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April 15, 2009

The Honorable Dale Klein, Chairman,
Gregory B. Jaczko, Peter B. Lyons,
and Kristine L. Svinicki, Commissioners,
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Statements on Low-Level Waste Disposal by NRC Staff and Commissioners

Dear Commissioners,

This is Cal Rad's third letter of background information for the April 17th briefing of the Commission on disposal of low-level radioactive waste. Here we quote several statements of concern on the status of low-level radioactive waste disposal and possible solutions by NRC Commissioners and Staff.

NRC COMMENTS ON THE JUNE 2004 GAO REPORT

In June 2004, the United States General Accounting Office (GAO) (now called the Government Accountability Office) issued a report entitled, "Low-Level Radioactive Waste: Disposal Availability Adequate in the Short Term, but Oversight Needed to Identify Any Future Shortfalls," GAO-04-604. Appendix V, beginning on page 49, is an NRC comment letter dated May 25, 2004 from Luis A. Reyes, Executive Director for Operations. The third paragraph of Mr. Reyes' letter reads as follows:

> "The current report is a sequel to GAO's 1999 report, "Low-Level Radioactive Wastes: States Are Not Developing Disposal Facilities" (GAO/RCED-99-238). That report concluded that none of the States' or compacts' efforts to develop new disposal capacity had been successful and the State efforts to do so had "essentially stopped." This earlier report also examined alternatives to the current system for development of new disposal capacity in the U.S., but did not recommend any of them. Appendix II of the current report updates those alternatives. We believe it is now time for GAO to explore these alternatives further because the future availability of disposal capacity and the costs of disposal under the current system remain highly uncertain and LLRW generators need predictability and stability in the national

> disposal system. We acknowledge that the potential approval for Envirocare to accept Class B and Class C wastes and the licensing of a LLRW waste disposal facility in Texas could significantly improve the current LLRW disposal system in the U.S. At the same time, the nearly 20 years of experience under the Low-Level Waste Policy Amendments Act of 1985 (LLRWPAA) has demonstrated the difficulties in siting and licensing a LLRW facility. Not one new facility has been developed in this time under the LLRWPAA. Therefore, we believe it is in the national interest to begin exploring the alternatives identified in Appendix II that would potentially provide a better legal and policy framework for new disposal options for commercial generators of LLRW." (Emphasis added.)

SPEECH BY FORMER NRC CHAIRMAN RICHARD MESERVE

On May 14, 2002, NRC Chairman Richard A. Meserve delivered the Keynote Address to the 17th Annual Low-Level Radioactive Waste Decisionmakers' Forum & Technical Symposium in Scottsdale, Arizona. Chairman Meserve's speech addressed the lack of disposal options for Class B and C wastes and the need for Congressional action. He expressed these concerns even while acknowledging (in 2002) that it was hoped that Envirocare would accept Class B and C wastes — a hope that has since been dashed. He also addressed use of mill tailing impoundments and RCRA facilities for some radioactive wastes.

> "It will not be news to any one here that the low-level waste siting program in this country is not working. Moreover, barring Congressional action, which is unlikely in the near term, the situation is unlikely to change." (Emphasis added.)

And,

> "With the eventual closure of the Barnwell disposal facility to states outside the Atlantic Compact, the absence of progress in other Compacts to site low-level waste disposal facilities, and few other disposal options, access to facilities for the disposal of low-level waste is increasingly constrained. Although Envirocare of Utah may eventually obtain state approval for disposal of Class B and C wastes, the limited options for disposal are likely to keep disposal costs high. There is thus the potential that the decommissioning process for many sites and the medical use of radionuclides will be affected adversely."

Mr. Meserve also noted "…that the Commission has voted to approve the use of mill tailing impoundments for disposal of other radioactive wastes similar to mill tailings…" "Also, because mill tailings impoundments and RCRA Subtitle C facilities can provide similar levels of public health and safety protection, we are beginning to work with EPA to consider a rule that would allow for disposal of certain radioactive material in RCRA impoundments."

MEETING OF THE U.S. NUCLEAR REGULATORY COMMISSION WITH ITS ADVISORY COMMITTEE ON NUCLEAR WASTE, JANUARY 11, 2006. STATEMENTS OF COMMISSIONERS JACZKO, LYONS, AND MERRIFIELD

Attached to this letter is the transcript of the Commission's meeting with its Advisory Committee on Nuclear Waste (ACNW) held on January 11, 2006. Please see statements by Commissioners Jaczko (pp. 44-45), Lyons (pp.48-49) and Merrifield (pp. 59-60) who all raised concerns about the closing of the Barnwell disposal facility in 2008 to waste from outside the Atlantic Compact region and the possible consequences of lack of access to disposal for Class B and C low-level waste.

Cal Rad Forum appreciates the NRC's expressions of concern about the problems of low-level waste disposal and the consideration of possible solutions "outside the box" of the Low-Level Waste Policy Act.

If you have any questions or comments about information in this letter or the enclosures, please call me at 925/283-5210 or send me an email at APasConslt@aol.com.

Sincerely,

Alan Pasternak

Encl.: Transcript of Commission Meeting
with ACNW, January 11, 2006
Speech of Richard Meserve, May 14, 2002

cc: NRC Staff
Cal Rad Forum Board of Directors

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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MEETING WITH THE

ADVISORY COMMITTEE ON NUCLEAR WASTE (ACNW)

+ + + + +

WEDNESDAY

JANUARY 11, 2006

+ + + + +

The Commission met with the Advisory Committee on Nuclear Waste at 2:00 p.m., 11555 Rockville Pike, Rockville, Maryland, the Honorable NILS J. DIAZ, Chairman, presiding.

COMMISSIONERS PRESENT:

NILS J. DIAZ, Chairman

EDWARD McGAFFIGAN, JR. Commissioner

JEFFREY S. MERRIFIELD, Commissioner

GREGORY B. JACZKO, Commissioner

PETER B. LYONS, Commissioner

ACNW MEMBERS PRESENT:

MICHAEL T. RYAN, Chairman

ALLEN G. CROFF, Vice Chairman

JAMES H. CLARKE

WILLIAM J. HINZE

RUTH F. WEINER

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

(9:57 a.m.)

CHAIRMAN DIAZ: The Commission is pleased to meet today to hear from the members of Advisory Committee on Nuclear Waste the status of the Committee's recent activities and its plan for next year.

Of course, the Committee's recent activity eventually becomes – I just gave three speeches, I'm still on my last speech, Commission's activities. This is one of our periodic briefings. And we appreciate you coming in and keeping the Commission fully and currently informed.

The Committee advises the Commission on a wide variety of nuclear waste and materials issues. And today's meeting is on low-level waste, waste determination activities, decommissioning, igneous activities as it relates to the high-level waste program.

We are looking forward to discussing the issues on the agenda in today's briefing. And do my fellow Commissioners have any comments?

(No response.)

CHAIRMAN DIAZ: If not, Dr. Ryan, please proceed.

DR. RYAN: Thank you, Chairman Diaz. It's a pleasure to be with you and Commissioners McGaffigan, Merrifield, Lyons, and Jaczko. The Advisory Committee is pleased to be with you today for this periodic briefing.

I would like to spend on -- slide 3, I believe is the number -- a couple of items on the agenda. I'm going to discuss with you briefly

low-level radioactive waste and our white paper. We are in preparation on some comments on the 10 CFR 63 standard, some radiation protection issues, and then our action plan, including our Tier I and Tier II activities.

Dr. Weiner will then discuss our review of research activities in the agency and the technical assistance activities provided by the Center for Nuclear Waste Regulatory Analysis.

Mr. Croff will then discuss the Committee's activities related to the staff development of the Standard Review Plan related to waste determinations.

Professor Clarke will discuss the Committee's activities in support of the decommissioning program, including rulemaking that is underway.

And, finally, Professor Hinze will discuss updates on information related to igneous activity related to Yucca Mountain. We'll then be happy to entertain your questions and comments as we will throughout the entire briefing.

Let me turn now to slide 6, if I may, please. It's important at the outset with regard to low-level radioactive waste that the Committee believes that the current regulations are fully protective of the public health and safety and fully protective of worker health and safety.

The white paper which we have recently provided to you is a detailed summary of low-level radioactive waste regulation in the United States with particular emphasis on the technical bases for the regulations that exist in 10 CFR Part 61.

The Committee also believes that this white paper

provides a framework to identify opportunities to better risk-inform and thereby improve the clarity and transparency of low-level regulation for stakeholders.

The Committee has carefully coordinated and communicated with the Nuclear Materials Safety and Safeguards staff on the development of this white paper. And we further carefully coordinated how any of the opportunities that we have identified may fit into their agenda for their work activities in this area. We look forward to your feedback on the white paper and further input and guidance from the staff on this topic.

The opportunities for risk-informed improvements identified in our letter to you are meant to be examples rather than an all-inclusive list. The Committee believes that in 10 CFR 61.58 on alternative requirements for waste classification, that that part provides an opportunity to use alternative definitions for classifications of waste, taking into account site-specific issues, waste-specific issues, and others that gives, we believe, the Commission the opportunity to actually better risk-inform perhaps new or emerging low-level wastes or other issues that may be current, as compared to what was first envisioned in the late '70s, when the regulation was in its developmental phases.

Again, we look forward to the continued dialogue with staff, and we're planning a working group session with staff and stakeholder participation to further develop these concepts and ideas.

Next slide, please, slide 7. The Committee, as promised in late 2004, followed up with the International Commission on Radiological

Protection's foundation documents that were the underpinning for its 2005 general recommendations.

In reviewing those documents, we can summarize by saying that we found nothing in the foundation documents that indicated that our original recommendations to you in 2004 should change.

We further extended our review to the foundation document that provided a conceptual framework for standards related to non-human biota. And, in fact, we found no evidence to support the need for such a standard and, in fact, found no evidence to contraindicate the longstanding principle that if you protect man, you protect the environment and everything in it. So we found no reason to offer you any advise beyond that observation.

We also reviewed collective dose. The staff presented some options for considering collective dose. And after hearing their presentation and considering, we found or concluded that collective dose is useful for comparative analyses or cost trade-off kinds of analyses or in some very specific circumstances for work-planning activities for small workgroups and so forth. But we found they're generally not applicable and, frankly, often misused and used in a way that mischaracterizes risk. So we think it should be used, again in these very limited circumstances, and very carefully after considering to be sure that it's not misused or miscommunicates risk.

Turn to slide 8, please. We further reviewed, as it was published in the National Academy of Sciences' committee report, on the biological effects of ionizing radiation.

The report was voluminous, over 700 pages in length. And the report concluded that the current scientific evidence is consistent with the hypothesis that there is a linear dose-response relationship between exposure to ionizing radiation and the development of radiation-induced solid tumors and solid cancers in humans.

The report further reported that it is unlikely that a threshold exists for the induction of cancers but notes that the occurrence of radiation-induced cancers at low doses is small.

The report maintains that other health effects, such as heart disease and stroke, occur at high radiation doses but that additional data must be gathered before an assessment of any possible dose-response can be made of connections between low-dose radiation and non-cancer health effects.

The report also noted that knowledge of adaptive responses, genomic instability, and bistandard signaling among cells that may act to alter radiation cancer risk was judged to be insufficient to be incorporated in a meaningful way into the modeling of epidemiologic data.

In short, everything seems to be pretty much the same as the previous BEIR reports without significant change in risk estimation with regard to radiation exposure.

COMMISSIONER MERRIFIELD: Mr. Chairman, for purposes of clarification, the slide -- and we do have one down side. And our slides have to be relatively brief in order for them to be transmitted over the Web.

The two bullets you have here on the results. The linear

no threshold model is the preferred model for radiation. And newer radiation biological information is not sufficient at this time for changes.

That is your summary of the findings in the BEIR report, not the independent findings of the ACNW, correct?

DR. RYAN: That's correct, Commissioner Merrifield. This is the summary from the report. And I'm providing you our review. And that's what we expect.

COMMISSIONER MERRIFIELD: Right.

DR. RYAN: What I said in the more lengthy statement to you is directly from the report.

COMMISSIONER MERRIFIELD: Yes. I wanted to make that point for clarification and to underline that in the record so that there was no misunderstanding –

DR. RYAN: Thank you.

COMMISSIONER MERRIFIELD: -- as we later went back and looked at this, perhaps thought that you agreed with those conclusions because you may, but, then, you may not.

DR. RYAN: Yes. Again, we wanted to report that. And I think the conclusion statement that we believe is that nothing has changed from the previous BEIR reports and the risk estimators that they have previously reported. Thank you very much. We appreciate the clarification.

