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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON NUCLEAR WASTE SAFETY

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TUESDAY

JANUARY 30, 2001

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ROCKVILLE, MARYLAND

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The Commission met in the Commissioners' Conference Room, 1F16, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 9:30 a.m., Richard A. Meserve, Chairman, presiding.

PRESENT:

|                        |              |
|------------------------|--------------|
| RICHARD A. MESERVE     | Chairman     |
| NILS J. DIAZ           | Commissioner |
| GRETA J. DICUS         | Commissioner |
| EDWARD McGAFFIGAN, JR. | Commissioner |
| JEFFREY S. MERRIFIELD  | Commissioner |

I-N-D-E-X

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

(9:30 a.m.)

CHAIRMAN MESERVE: Good morning. On behalf of the Commission, I'd like to welcome you to today's briefing by the Office of Nuclear Materials Safety and Safeguards, the Office of Nuclear Regulatory Research and the Regional Office, represented by Region 4 on the status of programs in the nuclear waste safety arena.

As I think everyone in the audience knows, this is the third of our arena briefings. We've had them previously in the nuclear reactor safety area and in the materials safety arena and this one will move on to the area of the waste area.

Although the activities in this arena are perhaps less diverse than those in the materials arena, they present challenges that are unique and are very significant and difficult. We very much look forward to the presentations by the staff that has confronted them, the difficulties that this area presents.

Let me turn to Dr. Travers now to start the briefing.

DR. TRAVERS: Thank you, Chairman Meserve and good morning. The staff is glad to be here to provide the Commission with the status of the nuclear waste safety arena, as you've indicated. Today, as

we have been doing, we plan to highlight for the Commission our achievements in the past fiscal year, talk about some on-going and planned staff initiatives in the waste arena and some of the key Agency challenges that we see for the current and upcoming fiscal years.

As you are aware, the nuclear waste safety arena is a dynamic arena. It does have some diversity, certainly, and it includes facility decommissioning. It includes areas of both high level and low wastes, including the storage transportation and the disposal of those licensed materials.

And once again, we've brought together a key senior management team to provide the briefing. Carl Paperiello is, of course, the Deputy Executive Director for Materials Research and State Programs. Marty Virgilio is the Deputy Director for the Office of Nuclear Materials Safety and Safeguards. Margaret Federline is the Deputy Director for the Office of Research. And as you've indicated, Ellis is here with us today, Ellis Merschhoff who is the Regional Administrator for NRC's Region 4 and with that, let me turn it over to Carl for the briefing.

DR. PAPERIELLO: Thank you. Good morning. Could I have Slide 2, please?  
(Slide change.)

DR. PAPERIELLO: Today, I'm pleased to report to you on the NRC activities in the nuclear waste area as both the Chairman and EDO have alluded to this strategic arena includes some of the most dynamic and sensitive areas in which the NRC is involved, including high-level waste storage transportation disposal, decommissioning and license termination, low-level waste and release of material from regulatory control.

The Commission is and will continue to be involved in a number of very important policy decisions in this arena in the coming year. The nuclear waste arena is the smallest of the three technical programs the Commission is being briefed on with about one fifth of the FTE that is in the reactor arena.

The NRC has met all strategic and performance goals in this arena in Fiscal Year 2000. There were no deaths, no major radiological events, no significant releases and no loss of formula, quantities of materials and no major environmental impacts.

There were no events that resulted in radiation, overexposure, no breakdowns of physical protection that resulted in a vulnerability to radiological sabotage, threat, diversion or loss of special nuclear materials or radioactive waste; no environmental releases from operational activities that exceeded the regulatory limits and no cases in which radioactive wastes could not be safely handled, transported, stored or disposed of.

The NRC met 7 of 10 output measures. Mr. Virgilio and Margaret Federline will discuss the output measures further, but those that were not met involved high-level waste which were two items for which lacked an EPA standard, or one item, a lack of incoming applications in the case of transportation containers.

I want to acknowledge that success on many issues in this area is due in large part from the cooperation of many offices and these issues involve clearance, reactor license termination, congressional inquiries, partial site release, decommissioning and license termination and international coordination.

I would now like to discuss some of the key challenges in this arena. Could I have Slide 3, please?

(Slide change.)

DR. PAPERIELLO: Although we are challenged to risk inform our activities, especially our way or thinking and reacting to regulatory challenges, I believe this arena has been informed by risk considerations in several areas. The decommissioning rule is both risk informed and performance based. We are working to achieve the same result in Part 63.

Later in this presentation, Mr. Virgilio will describe additional activities in dry cask storage and spent fuel transportation to risk inform them.

Stakeholder confidence in this arena is very complex. In a case of high-level waste, there's a waste array of stakeholders from the Congress, DOE, Department of Defense, utilities, State utility regulators, Nevada State and local government officials and the public. Decommissioning has had a large amount of public involvement and has been affected by differences between the NRC and the EPA. We are involved with hearings on the licensing of private fuel storage and numerous stakeholder meetings have been held on clearance, a topic currently being studied by the National Academy of Sciences.

We have developed communications plans discussed later in this presentation to enhance stakeholder confidence and the NRC's ability to complete its mission in an efficient and timely fashion.

We have discussed in previous presentations the need to maintain a highly competent staff in the materials and reactor safety arenas. Some of the core competencies in this arena include performance assessment, criticality, particularly relating to burn-up credit, several disciplines relating to the geological sciences and the overall ability to master computer codes for a variety of environmental evaluations. And as we have discussed in the other arenas, there is a focus on entry level hiring and a formal qualification program for inspectors and license reviewers.

Our interfaces with other agencies are very important in this arena. The matrix of EPA interaction shows interactions in 18 areas. The NRC is extensively involved with DOE in this arena, both as a licensee or applicant under Parts 40, 63, 71 and 72, a co-regulator on ISCORS and a supporting agency with respect to material or site custody. We are engaged with the other federal agencies making up ISCORS.

Key Commission policy issues involving other federal agencies could include the presidential guidance on public exposure. And recall that although our Part 20 limit is 100 millirem per year, the presidential guidance which hasn't been updated in a couple decades is still 500 millirem per year. We anticipate that the EPA may offer a revision of that guidance in the coming year. The finality on decommissioning is still an open issue.

Sewer sludge and ash standards, this project to characterize sewer sludge and establish standards of the EPA began as a result of a congressional hearing several years ago. It is coming to completion in a coming calendar year.

We are interacting with DOE as you're well aware on decommissioning criteria for West Valley and we are interacting with DOE on other issues, one is taking title or custody of certain sites under Section 151(b) of the Nuclear Waste Policy Act and also their accepting greater than Class C waste that has been placed in dry cask canisters. And all of these issues will likely be coming to the Commission for policy decisions.

I'll now turn the presentation to Marty Virgilio.

MR. VIRGILIO: Thank you, Carl. Good morning. If I can have Slide 4, please?

(Slide change.)

MR. VIRGILIO: The first part of this presentation I'd like to talk about the output measures. MNSS met six of the output measures, those associated with resolution of technical issues for the Yucca Mountain site, those associated with commenting on DOE's programs, specifically comments on the draft environmental impact statement, high-level waste storage and installation design reviews, maintenance of the low-level waste regulatory framework, specifically a branch technical position for low-level waste performance assessments, and we've removed three sites from the site decommissioning management plan list.

What we did not meet were three measures, as Carl said, associated with this program. The first we did not publish Part 63 on the schedule that we had anticipated, that having to do with the resolution of a number of complex technical issues and it was also complicated by the delay of the standards required to be issued by EPA.

Similarly for the draft Yucca Mountain Review Plan, the guidance that we're going to use to evaluate a submittal by DOE, we did not publish that guidance, again, because of the resolution of complex issues and the delay in the issuance of the standard by EPA.

With regard to transportation reviews, we completed 96 of our transportation container design reviews. We had originally scheduled to complete 125. However, mid-cycle, about the middle of the year in the January-February time frame, we realized that the incoming, that did not meet our expectations.

We weren't getting the submittals at the rate that we expected to get the submittals. So therefore we revised our target downward and took those resources and used them to work down the expending cases that we had. So that's how we did against those output measures.

The next slide I just wanted to talk about, actually the next two slides I want to talk about some on-going assessments that we have within the waste arena.

(Slide change.)

MR. VIRGILIO: The first is to rebaseline the materials decommissioning program. Much of this effort was described in a SECY paper. It was SECY-0094, the status of the decommissioning program that we issued last April. NMSS is currently in the process of rebaselining the materials decommissioning program to determine the current status of each site on the site decommissioning management plan and also the status of each of our complex sites.

