainly can get back to you. I will pulse the Academy and  
6 see if they will give me anything a little bit more clear. But soon was what I  
7 was told. So that's what I quoted.

8 COMMISSIONER LYONS: A question on one of the ICRP  
9 recommendations or a statement in their draft, and tell me if this is too  
10 detailed a question, but at one point, there are sentences which suggest  
11 increased confidence in the LNT, the linear no-threshold model. And they  
12 refer to work in the 1990's moving in that direction.

13 At least work I'm aware of would not support that statement. I  
14 was very surprised at that statement.

15 I'm just curious if from the perspective of the committee if -- I  
16 know that there already was a concern expressed back to ICRP about that  
17 statement. But I was just curious if you knew what led to that statement?

18 DR. RYAN: In fact, that's why we have on our physics agenda  
19 the action item to address or evaluate radiobiological information.

20 Frankly, there is a lot of, let me call it, anecdotal traffic on  
21 various internet web sites and chat rooms on LNT verses threshold and so  
22 forth.

23 There are some centers doing credible work on issues like  
24 bystander effects, which are single cell kinds of experiments and other  
25 credible work. There's some interesting work on biodosimetry to look at the  
26 occupational exposures to folks in the former Soviet Union after many, many  
27 years of exposure and so on.

28 So, there is a growing body of evidence. I think it is important  
29 that we stay cognizant of that body of evidence. But I concur with your  
30 thought that at this point, and again as a health physicist, I certainly don't and  
31 I believe the committee has written you a letter to this effect several years  
32 ago, I don't think there is a body of evidence to change the basis for our  
33 regulatory thinking at this point.

34 COMMISSIONER LYONS: As you do convene that working  
35 group, I would suggest that at least one source of information, which I'm sure  
36 you would be planning to include anyway, DOE has been funding a  
37 substantial program in this area looking at single cell and then moving up to  
38 the organism level. That's been either a five or six-year program at this point.

39 And the last briefing I had on that program was really quite  
40 positive, not that it was definitive on this question. But that it was excellent  
41 research which had been conducted which was perhaps starting to lead in  
42 various directions.

43 DR. RYAN: That is one of the centers, Texas A&M has some  
44 excellent researchers working in this area, and there are others. But, yes, we  
45 certainly will include them. Thank you.

46 COMMISSIONER LYONS: Do I have time for one more  
47 question?

1                   Maybe this is to Bill Hinze, I'm not quite sure, or maybe some  
2 of the others. But as you talk about the modeling on igneous activity, you  
3 mentioned the difficulty of validating or benchmarking codes. I'm just curious  
4 if you could you add a little bit more about how one approaches  
5 benchmarkings in that kind of an area?

6                   It strikes me as incredibly difficult to accomplish. I'm  
7 wondering what approaches are used?

8                   DR. HINZE: It is difficult. But to the center's credit, Dr.  
9 Connor, who used to be at the center, took some of the models and applied it  
10 in a hind casting type of way on a volcanic field and did some validation of the  
11 model in that way.

12                   Geological analogs are always an opportunity. They are  
13 difficult, but generally, good geoscientists can separate out the various  
14 processes involved in the various parameters. And I think that this is one way  
15 that we can accomplish validation of those models.

16                   We have very poor analogs in terms of the interaction of  
17 magma with an underground chamber. The DOE has scoured the earth  
18 trying to find analogs of this, trying to find something that might help us.

19                   They have been unsuccessful, to the best of my knowledge.

20                   Again, the NRC has tried to use geological studies again,  
21 analogs, if you will, in various areas Sara Blanca. And they are attempting to  
22 put those into the framework of these models.

23                   It's a question that is constantly on our mind, Commissioner  
24 Lyons.

25                   I am concerned that we make these models and parameters  
26 just as realistic as possible. And the only way you can check that out is to  
27 look at some of these analogs. And that is being done.

28                   I think that the center and the staff deserve credit for trying to  
29 do that. They need to do more, though, I might say.

30                   COMMISSIONER MC GAFFIGAN: Thank you, Commissioner  
31 Lyons.

32                   I will just in passing say I thought that your answer to the  
33 question or the answer you heard to the question about whether the ICRP  
34 current draft would improve public health and safety. And you got a no from  
35 everyone, says that the ICRP has a lot of work to do between now and  
36 perhaps late 2006 or whenever they finish their guidelines.

37                   I do think, and maybe after we see the BEIR VII results, these  
38 methodological issues that you mentioned on one of the slides, I do think that  
39 we need to get on with that. And as I think you said, Dr. Ryan, we already do  
40 in various exemptions or guidance documents, so at some point -- that the  
41 danger in this area is you wait for perfection, and you don't get it. And they  
42 are bite-sized things that there is a pretty strong consensus would be a pretty  
43 good thing to do, and we may need to get on with those at some point.

44                   That's more a statement, but as I say, if there are any media in  
45 the room, that that was the news today, I think, your statement.

46                   With regard to decommissioning, slide 32, you said that your  
47 focus is going to be West Valley Demonstration Project and other complex

1 sites. We are experimenting with the guidance -- the staff is experimenting  
2 the guidance that the Commission has given them at various sites that are a  
3 little less complex than West Valley but where there could well be -- I mean,  
4 they are certainly on a shorter time horizon than West Valley is and you might  
5 look at some of the places where we are first applying institutional controls.