On slide 9, we also reviewed the Occupational Safety and Health Administration's request for information with regard to their interest in modifying its radiation protection standards. And we found that and

believe that existing -- that is "we," the committee – that existing radiation protection programs provide adequate radiation protection to workers.

And our letter report to you summarized over a dozen components of this robust radiation protection system in the United States. I'll just mention a few from the top of that list of ten: the NRC and Agreement State regulations promulgated for activities regulated by the Atomic Energy Act, State radiation protection programs for non-AEA radioactive materials, federal guidance on sources of electronic product radiation from the Center for Devices and Radiological Health of the Food and Drug Administration, State programs for electronic product radiation, and the U.S. Environmental Protection Agency's generally applicable radiation protection standards, just to mention a few.

We also found that the trends in worker exposures that were suggested as being increasing, were in fact, we found evidence to the contrary. We looked carefully at our U.S. NRC, Nuclear Regulatory Commission, publication, NUREG-0713, and found that trends in measurable exposure, as reported by total effective dose equivalent for worker, have decreased in every one of six categories of NRC licensees from the period of 1994 through 2003, which is the year for which the latest report has been published. So we concluded that there really wasn't a need for a change to that regulation or activity by OSHA in this area.

COMMISSIONER McGAFFIGAN: Can I just ask a clarifying question? Are you familiar with the fact that the current OSHA regulations I think reflect ICRP-2 and that were never updated to be consistent with NRC regulations and DOE orders?

I would be a little wary of saying they don't need to be updated. They might not need to be updated to where you might have thought OSHA might want to go, but getting OSHA to sort of come up to where the -- I think there is a Presidential guidance document signed by President Reagan in 1987. And I think they're the sole agency of government that has never brought their regulations up to the Presidential guidance.

They're back in ICRP-2 space or whatever the '60s is. We're regulations issued in the '70s, mid to early '70s.

DR. RYAN: Commissioner McGaffigan, I appreciate the clarification. We were I think responding to the idea of them issuing new regulations, but certainly consistency among agencies to have the same basis for regulation makes sense. But that doesn't necessarily imply that they would change it but simply provide, as the NRC does, guidance on what the right technical basis might be.

COMMISSIONER McGAFFIGAN: Well, they actually need to change the regulation to get it to be consistent with the Presidential guidance of 1987, which is consistent with, you know, not ICRP-60 but ICRP whatever was between 2 and 60, you know, 28 or -- I can't remember the number.

DR. RYAN: ICRP-2 was first written in 1959 --

COMMISSIONER McGAFFIGAN: Right.

DR. RYAN: -- and used throughout the '60s.

COMMISSIONER McGAFFIGAN: Yes. And that's where OSHA is today in its regulations. So there is a need for change in OSHA's

regulations. The question is, did they take the small increment to get themselves to where the other agencies are consistent with the 1987 Presidential guidance or do they take an extra step to get themselves consistent where the ICRP-60 and the likely new ICRP report are going to be? And that's the issue that they're grappling with.

It sounds like you dealt with the latter issue but perhaps not with the former.

DR. RYAN: That's a fair comment. Yes, sir. Thank you.

COMMISSIONER MERRIFIELD: Mr. Chairman, a clarifying question on the same slide. It's very helpful information you're providing to the Commission. Have we provided your analysis either to the Department of Labor or to other entities outside of the NRC family?

DR. RYAN: As far as I know, Commissioner, we have provided it to you, and that is as far as it has gone. Now, where it has gone beyond that, I do not know. Thank you.

COMMISSIONER McGAFFIGAN: And just for the record, Mr. Chairman, I don't think the ACMUI took me up on it, but I did urge ACMUI to be aware of what was happening in OSHA space and aware of what was happening in ICRP space because the medical community if changes are made in this area is likely to be the most impacted community, not power reactors or whatever because power reactors, as you say, are already achieving the equivalent of ICRP-60 results, but the medical community, it would be a big potential change.

I don't think that that community is necessarily fully aware of what is going on.

DR. RYAN: Thank you. We'll continue to follow and consider your comments carefully. Thank you, Commissioner.

I would like to now turn our attention to our action plan. We have a number of Tier I and Tier II activities. I'll start with the proposed Yucca Mountain repository.

As we all know the Department of Energy plans to submit a license application for the first geologic repository in the United States. Though the schedule for that license application is not as clear as it has been in the past, it is certainly something we will be prepared to address as it comes in in the way you have asked us to address it.

In the meantime, until the license application is submitted, the Committee will continue to perform technical reviews of the staff's prelicensing programs. Areas of interest include progress in staff assessments on the effects of certain disruptive events, the igneous activity and seismicity, on which we'll report today, and then on the overall repository performance in the post-closure phase and progress in staff efforts to develop an independent performance assessment computer code capability for evaluating repository performance over longer times, consistent with the standard that has been promulgated by the EPA.

Once the license application comes in, and, of course, as you directed us, we will be working at your direction and we'll prepare ourselves by studying the license application when and if it comes in. And we'll be ready to take assignments that you choose to provide to us.

The second area of the risk-informing nuclear waste and materials activities, the Committee will continue to support the

Commission's policy statement on the use of probablistic risk assessment methods.

The Committee is already working in several areas, including decommissioning of complex sites, waste determinations, low-level waste, and the Yucca Mountain prelicensing reviews, where opportunities exist to risk-inform these activities.

Specifically, the Committee will continue to evaluate the strengths and weaknesses of adapting PRA techniques to nuclear materials and waste areas and communicate risk insights to the Commission for use in their decision-making.

I was happy to be here in October as part of the NMSS briefing. And that's a success story that I mentioned to you then that we have worked very carefully with them and have become integrated into their stakeholder efforts. We participated as a committee of the whole in that activity and will continue to look for opportunities to coordinate proactively with NMSS on opportunities where our efforts and theirs can be well-coordinated.

So let's see. I think I've talked already about decommissioning will be covered along with waste determination. So I will let my colleagues speak on those activities and plans.

The Tier II activities include again health physics, which we will continue to follow, as we expect the ICRP to revise their guidance. And off of that, we'll be ready for that. We will also identify any emerging radiobiological data or issues that may develop.

We are prepared for the Package Performance Study

review, which we now understand that that test plan will be available around midyear of 2006. And, as you have indicated, we will be ready to provide you with a review of that Package Performance Study.

We'll continue to advise with waste management research activities, both in the Research Division here at the agency and at the center in San Antonio. And we will also be ready to review other fuel cycle facilities as needed and as priorities dictate to be ready to address any emerging issues in those areas.

We have several working groups planned over the coming year in decommissioning West Valley, in modeling and monitoring. And you'll hear from some of these from our colleagues. I'll just mention one that I think is interesting and important.

Modeling and monitoring working group is designed to take advantage of trying to coordinate monitoring that's done for the purpose of compliance demonstration and integrating that with assessment that's done for modeling purposes.

We believe there are some opportunities where if those two goals are combined, we can not only demonstrate compliance but increase confidence. And that's particularly important in the area of decommissioning, where longer-term compliance and performance demonstration are helpful. And I believe Professor Clarke is going to talk a little bit more about that.

So, without further ado, I will then turn the discussion to Dr. Weiner, who is going to provide you with an update and review of selected NRC research and technical assistance activities.

DR. WEINER: Thank you, Dr. Ryan. I am going to be reporting, as Dr. Ryan said, on our review of selected NRC research and technical assistance programs. We do these reviews to ensure that the programs are of value to the work of NMSS and that they make the best possible use of the rather limited research budget that NRC has.

Next slide, please. Recent activities of the Committee in connection with our research overviews. A group of Committee members visited the Center for Nuclear Waste Regulatory Analysis in April 2005. And the Committee received a briefing by Research on the waste safety research program in July 2005 and a briefing on reactive transport of radionuclides in November and December of 2005. These will be reported on in the next few slides.

Could I have the next slide, please. The Committee has reported to the Commission on research-sponsored work on groundwater discharge in a letter, April 2005, reported on the Center for Nuclear Waste Regulatory Analysis programs. And the first of these reports went to the Commission in August of 2005. The second report on igneous activity was issued in December of 2005. A report on research-sponsored programs and an overview of these programs is still a work in progress.

Could I have the next slide, please. At our working group meeting in Las Vegas, there was considerable interest and discussion of the question of igneous activity. So that our 2005 visit to the Center focused on igneous activity. And Dr. Hinze will report in more detail on that.

Three member of the Advisory Committee on Nuclear

Waste visited the center, together with ACNW staff, NMSS staff, and two consultants. Because the visit focused on igneous activity, I will not report further on that here.

We also reviewed the Center's work on container life and the source term on their codes and models for complex decommissioning sites and on radionuclide retardation.

The Center is reviewing codes, several codes and models, for use in performance assessment of decommissioning sites. And that is really the limit of their work there. They're not designing their own codes.

The Center's work on source term, near field environment, radionuclide retardation, and on the current version of the total system performance assessment is very comprehensive and is one of the Center's strengths. This is also work that is preparing the NMSS staff to do a better job in reviewing the Yucca Mountain license application.

Could I have the next slide, please. The results of this work to date include characterization of the passive film in alloy 22, quantification of the behavior of localized corrosion, and corrosion inhibitors, and the evaluation of the water chemistry on radionuclide absorption and desorption.

This is ongoing experimental work and some field work by the Center and is directed toward developing input parameters to performance assessment. The Center's experimental work is independent of other work and is exceedingly thorough. They have found that it is markedly better to use their own experimental work when that is possible.

All models they believe -- and I tend to agree with them --

should essentially be grounded somewhere in experimental observation. Although this is not always possible, the Center does do it to the extent that they can.

There has been significant progress in understanding of the corrosion mechanisms and the influence of water chemistry; in particular, the inhibiting influence of corrosion of anions in the water that inhibit corrosion by chlorides. The Center in their studies of spent fuel dissolution is using both values from the literature and the results of their own experimental work.

Could I have the next slide, please.

COMMISSIONER McGAFFIGAN: Could I ask a clarifying question just very quickly? Is this work dependent on whether it's a cold or hot repository, whether it's below the boiling point of water, or not, the temperature in the first --

DR. WEINER: They are looking at the temperature dependence of these processes, taking into account both. In other words, as I gather, the tenor of your question is I believe that the work that they're doing would be applicable in any case to both cold and hot repositories. It is a very comprehensive program on corrosion.

The other research-sponsored work I wanted to say is very high-quality work that is done with limited funding. And the Nuclear Regulatory Commission has leveraged the effectiveness of these programs by cooperative programs with other Federal agencies, with national and international research organizations.

The infiltration and groundwater recharge studies have led

to a better understanding of these processes using the methods that are developed in research. The continued collaboration between the NRC and other agencies is a very cost-effective way to do this work. The Committee has noted that the cost to NRC to date of this research has been approximately two percent of the total cost.

The collaborative research program is important because it is aimed at reducing model complexity and assessing uncertainty while maintaining a realistic model of groundwater recharge and the ability to support risk-informed decision-making.

Both the field studies and the model abstraction research appear to have important applications in site characterization, in the modeling of flow and transport of radionuclides in performance assessment, and in technology needed to isolate contaminants.

The Committee has encouraged the research staff to develop strategies to enable the transfer of results from the studies at the Beltsville site, which is a cooperative site with USDA, to other hydrologic environments.

At the present time, they're simply looking very closely at the techniques that can be used to measure water recharge at Beltsville, but with appropriate parameter changes, this can probably be used at other sites.

Could I have the next slide, please? As has already been mentioned in Dr. Ryan's discussion of Tier II topics in the action plan, the Committee is going to undertake a review of the Package Performance Study protocols. And we are preparing ourselves for that.

I would like now to turn the presentation over to Mr. Allen Croff, Vice Chairman.

MR. CROFF: Thank you very much, Dr. Weiner. This afternoon I would like to report on the Committee's activities concerning waste determinations.

Next slide, please. The Committee's objectives concerning waste determinations are twofold: first, to provide advice concerning the development and implementation of a Standard Review Plan so that its use in reviewing waste determinations will be risk-informed; and, secondly, to evaluate emerging technologies and approaches related to waste determinations in areas such as waste retrieval, waste processing, and waste stabilization.

Next slide, please. The Committee's waste determination activities in fiscal year 2005 began in November 2004 with a briefing by staff on the history of waste determinations, current waste determination criteria, and staff's path forward.

In June 2005, a Committee staff member and I attended an interagency cement materials workshop. This subject is important because cement materials are central to on-site disposal of waste determined to be non-high-level waste because they are used to stabilize the waste, to fill tanks, and as disposable structures.

The workshop summarized the state-of-the-art for predicting the performance of cement materials and provided the Committee background useful in developing the agenda for a planned working group meeting on waste determinations.