What we'll be doing is developing site status summaries and updating those site status summaries on a quarterly basis. For those licensees that have submitted a decommissioning plan, we'll use the schedules that are included in those decommissioning plans. For those licensees that have not yet submitted a plan, what we intend to do is work aggressively with the licensees to get the information we need to make the projections.

Individual site milestones will be established and they'll be tracked, not only in this plan, but at a more detailed level in our own operating plants.

In addition, I mentioned interacting more directly and more aggressively with these licensees. We will be doing that to get the information we need. We will also be doing that to resolve any issues that we have. We're going to streamline our review processes so that we get down to one question per review approach to doing business. We'll be conducting side by side confirmatory surveys with the licensees as they go through the decommissioning process and we'll wrap this up in terms of status reports periodically for the Commission. The next status report for the Commission is due to you in August of this year.

That's all I wanted to say about that effort, but there's another effort that's closely linked to that and that has to do with the decommission appropriations funding analysis that we have under way. Here, in response to Commission direction, we've started a number of additional initiatives and assessments under way. The first having to do with estimating and requesting funds for State directed remediation of terminated licenses in affected States.

These are nonagreement States. Then we're also -- the second phase of this is to look at the SDMP or site decommissioning management plan sites and other complex sites and look at establishing an agreement with DOE for long-term care of these sites following the termination of the license. And the third phase of this effort is to identify potential sites where licensees may have insufficient funds to conduct decommissioning and as part of that assessment, we'll be preparing initial cost estimates for both unrestricted and restricted release options and determining whether the State or other federal agencies might be willing to direct site remediation for these facilities.

Like the decommissioning program, we'll be wrapping this up periodically in assessments for the Commission to give you updates on where we stand on these programs and the next update for the Commission on this program is due in April of 2002.

If I can have Slide 6, please?

(Slide change.)

MR. VIRGILIO: The next assessment I wanted to brief you on is the consolidation and update of the NMSS decommissioning policy and guidance. This is a two-phase program that we have underway today. The first phase is basically to identify the guidance documents that we would be consolidating and updating, not all of them are subject to this updating process; developing technical basis to support the updating process and interacting with the stakeholders as part of the decommissioning process.

Phase 2 will actually be the revision and consolidation of the guidance and approval of any policy issues will come forward to the Commission and then we'll go forward and implement that program.

I wanted to also mention the risk group case studies of Bill Kane. When we briefed on the materials arena mentioned these studies. What we're doing today is looking at the waste arena in specific areas to determine what has been done in terms of risk informing our programs to see what can be done in the future to establish a framework for further risk informing the activities in the waste arena and also to see if we can derive and develop safety goals in this area.

Individual studies that we'll be doing in the waste arena include site decommissioning, radioactive material transportation and spent fuel interim storage.

On the subject of risk, I'll divert for just a second and talk about risk training. We have just taught the first basic risk training course. We did that here in headquarters. It's the introduction to risk assessment. It's a P400 series course. We did this here in headquarters with a lot of assistance from TTC. Ken Raglia and his staff were very instrumental in helping us develop this course.

This is a course that's being designed for all headquarters' employees that are involved in the waste arena, and also, the region-based employees that are involved in the waste arena as well, so it's for both reviewers and inspectors that are working in the technical matter.

This course was developed with significant headquarters and regional input and another course that we're working on today is the introduction to risk management for NMSS and technical managers. That's going to be a P401 course.

These courses, although they're primarily going to be given here in headquarters in FY01 we have one scheduled to be given in Region 3 as well. So we'll be getting out into the field and offering these courses out there as well.

Now the next phase of the project, beyond teaching or providing course opportunities for the managers working in this arena is to provide more detailed training for the people that are actually using these tools. This is just a basic course that we have now. What we want to do is more forward and have an advanced training program and NMSS and the TTC staff today are working together to develop a needs assessment that will allow us to better design this course more specifically to the decisions that have to be made.

That's all I wanted to say on that slide. If I could move to Slide 7, please.

(Slide change.)

MR. VIRGILIO: NMSS has a number of other related initiatives that I just wanted to highlight to you in the waste arena, the first being in communications. Carl mentioned our initiatives here to improve stakeholder confidence. We are communicating both internally and externally. Today, internally we are developing policy and procedures guidelines and individual communications plans. Our internal communications initiatives include regular staff meetings and then periodic meetings at the office management level with all NMSS staff.

We're also getting out to the regions periodically. Our senior managers are out participating in the region counterpart meetings. Also speaking of the topics that we have, hot topics and issues of the day.

We're creating an NMSS internal website and we're using an NMSS e-mail box for additional communication purposes internally. When I think about externally, I look at the communications plans that we've developed and are further refining particularly in high level waste, including transportation. We have communications plans. We have established a website in that area. We're developing a set of frequently asked questions and answers to those questions to be used both internally and externally.

For decommissioning we have a number of related initiatives under way including workshops that we've had. Site-specific training and we're starting to use the site survey, the feedback form that's been developed for the public meetings and getting a sense for how these presentations are going.

On the web status, NMSS has been actively engaged in the Agency-wide effort to redesign the web. We're working along with CIO and other partners in this project. We are currently mapping our web pages, the NMSS web pages to the new web design and we're looking at how we periodically maintain these

pages to keep them up to date and keep them relevant so that the stakeholders that log on to the web can get to them easy and have information that they can readily understand.

Another initiative that we have underway has to do with empowerment. What we want to do is basically increase employee satisfaction at NMSS and also increase the efficiency and effectiveness of our programs.

We believe that we have a number of initiatives underway that have the capability to increase empowerment in NRC and when I talk about increasing empowerment, I'm just basically talking about increasing the authority and accountability of the staff at all levels to make decisions within their scope of responsibility and perform tasks that they're responsible to perform.

On the last item I just wanted to speak to briefly is rulemaking for certificates of compliance. We have a number of initiatives there to improve our efficiencies.

Three initiatives I wanted to highlight to you include the use of standard rulemaking packages, both for the rulemaking plans and the final rulemaking packages. Having these certificates signed out by the EDO has also streamlined the process and we're also using direct final rulemaking for the amendment process which has been very successful. We've used this six times thus far. We've had one case where we had significant comments that dictated we go back into the more normal routine rulemaking process. But when you think about efficiency, we've gone to a cycle that typically takes about 51, 52 weeks and we brought it down to 23 weeks. So it's a significant time and resource savings by using the direct final rulemaking process.

There are also a number of other initiatives beyond these three that I'd just like to highlight, one being the new 7248 change process. This is like 5059 allowing licensees to make changes that don't significantly increase risk or have a minimal increase on risk without prior NRC approval. And we are currently responding to a petition for rulemaking that's come in from NEI that would amend the rulemaking process to make it more traditional, more like a traditional licensing process forecast as opposed to what we do today which is a rulemaking process. And our staff recommendations to the Commission are due within the next few months.

That's basically all I wanted to say about the initiatives that we have on-going in the waste arena and Ellis Merhoff is next and is going to speak about what the regions are doing in the waste arena.

MR. MERSHOFF: Thank you, Marty. Good morning, Chairman, Commissioners. I appreciate the opportunity to be here today.

(Slide change.)

MR. MERSHOFF: The Regions are implementing a diverse and evolving inspection program in the waste area. By way of illustration of this diversity, we inspect permanently shut down reactors to assure that activities are being performed safely and in compliance with NRC requirements, with emphasis on safe dismantlement operations and verifying that systems critical to the safe storage of spent fuel are properly monitored and maintained.

For shutdown reactors and active dismantlement, we inspect about four times per year and may increase the number of inspections based on the level and nature of safety significant activities in progress.

For permanently shut down reactors and safe store, we inspect about one or two times per year.

Our decommissioning inspections include reactors, fuel cycle facilities and materials sites where the emphasis is placed on radiation safety and control, the rigor and adequacy of licensee decommissioning programs and independent measurements. A number of materials and former fuel cycle sites are under enhanced oversight through the site decommissioning management plan, the SDMP plan. Nationwide, we currently have about 18 reactors in decommissioning or safe store, 27 SDMP or other complex decommissioning sites, and 18 former uranium recovery sites in remediation.

In addition to the major decommissioning activities just mentioned, the Regions also conduct inspections as needed of partial site release and routine materials licensed decommissioning and close out. Construction and licensing of independent spent fuel storage installations is a growth business in the Regions. We inspect civil, structural, security, operational and health physics aspects of ISFSI construction and operation. Currently, there are 19 operating ISFSIs with 18 more announced and in the planning stages nationwide.