6 We have had correspondence with the State of New Jersey  
7 about one of the sites, I believe the Shieldalloy site. And I think what the staff  
8 is trying to do is exactly the right thing or else we would not have told them  
9 that.

10 But I think your review could lead to some additional technical  
11 support in the technical community. Or it might undermine us. But I think if  
12 you take a look at some of what we are doing there, you are going to be  
13 impressed with what the staff is trying to do at some of the complex sites.

14 Just West Valley, I remember when Commissioner Merrifield  
15 first came on the Commission and we had a meeting on West Valley because  
16 we thought it was a near term activity, and many forks in the road later, I am  
17 not sure it is any nearer term than when Commissioner Merrifield joined the  
18 Commission six and a half years ago.

19 It is where some of these other things are going to happen,  
20 Shieldalloy, whatever, are going to happen.

21 West Valley will happen, too. It is just that we don't have  
22 control over that --

23 COMMISSIONER MERRIFIELD: It is a very important point.

24 COMMISSIONER MC GAFFIGAN: Right.

25 The issue of waste incidental to reprocessing, I associate  
26 myself with Commissioner Jaczko's remarks. And I do think you will bring  
27 additional technical credibility and potential additional public confidence  
28 through your involvement in that area.

29 I don't know whether the Academy of Sciences panels -- they  
30 had one last year, recently reported they have another one started -- ever  
31 talked to you guys about some of these things. But they should be aware,  
32 maybe, that we rely on an enduring advisory committee staffed by  
33 independent scientists who try to give us their best advice as we and the staff  
34 proceed on these matters.

35 But, I think you have a role there. And I think it's one that  
36 oftentimes is missed. I mean, when people talk about this agency, the fact is  
37 we have a variety of controversial issues, either you or ACRS having public  
38 meetings and thinking about these things and giving us your best technical  
39 advice.

40 I guess that was more a statement than a question as well.

41 I think that's all I have. There are a couple of other things I  
42 could raise, but does any Commissioner need a second round of questioning?

43 COMMISSIONER MERRIFIELD: I don't need a second round  
44 of questioning. I would like to make a comment.

45 And that is: We did have an interaction and Commissioner  
46 Lyons did come with me where I had an opportunity to meet with ACNW and  
47 talk a little bit about my own views regarding the fact that we have so many

1 decommissioning activities underway right now as it relates to reactors, as it  
2 relates to other sites, some complex, some, as Commissioner McGaffigan  
3 has said, not quite so complex.

4           And I do think that the role that ACNW can play in assisting us  
5 in trying to learn some of the lessons in improving the work that we do and in  
6 terms of capturing that information for a point down the road when we may  
7 see yet another big round of decommissioning activities, although it seems to  
8 be in a position now where it may be trailing off not too far down the line.

9           I would say, finally, I think I would agree with Commissioner  
10 McGaffigan's characterization of the importance that the Commission had  
11 placed on institutional controls. Again from my own personal perspective, I  
12 think one of the things that we need to be mindful is that these facilities, these  
13 sites were used for a purpose.

14           The folks who live around those sites, work around those sites,  
15 I think, would like to see those put back into useful societal purposes,  
16 focusing, as we did at one time, on a resident farmer scenario was not going  
17 to make that happen. And I think to the extent in concert with the overall  
18 designs that Congress has had on moving brown fields back into the  
19 economic mainstream, I think we need to be continuing to focus in that area.

20           What can we do that is common sense, logical and rational  
21 that will allow these sites to go back into productive re-use, whether that's for  
22 more natural purposes or for industrial or somewhere in between?

23           I think that common sense issue is one that I think we could  
24 certainly benefit from a further look, see from the committee.

25           COMMISSIONER MC GAFFIGAN: Dr. Ryan, do you have any  
26 closing remarks?

27           DR. RYAN: Just one quick comment to Commissioner  
28 Merrifield.

29           We did take that advice you gave us to heart. And, in fact, we  
30 have integrated it into our working group, planning to be very much focused  
31 on lessons learned and to look at the broad spectrum of licensees where  
32 these questions are complicated. So we heard the message and we will take  
33 it up.

34           In closing, Commissioner, I would like to thank the Commission  
35 and the Chairman, in his absence, for your support of the committee. I  
36 think we are all committed to providing you with the very best technical  
37 guidance that we can.

38           We have worked, I think, effectively in the last year to develop  
39 an agenda with NMSS that compliments our agenda with high-level waste.  
40 And as we recognize that workload will shift from perhaps one to the other  
41 over time as it has in the past, we feel like we are very well prepared to move  
42 ahead and continue to give you advice that's relevant and helpful to your  
43 decision-making processes.

44           So, we thank you for your time today and look forward to future  
45 interactions.

46           COMMISSIONER MC GAFFIGAN: We in turn thank you for  
47 the great advice we have gotten over the years from ACNW. I'll mention

1 Hornberger and Garrick again, as you have on several occasions. They are  
2 big shoes to fill, but we are confident you all will be able to do that, and  
3 continue to provide us very, very sound scientific advice that perhaps is not as  
4 widely recognized as it should be by certain parts of the public.

5 DR. RYAN: Thank you very much.  
6 (Whereupon, the hearing was adjourned.)  
7