The Committee's waste determination working group meeting was held last August. It was held over 2 full days with 13 speakers and 3 panels. The workshop summarized the state of technology related to waste determinations by addressing waste retrieval, waste processing, waste forms, tank closure, performance assessment, and monitoring.

Also in August, three Committee members plus Committee staff, Nuclear Materials Safety and Safeguards staff, and a member of the public toured and were briefed on facilities and activities at the Savannah River site concerning waste determinations and the planned mixed oxide fuel fabrication plant. This provided an excellent opportunity to see the physical situation and to have discussions with the Department of Energy and its contractors.

In September of last year, AEA Technologies demonstrated advanced technology for retrieving sludge from large underground tanks and calcine from Idaho bins on simulated waste. This demonstration was attended by a Committee staff member.

Next slide, please. Our activities have continued into fiscal year 2006 with Committee staff attending the initial meeting of a National Academy of Sciences committee on barriers related to near-surface disposal of hazardous waste. This study is scheduled for completion in 2007. And the Committee will continue to track its progress and the information it develops.

In October, the Committee visited the West Valley site. This visit provided an opportunity to understand the physical situation and

planned approaches to waste determinations and a site that has a number of wastes that may require such determinations.

In November, a Committee staff member and I attended a public scoping meeting for the Standard Review Plan to obtain a current understanding of staff's plan forward concerning the development of the Standard Review Plan for waste determinations and a better understanding of stakeholder views.

The Committee used information from the activities I have described as a basis for preparing a letter to you concerning preparation of the Standard Review Plan. The letter was issued in December of 2005. On the next two slides, I will summarize the recommendations in this letter.

Next slide, please. By way of introduction, there are three sets of similar but not identical waste determination criteria: Section 31.16 of the National Defense Authorization Act of 2005, DOE Order 435.1 and its associated manual and guidance, and criteria promulgated by the Nuclear Regulatory Commission for use by the West Valley demonstration project.

The Committee believes that similar criteria should be subject to a consistent risk-informed interpretation. This requires that criteria be addressed in a single integrated Standard Review Plan.

Some examples of the similar criteria are removal of key radionuclides or highly radioactive radionuclides, and radionuclide removal to the maximum extent practical or to the maximum extent practical with economic and social considerations being taken into account and that doses be ALARA.

We also believe that 10 CFR 61, Subpart C should be used as the source for performance objectives unless there is a strong justification that an alternative set of objectives is equally protective.

We also note that closing large underground tanks is similar to decommissioning many sites because it must be accomplished in the context of risk from nearby tanks or from previous releases to the environment.

We believe that a risk-informed review of waste determinations means that this context should be considered when evaluating whether the Department of Energy's approach removes radionuclides to the maximum extent practical and that doses and actions are as low as reasonably achievable.

Next slide, please.

COMMISSIONER McGAFFIGAN: Mr. Chairman, this is truly a clarifying question. I know there is always some doubt. I read that in December. Could you just clarify? Which way do you see that cutting? Does that mean that if everything else around it is contaminated, that you can do a little bit less or does it mean that if everything else around it is contaminated, you should do even more? You talked in tongues as far as I am --

MR. CROFF: It may possibly cut either way. You're exactly right. The situation in these tank farms that I normally think about are have there been releases of substantial amounts of radioactivity to the environment beneath and around the tanks.

And a consideration in the staff's decision should be

whether continuing to reduce what is in the tank makes sense in the context of what is out of the tank. And it may indicate somewhat less, but it is one factor amongst many to be followed.

COMMISSIONER McGAFFIGAN: Okay.

MR. CROFF: I would not want to imply that it is the factor.

I'm on slide 25, I hope. Yes. The capabilities of technologies for removing radionuclides from tanks and for stabilizing these radionuclides are likely to improve over the many years the Department of Energy will be remediating its tanks.

The Committee believes that the Standard Review Plan and staff should anticipate such improvements will occur and should expect the Department of Energy to take risk-informed advantage of them. Improvements in technology also means that staff will have to maintain awareness of technology capabilities and improvements on a continuing basis.

The Committee believes that the Standard Review Plan should encourage that DOE's approach to the performance assessments underlying DOE's waste determinations be risk-informed. This means the Standard Review Plan should expect the Department of Energy's performance assessment will be probablistic and include an associated uncertainty analysis or strong justification for any other approach and be based on realism in establishing important assumptions that cannot be validated.

Regarding monitoring, the Committee believes the Standard Review Plan should expect the Department of Energy's waste

determinations to describe monitoring provisions that are adequate for the Nuclear Regulatory Commission and the host state to fulfill their responsibilities.

A minimal expectation should be standard environmental monitoring plus state-of-the-art anticipatory monitoring of engineered barriers. The preferred expectation would be the minimum coupled with a performance confirmation program. And we would note that the NRC staff needs to evaluate the adequacy of monitoring beginning with facility design to allow the monitoring to occur.

Finally, the Standard Review Plan should be consistent with and capitalize on existing risk-informed regulations and guidance that address similar situations.

Next slide, please.

COMMISSIONER MERRIFIELD: The second bullet, "Encourage risk-informed performance assessment by DOE," I take it that it's your view, then, that they aren't there?

MR. CROFF: We have not looked at what DOE is doing. We are addressing here what the staff should require in the Standard Review Plan.

COMMISSIONER MERRIFIELD: Okay. Thank you.

MR. CROFF: Slide 26, I hope. Yes. Looking forward, the Committee's emphasis will be on reviewing a draft of the Standard Review Plan for waste determinations when it becomes available and later reviewing how staff have resolved comments leading to the final Standard Review Plan.

The Committee also plans on maintaining familiarity with the status of technologies to meet the second objective I stated at the beginning of my remarks. One important component of this is to organize a working group meeting on predicting the performance of cement barriers used in waste management applications in conjunction with the Office of Nuclear Regulatory Research.

After the Standard Review Plan is completed, the Committee plans to review its implementation in representative cases. And this will probably occur in fiscal year 2007.

Finally, we'll maintain our readiness to undertake any other activities related to waste determinations that you might request.

With that, next, Dr. Jim Clarke will talk about decommissioning.

DR. CLARKE: Good afternoon, Chairman Diaz and Commissioners. With respect to decommissioning, the committee has been working in two areas: the proposed revisions to the decommissioning guidance under the license determination rule and the West Valley demonstration project decommissioning activity.

During the October briefing, as Dr. Ryan mentioned, we had reported to you on our activities in the first area, proposed revisions to the guidance. I will briefly summarize our work there, report to you on our activities concerning the West Valley site, and conclude with future activities in decommissioning.

May I have the next slide, please. As Dr. Ryan reported, the Committee attended the staff decommissioning workshop in April last

year and conducted a working group session in June with participation from five invited experts. This led to our August 2005 letter to the Commission, in which the following recommendations were made.

May I have the next slide? Now, the Committee was asked to consider the merits of partial restricted release and had commented earlier on intentional soil mixing. In both cases, the Committee believes that site-specific factors will be important and recommends a case-by-case approach.

Two options will be available for sites needing legally enforceable and durable institutional controls, a long-term control license, and a legal agreement, restrictive covenant, which provides an alternative to the licensee, both of which will be enforced by the Nuclear Regulatory Commission. The staff indicated a preference for a long-term control license. The Committee concurs with that preference.

The Committee also learned that the staff was considering expanded guidance with respect to engineered barriers and was asked to comment on the needed breadth and depth of that guidance. The committee believes that the breadth and depth of the guidance should be sufficient to provide a risk-informed decision and encourages the expanded guidance.

The Committee also learned the guidance concerning alternative exposure scenarios linked to future land use was being developed and agreed that alternatives to the resident farmer scenario would be important to the decommissioning component sites. The Committee considers use of the resident farmer scenario especially useful

when it is used within the context of the screening tool.

Finally, the Committee appreciates that lessons learned from past decommissioning efforts will be valuable not only to future decommissioning efforts but to future facility designs as well and recommended that the staff also devise a process to evaluate the quality and the reliability of the information that will be disseminated.

Can I have the next slide. With respect to West Valley, the committee held a working group meeting on the West Valley decommissioning this past October at a location close to the West Valley site.

The purpose of the meeting was to receive an update on the status of decommissioning activities, to learn about the approaches that the Department of Energy and the Nuclear Regulatory Commission were taking in their respective performance assessments, and to hear from interested stakeholders. Three invited experts participated in this meeting, and several stakeholders attended as well.

May I have the next slide. Major observations and recommendations the Committee has on West Valley are shown on this slide. The Committee believes the West Valley site is a useful model for the decommissioning of complex sites. This site presents several complexities with respect to ownership and responsibility, types and magnitude of sources, subsurface geology and subsurface transport, and ongoing erosion.

The staff is doing a probablistic performance assessment. And the Committee believes that will enable risk-informed review. Erosion

is occurring adjacent to buried waste. Consequently, erosion modeling and analysis will be critical to remedial decision-making.

And, finally, the Committee recommends that subsurface characterization data be used to verify groundwater modeling. And, if I might add, as Dr. Ryan mentioned, the Committee believes that in both the proposed guidance revisions and the West Valley site decommissioning, our early involvement is very much appreciated and has been very beneficial to our deliberations.

Let me have the next slide.

COMMISSIONER MERRIFIELD: Yes. I'm sorry. Can I get a clarification regarding slide 32? You said the West Valley site provides a useful model for the decommissioning of complex sites. Is that meant as an endorsement of ACNW as to the activities that are going on up there or is it merely to say that it's useful as an information source, both positive and negative?

DR. CLARKE: Thank you for that question.

Our intent here is that the West Valley site presents just about everything you're going to run into on the decommissioning of the complex sites: soil contamination, groundwater contamination, tanks, buildings, spent fuel. It's a site that --

COMMISSIONER McGAFFIGAN: Divided regulatory authority, warring --

COMMISSIONER MERRIFIELD: And this is truly a clarifying question. So there may well be things going on at West Valley that you wouldn't necessarily recommend to the Commission that we

replicate?

DR. CLARKE: Right.

COMMISSIONER MERRIFIELD: Is that a fair assessment?

DR. CLARKE: That is not the intent.

COMMISSIONER MERRIFIELD: Okay. One wouldn't necessarily get that from the words on the papers.

DR. CLARKE: Thank you.

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman.

DR. CLARKE: With respect to future activities, the Committee is planning a follow-up working group meeting concerning the decommissioning guidance revisions that have been proposed and the staff's analysis of the comments that have been received.

The Committee is planning a working group meeting on modeling and modeling interface with the Office of Nuclear Regulatory Research, as Dr. Ryan indicated. This meeting will focus on using monitoring data to build model confidence for performance assessment, performance confirmation, as well as compliance.

Also, as Dr. Ryan indicated, we are looking forward to a follow-up working group meeting on West Valley when the performance assessments are available.

That concludes my remarks. And now I would like to turn the presentation to Dr. Hinze.

DR. HINZE: Thank you, Dr. Clarke. Gentlemen, this

afternoon the Committee is reporting on its recent observations and recommendations regarding potential risks from igneous activity as the proposed Yucca Mountain repository. Our recommendations emphasize enhancing realism and making the analysis more risk-informed.

Next slide, please. The current status of the investigations into the effect of igneous activity and related volcanism at the proposed repository is, the potential for volcanism is, not screened out as a very unlikely event and, thus, must be evaluated.

Further, volcanism potentially is a significant contributor to dose to the recently maximally exposed individual during the first few thousand years of the life of the repository.

We also note that significant progress has been made by the staff in developing and analyzing volcanic scenarios and the technical aspects of these scenarios and their consequences, but differences in views that are based on professional judgment remain.

Next slide, please. In terms of our recent activities over the past several months with regard to igneous activity at Yucca Mountain, first of all, as Dr. Weiner has indicated, igneous activity was a critical topic of discussion during the visit to the Center for Nuclear Waste Regulatory Analysis in April. This led to the identification by the Committee of several questions of concern to it. These have been the subject of continued discussion with the NMSS and the review of recently released documents of the staff and the Center. Representatives of the Committee have also monitored the activities of the DOE and its probablistic volcanic hazard analysis update.

Last month the Committee did prepare and sent a letter report on igneous activity, which is the basis for this report this afternoon. There were three major topics of that letter indicating our major concerns and interests: first, an alternative realistic scenario involving the interaction between the intruding magma and the repository; second, the exposure scenario describing the impact of contaminated volcanic ash on dose to the reasonably maximally exposed individual; and, finally, the probability of a volcanic event intersecting the proposed repository.

Next slide, please. Information that has been received and evaluated by the Committee suggests that an alternative scenario to those considered by the staff is likely to lead to rapid solidification of magma in the drifts of the repository, with associated modifications of the resulting consequences of volcanic activity.