Although uranium recovery activities are actually in the materials arena, a majority of the uranium recovery licensees are in some phase of decommissioning and site reclamation and a Region's inspection program for these sites is focused on these activities.

Inspections are conducted by Region 4 at 18 former uranium recovery sites. Most of these operated as conventional mills at one time and have large volumes of tailings and other waste. During these inspections we assess the adequacy of the rock cover, the radon barrier, ground water management and we take independent measurements. These inspections are conducted at least once every two years with a number of inspections increasing as a function of site activity.

May I have Slide 9, please?

(Slide change.)

MR. MERSHOFF: Formerly licensed sites nationwide include about 675 loose material and 564 sealed source sites that have been or will be located and surveyed by regional inspectors as an overcheck of the former AEC and NRC decommissioning decisions. So far, 38 of these sites have been found to have contamination levels above NRC's restrictive release limit.

The current role of the Regions in the inspection of high-level waste entails oversight of ISFSI construction, loading and operation and in the future may include, if licensed, inspection of construction activities at Yucca Mountain and private fuel storage.

Our low-level waste inspection program includes facilities like Envirocare where we focus on control and isolation of 1182 waste. These inspections focus on waste recede and handling operations, radiation safety and environmental protection. The Regions also conduct routine inspections of waste generators which include operator and reactor fuel cycle facilities and material licensees to ensure the proper storage, packaging, classification and transfer of low-level waste for disposal.

In the waste arena, the Regions are involved in the inspection of transportation activities involving all classifications of waste, from low specific activity material up to irradiated and spent fuel. These inspection activities include the preparation of the shipments, verification of shipping package requirements have been met and route surveys.

Slide 10, please.

(Slide change.)

MR. MERSHOFF: The Regions have made excellent progress in these areas. Our inspections have ensured safety operations at decommissioning facilities and recent successes include activities such as the Trojan reactor vessel removal project, progress in the large component removal and vessel segmentation at Adam Neck and at Maine Yankee and removal of the ventilation stack at Humboldt Bay.

In the fuel cycle areas, the Siemen's Power Corporation rafenate pond and legacy waste cleanup progress and General Atomic's trigger fuel facility decommissioning and release are both examples of success and progress.

In the materials are, waste material processing and recovery at the Fan steel site in Oklahoma, the hot cell facility decommissioning and release at General Atomics in California, and the underground waste removal at the Safety Light Corporation in Pennsylvania additionally represent successes in this area.

Our public outreach efforts have been successful as evidenced by positive feedback from public, local officials, licensees and the media.

In the areas of waste management we've contributed to safety at Envirocare in the areas of dose control and effluence; at Atlas Mohab where exposure to members of the public were approaching public

dose limits was largely as a result of site radon emissions and this resulted in changes to the licensee's program for monitoring public dose.

In the high-level waste area at Fort Saint Rein fuel was successfully loaded into their ISFSI at TMI too also loaded into the ISFSI at the Idaho National Engineering and Environmental Laboratory and transportation of foreign research reactor fuel to DOE Idaho was accomplished safely.

Finally, challenges in this arena will be addressed later by Carl, however, I'd like to highlight the Regions' key challenge for Fiscal Year 2001 which is staffing and training to support these diverse areas and their associated evolving requirements, while simultaneously training and transitioning to a risk-informed regulatory environment.

At this point, I'll turn the presentation over to Margaret Federline and I'd be happy to answer questions at the end of the presentation.

MS. FEDERLINE: Thanks, Ellis. Good morning. May I have Slide 11, please?  
(Slide change.)

MS. FEDERLINE: During my presentation this morning, I'd like to discuss how research is contributing to meeting Agency performance goals in the waste arena and just touch on a few of the challenges which we see are specific to research in this arena.

Research exceeded its waste arena output measure of issuing three research products that respond to high and medium priority needs by completing four products. As discussed in the materials briefing earlier, Fiscal Year 2000 targets focused on our developing realistic models for assessing radiation exposure. During Fiscal Year 2001 we have moved additional activities into the waste arena including the release of solid materials, dry cask storage and burnup credit and I'll discuss those on the next slide.

The goal of our radionuclide transport program has been to develop a tool box of analytical tools which facilitate the reviews of the broad range of sites that are included in this arena, including decommissioning sites, waste disposal sites and uranium recovery and mill tailing sites.

This year, we've made important progress in completing our tool box. We completed a technical data base of hydrologic parameter distributions for use in the probabilistic versions of radionuclide transport models and the goal of this is to facilitate a more transparent understanding of uncertainties related to these analyses.

We also completed a probabilistic version of RESRAD which is a popular radionuclide transport model and we've had very positive feedback from our stakeholders as they're able to use this to calculate more realistic estimates of potential doses.

We also completed guidance for characterization of decommissioning sites containing mineral slags from ore processing at SDMP sites. This work draws upon our cooperative work with Johns Hopkins University on degradation of archeological slags and it provides a more realistic basis for leach rates from such slags and will be used in the reviews of SDMP sites.

We also completed recommendations to the Commission on the entombment option for decommissioning considering previous research and also reflecting the views of our stakeholders that we interacted with during this process.

We'll continue to support NMSS in this regard as they develop a rule making plan which will come to the Commission in June of this year.

Now one of the most significant challenges specific for research in this area which will really benefit public confidence is the development of common models among federal agencies who worry about the transport of radioactive materials. We're excited to say that we're reaching an important milestone in that regard. We're culminating a Memorandum of Understanding with five other research organizations and EPA, DOE, the U.S. Agricultural Research Service, U.S. Geologic Service and the Corps of Engineers. This work will not only focus on the modeling concepts, but also on exchanging scientific information as a basis for the models and making sure we have a common understanding among the federal agencies. This will facilitate our work on the next tool that we need which is a linkage to a multi-dimensional ground water flow model for use in our more complex decommissioning sites.

May I have the next slide, please?  
(Slide change.)

MS. FEDERLINE: The discussion on this slide will illustrate our broad involvement in arena activities. Research has actively supported NMSS in their activities related to controlling the release of solid material. Our role in this regard is to develop the technical basis which the Commission will need in its deliberations on how to move forward on controlling the release of solid materials.

We've been sharing the results of our work internationally and also trying to take advantage of the extensive work that's going on elsewhere in this area.

In Fiscal Year 2000, the Commission is familiar, we placed the contract with the National Academies of Science to examine the alternatives for controlling release of solid materials. We also completed significant technical work in these areas, including more realistic parameters for dose modeling for clearance of soils.

In 2001, we plan to expand upon the work that was conducted in NUREG-1640 for estimating individual doses. We want to look at estimating collective doses, get a better handle on inventories of clearance materials, as well as looking at the implementation and operational costs of the scenarios that we've defined in this area.

One of the most significant areas of technical work during the coming year will be to develop a performance-based regulatory approach in this area, focusing on measurability as opposed to detectability. Our work emphasizes defining practical survey protocols and analytical techniques. For example, we're working on expanding the MARSSIM methodology which covered surface contamination and expanding it to use performance-based techniques to look at volumetric contamination.

And of course, our challenge in this area is to see that the technical work all stays on schedule so that we can provide this information to the Commission in a time frame consistent with the results of the National Academy Study.

In the dry cask storage area, we support NMSS by providing technical information to confirm decisions on renewal of dry cask storage certifications. As you are probably aware, Virginia Power is planning to come in for a license renewal in April of 2002. We're involved -- our stakeholder interactions in this area are particularly significant. We're involved in a cooperative program with DOE and EPRI to confirm the predicted behavior of a cask that's been storing fuel for 15 years. We've completed the visual inspections in this work and it's shown no cask degradation, no tears in the seals and no binding of the assemblies that were removed. So this year we're planning to move on to some destructive testing in this area to confirm the actual fuel performance during long-term storage.

Another important component in future activity is to confirm cask performance with storage of high burnup fuels by confirming cask integrity and fuel integrity.

I just wanted to mention in the area of burnup credit, the Commission is aware that fuel, press fuel assumptions have been used for evaluating criticality safety. Research has worked with NMSS in defining a phased research approach which will allow NMSS to grant incremental levels of more realistic guidance in this area. You're probably aware that NMSS has issued interim Staff Guidance 8, Revision 1, which will allow licensees to take credit for Actinide burnup credit. Our research was used in this effort and we also have just provided information in December which will allow licensees to expand the types of fuel on which Actinide burnup credit can be used.

We're also going to respond to needs in this area evaluating the feasibility of burnup credit for fission products and we'll be using our phenomenon identification and ranking process to focus on key issues in this regard.

Our key challenge in this area is to make sure that we don't duplicate work that's already been done around the world and try and take advantage of all the international work as well as RIVA's

experiment in Belgium that will benefit us in this regard.

That completes my presentation. I'll turn it over to Carl.

DR. PAPERIELLO: Can I have Slide 13?

(Slide change.)

DR. PAPERIELLO: The program is evolving and there'll be somewhat different emphasis in Fiscal Year 2001 than in Fiscal Year 2000.

Risk-informed activities will increase. You have heard a number of initiatives today and activities in this area and I do want to note the role of research in establishing the technical basis for a number of these activities.

This is the year the high-level waste transitions from preclicensing consultations with DOE which I want to remind everybody were mandated by Congress, to more traditional licensing activities: review of the EIS and review of site suitability.

We expect the site recommendation this year with a possible license application next year.

Using PBPM, we're going to be assessing all program results and make appropriate changes and this is being conducted as part of the Fiscal Year 2003 budget process which we have recently started.

May I have the next slide?

(Slide change.)

DR. PAPERIELLO: What are the key issues that are likely to come up and in fact, will come up in Fiscal Year 2001, many of which will have Commission policy decisions involved? Licensing casework, significant licensing casework. Private fuel storage. High-level waste. Dry cask amendments. We mentioned the licensed renewal which will get an application in 2002, we expect for the slurry cast and will begin the process of renewing and establishing policies for IFSFI license renewals. Decommissioning and the SDMP program is now involved in more of the more complicated sites where there is going to be coordination needed with the EPA for chemicals and perhaps even DOE custody of the site, if for restricted release.

We will be working on a lot of environmental and technical standards. Margaret mentioned the multi-media models. This is a follow-on to MARSSIM and I'm going to talk about harmonization under emerging issues, but it plays an important role in harmonizing standard. At least, we ought to be able to predict the same consequences for a given distribution of radioisotopes in the environment.

The Yucca Mountain Review Plan, clearance studies, National Academy of Sciences review, the modeling work both for material and for soil is on-going. The contracts are in place for looking at the detection, the measurement and surveying of radioisotopes and material. Engineering barrier research is on-going. We need to define more of what we mean by institutional control.

There's a number of issues with ISCORS. I mentioned the sewer sludge and presidential guidance. We may also be dealing with issues on mixed waste depending again on the speed at which EPA is involved in rule making and I think I previously mentioned West Valley.

Rulemaking, we've touched briefly on the petition from NEI for changes in Part 72. There may be changes in Part 72 that we recommend to you as a result of our efforts to streamline the licensing of dry cask, particularly the amendment process. We have to complete, we expect to complete Part 63. We have the greater than Class C waste rule. We have the revision of Part 71 to bring it into alignment with the international, current international criteria. And we also have an OU, a potential -- a rulemaking plan for entombment, potentially a plan. You'll get a paper. It will be your decision on whether to go forward.

Emerging issues. What could happen? Low-level waste, I think we're all aware that Barnwell is closing. There is not much of a change in what they will receive this year over previous years, but next year it gets cut in half and in about, I think about 6 or 7 years, it is phased out, at least for out of compact waste. That could evoke any number of creative ways of dealing with waste. I don't know what will happen, but some of these, we have a State come in and talk to us and I guess to you, about assured storage. Somebody may raise that. In fact, if we would propose to accept entombment, one could logically argue that assured storage isn't a lot different. I'm not saying that we're going to prove this. I'm just saying it could cause somebody to make a proposed -- extended storage. In the past, when we had the loss or potential loss of low-level waste disposal sites, we encouraged utilities to build facilities for extended storage of waste.

My guess is with the change in technology, a facility built a decade or more ago that had a capacity for certain number of years, would probably have a much higher capacity because there's been tremendous volume reductions in waste over the last 20 years.

And we may be involved with the entire care application to accept Class B and C waste. We've already dealt with at least one letter from the State of Utah on this issue. We may be asked questions from the State for assistance and I don't know. We could get asked to get involve with that.

And although we have responded recently to a petition on FUSRAP, that could still come up in the coming year.

There's any number of issues that deal with harmonization. Traditionally, harmonization and it was a meeting recently at the National Academy to ask for input, is considered harmonizing chemical and radiation standards. What I would assert and somebody at that meeting did, not me, that we don't even have harmonization among the radiation standards. I'll give you an example. Soil. Licensed termination, clearance or what we may get into later this year, the spreading of sewer sludge on soil, you have the same end state. Why shouldn't the standards be the same? Why should the standard be a function of how you get there? But in fact, we are evolving to a point where the standard is a function of how you get there.

There are issues with license termination and transportation package contamination. Transportation criteria evolved from essentially nondetectable 50 years ago, based on portable instruments at Los Alamos or at least I was told by somebody who claimed to be on the panel to a dose-based standard for decommissioning which could, in fact, be higher than the package limit. So therefore, I could decommission a facility and then a package could be offered with higher contamination than Part 71 would permit. So there's an inconsistency in the standards.

In institutional control, how do you implement it and how long is it good for? And then there is an issue in the Part 71, at least in the IAEA proposal where whether or not a material is hazardous is a function of what I intend to do with it. So if an ore is going to be processed for say gold or silver, the limits for hazardous material in terms of uranium or thorium are 10 times higher if I intend to process that mineral for its uranium values.

International developments, it could certainly affect us on clearance, on exemptions, on exclusions and commodities. We can't preclude additional, at least if I read the tarde press legislation, it could affect us. So these are all issues that are emerging and could come up in the next year, at least that I could foresee.

We have the licensing support network. This is the information handling system to deal with all the information that would -- that might be involved in a hearing on an application for high level waste disposal. The target to have that system in place is this year. There's also issues involving build out for the hearings, not necessarily to be completed this year, but in future years, to build the facilities both here and in Nevada to hold such a hearing.

We've already heard about the diverse and evolving inspection program. We have to recognize as the number of facilities grows, we're going to have to be handle the inspection of these facilities within the current staffing levels. We have to implement our various goals for hiring and retention. Our target this year is 25 percent entry level and that is a major challenge because in previous years we didn't make it.

Margaret touched on the expanding cooperative research program that we're entering into. If I could have the next slide?

(Slide change.)

DR. PAPERIELLO: In summary, we have met our strategic and performance goals. We met 7 of the 10 output measures and we discussed the ones that we did not meet. We have -- we are using -- we're beginning to use the PBPM process to emphasize outcomes and I think I presented to you, I hope I have, the key challenges that we face and what we're doing about them.

I would now like to turn it over to Bill Travers.

DR. TRAVERS: Well, I'll just simply say, Mr. Chairman, that that completes the staff's presentation.

Thank you very much.

CHAIRMAN MESERVE: I'd like to thank all of you for a very helpful presentation. You certainly have arrayed before us an intimidating list of matters for us, all of us, to deal with.

Let me turn to my colleagues for questions.

Mr. Diaz?

COMMISSIONER DIAZ: Mr. Chairman, first, I'd like to thank Carl for his introduction and when he clearly talked about risk-informed and performance-based approach it's a long story, I'll make it short. But I have a bunch of white hairs trying to convince Chairman Jackson to separate risk-informed from performance-based. I'm pleased to see that Carl now is right at that stage where I'll trust that he will do that.

However, having said that, if you look at page 13 of the presentation, the staff is still using --

COMMISSIONER MERRIFIELD: Don't bask in self-congratulations.

(Laughter.)

COMMISSIONER DIAZ: The staff is still using risk-informed, performance-based, while in the presentation, these issues were clearly separated and can only be put together on certain specific occasions.

Will you please make up your mind whether you have risk-informed or performance-based which I agree with Carl, of risk-informed, performance-based and reality, you know that the Commission has said clearly we are behind

risk-informed and/or performance-based. And that is a very clear distinction and I will encourage the staff when they put these things in their slides to make that effort.

Now let me to go the real issues in here. First, now that I have Carl on the burner and I praised him so highly, now I'm going to put him back on the burner.

The beginning statement you stated that there was no release from any site that was in excess of NRC limits. But however, Mr. Merschhoff says that there were 37 formerly licensed sites that have exceeded NRC limits. You put those two things together for me? There's something I'm missing in there.