Rapid solidification is really a common volcanic scenario, especially in magma high in water content, like the Yucca Mountain magmas, and is illustrated in this photograph of tree casks from Hawaii of the clenched magma surrounding the trees after the flow of lava through a forest.

Next slide, please. Consideration of this likely alternative scenario is significant because, one, the waste packages interacting with intruding magma may not fail as currently assumed by both the Department of Energy and the Nuclear Regulatory Commission because of the protective effects of the solidified magma and also the lower temperatures of the magma.

Secondly, waste that has been released into drifts from

corroded casks may be protected to some degree by quenched rind of magma.

Third, the magma flowing into the tunnels is unlikely to travel a significant distance into the tunnel and, thus, is unlikely to disturb a large number of waste canisters.

And, fourth, because the magma is unlikely to flow a significant distance into the drift of the repository, the intruding magma is unlikely to produce secondary vents, flag vents, which could carry waste from the drifts to the surface.

Furthermore, the NRC staff approach may lead to unduly conservative assessments, rather than a more realistic view of the effects of intruding magma, leading to misperceptions and perhaps even concealment of attributes of processes that should be investigated because they haven't been investigated because they're not important.

Next slide, please. The Committee recommends that the staff address the likely rapid solidification of magma in tunnels and on waste containers and analyze its impact on the consequences of a potential igneous event.

Next slide, please. The Committee after rather intensive review of the analysis of the exposure scenario by the staff finds that significant progress has been made by the staff in the analysis of the exposure to the reasonably maximally exposed individual from contaminated ash; and, secondly, that the health physics assumptions regarding dose are reasonable.

But the Committee recommends that risk-significant

parameters, processes, and assumptions used in the exposure scenario be justified, integrated, and documented, well-documented.

Next slide, please. The Committee continues to urge that a risk-informed approach be used in the analysis of the probability of an igneous event intersecting the repository by considering a range of probability values, rather than a single value that is currently being used by the Nuclear Regulatory Commission.

Alternatively, the staff should document how a single value estimate, as they are currently using, supports a risk-informed review and its consequences.

In terms of path forward, the Committee plans to continue to interact on igneous activity consequence issues with the staff -- and we have had excellent interaction -- and to review and comment on igneous activity consequence reports as they are issued.

And, with that and your questions, I will turn it back to Chairman Ryan.

DR. RYAN: Mr. Chairman, we would be happy to have your questions and comments.

CHAIRMAN DIAZ: All right. Thank you so very much. That was very quick, sequential, and well-orchestrated volcanic activity.

(Laughter.)

CHAIRMAN DIAZ: Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: I did not observe rapid solidification. Thank you.

(Laughter.)

COMMISSIONER McGAFFIGAN: Thank you, Mr. Chairman.

I'll start with Dr. Hinze, and I am not going to spend a lot of time with you except to say I think what I read in your letter report is the best thing that I have read about igneous activity since I have been here.

I know the Chairman was largely responsible for asking you to take a look at that area because we were frustrated with some of the stuff that we were seeing being written, including by our own staff. And I think you have done a real service there, but I assume other Commissioners are going to probe that more than me. So I'll leave that with just that comment.

DR. RYAN: Commissioner McGaffigan, I'd like to also recognize the staff for their close cooperation on issues where there were differing views. And it was a very professional interaction. And I think I am pleased to hear the work product represents that, but I do want to recognize the staff who worked on the issues with us for being cooperative, collaborative, and in spite of differing views, wrestling to the end of the road.

COMMISSIONER McGAFFIGAN: Thank you.

DR. RYAN: Thank you.

COMMISSIONER McGAFFIGAN: I'm going to I guess go to Mr. Croff. In the paper that you sent us about the Standard Review Plan, there's a statement that I have a little bit of problem with. And that's that there is a growing body of literature-setting experience which raises concerns about the reliability of such institutional controls.

And, we're going to use institutional controls. The Environmental Protection Agency uses institutional controls. Department of Energy I think I've seen documents which use the term "perpetual institutional controls." Perpetual is a long time, but probably, by the time the sun encompasses the Earth, I guess is what they're talking about or humans cease to exist or whatever.

I understand there are difficulties with institutional controls, but don't we have to make them work? You know, don't we have no alternative at some of these complex sites but to have something that will essentially have to last a very, very long time?

MR. CROFF: I would certainly agree that institutional controls are going to have to be used and every attempt should be made to make them last as long as they can. However, the intended implication of that statement is that when doing performance assessments and making decisions, that one shouldn't assume they will last forever but assume they will last for a reasonable time and then at that point assess the consequences and the risks of if they were to failure determine can this material be left there or should additional removal efforts be undertaken.

COMMISSIONER McGAFFIGAN: You know, aside from a place like West Valley, that probably isn't that big a deal for us, but for the Department of Energy and the half-life of some chemicals that the Environmental Protection Agency deals with is infinite.

So I don't know. I am familiar with some of the literature. It seems to me there is sort of a defeatism there, you know, because the Egyptians didn't put institutional controls into effect at some facility and,

therefore, they don't exist anymore, you know, they couldn't possibly exist for a long time. I think civilization has to some degree advanced. And I hope it has. Certainly information technology has.

And if we can keep compatibility between CDs and DVDs and whatever is going to replace them, you know, HD DVDs and as time goes forward, hopefully some future civilization would still know that this place requires institutional controls.

Just speaking as one Commissioner, I just have a sense that there is a certain defeatism that pervades some of the literature here. And I take that, go at it from a sort of practical view. And it is one I've seen reflected in legislation. We sort of have to make these controls work, and we have to make the best effort to make them work.

CHAIRMAN DIAZ: I tend to agree with Commissioner McGaffigan. In fact, some of us have really been thinking that there is going to be a time in which we need to seriously revisit the issue of how we establish institutional controls for specific periods of time, rather than perpetual, that the technology probably exists and if not, is soon to exist that would allow us to really establish institutional controls for very specific site characteristics of waste and that that might be an option that we need to revisit.

I'm sorry, but I certainly --

COMMISSIONER McGAFFIGAN: Let me go to another sentence.

COMMISSIONER MERRIFIELD: Not to use your time, I concur.

COMMISSIONER McGAFFIGAN: Let me go to another sentence. "The staff should expect DOE to have considered existing relevant technologies" -- and this is part where it's reflected in one of your slides -- "or technologies being developed by domestic and international organizations."

How far developed do you mean? I mean, if it's the gleam in the eye of somebody at Sandia, not to pick on Dr. Weiner, that may or may not prove to be possible, isn't that a prescription for delaying cleanup needlessly?

You know, if it's well-developed, all but on the market, you're pretty darn sure it's going to work, then I can understand it. But the words could lend themselves to either interpretation.

MR. CROFF: My mindset was using it in the sense of engineering development, meaning the technology would have to be well along, you know, perhaps not demonstrated at a large scale, but certainly I don't see much of it in the fundamental research stage that's, say, coming to fruition in an adequate time.

COMMISSIONER McGAFFIGAN: I will point out that in DOE space, occasionally, things grow by a factor of four, even when they're being developed. I mean, look at the MOX facility and the cost of the MOX facility in the recent DOE IG report. It has more than tripled in the last five years for a variety of reasons that we don't have to go into today. So sometimes, even if they're in engineering development, the cost is not necessarily under very good control.

So I just hope that you're careful there is all I'm saying.

And it sounds like you intended to be careful. I would have loved to -- you know, technology is well into engineering development. You have done the clarification that I was seeking.

One issue that you don't have on your agenda -- and I guess this is for Dr. Ryan -- that at least some of us are thinking about -- and perhaps Commissioner Merrifield will follow -- we postponed a Part 41 rulemaking dealing with in-situ leach facilities several years ago, when the price of yellow cake was less than $10 a pound. The last time I checked, it was approaching $40 a pound.

And the industry probably can afford us to do that rulemaking now, and there is some need to do that rulemaking because we continue to try to regulate the ISL facilities using Part 40 -- and we can do it -- guidance documents, but it was clearly not designed for in-situ leach facilities.

So you may find that as we review that, some of us may say that -- and this is one Commissioner talking. I'm not trying to -- where there is a process for us voting on your paper, but you may find some of us saying that Part 41 needs a little bit of attention, --

DR. RYAN: One of things we have done --

COMMISSIONER McGAFFIGAN: -- Part 41, which doesn't exist yet. It may not need it in this current fiscal year, but it may be something that we want you involved in as we move forward.

DR. RYAN: Thank you.

One of the things that we worked very hard over this year, recognizing the schedule delays in Yucca Mountain, as we have actually

shifted our focus on the action plan as well as our resources to support other areas within materials. And we'll certainly be prepared to support any direction you might want to give us for Part 41.

COMMISSIONER McGAFFIGAN: Thank you.

Mr. Chairman, my time has expired.

CHAIRMAN DIAZ: Commissioner Merrifield.

COMMISSIONER MERRIFIELD: Based on that opening and following up with Commissioner McGaffigan, he is right. I do want to comment on that. Having taken quite a hard look at those issues recently with in-situ leach facilities, it strikes me that when we entered into our program to try to regulate those, we had authorities under UMTRCA that really came through a legislative regime really flowing from the Solid Waste Disposal Act. Subsequently, after we had moved forward on that, Congress passed legislation relative to underground injection well programs.

And I think, at least in my own eyes, looking at those two regimes, I think if we have the underground injection authorities at the time in which we're crafting the regulatory framework for in-situ leach mining, in my personal opinion, it would be more like an underground injection program vice treating it as something under UMTRCA.

But I do think, as I agree with Commissioner McGaffigan, I think that may be something you may want to have on your radar screen because the Commission may well decide it needs some further attention to that particular issue.

The only footnote I would make, perhaps disagreeing with

Commissioner McGaffigan, there are only one or two entities right now that are undertaking that type of technology. There's a whole lot of people who may want to enter that. And I think our fee framework, which would place the burden of paying for that regulation on the few folks now to benefit a whole lot of folks who may be interested in this market because of the rise in the price of uranium, I'm not certain, in equitable fairness, that that is where I would be but –

COMMISSIONER McGAFFIGAN: We can always work on that.

COMMISSIONER MERRIFIELD: -- that is something that the Commission could certainly --

COMMISSIONER McGAFFIGAN: We can decide as a matter of policy --

COMMISSIONER MERRIFIELD: Right.

COMMISSIONER McGAFFIGAN: -- that fees are not going to go to the current licensees but in the overhead.

COMMISSIONER MERRIFIELD: Right. And that is something that we can actively consider, all five of us.

COMMISSIONER JACZKO: If I could just add to this, too, because this is something I know we have all discussed? There was an article yesterday talking about the rush of people in Utah to actively investigate potential uranium resources there.

COMMISSIONER McGAFFIGAN: I think Nevada, too.

COMMISSIONER JACZKO: And Nevada perhaps as well. So it certainly is an area that I think there is a lot of activity.

COMMISSIONER MERRIFIELD: Dr. Ryan, turning to the presentation you did make, I want to compliment you. I did not have the chance to go through your white paper in great detail. I have a little note to myself to take it home for my home reading.

But it certainly in terms of reviewing it more briefly, I do think it was a thorough look at this. And so I look forward to reviewing it.

That having been said, I sort of hear you in terms of wanting to make that program more risk-informed. To me in the short term, it would seem we need to focus on some of the guidance issues to get more of an immediate benefit for ourselves and the licensee.

There may be in the long term some major changes that we could think about making to Part 61. Those do come at a cost. And as we have reflected on the costs associated with in-situ leach facilities, again, I think who pays for that and does it meet the cost-benefit ratio is one I think you all need to be mindful of.

I think in a lot of the risk-informed areas, there's a lot of things if we had infinite amounts of money we would like to do but recognize we don't. And, therefore, we've got to pick and choose what makes the most sense and gives us the biggest bang for the buck.

So it's really more of a comment on my part.

DR. RYAN: Just a quick thought. And I appreciate your comment and thank you. I couldn't agree with you more. I think there is a lot of opportunity to do a lot in even more basic areas of license conditions and specific case analyses as well as the guidance area that could do a lot.

And that's why we structured our letter to you trying to identify some of that low-hanging fruit, some of those opportunities that could be dealt with in those simpler ways, rather than, you know, a more global program.

So we agree with you. And, in fact, our efforts now are focused on trying to further identify; clarify; and, in fact, prioritize with consultation with the staff on where those basic opportunities might be.

COMMISSIONER MERRIFIELD: Another issue on your slides, in slide nine, you talk about OSHA and the work you did in analyzing where they want to go. I asked the question, the clarifying question, had you disseminated that to other folks? You had given it obviously to the Commission.

I think one of the things that we as a Commission may wish to think about is whether we want to encourage you to perhaps provide a wider dissemination of that information to help other decision-makers in the government who are involved in this to get a better understanding of the technical issues because I think in my view, you made some very important findings, which have a critical impact on many of our licensees.

I think our counterparts, whether it's in the Department of Labor or otherwise, should be made aware of those very same findings.

COMMISSIONER McGAFFIGAN: Mr. Chairman, if I could, I agree, but I also think that the thought occurred to me as I was listening to the discussion, did we comment on the OSHA RFI? Because we could at least say, you know, with the part that you leave out, I know I

have said it in --

COMMISSIONER MERRIFIELD: I believe we're getting a Marty Virgilio head nod. I believe we did, for the purposes of the record. It could well be that we may wish to supplement that in some way if need be.

DR. RYAN: Commissioner, we would be happy to take this back up and move it forward in any way that is effective for the Commission or, in fact, expand our study and look at any additional questions.

And I'll take Commissioner McGaffigan's question on the ancient history of ICRP-2 and others and look at those in more detail. And we'll be happy to take your direction on how to move forward.

COMMISSIONER MERRIFIELD: Mr. Virgilio has just pointed out Mr. Cool. He's the person who knows all there is to know about OSHA.

DR. RYAN: Yes, he is.

COMMISSIONER MERRIFIELD: I'll do one last brief one. I would say I agree with Commissioner McGaffigan, Dr. Hinze, on your comments relative to igneous activity. I thought that was very helpful, certainly did raise the bar in terms of our understanding of these issues.

And I need not have your comments on that, and certainly we'll leave, as he said, others to perhaps ask more detailed questions. But thank you.

DR. HINZE: Thank you. As Chairman Ryan has indicated, there were a lot of people involved in trying to make this really

come out and be the right thing. And we had the cooperation of the staff and of our ACNW staff as well as the Committee.

CHAIRMAN DIAZ: Thank you. Commissioner Jaczko.

COMMISSIONER JACZKO: I wanted to try and ask questions on three different topics. We'll see how far I get. The first one is, as Commissioner Merrifield said, I had a little note on the white paper on low-level waste to supplement my bedtime reading with that paper. I've gotten through a little bit of it, I must say.

MR. CROFF: It's not that long.

(Laughter.)

COMMISSIONER JACZKO: Unfortunately, my bedtime reading is, unfortunately, somewhat long.

COMMISSIONER McGAFFIGAN: It also may tell you the sleep-inducing nature of that.

COMMISSIONER JACZKO: I won't say the extent of time that I've read each section, but one of the things that I think happened at the meeting last year, where we talked about this issue -- and one of the reasons that prompted me at that time to talk about it was the pending situation with Barnwell and what will happen potentially there. I think in mid 2008, they're scheduled to no longer receive B&C waste from out of compact states.

While I did think that the white paper was a very good review of kind of how we got to where we are, one of the things that I think would be helpful, too, is how potentially we deal with some of those pending issues. For instance, what will the situation be?

One of the things that I think you highlighted very prominently in the report is the fact that most of the effort so far to stimulate new development of low-level waste sights have failed. And we may find ourselves in a situation -- I don't want to speculate on the time frame -- where we may need to somehow develop new sites and what the right ways are to get those.

While some of those -- certainly the development aspect is certainly beyond the NRC scope, certainly I think it would be helpful to have your perspective or the Committee's perspective on how to deal with some of those issues and what may come out of that so that we're prepared from a regulatory standpoint to deal with the scenarios that develop. So that is perhaps one thing that I think would be helpful in that as well.

The next topic I want to touch on quickly is the waste incidental to processing. And I never miss an opportunity to give people more work when they request it. And I think, as you said there at the end of your slide, Dr. Croff talked about other activities, as requested by the Commission.

I will first ask this in the form of a question and then perhaps make a recommendation of my view. One of the things that has recently been released is the staff's technical evaluation report on the salt waste determination.

I'm wondering, did you have an opportunity to review that report or --

MR. CROFF: No. No, we did not review that.

COMMISSIONER JACZKO: In the future, is this something that you think the Committee would be able to review? I mean, certainly a lot of the issues that you raised in your letter on the Standard Review Plan I think apply equally to those reviews that are happening before we get the Standard Review Plan in place.

MR. CROFF: At this point, your direction has been to focus on the Standard Review Plan. So that's what the action plan does. We would certainly be able to review these more specific documents if you should so direct, yes.

COMMISSIONER JACZKO: Certainly I think from my perspective I think that would be very helpful for us. Since you hadn't had an opportunity to review it, I will perhaps give you an opportunity now.

(Laughter.)

COMMISSIONER JACZKO: There are a couple of issues that I did notice as I was going through it. And some of these, again, get to issues that Commissioner McGaffigan raised about institutional controls.

I think the staff's recommendation in that report was essentially that if -- I think there was a list of about 12 different criteria -- those criteria were complied with, or those assumptions were valid – I think they are assumptions, not criteria -- those assumptions were valid, it would be the staff's position, then, that this waste determination would comply with the provisions of the Defense Authorization Act for this particular determination.

One of the criterion there is that the institutional controls I think would be valid for 100 years. So I'll just ask you, I guess, that

question. When you talked about institutional controls, I think you mentioned the term is a relatively long term. Is 100 years in that time frame or do you think that is a good time frame to be looking at?

DR. RYAN: Commissioner Jaczko, one clarifying point. Our interest would be focused on the technical and technological durability, not financial instruments or other legal or other controlling issues that might also be asked in that same framework.

So, with that, I think, Allen, take it away.

MR. CROFF: With that I step into the pit, yes. First let me reemphasize that the language in our letter and in my answer here is related to the assumption of the duration of institutional control for the purpose of doing a performance assessment.

It is not necessarily what you would try to do or when you would say it would end, but where should you assume it fails and see what the consequences are?

I believe 100 years is a reasonable number. I think it's within the framework of reasonableness, at least. I have not done, nor have I seen an exhaustive review of how well we have done, say, in the last 50 years, you know, what has failed, how many have worked, how many have not. That may be there. I haven't seen it yet. But 100 to me personally, appears to be about right.

COMMISSIONER JACZKO: As I said, I think one of the things and certainly I think in the future, it would certainly be helpful to have the Committee review these.

One of the others issues that's in there -- and I won't ask

for your comment on this one -- is certainly there are a lot of modeling issues and modeling assumptions that have gone on.

And the staff makes a point that some of the modeling that is produced by the DOE for this particular determination does not show compliance with Part 61, but if more realistic modeling was developed, that would, in fact, show compliance with the performance objectives of Part 61.

So I think certainly having your take on some of those kinds of issues and having a better understanding of where that is going to go I think is important.

And I'll wait for the others if we have another round.

CHAIRMAN DIAZ: Okay. All right. Commissioner Lyons.

COMMISSIONER LYONS: Well, let me start by thanking the Committee. I very much appreciate the work you do, the caliber of the work you do, and the report today.

I was going to start out talking about the white paper on low-level rad waste. And two of my fellow Commissioners have already beat me to it.

I also have not read the report. I read the letter summary. It also is in my stack of bedtime reading. And I do intend to wade through it.

I think the point that Commissioner Merrifield made about how from the Commission perspective we'll need to evaluate where to put the resources in this particular area, I was also going to make comments very similar to that.

I have interacted with several of you on this question of low-level rad waste. And it's one that I have worried about a lot, as Commissioner Jaczko mentioned, particularly with the potential concerns coming in 2008. So it is an area that I am very interested in, but I do look forward to reading your report and probably getting back to you with questions after that.

DR. RYAN: Thank you.

COMMISSIONER LYONS: A question on, Mike, in your discussion, you talked about ICRP. You talked about BEIR VII.

DR. RYAN: Yes.

COMMISSIONER LYONS: There has been another major report in the last year from the French Academy, which came to I would say diametrically opposite conclusions than BEIR VII. And I was curious whether the Committee had considered an evaluation of the French work, perhaps a comparison of the French work, and BEIR VII, perhaps considerations of why they have come to such different conclusions.

But just, in general, have you looked at the French report yet and started into that at all?

DR. RYAN: I personally read it. I have not studied it. But we could certainly take up a comparison of that international work and integrate it into our thinking and advise you of our view on it. We have certainly not taken it up as a Committee.

COMMISSIONER LYONS: At least, from my perspective, I think that could be very, very interesting because you do have two very, very well-known research bodies coming up with very different

conclusions. And in my mind, that probably means there are some pretty fertile grounds there for further study.

COMMISSIONER McGAFFIGAN: From the same database, which is always good.

COMMISSIONER LYONS: I'm sorry?

COMMISSIONER McGAFFIGAN: From the same database. I mean, they're looking at the same literature.

COMMISSIONER LYONS: Well, actually, I think that will be one of the things that comes out in a review, is that it's not the same database, because BEIR VII very specifically did not consider the more recent DOE research, which was, in fact, why Dr. Orbach with DOE has expressed his concerns to BEIR VII, that they did not consider the more recent DOE work.

I believe the French report did consider it, but, again, I'm probably going further than I know on this report. And perhaps just because we're having this discussion, this may be indicative of a reason to look at it.

DR. RYAN: We can certainly take it up, Commissioner. And, again, as I mentioned, where I'm trying to be mindful of all emerging radiobiological research, both here and abroad, on some of these more fundamental radiation biology questions as they will ultimately either impact or not impact radiation protection requirements. So we'll certainly take that up.

Thank you.

COMMISSIONER LYONS: Just a few comments on your

action plan. I don't disagree that Yucca Mountain should remain at the top of your list and certainly remain in Tier I and be a continuing focus for ACNW, but, as I think you emphasized in your comments, the plans for Yucca Mountain, to say the least, are in a state of flux.

So I think what you do on Yucca Mountain is very much going to be a moving target. And to the extent that over the next few months it becomes a little bit more clear how DOE's thinking may be evolving on this, this would tie in perhaps with their so-called Genie initiative. There may be a number of changes coming which I think is going to provide a rather broad plate of activities for you.

DR. RYAN: Indeed. And I think in our strategic planning activities, we took up that exact question. And, in fact, in years past, most of our resources were devoted to Yucca Mountain-related activities. And this year there has been a rather significant shift. So that Yucca Mountain is not even the majority of our resources. We have shifted much of our resources to these other activities.

So we're very mindful of that. And Dr. Larkins and the other staff folks have helped us very efficiently become reoriented and, frankly, quite flexible based on how Yucca Mountain might shift. It's been a rather intensive planning exercise to be ready to do that, but I believe we are.

COMMISSIONER LYONS: You have the fuel cycle facilities in Tier II. And already Commissioner McGaffigan and Commissioner Merrifield have talked a little bit -- well, Commissioner Jaczko, too -- on increased interest in ISL mining.

And I think the comments that were made by my fellow Commissioners on the need to re-look at some of the regulations in that area would be time very well spent.

DR. RYAN: And if you see that they rise to a Tier I activity. We'd sure appreciate that clear guidance because we can certainly adjust. And that's obviously the reason for the review cycle. So we will be happy to respond as you prioritize for us.

COMMISSIONER LYONS: And then maybe one quick comment and a few others when we come to the second round. I would like to agree with Commissioner Jaczko that I think involving ACNW in WIR reviews I think would be, in waste incidental to reprocessing reviews I think would be, a very useful step.

Those are going to be very complex reviews, very challenging to the staff, very important to the DOE, very important to the country. And I think having ACNW's perspective on that could be very, very useful.

DR. RYAN: Thank you. We'll be happy to help.

CHAIRMAN DIAZ: All right. Well, thank you very much. I also want to express my appreciation the Committee. As I sit in here and listen to my fellow Commissioners, I think we have concluded that you can do a lot of work.

DR. RYAN: Yes. We try.

COMMISSIONER McGAFFIGAN: When you and I first got here, they were entirely focused on Yucca Mountain, and I think we have broadened their agenda. And I think it has been very useful to us to

have broadened your agenda.

CHAIRMAN DIAZ: Absolutely. I agree. I completely agree.

DR. RYAN: Thank you.

CHAIRMAN DIAZ: And it has certainly been helpful to us. And, as you take a look at other things, we are seeing that the panorama keeps changing.

Let me try to come up with some of the issues that were presented in your presentations. Dr. Ryan, in your cover letter, you refer to the collection of environmental monitoring data, these require the institutional control period, which goes back to some of the things that we were talking about, and indicated that this data could be used to increase confidence in long-term predictions of performance of low-level waste facilities. What types of data do you think are --

DR. RYAN: Well, that's a great question. And it gets to the working group I mentioned. For example, very often we think of taking samples and measuring a concentration and determining that complies with some license condition or requirement.

But at the same time, in that same monitoring, well, you could put a rather inexpensive constant water level monitoring so you could see water level going up and down.