DR. PAPERIELLO: I think we were referring to the fact that we went back and looked at all of the previously released sites, sites that were released by the AEC and like in the old days. And we identified that many sites that had to be recharacterized and re-looked at because we think we may have released them without -- I would argue we probably released them in accordance with the criteria that we thought we had in the 1960s. In other words people were working against 500 millirem per year. By today's criteria using 25 millirem, that is not acceptable. So I think -- and I don't have numbers. I can't tell you which sites fall in which categories, but we did find that number of sites over the years, over the last several years when we went back and looked at all of -- I forget how many sites.

DR. TRAVERS: I think we're rolling up a compilation of that information. I think all the inspections are intended to be complete this year.

COMMISSIONER DIAZ: So we will have that information.

DR. PAPERIELLO: I understand.

COMMISSIONER DIAZ: There just seemed to be a little discrepancy in there.

The issue of public confidence and I know that that has been a major new undertaking for you this year and you had plenty of opportunities to test how well we're doing in many different areas. Are you gathering these things together in a more compact plan with your lessons learned and these things? Are we getting to a point where we can really more effectively use our efforts in this area?

MR. VIRGILIO: I would say high-level waste and transportation, Commissioner Diaz, are two areas where we're continuously assessing the feedback and the lessons learned from the meetings and incorporating these in our plans and activities. Staff are being trained, procedures are changing. The way we interact at the meetings are constantly evolving as a result of these lessons learned. And they're tough lessons too. It's a tough crowd out there when it comes to high-level waste and transportation issues. So these are challenging meetings for our staff, but they are meeting the challenges.

COMMISSIONER DIAZ: All right, thank you.

Mr. Merschhoff, you talk about the diverse and evolving inspection program and you talk about how we're trying to train both the headquarters and the region staff on becoming more aware of what risk-informed regulation is.

There's a lot of issues in here that are performance-based. How is our training program in the regions addressing these issues of really looking ahead, having our people trained to be able to address that very diverse performance-based issues?

MR. MERSHOFF: We have a training program, training journals that we follow that have been revised and reviewed to move more towards performance-based and in fact, we've seen that in the past year or two, moving away from in the materials area, in particular, program reviews and out into the field at the site and observing activities actually being done. So we're ahead in terms of performance-based. The next big challenge is risk-informed and we have the tools in place. MARSSIM is having us focus in areas that have the highest risk, so we can employ our performance-based tools. The ISAs that are being developed for the fuel cycle facilities are doing the same thing.

COMMISSIONER DIAZ: All right, thank you.

Margaret, you talk about two words

that are very close to me, assurability and detectability. Can you tell me specifically what have we gained in that area that is positioning us well to be in good tracking with where we should be regarding timeliness in this issue?

MS. FEDERLINE: Yes. We essentially have a three-pronged approach that we're looking at. We're looking at developing improved survey protocols, looking at improved analytical methods which will allow us to enhance the survey protocols and then finally, we're looking at implementation, cost effective implementation of these. We have the contractors in three different areas working to bring those products all together and deliver them in a time frame which the Commission will be able to consider as it decides whether or not to go forward.

COMMISSIONER DIAZ: Thank you. Maybe I'll wait for my second turn, if there's time.

CHAIRMAN MESERVE: Commissioner McGaffigan.

COMMISSIONER MCGAFFIGAN: Thank you, Mr. Chairman. I'll join the other Commissioners in commending the staff for doing a great job this last year, moving the ball forward in so many areas.

There's a couple of questions I have, a lot of them dealing with decommissioning. I see Mr. Collins in the audience.

In terms of this arena, you mentioned, Ellis mentioned the reactors. Is the reactor decommissioning activities in this arena or are they considered in the reactor arena?

DR. PAPERIELLO: They are considered in this arena, but we overlap. That's not a --

COMMISSIONER MCGAFFIGAN: I'm just trying to figure -- there's one challenge that I would have thought might have been mentioned. There's a couple. There's the spent fuel pool study that we're going to have a separate Commission meeting on on the 20th of February and we don't need to dwell on that. But NRR also has an update of the supplement to the EIS on reactor decommissioning underway that EPA and others asked us to do, I think the last time we had updated that EIS may have been in the late 1980s, I forget. And we've done some town hall meetings around the country. We've got some complaints from some

stakeholders that they would have liked to have had even more time to prepare for that -- those scoping meetings and they've asked us to delay, etcetera, which I don't think we're going to do, but that's a major undertaking, fairly controversial and I would have thought it might be included here. I think I still see a little bit of stovepiping. It's a slight -- in that we focus on NMSS waste arena as opposed to the integrated waste arena here and it's just -- I think that's an important undertaking and I think the spent fuel pool issue study is an important undertaking and if they're in the waste arena, I would have listed them as challenges, just in passing, the decommissioning rulemaking, the decommissioning environmental impact statement, etcetera. It's just for next year you might want to think about that.

DR. PAPERIELLO: I do want to address your points and I think they're important. None of these areas are really -- we broke them up a certain way, but in fact, there's an overlap between materials, both in the reactors as well as in the waste arena, so all the things -- we are paying attention to the EIS. NRR has the lead on writing it, but I believe we're giving them support. There's issues there.

On the spent fuel pool, obviously, Zirconium Fire and the like, obviously research being under me, I have an interest. I have read the paper. I understand the paper. I have raised some issues with the staff on the whole thing. Even though it may be a predominant reactor, NRR project. I didn't put it in this arena although I'm very cognizant of it.

MR. VIRGILIO: There is also a decommission coordination committee that we have, so managers on both NMSS and NRR. And I would say that when I think about what we're going to hold up as a significant accomplishment in 2001, it's going to be the decommissioning of the Trojan and approval of their license termination plan.

COMMISSIONER MCGAFFIGAN: Ellis mentioned the reactor. In the regions, all this stuff tends -- Ellis is the one person who integrated, and I want to compliment him for that because he can't not integrate in the regions.

MR. MERSHOFF: We are in the middle in the case of SONGS, there's a project manager for NMSS. There's a project manager for NRR.

One thought, if I can add, we recently had a decommissioning counterpart meeting that Region 4 hosted. It was a headquarters meeting. NRR was there. NMSS was there. All of the offices work together in discussing the common problem, so the integration does occur.

COMMISSIONER MCGAFFIGAN: I am sure the integration occurs. And I'm sure -- I just think you should highlight it at this meeting each year, just if there are challenges. It doesn't mean that Sam or one of his deputies has to be at the table, but I think it would be worthwhile just saying we are working on this major EIS and we're working on decommissioning.

By the way, I think that that paper, Marty, that you mentioned, SECY-0094 was an excellent paper. I mean it was in response to Commission guidance, Commission Merrifield and I, to a lesser extent, worked on that guidance at the time, but it really gave us a comprehensive look at decommissioning as it existed last April. I think the Commission, you'll find, wouldn't mind having the -- you mentioned an August due date. I think we wouldn't mind a June due date for the update, but we thought it was going to be annual and we can negotiate on that.

Margaret, on the complex codes, the last time we did have a decommissioning briefing for the Commission, I thought we also were working on various dates of the DND code to make it more realistic.

MS. FEDERLINE: Yes.

COMMISSIONER MCGAFFIGAN: And I know we've done some, but there was -- my recollection was that we were trying to do a probabilistic RESREV --

MS. FEDERLINE: Yes.

COMMISSIONER MCGAFFIGAN: And then we were going to try to do a probabilistic DND.

MS. FEDERLINE: Yes, that's correct.

VICE CHAIRPERSON MITTEN: Where does that latter stand?

MS. FEDERLINE: Yes, we have completed the probabilistic version of DND as well. It was just not featured as one of our performance targets.

COMMISSIONER MCGAFFIGAN: Is it that the stakeholders didn't like it as much as the probabilistic RESREV?

MS. FEDERLINE: No, I think it was just the tail end of a significant activity that we'd been doing and our focus was on trying to also bring RESREV into the probabilistic fold.

COMMISSIONER MCGAFFIGAN: Finally, in terms of maintaining staff, one of the staffs we have that's an extension, maintaining competence staff, one of the staffs we have that's an extension of our staff is the center staff. It's the only FFRDC that works primarily for NRC.

How are we doing in terms of maintaining competent technical staff there? Do they have advantages compared to the civil service in being able to maintain competent staff?

MR. VIRGILIO: I don't know about their benefits package, but I do know that where we were when I think two years ago back where we had vacancies there that we were working to see and pressure the center to fill, they've overcome that. They're staffed today. And what we've done is I think we've improved our ability to put additional work out there. There are challenges as the flow of work associated with the high-level waste project. It tends to be a little bit cyclic. What we've been able to do over the last several years, working very cooperatively with their senior management is to balance that work load out with other activities and other projects.