There is an opportunity to enhance understanding of the geohydrological environment in that case as well as demonstrating compliance. And what we want to explore with the research group -- they have indicated a lot of enthusiasm for this -- is where are the other

opportunities where we can make a measurement to demonstrate compliance and also enhance through some other kind of measurement or complementary measurement to increase our confidence in how that system is fundamentally behaving. It gives you the ability to better interpret whatever that microcuries per cc might be. Is it important? Is it not important and so on?

And so I think there is an opportunity to increase confidence as well as demonstrate compliance over time.

CHAIRMAN DIAZ: I totally agree. I think that this is an area in which we always seem to be busy looking at the next model, but the reality is that there is an entire set of capabilities of monitoring all of those variables or not all, but the majority, of the variables that we need to make actual useful predictions for both, both compliance and performance. I think we talk about it and then we come back here.

I think that would be a very useful thing to do and take a specific case and actually go and see what is it that we need to get the information and how could that information be used for different types of things, either whether we're going to do institutional controls, whether it’s a 100 years, or periods of times like that.

DR. RYAN: And, again, we're mindful of the priority that, you know, some of those things could be very expensive, but some of them may be very inexpensive and easy to use and we want to explore that range of possibilities.

As you noted, we're across a wide range of disciplines here. And I think we can all work with staff and try to identify where we

can make those enhancements that provide the best return on investment.

CHAIRMAN DIAZ: Okay. Dr. Weiner, from your review, do you have one specific recommendation in which we should put additional resources and research that would actually benefit the Commission in making decisions?

DR. WEINER: At this time, I can't think of any specific single recommendation. I think as these research programs progress -- and we have had just recently some presentations that I was not able to cover in this meeting -- we will be making more specific recommendations. But I can certainly appreciate your request with respect to that.

CHAIRMAN DIAZ: All right. Thank you.

Mr. Croff, one of the flexibilities this agency has is contained in 61.58, which is alternative requirement for waste classifications and characteristics.

Given the flexibility that is given to the Commission in this rule, do you have any specific recommendations for alternative waste classifications now that you have looked at it?

MR. CROFF: Wow.

COMMISSIONER JACZKO: You thought my question was tough.

MR. CROFF: I would like to think about that.

CHAIRMAN DIAZ: How about you provide us a response to that?

MR. CROFF: Okay. Thank you.

CHAIRMAN DIAZ: It is --

DR. RYAN: Mr. Chairman, I would be happy to offer you my --

CHAIRMAN DIAZ: Okay. All right.

DR. RYAN: Upon request or its own initiative, the Commission may authorize other provisions for the classification and characteristics of waste and the specific basis if after evaluation of the specific characteristics of the waste disposal site and method of disposal, it finds reasonable assurance of compliance with the performance objectives of part C, which are the principal dose protection requirements.

CHAIRMAN DIAZ: Right.

DR. RYAN: I think my own personal view is if you maintain the risk-informing view of those things that will allow you to demonstrate those dose performance goals in the regulation without change, you have the ability to make alternate determinations on a case-by-case basis or within guidance for specific generic kinds of cases.

So I think the opportunity exists. I recognize that 61 and particularly the classification system it's in -- I believe it's 61.55 -- is now about 30 years old from its inception. I think the final EIS was 82 and the regulation thereafter. So a lot has changed in the kinds and types of waste that have been developed in the broader use of the classification system for WIR determinations.

There are many examples already in hand on how alternate determinations have been made. For example, in irradiated hardware from power plants, we have an averaging procedure that can take like materials over a range that might even bridge class C. As long

as that package averages below class C, it's low-level waste.

So there are examples out there where guidance can be offered. And I think going back to our letter and our follow-up with the staff is to try and identify and work with their program to make sure we identify the priorities that will best serve the Commission, the licensees, and do this in a risk-informed way. That's a start.

CHAIRMAN DIAZ: Okay. That's a start.

Commissioner McGaffigan, second round.

COMMISSIONER McGAFFIGAN: Since the Chairman didn't take me up on it, Dr. Hinze, I'll tell you --

CHAIRMAN DIAZ: No, I didn't because I ran out of time, but I will.

COMMISSIONER McGAFFIGAN: Okay. I will tell you one of the refreshing things about your study and discussion of rapid solidification, I mean, I'm not a volcanist, but intuitively to me it sounds more physical. With your predecessors some time removed, I remember with Dr. Garrick once we were talking about some model that had harmonic oscillators.

You know, the stuff was just sort of -- and it was so silly. I mean, it was because it was calculable. So the standard that I'm using is for yours to be the best thing I've read on the subject is not a high standard, but also --

(Laughter.)

COMMISSIONER MERRIFIELD: Aren't you glad for that clarification.

COMMISSIONER McGAFFIGAN: But, actually, I also think that it's a very good piece of work.

Okay. A couple of other issues. Institutional controls, 100 years, at DOE sites, they're still going to be there 100 years from now. They're still going to be there 500 years from now. I mean, I think it's different.

I think that the Committee's interest in, say, at West Valley, preferring -- you say that long-term control licenses are in decommissioning, long-term control license over restrictive covenants.

I can understand that. I mean, DOE is supposed to under the existing law leave, and NYSERDA becomes the licensee. And we might well -- I mean, we hinted at it in our policy statement – we might well require a long-term license for the enduring licensee there given how we see the possible cleanup of West Valley going.

So a long-term license may make sense. And long term may be very long-term, well over 100 years, I mean, you know, with sort of periodic reviews or whatever. Is this license terminatable at this time because we're feeling that we can?

So I'll tell you, in DOE space, 100 years is probably an optimistic estimate as to when they are going to be finished with their cleanup activities, first round. And there are certainly ongoing national requirements that will require them to continue to be there well beyond 100 years.

So 100 years to me is a short time for an institutional control at the DOE site. Mr. Croff, do you --

MR. CROFF: Well, again, to reiterate the point, I am talking about selecting a time at which a performance assessment will be performed for the purposes of making a decision.

COMMISSIONER McGAFFIGAN: I'm saying even for a performance assessment. I'm willing to go further. But we can have that discussion another time.

Two other quick points. I agree with Commissioner Lyons that we should look at the French Academy.

And then on the WIR reviews, I agree with Commissioner Jaczko that it isn't just the one that we just did. There's also a paper that the staff gave that I'm told is consistent with what we did, for example, allowing the reactor vessel with internals intact to go to the Hanford commercial waste site, about averaging. And it was something DOE asked our staff to provide early on. I think it's actually out for public comment. It's not a final thing.

But that's another example of something where I think you all could reasonably roll up your sleeves and give us and the staff a quick comment as to whether you believe that document on averaging is appropriate.

CHAIRMAN DIAZ: Commissioner Merrifield?

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman.

I was reminded of when you were having discussion with Commissioner Jaczko about the Low-Level Waste Policy Act a comment I made back in '98. And I still believe it. If I had to make my list of

unsuccessful Congressional initiatives, with over half a billion dollars spent and not a single low-level waste site identified, the Low-Level Waste Policy Act is probably one of the most horribly unsuccessful pieces of legislation that ever passed Congress. But you don't need to comment on that.

In terms of an area I do want to probe, Dr. Clarke, in your slides -- and this is somewhat along the lines of Commissioner McGaffigan's probing -- on slide 29, you reference the fact that long-term control license is preferred over restricted covenants.

Again, looking at it from my background in terms of trying to deal with brown field areas, areas where you were trying to get back into economic redevelopment, long-term licenses can put a cloud over a specific facility vice a restricted covenant, which would allow greater flexibility for the potential beneficial reuse of that land for the people who live around and near that site.

I was struck. Those comments are more -- it doesn't strike me as necessarily technical, which is traditionally your role, more of a land use issue and potentially a legal analysis, particularly vis-a-vis restrictive covenants. So I just wanted to know if you wanted to clarify that at all.

DR. CLARKE: I'm pleased. Thank you for the question.

The staff preference, as I understand it, for the long-term license has a basis in several factors. And you are correct. I am not an attorney. I'm very interested in this area, but I am not an attorney.

And their basis for the preference, as I understand it, is that this is not an option that the Nuclear Regulatory Commission has implemented. It's not been tested.

And, through work that I have done in other venues, I am aware, I believe, of the possibility that enforcing a restrictive covenant can depend very much on the jurisdiction in which the site is located.

So you're right. Those are not technical reasons for having a preference, but --

COMMISSIONER MERRIFIELD: Well, I have been here seven years. And I and others on this Commission have been trying to push the staff to look at this with a greater eye toward making it work. And clearly there are some members of our staff who would prefer to stick to sort of the old tried and true, but the problem is for some sites out there, I think we would be unnecessarily limiting the opportunity for beneficial reuse by sticking to our guns on that.

That's a problem that EPA has found in a variety of brown field sites across the country relative to hazardous waste and one that certainly I think is worthy of you perhaps thinking about it a bit more.

Before my time is up --

COMMISSIONER McGAFFIGAN: Can I just clarify my comment? I'm using your time.

It was a West Valley comment. At West Valley, I think we probably may well need a long-term license. I entirely agree with Commissioner Merrifield that restrictive covenants can be made to work in many other circumstances.

COMMISSIONER MERRIFIELD: Yes.

CHAIRMAN DIAZ: I think we surprise ourselves.

COMMISSIONER MERRIFIELD: Well, it continues to

trouble me that our staff is sort of – are where they are, but we can address that one, Mr. Chairman, later on.

CHAIRMAN DIAZ: Yes.

COMMISSIONER MERRIFIELD: The last thing I would say, Dr. Weiner, on your comments about the Center for Nuclear Waste Regulatory Analysis, you guys have spent a lot of time down there. We're in a position right now where given where DOE is and where we are, obviously there are some complications.

I would be interested separate and apart, perhaps in written form, if you could give us some suggestions about any identifiable areas that the Center might be able to broaden their assistance for the agency, either as it relates to issues in front of NMSS or potentially given all the reactors orders we have potentially ahead of us, whether there are areas of expertise they might be able to assist us on in the NRR side of the house because in my personal view, that is a resource that is dedicated to this agency.

They have done good work. And certainly, given the difficulties with Yucca Mountain, I don't think we should necessarily erode that work. Perhaps we can think of other areas for them to work on.

So if you might be --

DR. WEINER: Thank you. I'll take --

COMMISSIONER MERRIFIELD: -- able to contribute to that, I would appreciate it.

DR. WEINER: I will take that on. Thank you.

COMMISSIONER JACZKO: I wanted to go to a comment

that I think came out of the previous discussion and was in your letter on decommissioning. I think it's a very good comment. And that has to do with, again, in your letter on decommissioning, you said, "The committee recognizes that the lessons learned from decommissioning projects provide valuable information for designing new facilities."

That's something we heard a very similar point. We had a very productive meeting on decommissioning several months ago. And we heard a very similar comment from one of the decommissioning managers, essentially making the point that the best way to deal with decommissioning is to deal with problems up front. And I think it's a similar comment there.

I'm wondering if you could provide a little more information perhaps about how you see the Commission accomplishing that goal. Is that something that should be a part of design criteria if you have any thoughts on that at this point?

DR. CLARKE: Gee, I would like to think about that a little more, but I think the intent of the observation was on a new facility, you have an opportunity to factor into the design up front everything that you have learned in the past, life cycle analysis, whatever you want to call it, and that this is a real opportunity that I think should be seized as new facilities are being considered.

I don't think a requirement that that be considered in the initial design is unreasonable, just speaking for myself.

DR. RYAN: Jim, I might add, and Commissioner Jaczko, that I think that there are also opportunities for existing facilities. You

know, every facility receives inspection, whether it's directly from the NRC or through an Agreement State. And there is probably a gradation of facilities in terms of performance. How is their housekeeping? Do they generate a lot of waste? Have they had releases to the environment? What's worked well? What hasn't worked well?

And I think it would be helpful to try and gather -- and I'm not sure I even know how to best gather the information from the inspection process, but there may be some lessons learned there on who has been successful and not.

To me, from my own experience working for a licensee and with other licensees, that higher performance of maintaining control of materials during an operational phase certainly makes decommissioning easy.

And you can see a range of performance in that area. And I think picking it up, not only in the initial step of design and new facilities, but also, who has an older facility that is doing well versus an older facility that is not doing so well. And, that is another opportunity that I clearly see could enhance the response to your question.

COMMISSIONER JACZKO: I can appreciate that. Now, like I said, I think it was something that came out from the decommissioning manager. I think it's a very good point.

And certainly I think, again, adding to the list of potential work that I think the Chairman referred to, --

DR. RYAN: Sure.

COMMISSIONER JACZKO: -- this would potentially be

-- flushing that out a little bit I think would be very helpful and very fruitful long term.

DR. RYAN: One specific series of case examples is the decommission sites. To my knowledge, most sites that have been decommissioned have taken more time, more money, and generated more waste than initially expected. And that's because there was something identified. I don't know. There was a small leak over 20 years. And it created another 10,000 cubic feet of dirt that had to be managed and taken care of and so forth.

So the question would be not only how do you factor that into new design but is there a way for a similar facility to inspect or to investigate in such a way that you could address that earlier in the process, rather than at the end of the process?

So that's maybe a simple-minded example, but I think it's a real one in my own mind. There are opportunities to get it right as we go along, rather than just at the initial design or at the very end.

COMMISSIONER MERRIFIELD: Mr. Chairman, on that last note, I think there are -- we talked a lot about decommissioning. That's been an area which obviously, you know, I have a lot of interest in.

It might be worthy of taking a look at some of the things that they have been doing out at the Dairyland Power La Crosse site. That one has been somewhat under the radar screen, but they have been conducting a lot of ongoing decommissioning activities at a relatively modest cost.

Another one with some ongoing activity at the G.E. Morris

site. Although that is still an operating facility, the crew who operate that site have been able to do some work along the lines that has taken a lot of that material out at a relatively modest cost.

There may be some other areas in the scope you might want to take a look at.

DR. RYAN: Absolutely.

COMMISSIONER MERRIFIELD: Thank you.

COMMISSIONER McGAFFIGAN: Mr. Chairman, since Commissioner Merrifield managed to -- he's learned the art of not using somebody else's time -- let me just say that, again, following up on Commissioner Jaczko, if reprocessing is going to be considered in this nation, the only example we have at the moment of a reprocessing facility is West Valley. And it's an ugly one.

Figuring out from the start how to build design features into reprocessing plants so that they can be decommissioned for less than gazillions of dollars at the end would probably be a worthwhile place for you all to work if reprocessing is going to happen.

CHAIRMAN DIAZ: Interesting. I agree.

Commissioner Lyons?

COMMISSIONER LYONS: Just a couple of more comments. Dr. Weiner, you referred to the Package Performance Study, which you could put me down as a very strong advocate for doing that study, but that is another area where I worry that as DOE's plans are modified and changing, we may need to perhaps defer that study a while or at least be very careful before we jump into a study and then find that

DOE is undoing the parameters on which it is based. So that is more a comment, but maybe you want to respond.

DR. WEINER: Just briefly, one of the things that we are now engaged in is looking back at the history of NRC involvement in transportation. In particular, of course, it's been with transportation packaging. And we did have a presentation on the fabrication of the waste package, which has led to some consideration of this.

If the Department of Energy goes entirely as I expect they will to transporting canistered fuel, fuel that has already been canistered, it seems to me there are two apparent differences, two apparent considerations. One is that probably the robustness and testing and modeling of the behavior casks in very severe accidents is not going to yield anything that is worse than we have now. In other words, if there is another layer, all it can do is increase the safety.

On the other hand, if you have canistered fuel -- and we do transport some canistered fuel now -- the fuel at Idaho National Engineering Laboratory is already canistered. And that will be transported in type B spent fuel casks.

I believe that would probably carry fewer assemblies per cask, which would result in more trips. That is the most obvious result of this change, those two items. But I think that it does bear some looking at.

Since we have not yet received the protocols for the Package Performance Study and I recognize that the suggestion has also been made that we include, which wasn't originally the case, that we include fire in those, fire resistance in those protocols, I think there is an

opportunity to look at them and to perhaps structure them to better address what you are bringing up.

COMMISSIONER LYONS: Thank you.

The other question I was going to ask was to Dr. Croff, where you had many questions on waste incidental to reprocessing already. But in part of your discussion, you mentioned visits to Savannah River and discussions with different stakeholders in the Savannah River area.

I was just curious if you could perhaps characterize those discussions on the degree of support for the direction that is chosen or if you –

MR. CROFF: No. Maybe I misled. We did indeed visit Savannah River and talk with the DOE staff and tour and do the normal things. We were accompanied by one stakeholder and not a local stakeholder, but there were no public meetings or input obtained in that way.

COMMISSIONER LYONS: Thank you.

DR. RYAN: A member from Clark County, Nevada.

CHAIRMAN DIAZ: All right. On Commissioner McGaffigan's advice, I'm going to now turn to igneous activity. I do agree that the views presented provide us with a fresh view and a different view and one that I can really relate to in, again, physical terms.

The problem that we have had with igneous activity over the years that we have been here is the different groups with so many different opinions and the opposing, contradicting, sometimes slightly

supporting.

And, you know, I believe you have done a good piece of work, but let me bring it down to a level of something that the Commission would probably eventually like to do is, how do we reduce the body of knowledge to a set in which the Commission can eventually make a policy decision regarding what needs to be done in this area, if anything more, or how do we accept or how do we go forward?

In other words, you have an opinion. There are other opinions in there. How do we bring them to a set that this Commission can sit and decide what is it that should be done?

DR. HINZE: Well, Chairman, I remember writing a letter to the Commission, I think back in '91, suggesting that we start to think about closing down the igneous activity issue.

CHAIRMAN DIAZ: We have said this several times.

DR. HINZE: And I was author of those letters, some of those letters. So I must be beaten up on that. But let me just say that the knowledge regarding the prediction of volcanoes and its consequences in an underground facility were extremely primitive 15 years ago.

I mean, our knowledge was extremely limited. And through the efforts of the NRC, its contractors, the DOE, we have had a tremendous growth curve in the last decades. I see that as now starting to plateau out.

And I think that in this letter, we have hit these three items. And I think the alternative scenario is one that obviously we think that the NRC staff should investigate.

We're not telling them what is going to happen to it. We haven't done the calculations. And, frankly, it's going to take a good deal of effort to do that. It's not trivial. But I think it can be done and done in a manner that will be acceptable to the community.

I think also that the probablistic volcanic hazard analysis update that is currently being undertaken by the DOE and which is being monitored by your staff as well as us is looking at the very newest of data and, in fact, is collecting data; in fact, it's on hold right now because of some dating problem, some work to do dating.

So that, too, is really coming to fruition. I think we're seeing this plateau out, sir. And I think we're going to -- we'll never know everything, obviously, but we'll be there where we can minimize the uncertainties to the point where we can really deal with them in a risk-informed basis.

CHAIRMAN DIAZ: Sir, I totally agree that we will not know everything. I think what this Commission needs to have is a series of well-thought-out analyses that will allow the decision sometime. I don't know. Next year. I'm not going to prejudge. But there has to be a plan because we keep doing this, in which in front of the Commission, these issues need to be brought for deliberation and discussion and decision-making because if not, it keeps going ad infinitum.

One comment. I think we have a comment of minutes. And then I will go back to my fellow Commissioners. The issue of -- it's just amazing of how life goes on institutional controls, how long you need to control something.

Last night somebody asked me a question that I did not answer. I did not answer because whatever I answered could be misconstrued as a meeting and opinion, but the question was, if you have a geologic repository that is a nice geologic repository and you will put, you know, packages in there with, say, a lifetime expected of 300 years and you only expected them to be there for 100 years but the lifetime that is 300 years, would there be enough evidence now to be able to have a sound technical opinion, just sound technical opinion, on whether you could actually put in such a repository packages in a manner that they can be either recovered or kept for a period of 100 years?

And the word that was used was "used" fuel. I haven't seen that word in a long time, rather than spent fuel. It was used fuel, which I didn't relate to very well.

Did I express the question correctly? Will there be enough evidence technically to say you take a repository and put packages, like the packages that we have seen, and somebody were to conclude, like I heard many times that there are at least 300 years before these packages will have any problems, and we determined that they were only going to be there 100 years, at the end of 100 years, there is going to be, you know, an institutional control exacted on it.

Would you concede that that could be done with reasonable assurance of public health and safety?

COMMISSIONER McGAFFIGAN: Can I clarify the question, please?

CHAIRMAN DIAZ: Yes.

COMMISSIONER McGAFFIGAN: Are you implying that the fuel at that point may have useful value and, therefore, it was being taken out of the repository?

CHAIRMAN DIAZ: It could or it could be taken out at that time and put in another repository. It could be retransported. It could be moved. It could have a value. It could be done. I'm not assuming.

It's just that can you have something sitting on a geologic repository with a package supposedly is envisioned to last 300 years and you're going to have it 100 years. Do you think there is enough technical information that would be available to make a technical decision on it?

DR. RYAN: The easy answer is you chose not to answer that question.

(Laughter.)

DR. RYAN: It certainly embodies many of the challenges we have talked today, the last couple of hours about, Mr. Chairman.

CHAIRMAN DIAZ: It was an easy question.

DR. RYAN: It was an easy question.

CHAIRMAN DIAZ: All right. I just thought I would throw out that one for good thought. But do any of my fellow Commissioners have an additional comment or question?

(No response.)

CHAIRMAN DIAZ: If not, I want to thank the Committee. It has been fun. That's one of the best compliments that we all can think of. We actually enjoyed the discussion. We think you brought many issues to the table that we believe are important. We obviously have

enriched your plate with a series of what the NRC calls challenges.

DR. RYAN: Indeed.

CHAIRMAN DIAZ: And, therefore, we look forward to your work to continue communicating with us. Thank you very much. We are adjourned.

(Whereupon, the foregoing matter was concluded at 11:54 a.m.)

NRC NEWS

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PROVIDING CERTAINTY IN LOW-LEVEL RADIOACTIVE WASTE DISPOSAL: THE CONTINUING CHALLENGE

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U.S. NUCLEAR REGULATORY COMMISSION

KEYNOTE ADDRESS:
17th ANNUAL LOW-LEVEL RADIOACTIVE WASTE
DECISIONMAKERS' FORUM & TECHNICAL SYMPOSIUM
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Good morning. I am pleased to be here with you this morning to share my thoughts on the spectrum of issues facing nuclear licensees in their attempts to secure reliable options for disposal of low-level radioactive waste. The uncertainty as to the availability of safe and economical disposal options for low-level waste has become a key challenge for many categories of licensees.

Before discussing these issues, however, I would like to provide a status report on two related matters that could potentially affect low-level waste disposal activities. First, I will discuss the security measures that the NRC has taken in response to the terrorist attacks of September 11. And, second, I will provide a summary of recent activities related to the proposed high-level waste repository at Yucca Mountain, Nevada.

Security of Civilian Nuclear Activities

The terrible events of September 11 have had a profound impact on the NRC and its licensees. It has compelled all of us to reassess the full range of security issues involving NRC-related activities. This means, among other things, the examination of civilian uses of nuclear materials that have long been assumed to present minimal risks. As a result, the NRC has reassessed its assumptions about the nature of the threats with which our licensees might have to cope. In that regard, the events of September 11 have reinforced the fact that for all civilian nuclear facilities and activities, security concerns and safety are inextricably connected.

Nuclear security is not and cannot be an afterthought or an add-on; rather, it is integral to all our activities, across the board.

In the immediate aftermath of September 11, we advised reactor and fuel cycle licensees to proceed to the highest level of security -- a posture they have maintained in the intervening months. Many state and local government officials also took steps to augment power plant security forces with law enforcement personnel or National Guard troops. The NRC has worked closely with the Office of Homeland Security, the FBI, and other government agencies to provide our licensees with timely information about potential security threats. It is my view that nuclear facilities provide the strongest defenses that are to be found at civilian infrastructure in this country.

Although the NRC's primary safeguards focus has been on those facilities that constitute the highest risk, such as civilian nuclear power plants and fuel cycle facilities, we also are increasing security for those nuclear materials that could theoretically be used as radiological dispersal devices or "RDDs." Although there has been significant media attention to the hazards of such devices, our assessments indicate that RDDs are not particularly effective weapons in terms of the casualties that their use might be likely to cause. Large sources tend to be self-protecting and the dispersal of the material generally tends to reduce the hazard. RDDs are not very effective weapons, which is presumably the reason that such devices are not part of the arsenal of any country. Nonetheless, RDDs might be employed by a terrorist because of the fear that surrounds nuclear materials. Moreover, such a weapon could impose significant costs for cleanup and would obviously disrupt the use of the contaminated area until cleanup is accomplished. As a result, we have to assume that a terrorist might seek to use such a weapon.

The NRC has issued advisories to thousands of materials licensees and State agencies urging a number of specific actions to enhance the protection of nuclear materials. Generally speaking, these were directed to giving increased attention to unusual activities, ensuring conscientious use of security controls on radioactive materials, and restricting access during the use, storage, and transport of radioactive materials. The Commission is currently considering additional security enhancements as part of our comprehensive safeguards review.