So they've been able to maintain a fully staffed center and be able to work as work comes in for us on high-level waste to be able to focus on that work and not have to staff up again.

COMMISSIONER MCGAFFIGAN: I think that's terribly important as we move forward towards potentially dealing with site suitability recommendations and potential license applications. It's important that we maintain a very highly qualified, fully occupied staff there.

Thank you very much, Mr. Chairman.

CHAIRMAN MESERVE: Commissioner Merrifield.

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman. I'd like to second the comments that Commissioner McGaffigan just made about the center. I think it's a very important resource for this Commission and our moving forward in an informed wind in decisions we have to make relative to high-level waste and other waste issues, so I thank him for those comments.

Directing first towards Carl, I make a comment. To the extent we sometimes congratulate ourselves as a Commission or the staff in terms of all of the work that we have accomplished, the key challenges, as you have outlined them certainly seem to find that we remain relevant and have tasks ahead, so I guess that's a positive thing.

The first question I have is directed towards Marty Virgilio. On page 4 of your slides, you talked a bit about the output measures related to transportation container design reviews where you had an original target of 125. You've actually completed 96 and mentioned that, in fact, that was because of a lower than anticipated number of -- lower than anticipated receipt of materials from licensees.

You said as a result of that you modified your goals. I didn't quite -- if you could sort of walk through me what the actual numbers are. Did the number of submissions equate to the number of your modified goals and how are we to take that?

MR. VIRGILIO: We started out the year with a projection of 125. And it's -- we do our best to work with the stakeholders to get an understanding of what the incoming is going to be, but sometimes their estimates are not very precise. What we found and this was our projections early on, so we started into the year, the fiscal year, in September.

What we found in the January time frame or so, January-February is receipts were down by roughly 30 percent. So we adjusted our projections and revised that target from 125 down to 75, again, there's a lot of uncertainty in the estimates. There's a difference between 30 percent, but there's uncertainties, so we said let's revise our target down to 75 and let's also start working on the pending cases as a result of switching resources and attention to some of the pending cases at the end of the year

we completed 96, so again, there's a little bit of uncertainty.

You start with 125. You revise your estimate down to incoming, expecting 75, start working on the backlog and wind up in the end at the end of the year with the combination of incoming and backlog having completed 96 cases.

What we did was we reduced our pending which at the time we started into this which is roughly 50 down to roughly 35. So we were able to bring the backlog down.

We also -- so in the end, we wound up using roughly 90 so percent of the resources that we had targeted for this area in this area and we shifted some of our resources to dry cask storage. It was roughly 10 percent of our resources were shift.

DR. TRAVERS: We are in what I call some of the initial stages of looking at output measures and tracking them to make sure that we're not gaming the system. At the same time, I think an important point is here. If you think of the outcome that we are looking to achieve, I think we've actually met that even though when we report on some of this quantitative prediction and actual accomplishment, which we want to be pure on, I think an important point would be to say that we've done it in a way that we still met the outcome of the strategic goals of the Commission in carrying out and using the resources wisely given a change in the incoming requests that we've had from stakeholders, from licensees and applications.

COMMISSIONER MERRIFIELD: So I take it, given your revised expectation of receipts, the number you received was -- I was trying to follow your numbers, around 80 receipts this year?

You said you worked off your backlog, 15 off your backlog and down to 35. So you're sort of in that range?

MR. VIRGILIO: Right and as Bill said, the desired outcome is to meet the incoming and to reduce the pendings.

COMMISSIONER MERRIFIELD: I look forward to -- I'm sure you're working on a more detailed analysis of the accomplishments and I look forward to reviewing those down the line.

The second question goes to Margaret Federline. On page 11 of the slides you discuss some of your research initiatives that you currently have underway. And in fact, you mentioned in your verbal testimony that, in fact, you had four products that were completed versus what you originally anticipated would be three work products.

But my question is this, obviously the Commission has spent a lot of time over the course of the last year looking overall at the research programs and balancing out those resources that we direct towards short-term initiatives versus those which are more engaged with long-term measures. In your opinion, do we have at least as it relates to the nuclear waste arena, do we have the right level of balance between the short and long-term research initiatives under way right now?

MS. FEDERLINE: Well, I think we're discussing that with NMSS. Currently in the waste arena we're 100 percent user need. That does not say that the user needs don't look forward and I would just identify a case of NMSS has asked us to look at the package performance study.

You know, we have confidence that packages are transported safely in this country, but one thing we want to do is provide more transparent illustrations for public confidence and NMSS has asked us to take a look at that and that would be a long-term project, would involve international partners and domestic partners as well.

So you know, we are looking at that very closely. We'd like to move more in a direction of anticipatory engineered barriers, I think, given the emerging needs that Carl identified, looking at assured storage and what not. We need to look at effectiveness in that area, so you know, we continue to talk with NMSS about this.

COMMISSIONER MERRIFIELD: Okay, and to follow along Commissioner McGaffigan's line of questions, is it your expectation to try to focus to the extent that we can on some of those efforts to the center to take full advantage of perhaps some of those dips and peaks in terms of their work?

MS. FEDERLINE: Yes, absolutely. This year we did ask for an independent review of NUREG-1640 and the center conducted that, so we're looking for opportunities to involve the center wherever we can.

COMMISSIONER MERRIFIELD: Okay. The final questions I've got for now and I may have some additional for you in the second round, but I direct this toward Carl Paperiello and it's relative to the Yucca Mountain efforts we have underway.

As you know, there has been over the course over the last few weeks some concerns raised over DOE relative to the extent to which they may be leaning forward in their efforts at Yucca Mountain. And questions have been raised by the Nevada delegation and individuals from Nevada about the activities over there. Obviously, I think certainly from the rest of us the interest of the individuals from Nevada, people live in that site are important and should be appropriately balanced.

I want to direct a couple of questions at you just to clarify my own concerns. Do you believe, is it your impression that our Agency has a predetermined outcome relative to our review of issues associated with Yucca Mountain?

DR. PAPERIELLO: No.

COMMISSIONER MERRIFIELD: Have you been instructed by the Commission or anyone else associated at the Commission to reach a specific outcome related to the recommendations of the NRC relative to the --

DR. PAPERIELLO: Definitely not.

COMMISSIONER MERRIFIELD: You've not. If you or other members of the staff believed that the science either through what we do independently or through the center or other information becomes available to us, demonstrates that the licensing of Yucca Mountain would not be appropriate, are you prepared to give that recommendation to the Commission or do you have any reservations about giving that recommendation to the Commission?

DR. PAPERIELLO: Most certainly. We're going to give the Commission our best views and it's more complicated than that because we're putting out continuous reports on what we're finding in the raising issues. I mean we raised a number of issues with DOE. We do it in a public forum. So I don't think we have exhibited a predisposition. We're looking at the information and we're challenging the information and we're applying our own thoughts to the issues.

Now you say you're working on Yucca Mountain. That's because Congress mandated that be the place to be evaluated and mandated that we consult with DOE. I mean I don't actually have the resources or the mandate to say go out and evaluate, work on another site. But we are doing our -- trying to do and I think we are doing the best science that we can and making, and showing it to everybody.

COMMISSIONER MERRIFIELD: I thank you for those answers. I certainly am comforted by -- I don't know if anybody else of the Panel wants to make an addition to any comments that Carl Paperiello has made?

DR. TRAVERS: I don't think we could add anything to that. That's just where we are. Thank you.

COMMISSIONER MERRIFIELD: Great. Obviously, it's important and I think the public expects us to be independent in our views and to make whatever decision we feel is scientifically appropriate to the site so I thank the staff for that comment. Thank you.

CHAIRMAN MESERVE: I have just a few questions to follow up on some minor items in the slides that provoked -- my questions are really provoked by the oral presentation.

On Slide 6 when you were talking about the various case studies underway associated with the risk task group, obviously this was a vehicle for us to learn how we might think about risk-informing some of the activities in the materials and waste area.

You had indicated that one of the areas that you were examining as one of those case studies was decommissioning. If I were to pick one example of something where I think the Commission has already on record of proceeding on a risk-informed basis it was decommissioning in that our license termination rule is a dose standard which obviously is related to risk and everything is driven by trying to achieve

compliance in that area.

What more -- I'm intrigued to know what more the staff contemplates, thinks we should do in a decommissioning standards area to make it more risk-informed than it is already.