The concern for security will result, over time, in a somewhat different focus in our regulation of nuclear materials. Our existing regulatory scheme is premised on ensuring the protection of the workers and the public from the licensed uses of radioactive materials, with little specific emphasis on preventing terrorist diversion and misuse of such materials. We clearly will have to build greater awareness that such materials could be used as weapons and to include elements in our regulations to reduce that threat.

Another area that we have had to reassess relates to the information that we make available to the public. September 11 made clear the need to rethink just how open we can and should be with respect to physical security issues. In assessing these issues, we must give due regard to two vital but competing interests. The first is the public's right to know, a right that is grounded in law and that is one of the most cherished principles of our democracy. The other is the need to keep sensitive information away from those whose purpose is to destroy that democracy. We are endeavoring to strike an appropriate balance between openness and security.

As many of you may already know, we initially brought down our website in order to give ourselves the opportunity to review its contents carefully. We needed to make sure that we were not inadvertently providing terrorists with information that could be valuable to them. In the intervening

months, we have restored much of that information to public view. We realize that this has been an inconvenience to many who deal with the NRC, and we appreciate the patience and understanding that the agency has received in this critical period.

Status of Activities Related to High-Level Waste Disposal

Let me now briefly discuss recent events related to the proposal to site a high-level waste repository at Yucca Mountain.

As you know, several months ago, President Bush formally accepted the Secretary of Energy's recommendation that the Yucca Mountain site be developed as a repository for the disposal of high-level nuclear wastes and spent nuclear fuel. On April 8th of this year, the Governor of Nevada provided the Congress with the State's "Notice of Disapproval of the Proposed Yucca Mountain Project." Under the law, the President's determination will become a final decision if, within 90 calendar days of continuous session, Congress passes a resolution approving it. The House took such action last week and hearings on the site recommendation are scheduled in the Senate. If Congress endorses the President's approach, DOE will be authorized to apply to the NRC for a license to construct the repository.

Of course, we cannot know with certainty what the outcome of the Congressional consideration will be. Nonetheless, the NRC needs to be prepared for the possibility of such an application. Specifically, as required under the Energy Policy Act of 1992, the NRC has promulgated the health and safety regulations to guide a licensing decision on Yucca Mountain. These are demanding regulations, and we are confident that any proposed repository that can be shown by DOE to comply with them will adequately protect the public, now and in the future.
In addition, in order to prepare for a potential license application review, the NRC staff recently published a draft of the Yucca Mountain Review Plan. Thus, NRC's regulatory framework for a review of a license application, should one be submitted, is largely in place.

If an application is submitted, the administrative proceeding before the NRC is likely to be extensive and complex. Our Atomic Safety and Licensing Board Panel has already begun work to prepare the ground, including development of the electronic tools that will make it possible for the parties to have access to the enormous volume of documents that can be expected. We plan to harness electronic technology to replace traditional document discovery and to expedite the hearing.

One issue that has been prominent in recent discussions of Yucca Mountain relates to the safety of the transport of spent fuel. Federal regulation of spent fuel transportation is shared by the U.S. Department of Transportation (DOT) and the NRC. DOT regulates the transport of all hazardous materials, including spent fuel, and has established regulations for shippers and carriers regarding, among other things, radiological controls, hazard communication, and training. For its part, NRC establishes design standards for the casks used to transport licensed spent fuel, and reviews and certifies cask designs prior to their use.
NRC also conducts an inspection and enforcement program, and reviews and approves physical security plans for spent fuel shipments.

The safety record associated with the current regulatory system is exemplary – approximately 1,300 shipments of civilian fuel and 920,000 miles without an accidental radioactive release. But, as elsewhere in our activities, a record of success does not preclude the possibility that undetected weaknesses may exist, and neither the NRC nor its licensees can afford to become complacent. We

therefore continually examine the transportation safety program. Over two years ago, NRC began the Package Performance Study to study cask performance under severe impact and fire accident conditions. The study plan calls for full-scale testing of a cask to confirm computer models of cask response to severe accident conditions. As a part of its evaluation, the NRC staff is analyzing appropriate national transportation accidents, such as the 2001 train accident in Baltimore, to determine if our transportation requirements need to be modified. Finally, NRC is sponsoring a study to update its evaluation of cask response to acts of sabotage. These studies, together with any resulting changes to our security requirements, if necessary, should further ensure the safety of the transportation of spent fuel.

Low-Level Waste Disposal

I will now turn to the central focus of this meeting -- low-level radioactive waste disposal. It will not be news to any one here that the low-level waste siting program in this country is not working. Moreover, barring Congressional action, which is unlikely in the near term, the situation is unlikely to change. Access to low-level waste disposal sites affects many classes of licensees, including nuclear power plant licensees intending to decommission their plants. My remarks today will concentrate on the strategies that the NRC is considering to make sure the uncertainty in obtaining uninterrupted access to licensed low-level waste disposal sites does not adversely affect licensees' ability to decommission their plants safely.

Before I begin, let me say that the NRC staff will make a number of detailed presentations at this meeting on some of these topics, so I will discuss them only briefly.

It has been estimated that the volume of low-level radioactive waste generated over 40 years of operation is approximately 600 cubic meters for a pressurized water reactor and is approximately 2700 cubic meters for a boiling water reactor.[1] Thus, the total volume of low-level waste generated by existing reactors is on the order of 150,000 cubic meters. If decommissioning is also considered, however, the estimates are 8,000 cubic meters of waste for a pressurized water reactor and 15,000 cubic meters for a boiling water reactor.[2] The resulting total volume is on the order of a million cubic meters. Volumes of contaminated soil at fuel cycle sites and sites managed under NRC's Site Decommissioning Management Plan are less well known, but could be on the order of 650,000 cubic meters. Consequently, although the estimates carry considerable uncertainty, it is clear that there is a significant volume of low-level waste for which a disposal site or sites will be needed.

Sufficient disposal capacity currently exists to handle today's disposal needs, particularly in light of the trend towards license renewal of civilian nuclear power plants. (License renewal delays decommissioning and hence postpones the need to dispose of the waste associated with decommissioning.) In addition, waste minimization, volume reduction, and decay-in-place strategies

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[1] C.C. Miller, "Radwaste Management at U.S. Nuclear Power Plants: Where We Are Today (and How We Got There),", Radwaste Magazine, Volume 6, Number 6, at 8, November/December 1999.

[2] G. Konzek and others, "Revised Analysis of Decommissioning for the Reference Pressurized Water Reactor Power Station," NUREG/CR-5884, November 1995, and R. Smith and others, "Revised Analyses of Decommissioning for the Reference Boiling Water Reactor Power Station," NUREG/CR-6174, July 1996.

reduce the overall volume of material. Nonetheless, the disposal situation is increasingly uncertain. With the eventual closure of the Barnwell disposal facility to states outside the Atlantic Compact, the absence of progress in other Compacts to site low-level waste disposal facilities, and few other disposal options, access to facilities for the disposal of low-level waste is increasingly constrained. Although Envirocare of Utah may eventually obtain state approval for disposal of Class B and C wastes, the limited options for disposal are likely to keep disposal costs high. There is thus the potential that the decommissioning process for many sites and the medical use of radionuclides will be affected adversely.[3]

Even today, the reduced availability and the associated high cost of disposal at licensed low-level waste disposal sites are fostering exploration of a series of alternatives (e.g., assured isolation, rubblization, and entombment). However, all these alternatives face considerable uncertainty.

Moreover, the situation is aggravated by the reality that one important aspect of the license termination rule -- restricted release -- is not functioning as intended. You will recall that the LTR allows, under certain circumstances, license termination with restrictions on future site use, so long as there is an appropriate third- party custodian, such as a governmental entity, that will maintain the site in perpetuity and there are legally enforceable institutional controls that limit exposure to 25 mrem for an average member of the critical group. Those NRC licensees interested in restricted release are finding it extremely difficult to find an appropriate custodian. Thus, it now seems that the broad flexibility that the NRC's license termination rule was intended to provide is not being realized. As a result, licensees with sites to be decommissioned are being forced to pursue unrestricted release, which means increased volumes that must be shipped to offsite waste disposal sites. This, of course, simply serves to enhance the demand for increasingly unavailable low-level disposal sites.

The Commission is aware of and concerned by these developments. In November 2001, I sent a letter to Secretary Abraham of the Department of Energy noting that Section 151(b) of the Nuclear Waste Policy Act allows the Department to assume title and custody of low-level radioactive waste and the land on which such waste is disposed of, provided the NRC makes certain findings. We advised that NRC has identified a number of sites (currently about seven) that might be appropriate for future license termination under restricted conditions and that could be candidates for the exercise of DOE's statutory authority for long-term stewardship. I encouraged DOE to continue to work with NRC staff to develop a Memorandum of Understanding that addresses issues associated with long-term stewardship. In January 2002 Undersecretary Card responded to my letter by recommending that DOE and NRC work together with an appropriate Federal land management agency such as the Department of the Interior, as well as with the Office of Management and Budget, to seek a solution. DOE and NRC staff are preparing to begin discussions with OMB and DOI. In the meantime, it has become apparent that the Commission must also explore other ways to make restricted release a viable decommissioning option under the license termination rule.

The Commission is also taking other steps that may address, to some extent, the lack of disposal options. The NRC has reaffirmed that uranium mills can be used for processing alternative feed material, such as material from the Corps of Engineers Formerly Utilized Sites Remedial Action Program. Similarly, the Commission has voted to approve the use of mill tailings impoundments for

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[3] National Research Council, Board on Radiation Effects Research, "The Impact of Low-Level Radioactive Waste Management Policy on Biomedical Research in the United States" 2001.

disposal of other radioactive wastes similar to mill tailings, so long as the approvals of the long-term custodian and the relevant Low-Level Waste Compact are received prior to disposal. Also, because mill tailings impoundments and RCRA Subtitle C facilities can provide similar levels of public health and safety protection, we are beginning to work with EPA to consider a rule that would allow for disposal of certain radioactive material in RCRA impoundments. Finally, the NRC has agreed to help fund an assessment by the National Academies of the key issues affecting the safe and cost-effective management of civilian low-level waste. Many of these topics will be discussed in detail by other presenters at this meeting.

One further option that the NRC is exploring in its search for safe and otherwise suitable approaches to decommissioning is the unrestricted release of slightly contaminated material that poses no significant health threat. If this could be accomplished, it would serve to preserve scarce space in low-level waste sites. As many of you may recall, in June 1999, the NRC published an issues paper in the Federal Register to foster discussion about alternative courses of action for control of slightly contaminated materials. We indicated an interest in exploring options to address the issues, including whether to establish a standard for release by rule. In addition, the NRC staff held a series of public meetings during the fall of 1999 at four locations around the country to provide further opportunity for public input.

Over 800 written comments were received. Potential recipients of solid material, such as scrap metals and cement industry representatives, strongly objected to the release of contaminated solid materials. These commenters asserted that there would be severe economic impact on their industries if consumers were to refuse to buy their products because of concerns over the presence of radioactivity. Citizen groups and other individuals expressed concern about health effects of the potential presence of this material in the environment and many argued that NRC should prohibit the release of any contaminated material. Others strongly favored the establishment of clearance levels.

The number and intensity of these comments indicated that further careful examination of the issue was needed. Moreover, it was clear from the comments that there was an element of distrust among some stakeholders as to the objectivity of the NRC in these matters. As a result, the Commission concluded that any successful resolution of the debate over the unrestricted release of slightly contaminated material would be facilitated by an independent assessment. Accordingly, the NRC deferred action so that the National Academies could study

the issue and make recommendations to us. In the interim, the NRC and Agreement State staff would continue to handle releases on a case-by-case basis.

The NAS study is now complete and the NRC staff is currently evaluating the report and its recommendations.[4] The report finds that there is no immediate need for resolution of the issue, but that steady progress toward resolution should be undertaken. Although urging further careful engagement with stakeholders, the Academies clearly see conditional release -- that is release of slightly contaminated materials to unlicensed individuals for limited uses -- as an option that is worthy of careful exploration. I am very much looking forward to receiving the staff's analysis of the report and

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[4] National Research Council, Board on Energy and Environmental Systems, "The Disposition Dilemma: Controlling the Release of Solid Materials from Nuclear Regulatory Commission-Licensed Facilities," March 2002.

its recommendations for further steps on the part of the Commission. The staff's analysis is due to the Commission within a few months.

Conclusion

Let me note in closing that the Commission fully appreciates the importance of bringing greater clarity and predictability to the issue of access to low-level waste disposal for both current and future needs. The challenges are complex. Technology, science, economics, law, and public opinion all play a part. While none of us expects quick or easy answers, there is a need to bring greater certainty to low-level waste disposal. The Commission is committed to this task.

Thank you.