MR. VIRGILIO: I don't know that there is anything. I agree with you. We've done a lot. The license termination rule has taken us to a dose-based standard that is a risk-informed approach to regulating and decommissioning. What I think we can do here is look to see if there are insights that could help us shape safety goals in this area and that would be, I think, the emphasis of this study.

All of these studies go to what have we done, what can we do, what further could we do to risk-informed our programs, but they also are going to inform our on-going study to see if we can derive safety goals in these areas, whether one goal would be sufficient to envelope all of what we're doing within the waste arena or whether a series of goals would be a more appropriate way to address this issue.

And so we've broken it down in these case studies and in this decommissioning case study it would inform us, at least in this segment of what we're looking at as to what would be a safety goal or a set of safety goals?

CHAIRMAN MESERVE: On Slide 7 under "Other Related Initiatives" you have a relation, you indicated empowerment as an on-going task which, of course, is a very important area and one in which we want to make this a work environment in which people feel that they're accomplishing appropriate goals and feel satisfied with the work. You indicated that one of the ways you were trying to do that was increasing authority and responsibility at lower levels?

MR. VIRGILIO: Yes sir.

CHAIRMAN MESERVE: And you might talk about that a little bit more. It comes to mind and particularly to me in that we had a -- not in this arena, but we had an IG report that had talked about the review of the steam generator issue and was -- the assertion was that it had been done at too low a level without adequate supervision. I recognize there's a factual issue there that we and the staff may disagree, but there's -- it does seem to me that there's a dilemma for us on making sure the decisions are made at the right level, but at the same time making sure there's a satisfactory review and I'd like to -- you might talk about how you confront that sort of dilemma and how you make sure decisions are made at the right level?

MR. VIRGILIO: Let me just set a little bit of a backdrop. I'll get to your question. With respect to how we're approaching this at NMSS, it's almost on an individual basis, an organizational unit basis. It's -- there are so many diverse activities that I don't know that we could band everything with one policy or one set of tools to promote decision making at the right level.

So what we've done is we've established groups within NMSS to go down and look at -- for example, licensing reviewers and inspectors and staff working on rulemaking. What decisions do they have before them? What decisions are they making today and could they make decisions at the higher level?

We recognize that rulemaking -- within this context you recognize that rulemaking is the responsibility of the Commission, so that there are limits to decisions that can be made at any level as you work up the chain of command, but certainly we have division directors, we have deputy office directors, division directors, branch chiefs, section chiefs that are making decisions through that process on a particular rule and can we elevate that? Can we bring some of the decisions that are being made at the branch level down to the section level or down to the reviewer level?

That's the challenge today, not that we would at the staff level sign out a rule. We recognize that that's not -- that's the prerogative of the Commission, not been empowered to the staff. But there are things that the staff can do with regard to outlining options. Who is responsible for determining what would be the best set of options for a given rulemaking? What we'd like to do is bring that down to the staff level and have the staff members who's working on that lay out the options, lay out the pros and cons for the options. We believe that that will lead to a more satisfying job for that individual and promote even better decision making.

Now you work your way up the management chain and concurrence chain and as you work higher up you make sure that the policy is right, you make sure that the decisions are sound in light of other things that maybe that individual staff members can't see from their perspective. But I see that's our vision of how empowerment can work, just in that one example.

We do have team leaders. We do use the team leader concept, so we are now moving decisions downward in the organization.

CHAIRMAN MESERVE: My question is really how you police it. We've all had opportunities to work with, work for bosses before who have possessive of issues and sometimes appropriately so and sometimes inappropriately so from the vision of the worker. And I just wonder how as a management matter you sort of police the issue of how you make sure decisions are made at the right level and things that can be done quickly at a low level, a lower level are done that way?

MR. VIRGILIO: Part of it is feedback from the employees themselves. That's one mechanism that we're going to test in NMSS to see if we can do that, by surveying the employees, understanding how they feel about their job, how they feel about the decisions they're making and then coming back again as we move through these empowerment initiatives and see if the attitudes have changed.

If we're sensitive to this as managers, I think we'll look at the accomplishments and how the work was accomplished at the staff level and we provide feedback through the performance assessment process as well.

CHAIRMAN MESERVE: Margaret, I'd like to follow up on a question which Commissioner Merrifield had asked you in that you had indicated at the moment that work that you, research now undertakes in the waste arena and I think materials arena as well is one that is basically 100 percent driven by requests that are made from others of research.

I think one of the great challenges for research operation here is looking over the horizon for the issues that are emerging that are not yet so really apparent to those who are in the trenches of having to deal with the every day business of the Agency.

I wonder do you share that view, first of all?

MS. FEDERLINE: Yes.

CHAIRMAN MESERVE: And then secondly, you had mentioned engineering barriers, I think as one issue where you think that maybe research might want to move out of a little more quickly than your patrons would suggest.

Are there other things that NMSS has identified as things that it thinks it should be doing that relate to this arena that it does not have underway?

MS. FEDERLINE: I think engineering barriers is one of our primary areas. I think looking at methods for uncertainty analysis in terms of modeling environmental effects, I think we can push the state of the art there. I think where we can be very effective in supporting our internal stakeholders is perfecting the methods in a particular area and looking generically at the science, not in a case specific way, but making sure the best science is brought to bear.

And I think in the materials arena there's a lot of development in materials, ceramics and other materials, that offer long-term promise. They're not things that are being used today for waste disposal sites, but we see over the horizon could be used and that we could prepare the Agency to make decisions in that regard, but we think it's extremely important to have the balance between looking ahead and doing short-term needs.

The waste arena in research has a very small budget and sometimes we have to have the flexibility to in responding to current needs, you know, to do that work, but I think our long-term goal and I think NMSS shares this with us is to have a balance between anticipatory and confirmatory research.

CHAIRMAN MESERVE: Commissioner Dicus?

COMMISSIONER DICUS: I want to follow up on the empowerment questions that the Chairman asked and I think you answered one of my questions was how are you evaluating what the staff feels of empowerment? How is this coming back and you said you are going to do that. I assume that hasn't been

done yet?

MR. VIRGILIO: No.

COMMISSIONER DICUS: So we'll hear about it next year?

MR. VIRGILIO: Right. We are working very cooperatively with Office of Human Resources.

They've been supporting us with contract assistance and we are in the process of working to initiate the first survey and then we would come back and test that baseline again at a later time, but basically it is to test employee satisfaction, how do they feel about empowerment and then to come back. As a result of that survey, then we would go in and we would do some training for the managers and staff, specific to that organizational unit. So you might have one manager that's more empowered than another. They might get a different training program as a result of the survey and then we'll come back and test it again periodically.

COMMISSIONER DICUS: We'll look forward to hearing about that next year.

Research. One of the criticisms that has, on occasion, been leveled with research and I don't know -- it was more of a general, was a timeliness issue, whether the projects that were done were done in a way that the user that needed the information got it in a timely fashion. I'm assuming these products that did come out of research this year were timely?

MS. FEDERLINE: Yes, we believe we've implemented some process improvements working with Marty and Bill.

One thing we've done is integrate our operating plans, in other words, research milestones, go into NMSS operating plans and precursor items go from NMSS, go into research operating plans. So we can tell at any one point in time if they have a shift in a need or if we have a delay because of some new findings, it will immediately become apparent as part of our management review of the operating plan and we meet quarterly with Bill and Carl to go over by exception changes either new research information or emerging needs that have changed at NMSS. So we feel we have a process in place to make that happen.

As with any research, you can't guarantee results, you know, so you have to have a process that allows you to follow it.

COMMISSIONER DICUS: Something of a little plug for the cooperative research that you mentioned, particularly with international. I think you're aware that last week I was in Switzerland and I did visit the Paul Shearer Institute and among the many facilities that we visited in the half day that we spent there, was one where we're dealing with now on burnup, fuel burnup.

MS. FEDERLINE: Good.

COMMISSIONER DICUS: I was very impressed with what they're doing with the capabilities that they have there.

MS. FEDERLINE: Yes.

COMMISSIONER DICUS: I thought I would pass that along to you.

MS. FEDERLINE: Thank you.

COMMISSIONER DICUS: One final thing on Yucca Mountain, you mentioned if there's going to be a license application we might get it next year, is that building in the fact that there's basically been a 12-month delay?

DR. PAPERIELLO: I am basing my statement on what DOE told me within the last two weeks. It's sort of a moving target. I mean clearly, the site recommendation has slipped by somewhere in the order of five to six months. Exactly how that affects the license application -- it has to affect it. I'm just going by what DOE told me.

COMMISSIONER DICUS: And it affects what we're doing with the center, back to those questions and when everything starts slipping, it's just that it is something that we have to take into account.

That's it. Thank you, Mr. Chairman.

CHAIRMAN MESERVE: We have a little more time. Why don't we do, if people are interested, another quick round of question or so apiece so that we can -- if people have more, we'll give everyone an opportunity to share.

Commissioner Diaz?

COMMISSIONER DIAZ: Yes, two quick ones. One was already partially asked by the Chairman, but I want to focus on high-level waste research and we recently received a letter that I'm kind of quoting that the credibility and public acceptance of the NRC's licensing decision will also depend upon the adequacy and quality of NRC's independent confirmatory research. So it's looking at the high-level waste and with the confirmatory research is being established in that area.

Does NMSS and Research have any specific opinion on this issue, a little more specific than what we did just a moment ago?

MS. FEDERLINE: Well, the plan that we've worked out across the Agency is that, of course, the center will do the site-specific technical investigations. We have a generic environmental transport program where we focus on the fundamental elements, are there uncertainties with respect to absorption and uncertainties related to hydrologic transport? Are we using the best methods and we provide feedback to NMSS which they can use across their programs.

So in terms of we do not have a specific program that is Yucca Mountain specific, but our generic environmental transport program certainly is geared to the kind of issues that we will encounter as an agency in going through the hearings and we provide this information in NMSS and they use it across the various waste arena.

COMMISSIONER DIAZ: The question is are we thinking outside of the box, just in case we need to have a program that will be, could be relatively established if it needs to be? Are we looking ahead in those issues that appear that some of them will come out?

MS. FEDERLINE: Well, I think in areas in Fiscal Year 2001 coming up we have major products in conceptual model uncertainty which is a key issue for high-level waste. Also, more mechanistic absorption coefficients which are going to be extremely important in that area and uncertainty methodology. So certainly we're trying to think outside the box in terms of the issues.

COMMISSIONER DIAZ: Thank you. On page 14 when we talk about the key challenges and the SDMP sites, I noticed that one of the output measures is removal for Fiscal Year 2001, 2002, one site per year. For the past two years, we have removed three sites from the list. Is there a reason for the low number or are we revising it?

DR. PAPERIELLO: I would argue that we -- I know we have plucked a lot of relatively and this is very relative low hanging fruit. We are getting into sites that are going to be extremely difficult. There's groundwater, chemicals in some cases and I don't know exact number. I have the staff working on it. Whether there's sufficient money, so we can tell you who -- we're going to have to figure, scratch for money. So it's a more complicated one.

Some of the easiest ones and I say that in a relative sense are done and that's --

COMMISSIONER DIAZ: That's a complexity.

DR. PAPERIELLO: It's a complexity. In the report we owe you in June they're going to be described on decommissioning.

CHAIRMAN MESERVE: Thank you. We can look forward to June. Thank you.

(Laughter.)

Commissioner McGaffigan.

COMMISSIONER MCGAFFIGAN: I am probably just going to make a couple of statements. The letter that Commissioner Diaz referred to, basically, was written by a former research staffer who retired who was urging that we put the center under research as opposed to NMSS. That was the essence of his letter. I personally think that that would be a very, very bad idea, given that the process has worked well the last five years with the center under NMSS and would site suitability potentially looming with the license application thereafter. It makes no sense to me to change the institutional framework and the letter also mentions, I dealt with this issue at the waste water reactor safety

conference when David Lochbaum mentioned a concern that he was going to bring to the IG about whether we were violating the law by having this way.

I pointed out the AUOD had been a separate office for many years and it's one of his favorite research organizations within the NRC and no one had ever raised the issue that AUOD was somehow a violation of law.

So I think that there's -- that it's clear that we have the right to have the center report to NMSS and I think as we approach these critical milestones potentially, that it's vital that we keep the integrated effort going and I think the center does contribute a lot of long-term research. I think they're right at the state of the art in terms of understanding these complex issues.

The other item -- this is my usual lecture in case it's a GAO person in the audience and watching Commissioner Merrifield's dialogue with Mr. Virgilio. I think we have to be given the ability to make these mid-course corrections and just explain them to folks. I remember when Mr. Collins testified during the reactor meeting, we underperformed in terms of license, operating license exams. We didn't really underperform.

The rule overperformed in that we had fewer people coming to us for license exams and more people doing their own and these are hard to predict and so in advance, looking oftentimes 18 months ahead when we're setting these goals, what the real input will be for us in any given year and so we have to be able to make these mid-course corrections. We just have to explain them as Marty did in this case and as Mr. Collins did in the previous meeting and with those changes, we have the flexibility to put our resources where they need to be.

So please don't hold us to every output measure because it's nonsensical to hold us to every output measure. Give us the flexibility, Mr. GAO, or whoever watches these output measures to do whatever the right thing is.

Thank you.

CHAIRMAN MESERVE: Commissioner Merrifield.

COMMISSIONER MERRIFIELD: I find myself seconding Commissioner McGaffigan twice in a meeting. I agree with that. I think for us to do the best job we can as a Commission, I think the staff does have to have the flexibility to have those mid-course corrections, are justifying in the appropriate manner, obviously, will fulfill the obligations to be at GAO or to Congress or our general public.

Just two comments. I do appreciate the inquiry that the Chairman has made as did Commissioner Dicus about empowerment. I think obviously empowering people down the chain is important. I think it's a good initiative. There is a counterbalance to that and the counterbalance is the concurrence chain.

The sense of empowerment is not necessarily measured very well if it just means a longer concurrence chain, and so as you look toward empowering people, I think you also need to think about are there ways to shorten that concurrence chain so that we don't simply just add more names at the bottom of the concurrence chain to the extent that we're empowering people lower down the level.

The second comment I would make and you did have some detailed comments on pages 5 and 6 regarding decommissioning. You had a lot of things underway in decommissioning lately. We've gotten some papers up. I just want to note or I should say reinforce earlier sensitivities that I've given to the staff about our need to be cognizant of the fact that those efforts in decommissioning ultimately are passed along to our licensees and those who are involved with decommissioning are perhaps in less of a position to afford some of that operating reactor licensees.

The important point is to make sure that those facilities are decommissioned in a safe manner as soon as practical, even their own expectations and we just need to be cognizant about what we do and how impacts feeds. That's a standard warning I've said before and I just want to reinforce that.

Thank you, Mr. Chairman.

CHAIRMAN MESERVE: I have just one question to follow up on and this is directed at Margaret and it really is to follow up on the beginning comment that Commissioner Diaz has emphasized that we should all remember we are a performance-based organization as well as one that is seeking to be risk-informed.

We talked about MARSSIM or you mentioned MARSSIM which is, of course, basically a method, a sampling method that one uses for surface contamination and it basically sets out the protocol for determining how many samples you need to collect, how you collect them and so forth so that you have the balance of Type 1 and Type 2 errors. It's a statistical process.

And when we talked about that, you mentioned that the great shortfall of MARSSIM is that it doesn't deal with volume metric contamination which is the significance of many sites and it needs to be expanded to cover that. But when you talked about it, you said we're going to make MARSSIM performance-based. And I'm wondering how we're using the terminology. To me, MARSSIM is a sampling protocol. And I'm just curious what we mean, how we make -- what we mean when we say that's a performance-based activity.

MS. FEDERLINE: The intent is to define a statistical method which will allow licensees to determine how many samples they have to take according to a statistical rigor. In other words, it would not say you must take 150 samples or it would define the statistical protocol based on --

CHAIRMAN MESERVE: Okay, so it's basically the volumetric counterpart of the surface contamination, nothing else?

MS. FEDERLINE: Yes.

CHAIRMAN MESERVE: Thank you. Commissioner?

COMMISSIONER DICUS: Nothing further.

CHAIRMAN MESERVE: Good. Well, I think that I'd like to thank you all for a very informative briefing. This is an area that has got many difficult problems with which you are grappling and you are therefore presenting to us, for us to grapple with. We very much appreciate the efforts that you've made. This is perhaps an area of the Commission's activities that reflects I think well on the Commission in terms of the performance we've achieved in the past.

It's one that is going to be one that's increasingly, I think, in the public eye, when and if we have to deal in particular with a Yucca Mountain licensing action. So that this is an important area for the Commission and on behalf of the Commission, I'd like to express our appreciation to you for your good efforts.

For that, we're adjourned.

(Whereupon, at 11:10 a.m., the briefing was concluded.)